The Müller-Lyer Illusion
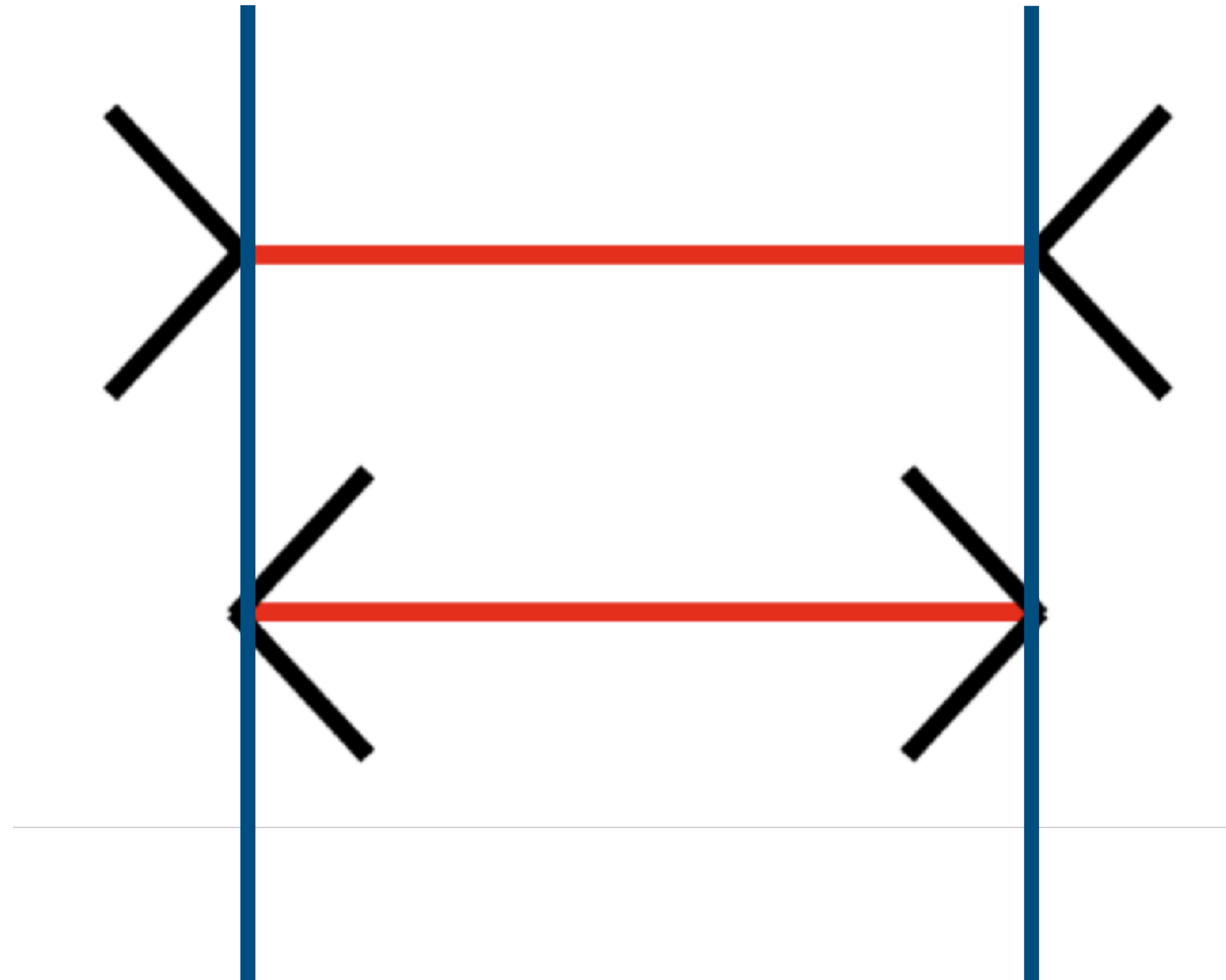
In *Natural* and *Artificial* Intelligence

Alish Dipani, *CoCo Fellow*

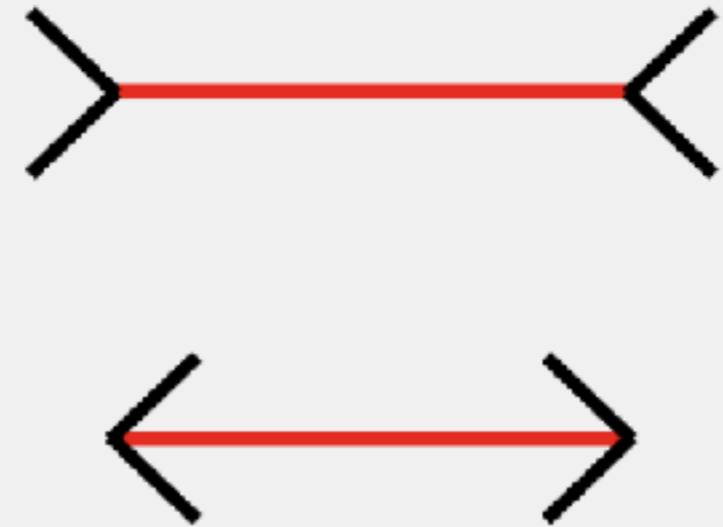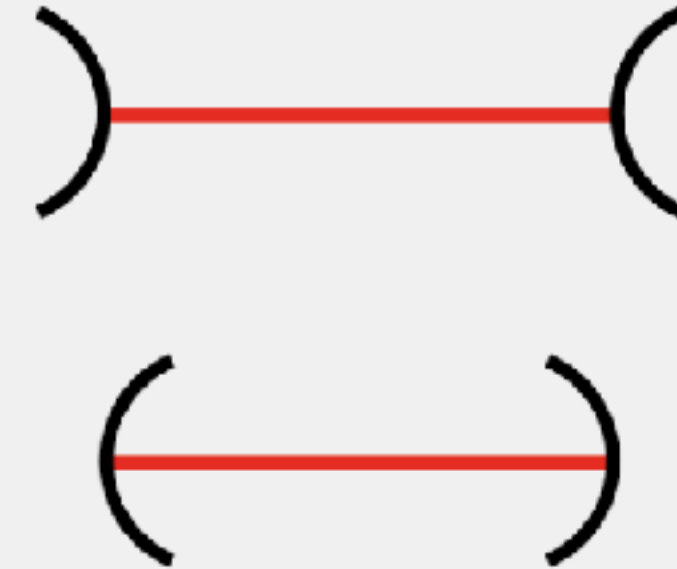# The Müller-Lyer Illusion
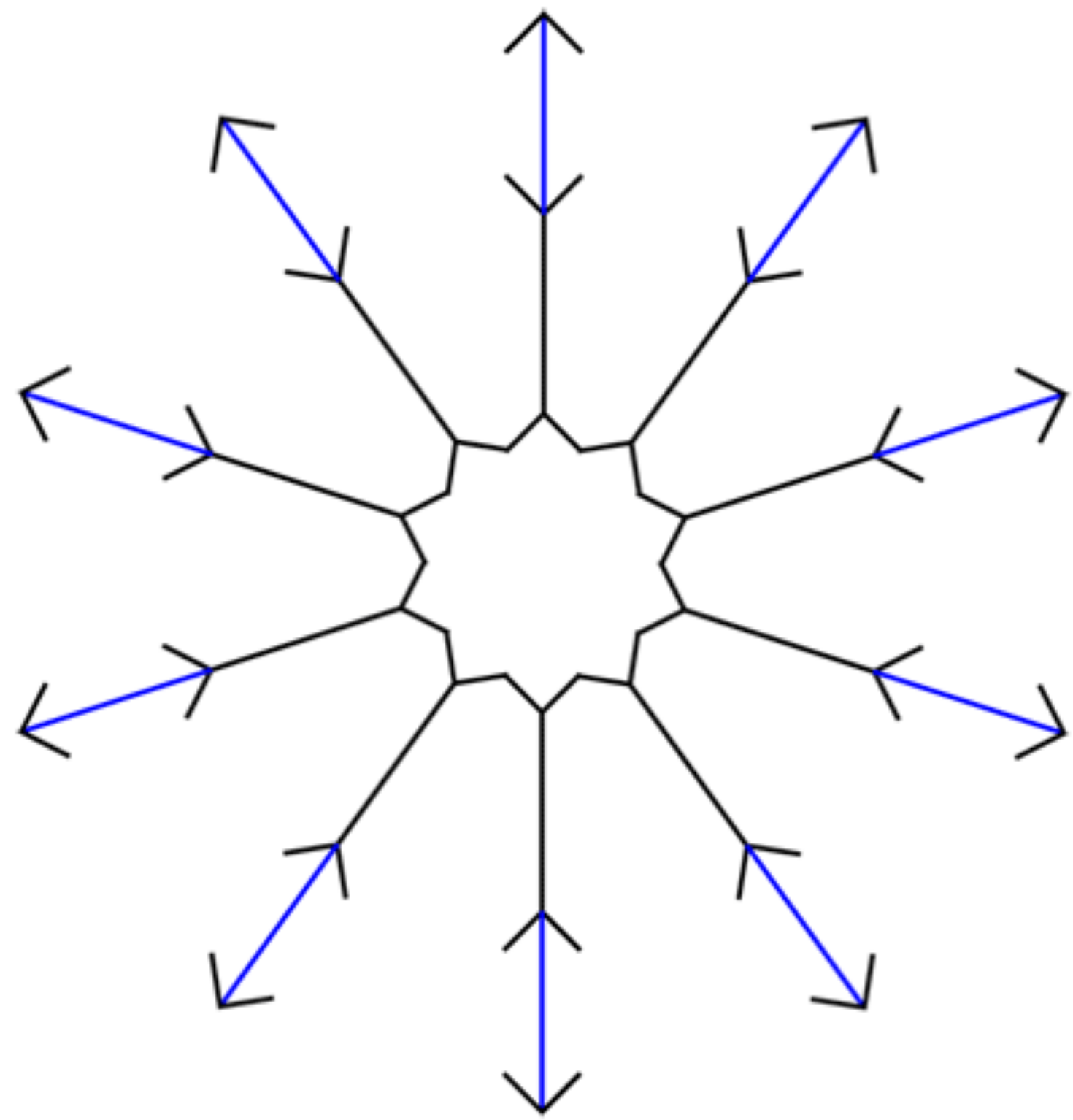
The Müller-Lyer Illusion
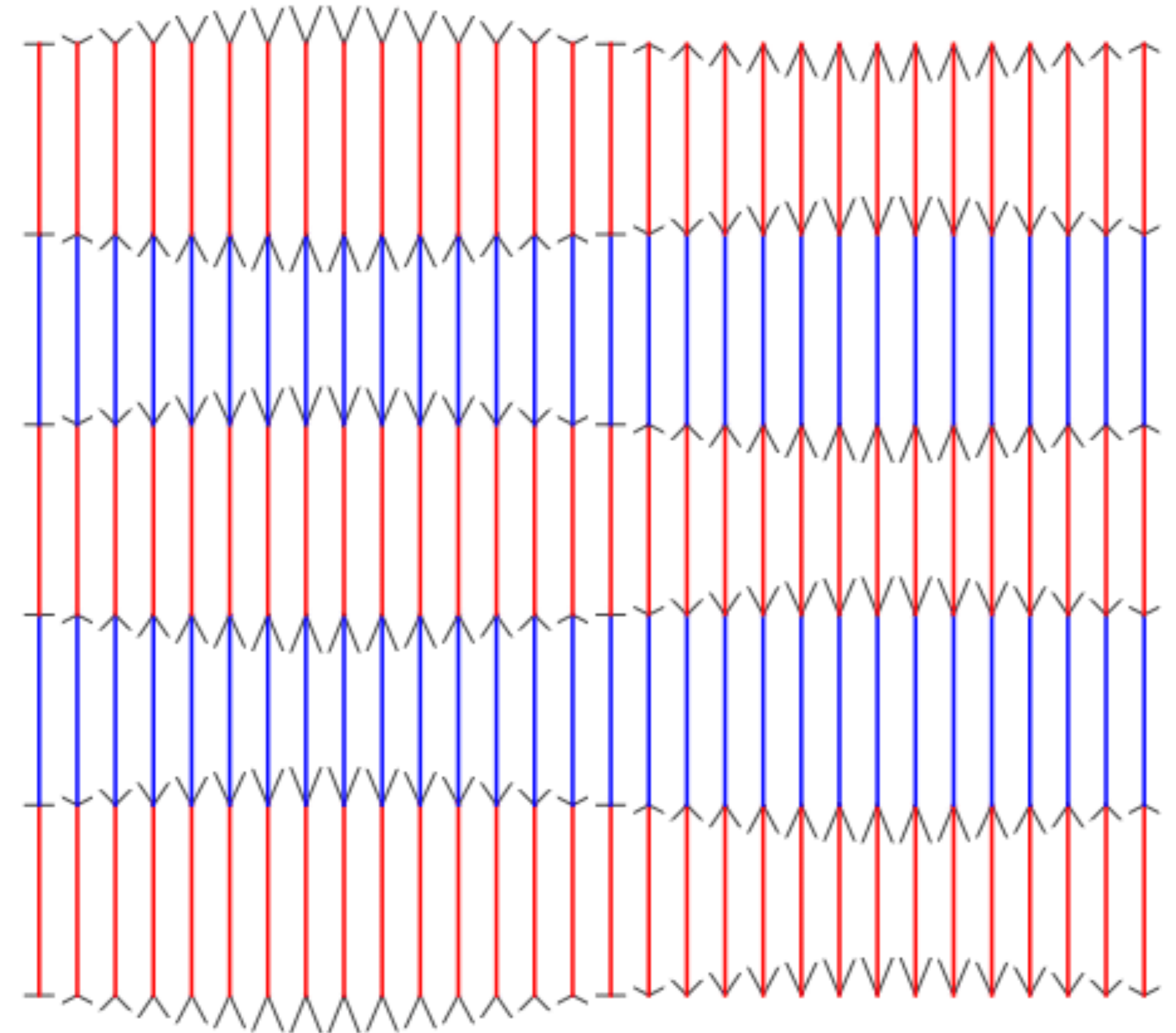## Variants

