

# **Cross-modal Effects: Taste, Olfaction, and Vision**

Student #1 & Student #2

English IIIA

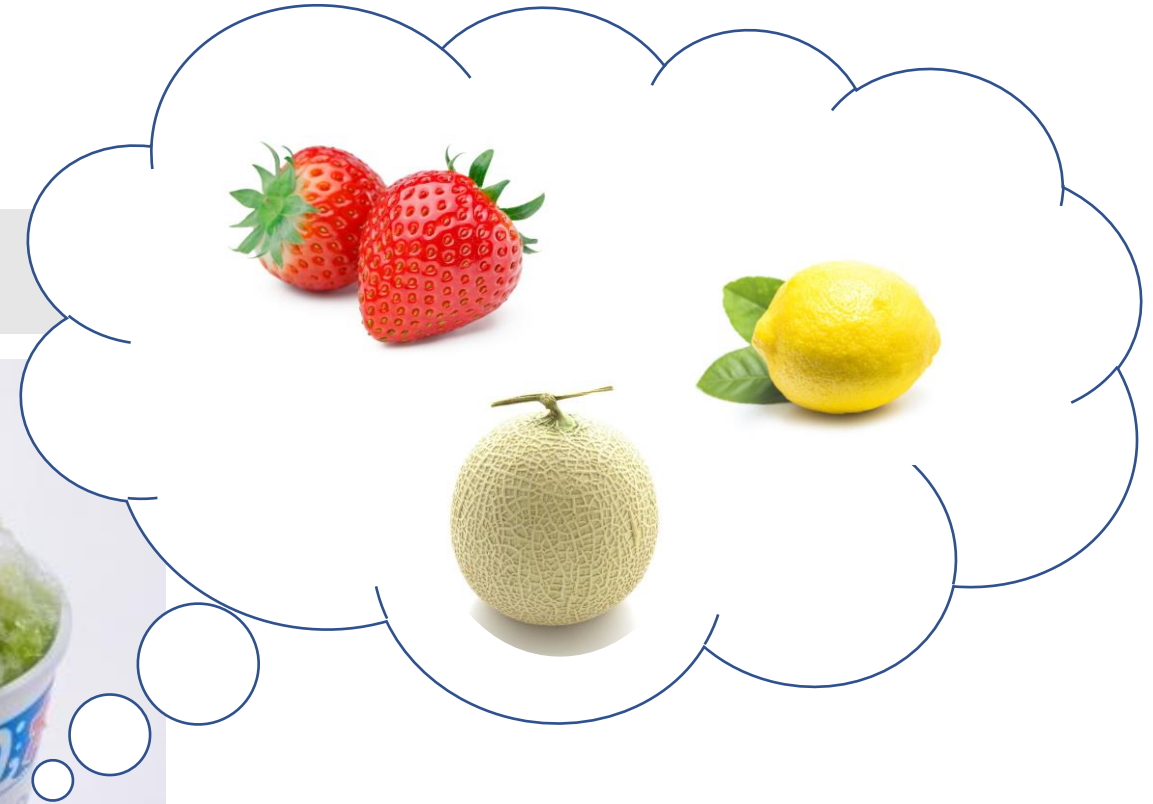
July 26, 2018

# Today's Topic

- Introduction
- Principle
- Research: Cross-modal effects on olfaction and vision
- Research: Smelling Shapes
- Research: Meta-Cookie
- Summary
- Q&A