The Müller-Lyer Illusion
Variants (with motion)

Sarcone's Dynamic Müller-Lyer Illusion

Sarcone's Dynamic Müller–Lyer Illusion
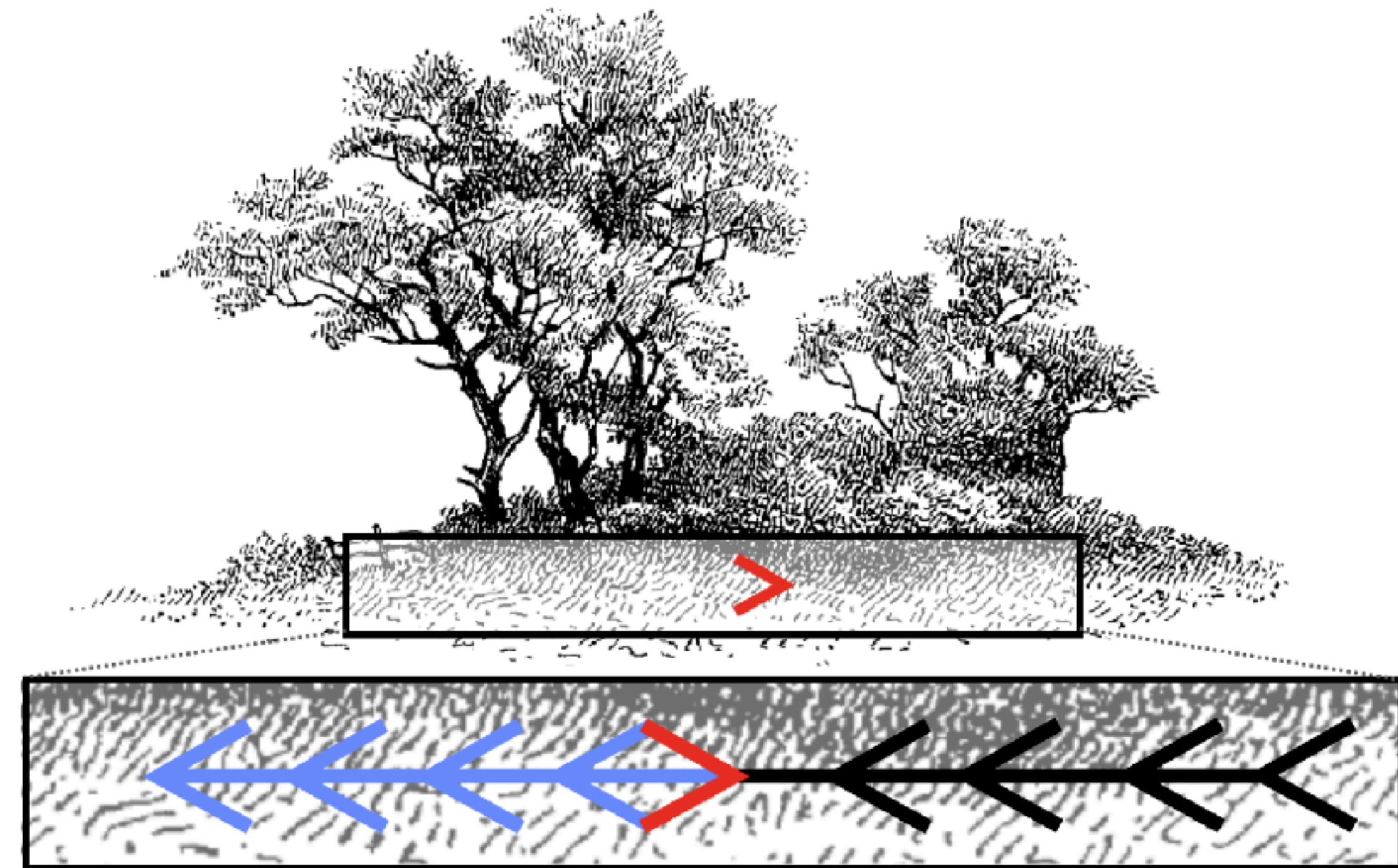involving sinusoidal wave motion with dynamic color spreading effects

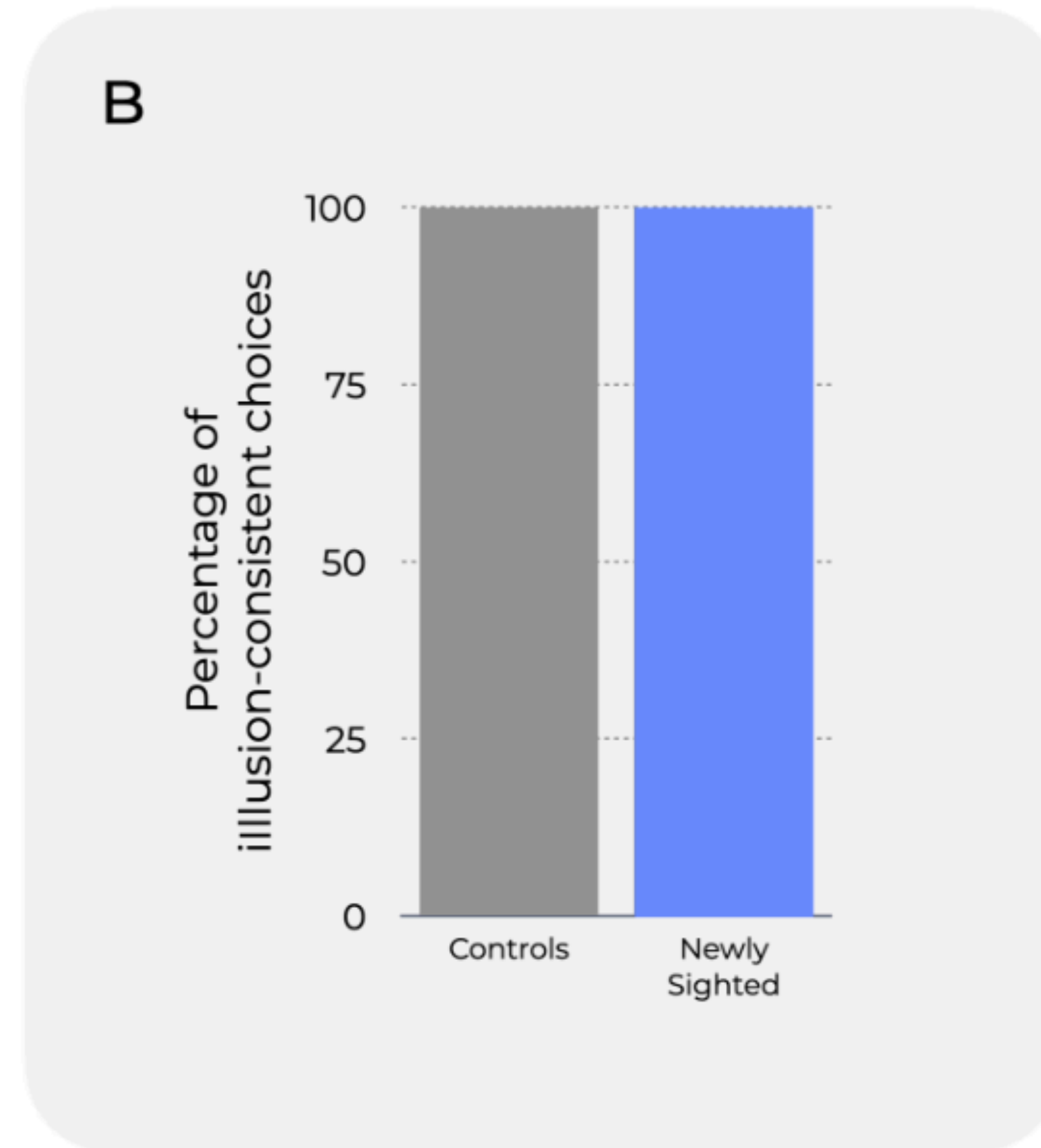# The Müller-Lyer Illusion
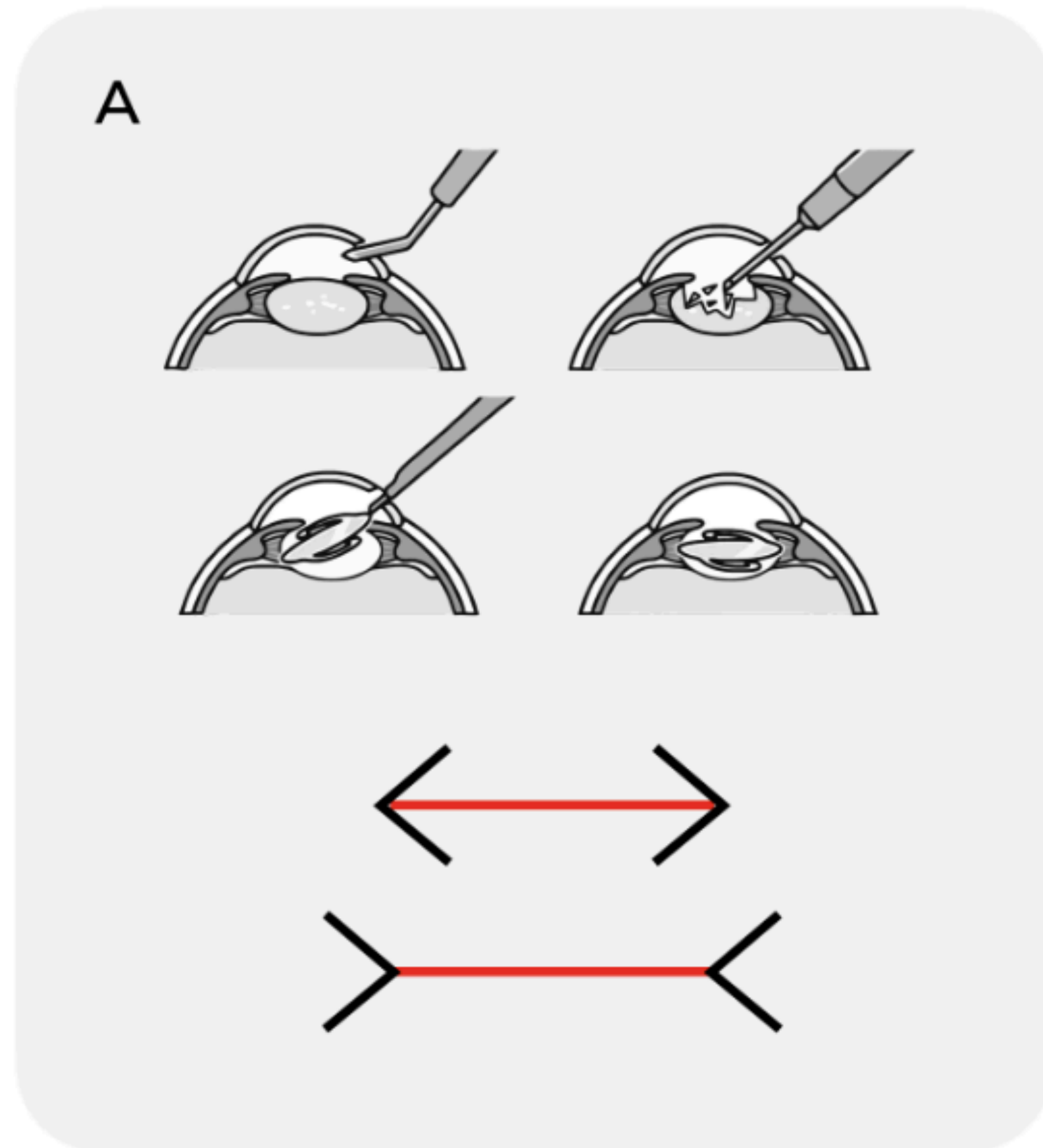## Limited to western cultures?

(Gregory, 1968)

(Segall et al., 1963)
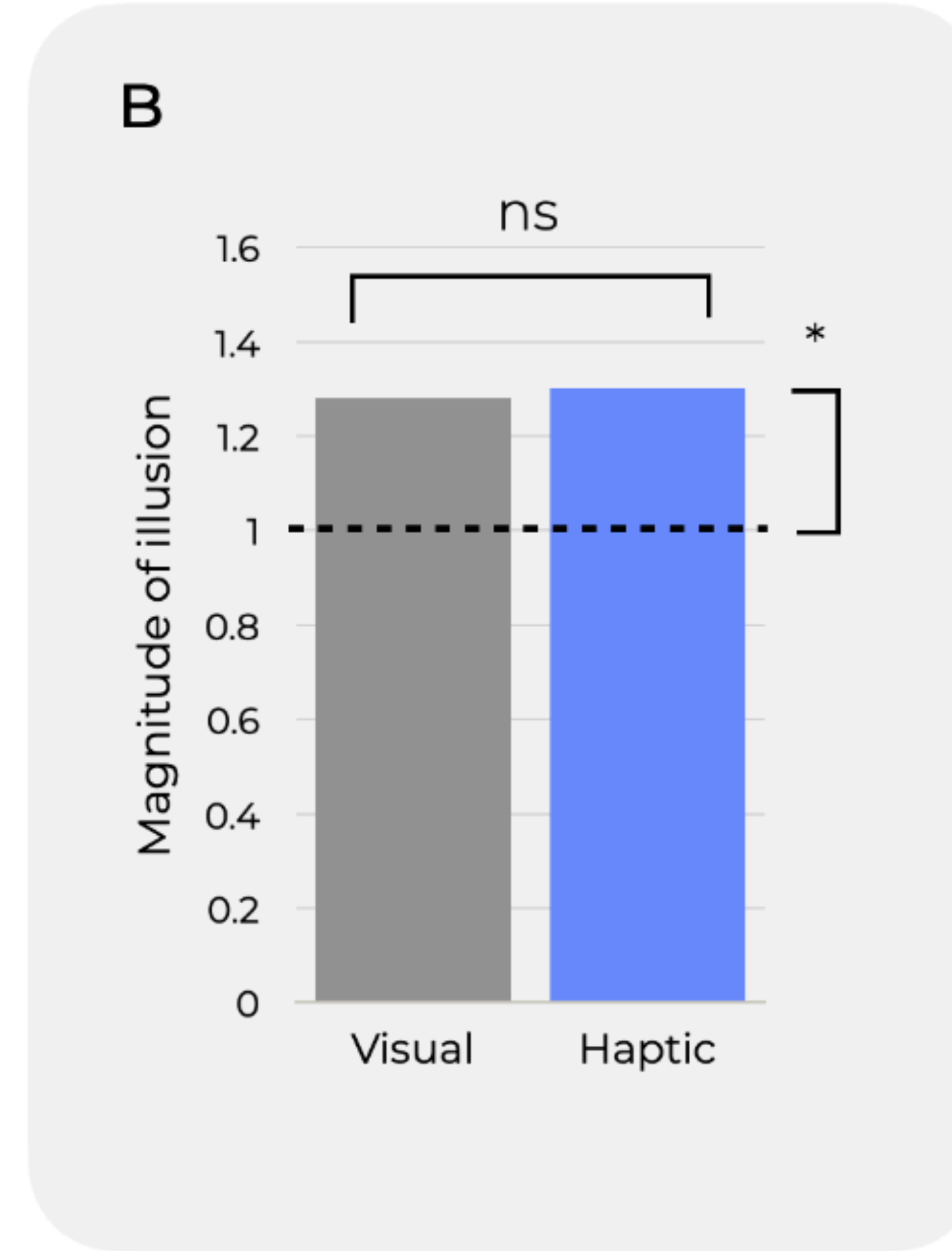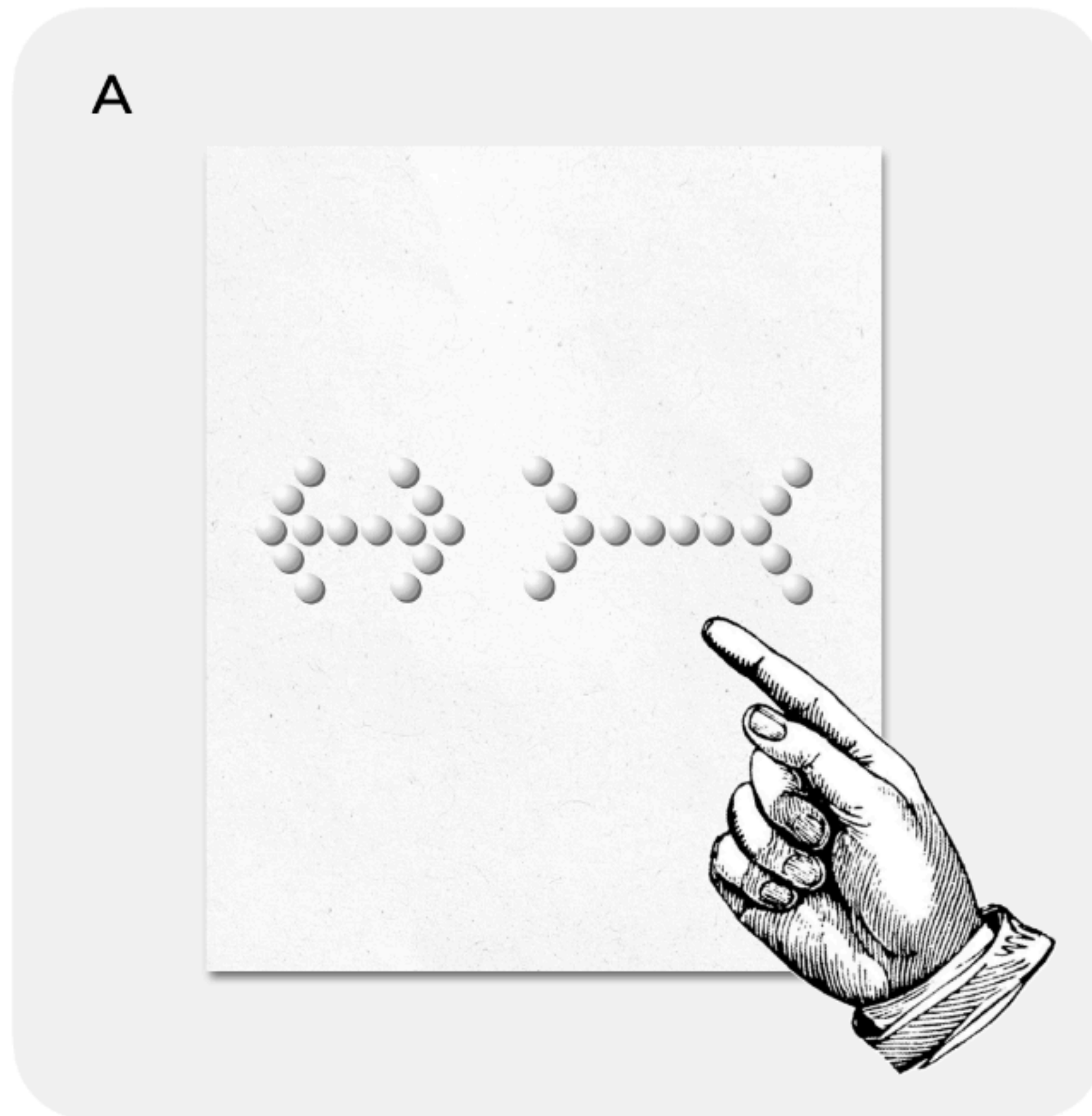
(Howe & Purves, 2005b)

The Müller-Lyer Illusion
Limited to typically developed individuals?
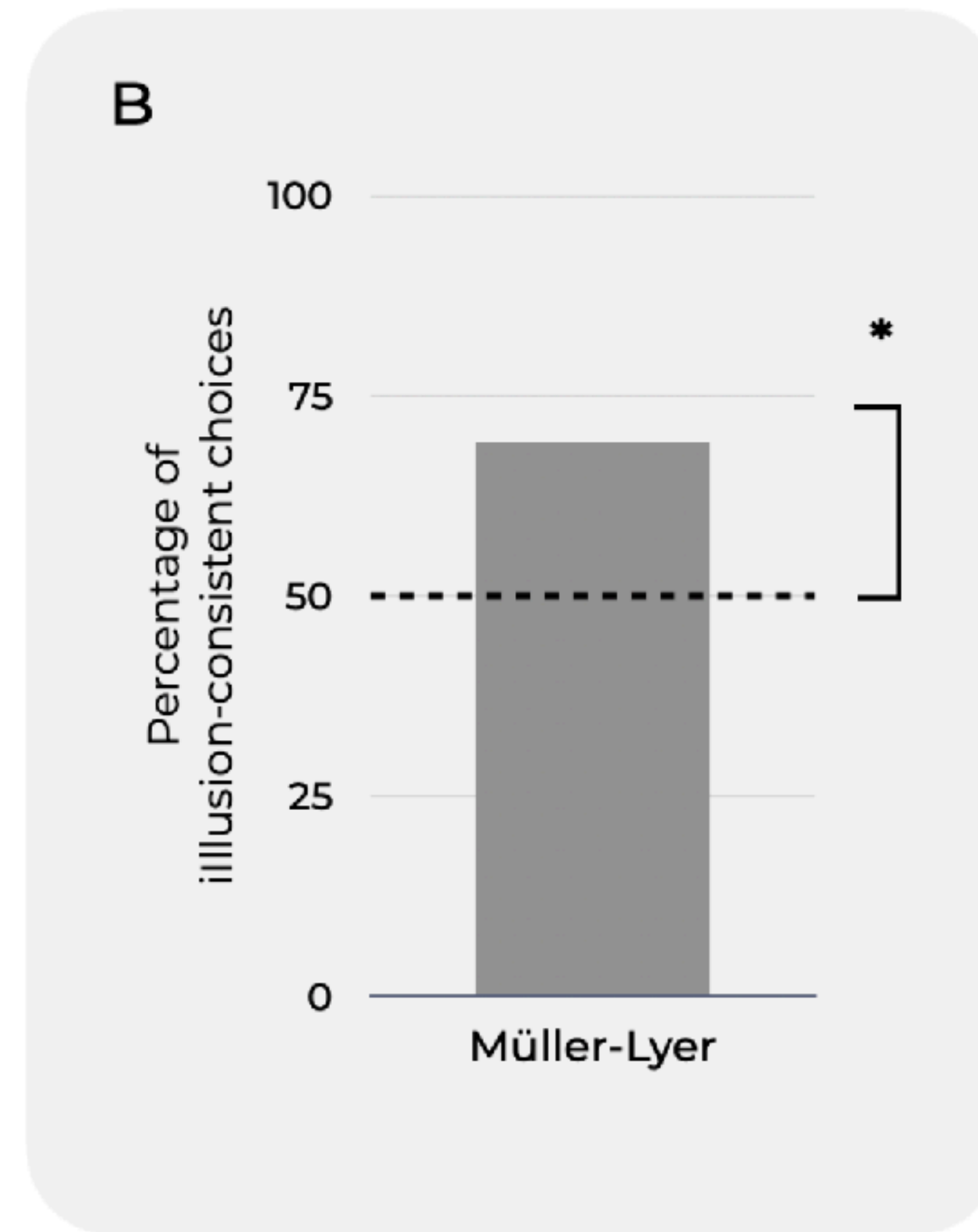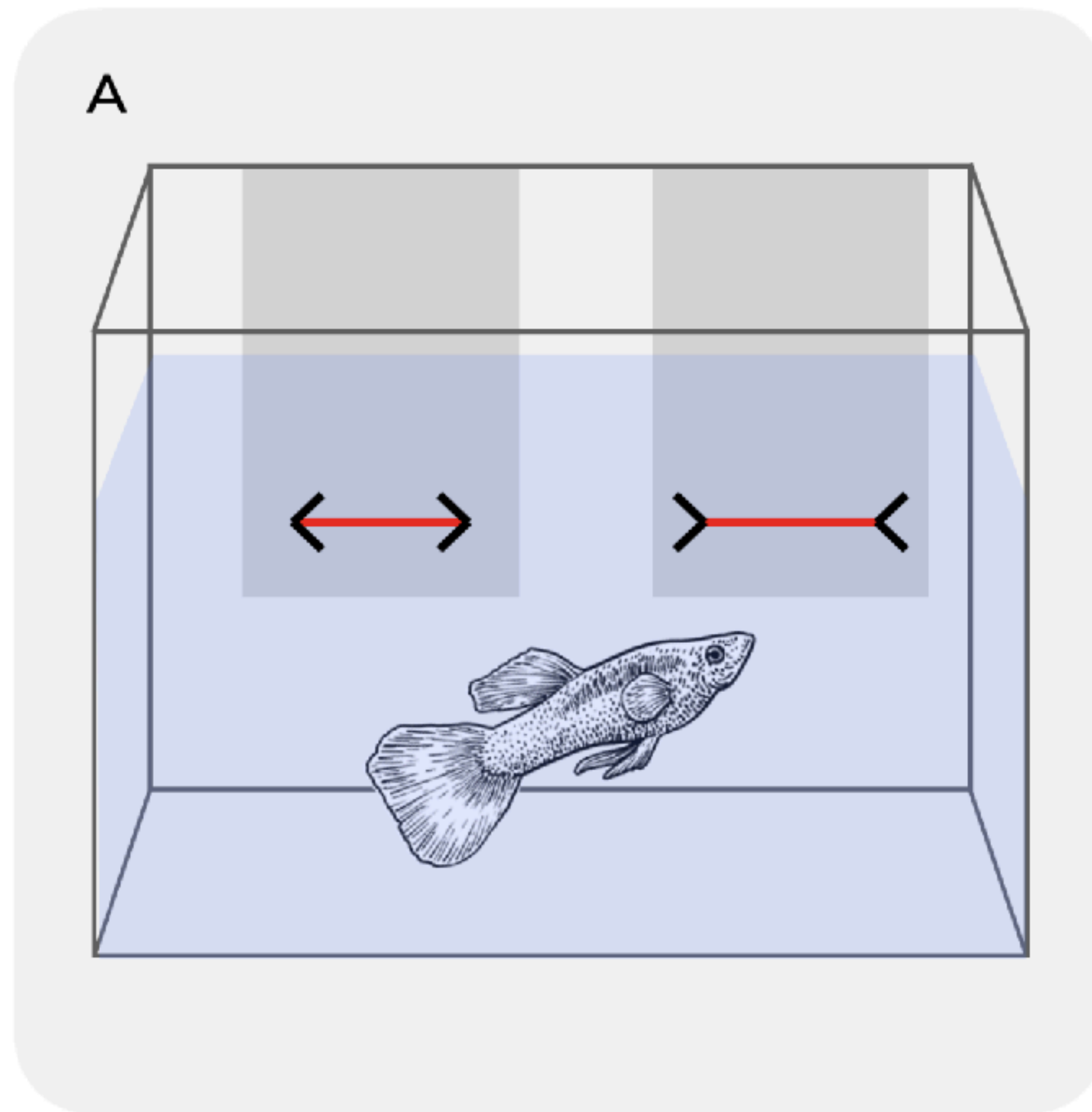

(Gandhi et al., 2015)

The Müller-Lyer Illusion
Limited to vision?

(Suzuki & Arashida, 1992)

The Müller-Lyer Illusion
Limited to humans?

A

B

Percentage of illusion-consistent choices

100

75

50

25

0

Müller-Lyer

*

Parakeets
(Watanabe, 2022)

Horses
(Cappellato et al., 2020)

Pigeons
(Nakamura et al., 2006)

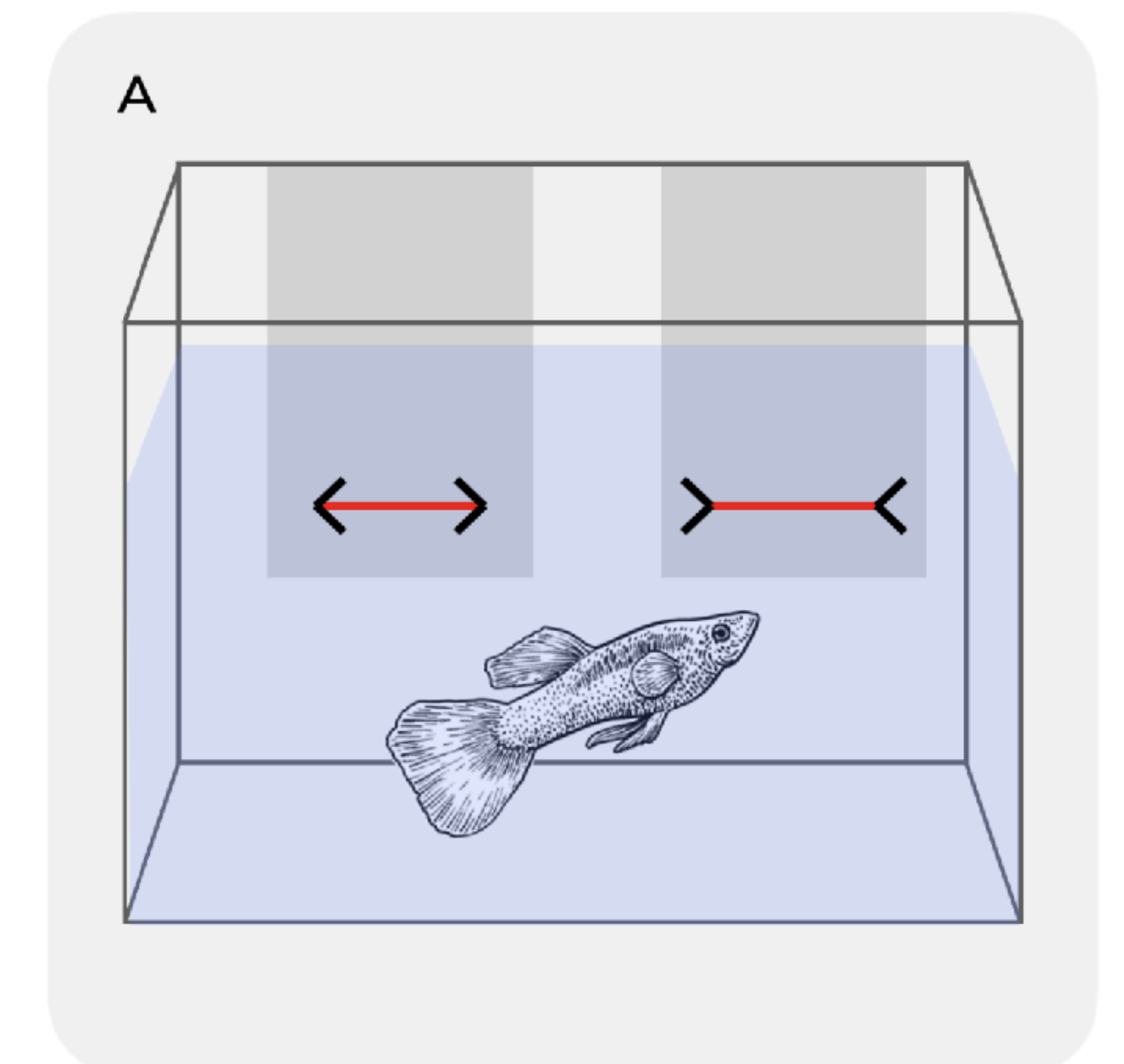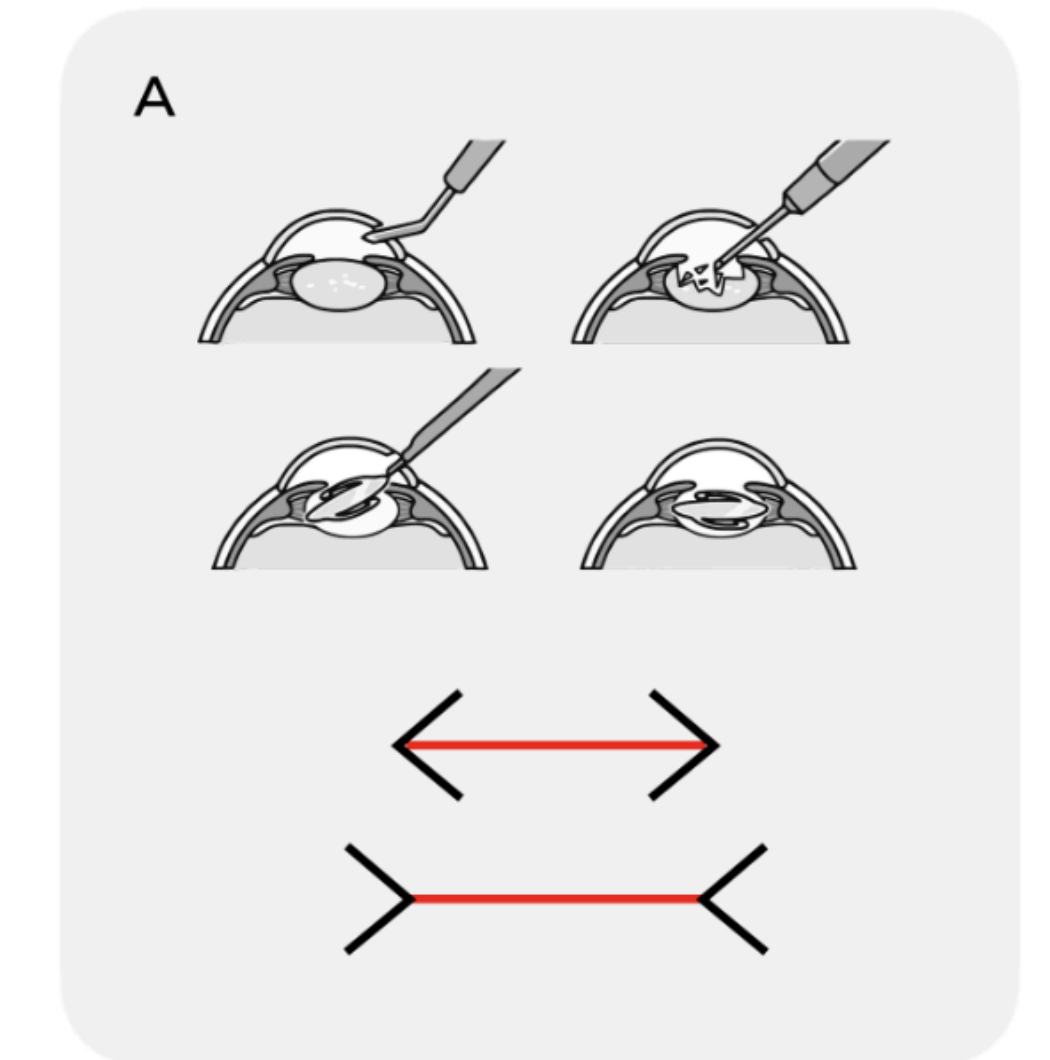*Lizards*
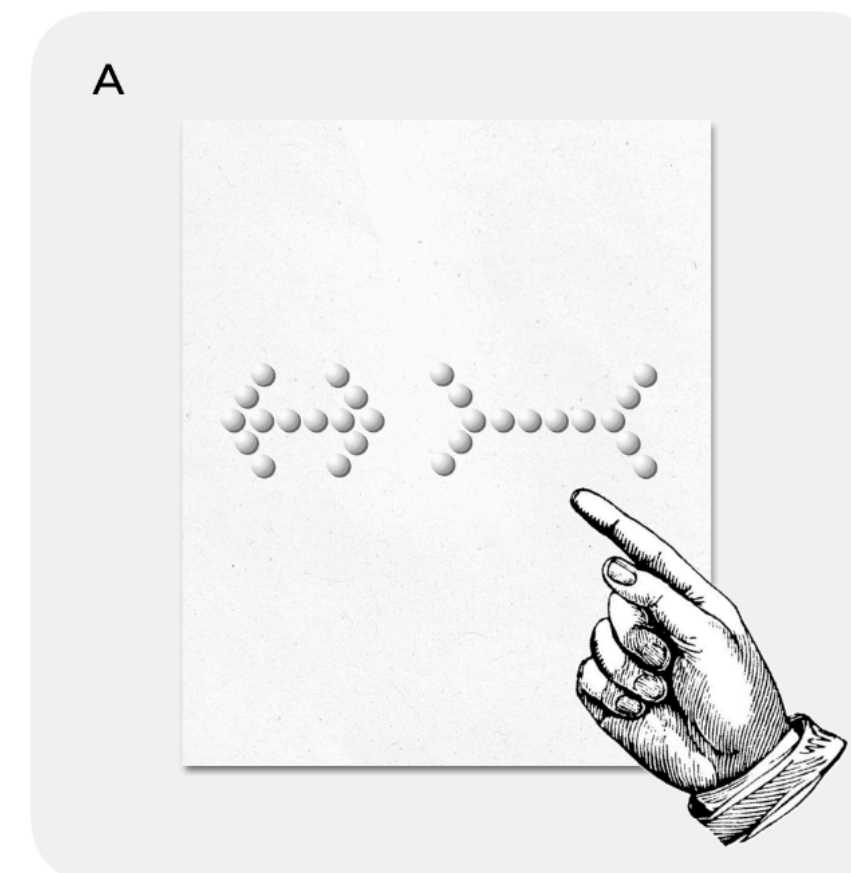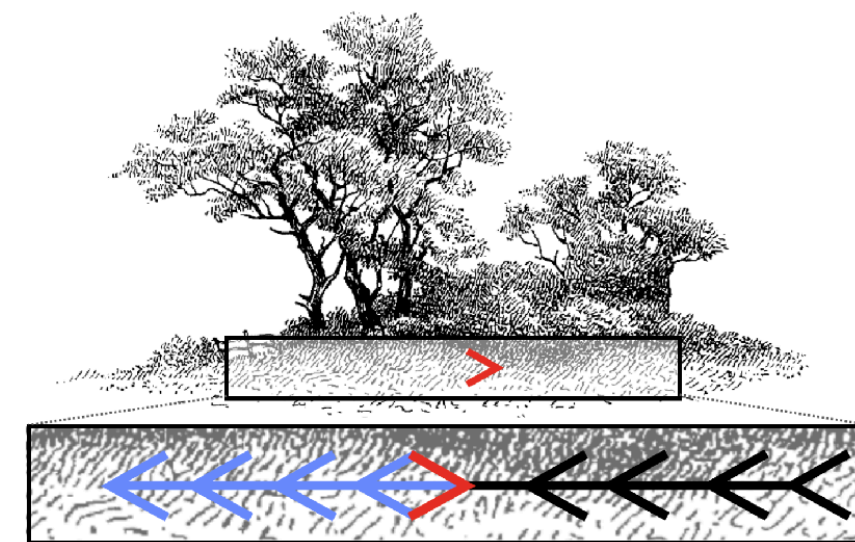*(Santacà et al., 2020)*

Ants
(Sakiyama & Gunji, 2013)

(Santacà & Agrillo, 2020a)
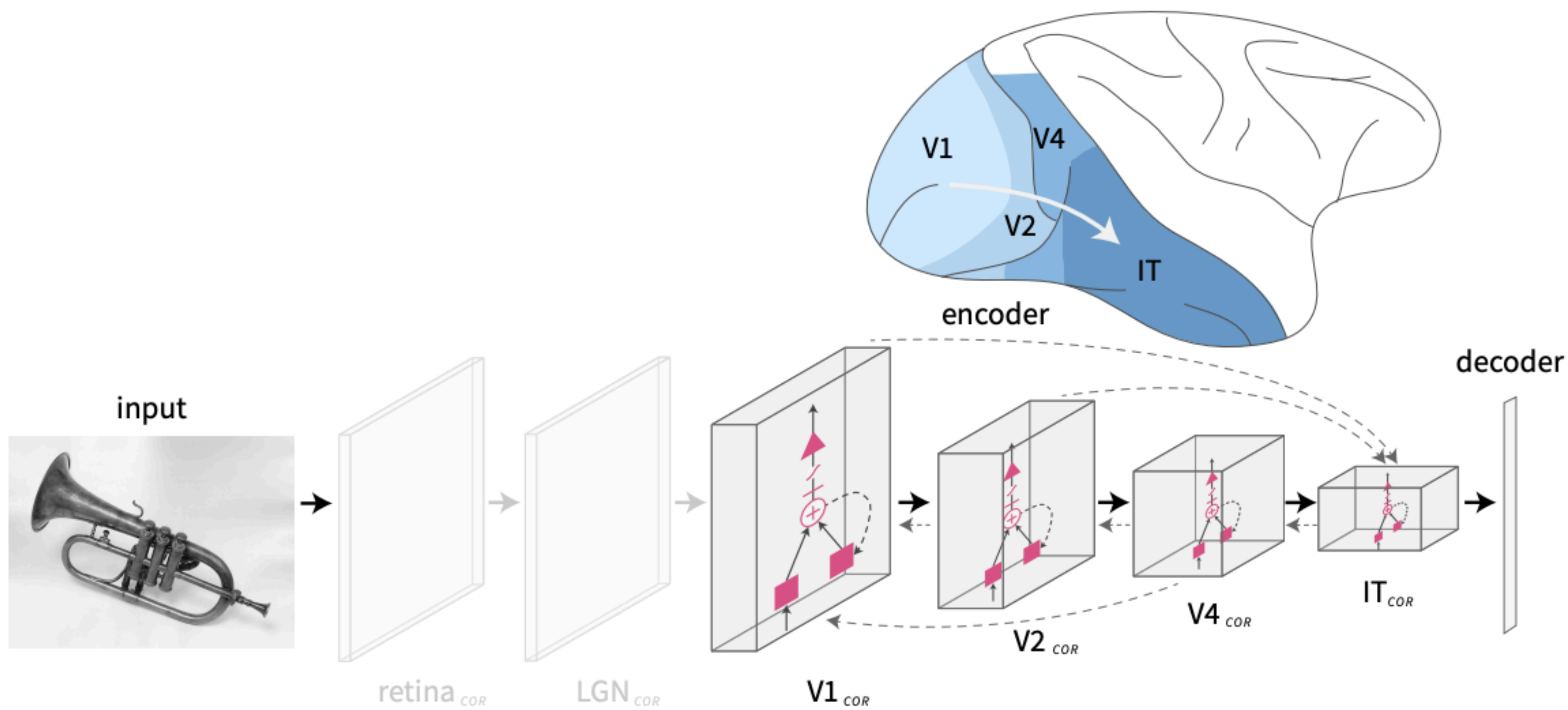
The Müller-Lyer Illusion
Summary

- *Not limited to straight lines*

- *Not limited to western cultures*

- *Not limited vision*

- *Not limited to humans*

Machines
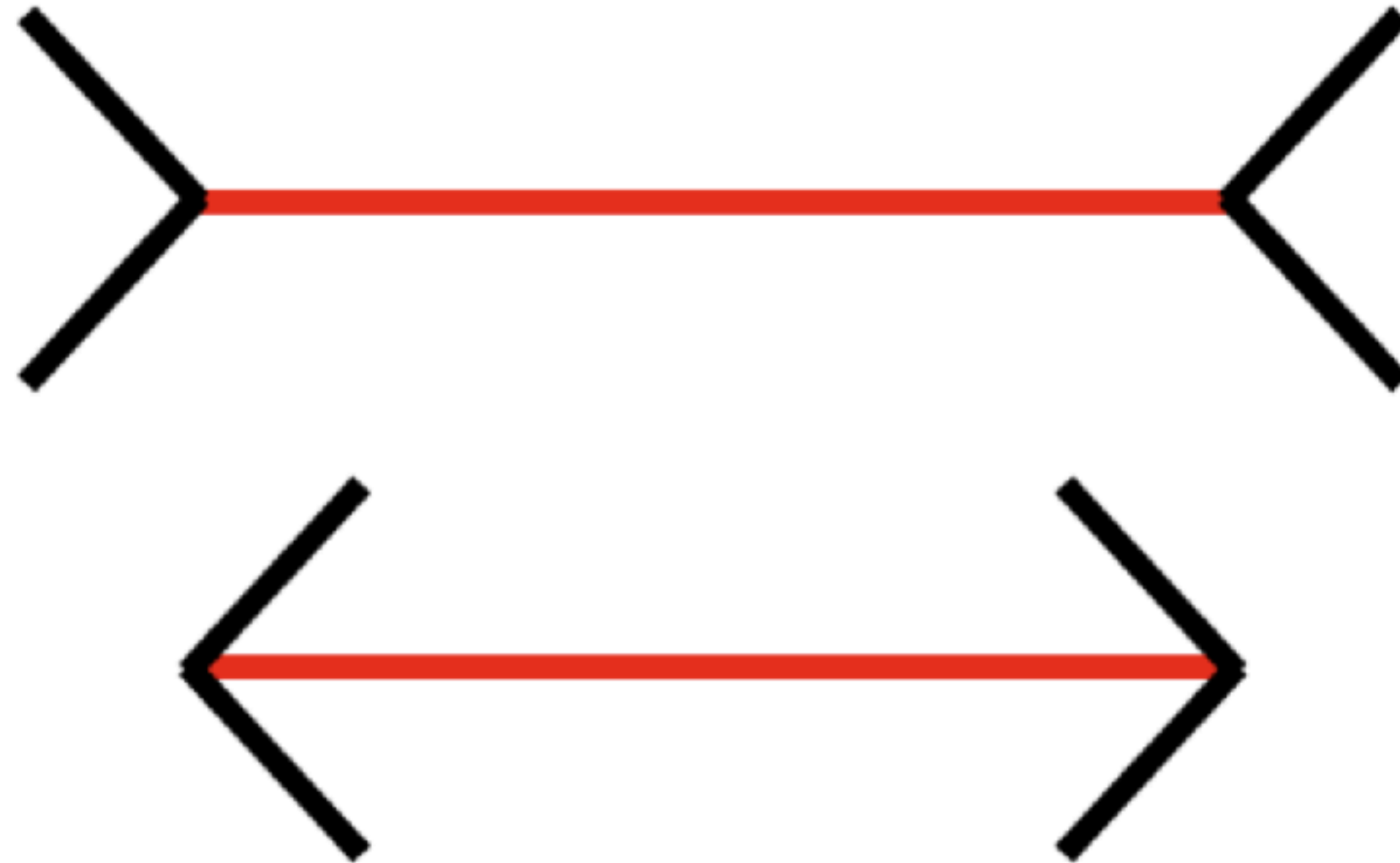## Deep Neural Networks as the model of the brain

(Kriegeskorte, 2015)

Machines
Do DNNs perceive the Müller-Lyer Illusion?

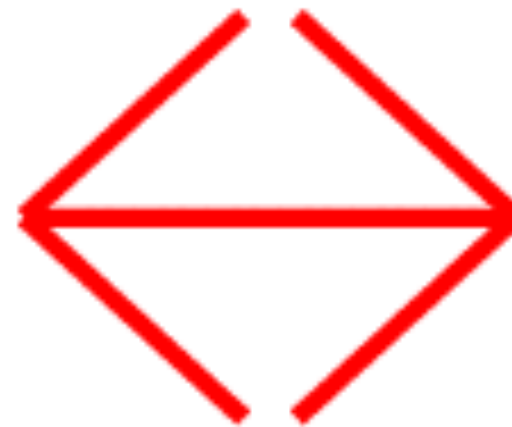# Demo
Does ChatGPT perceive the Müller-Lyer Illusion?

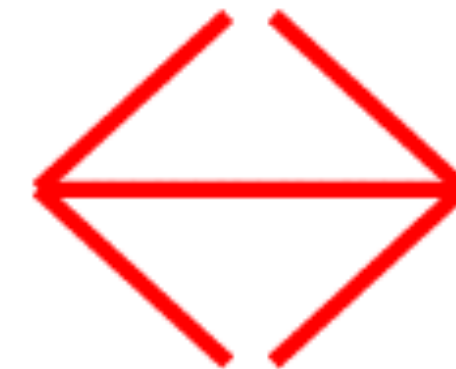*Which is longer, the blue line or the red line?*

Try it yourself

Machines
But do machines *really* perceive the Müller-Lyer Illusion?

Demo
But does ChatGPT *really* perceive the Müller-Lyer Illusion?

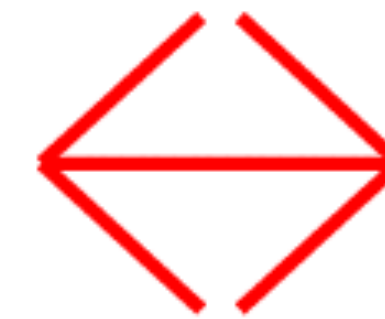*Which is longer, the blue line or the red line?*
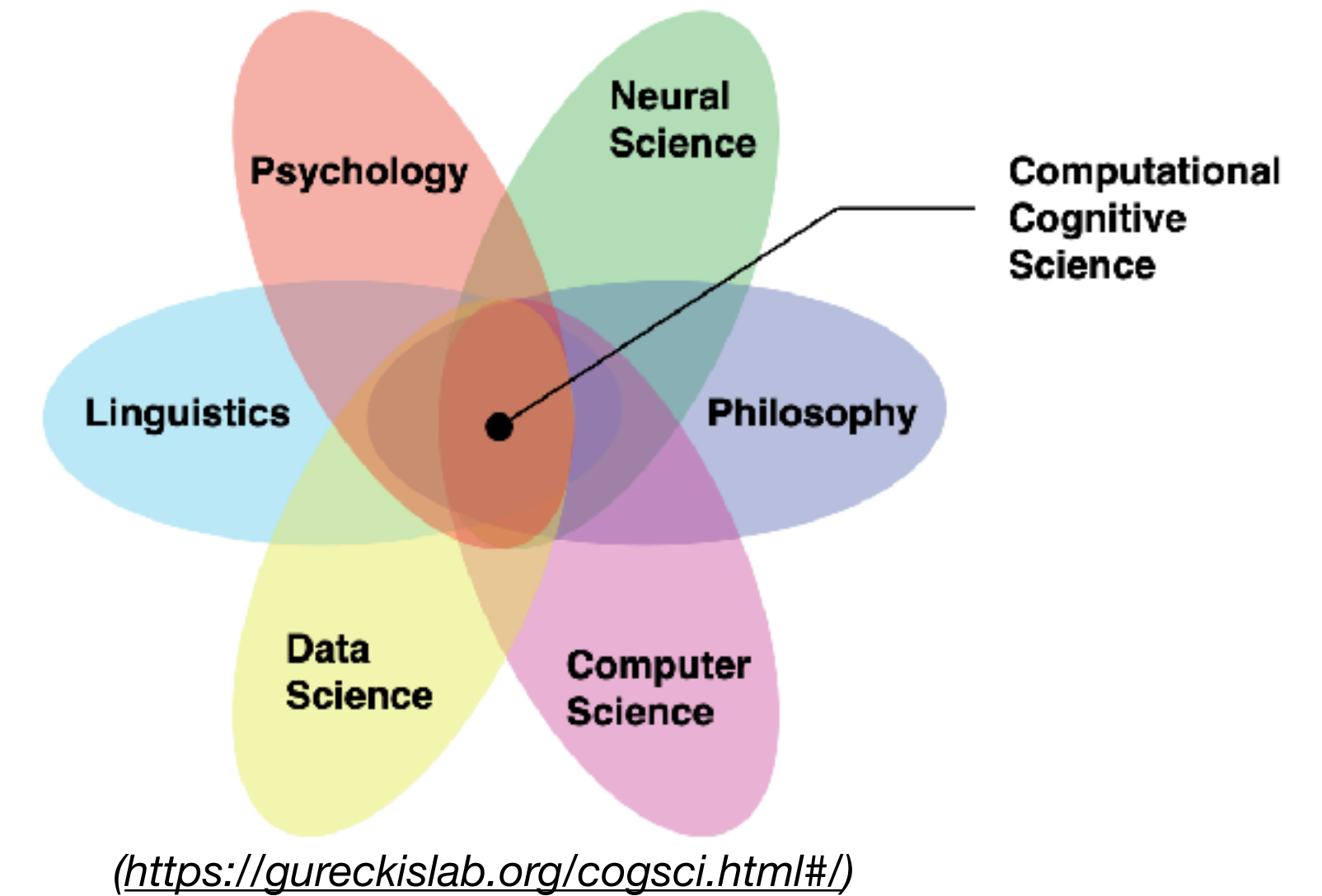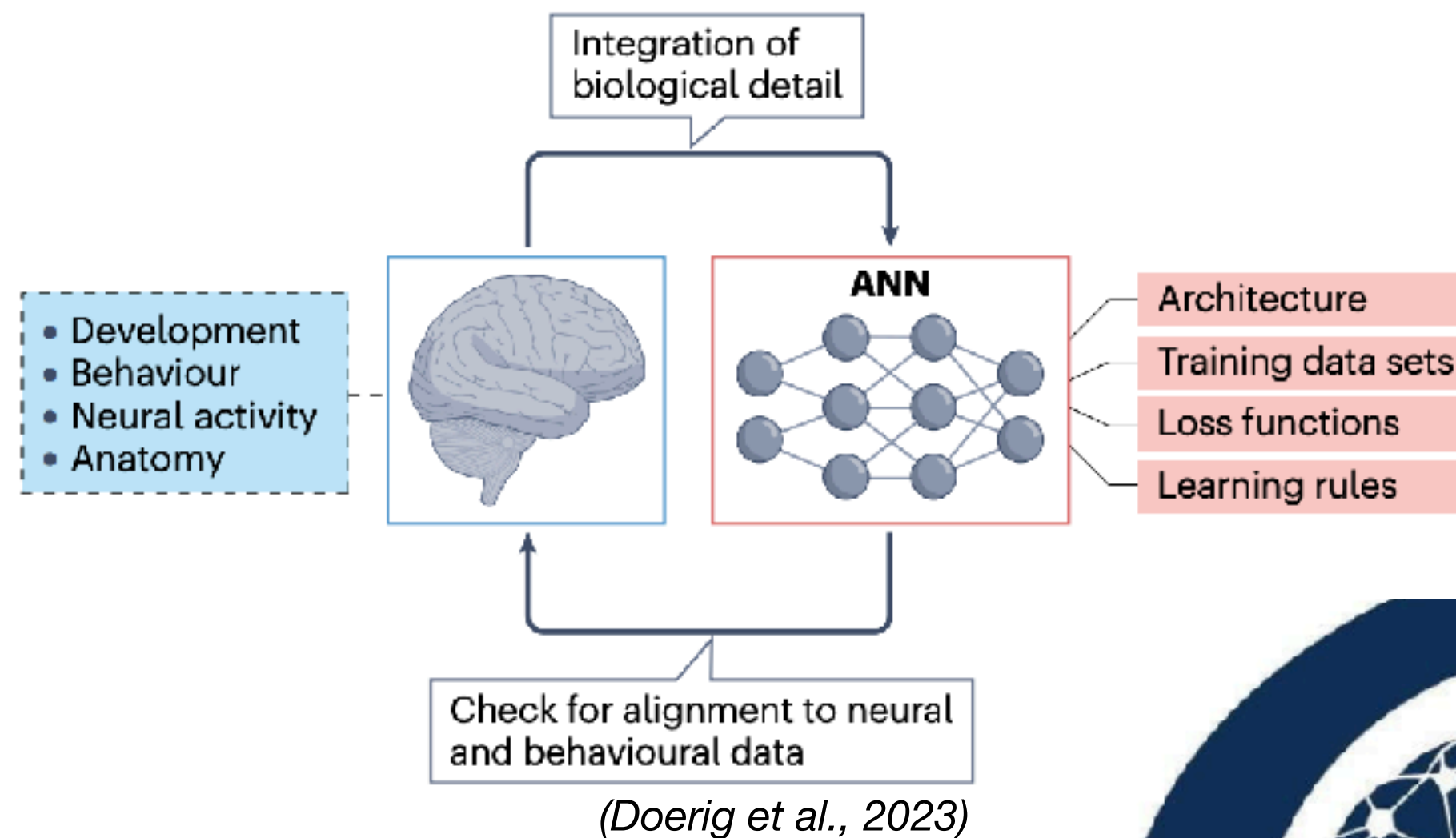
Try it yourself

Machines
Summary

- *DNNs may appear to perceive the illusion*

- *However, they also perceive the illusion when it's not present (*Illusion *Illusion)*

The Future
Computational Cognitive Science or NeuroAI
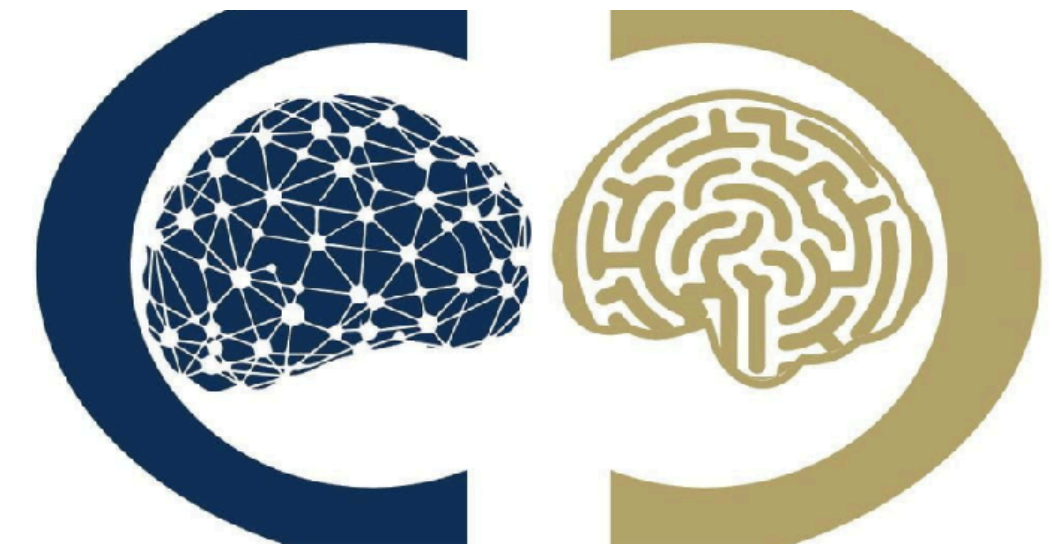

(Doerig et al., 2023)

(https://gureckislab.org/cogsci.html#/)

The Center of Excellence in Computational Cognition

https://coco.psych.gatech.edu/

(CoCo)

(Zandor et al., 2023)
(Neuromatch NeuroAI course)

Thank you!

Alish Dipani, *CoCo Fellow*

alishdipani.github.io

alishdipani@gatech.edu

Reach out if you have questions or thoughts

Try it yourself: *https://github.com/alishdipani/psyc1101_coco_demo*