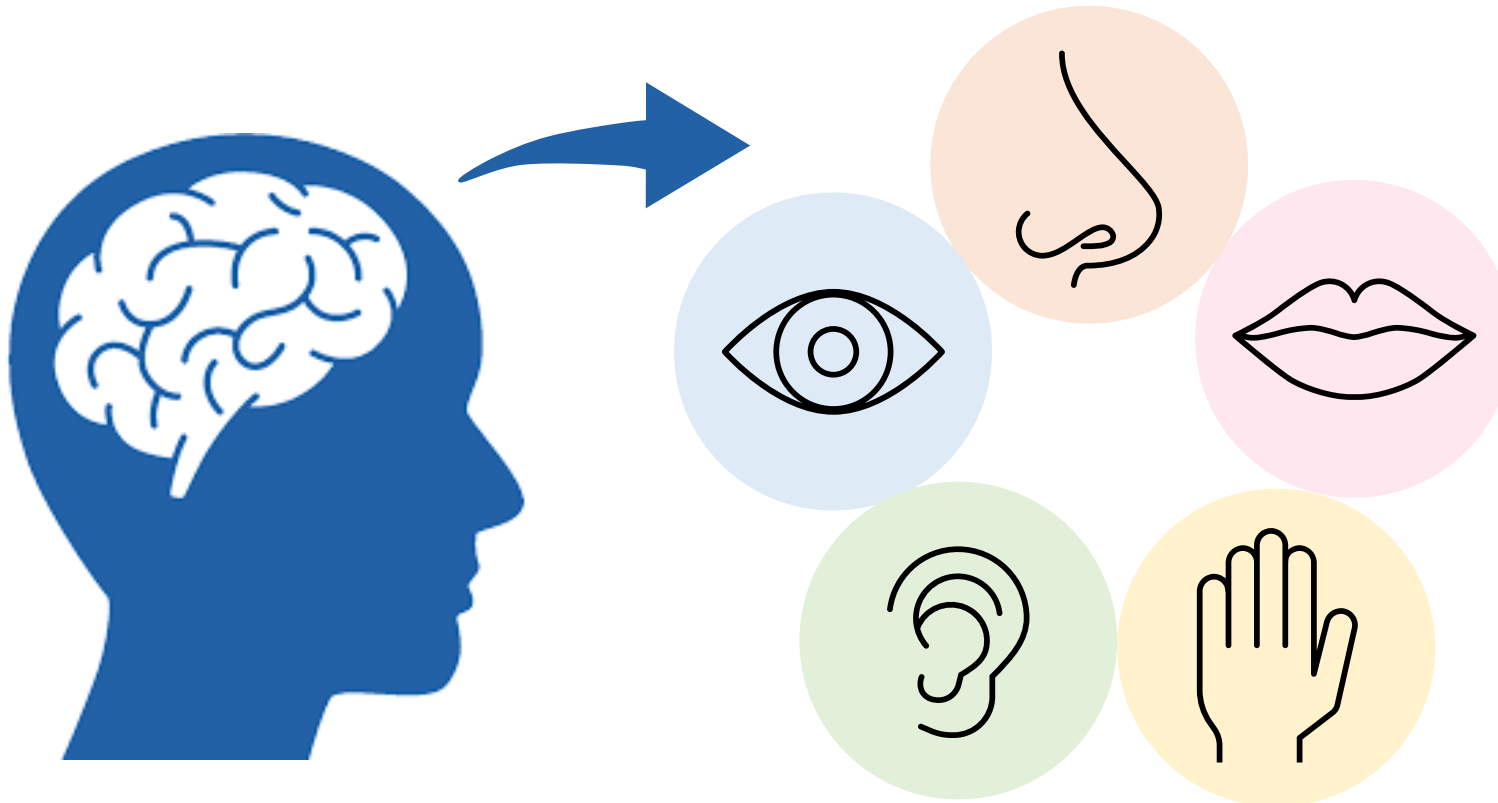
# Introduction

## Shaved Ice

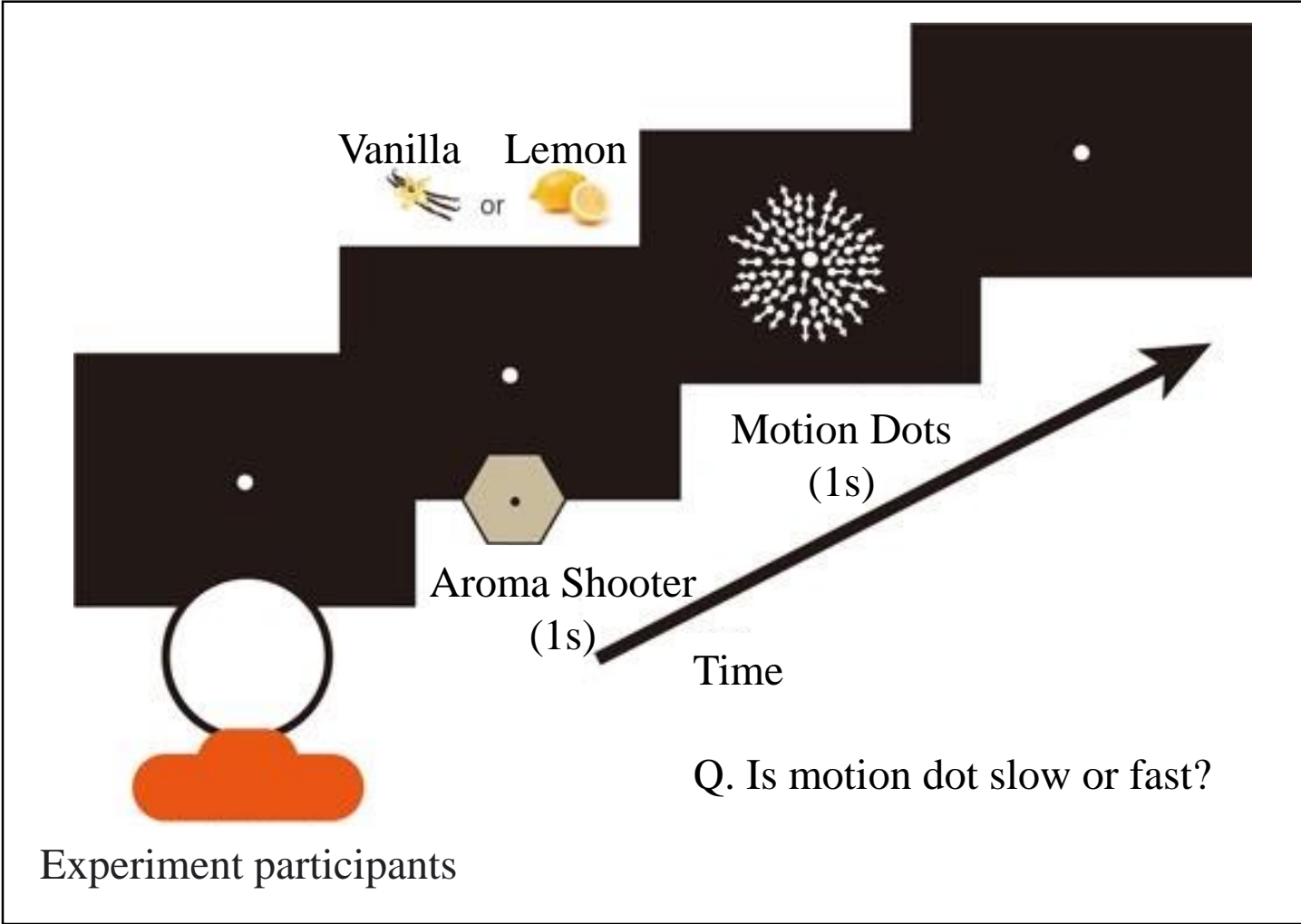


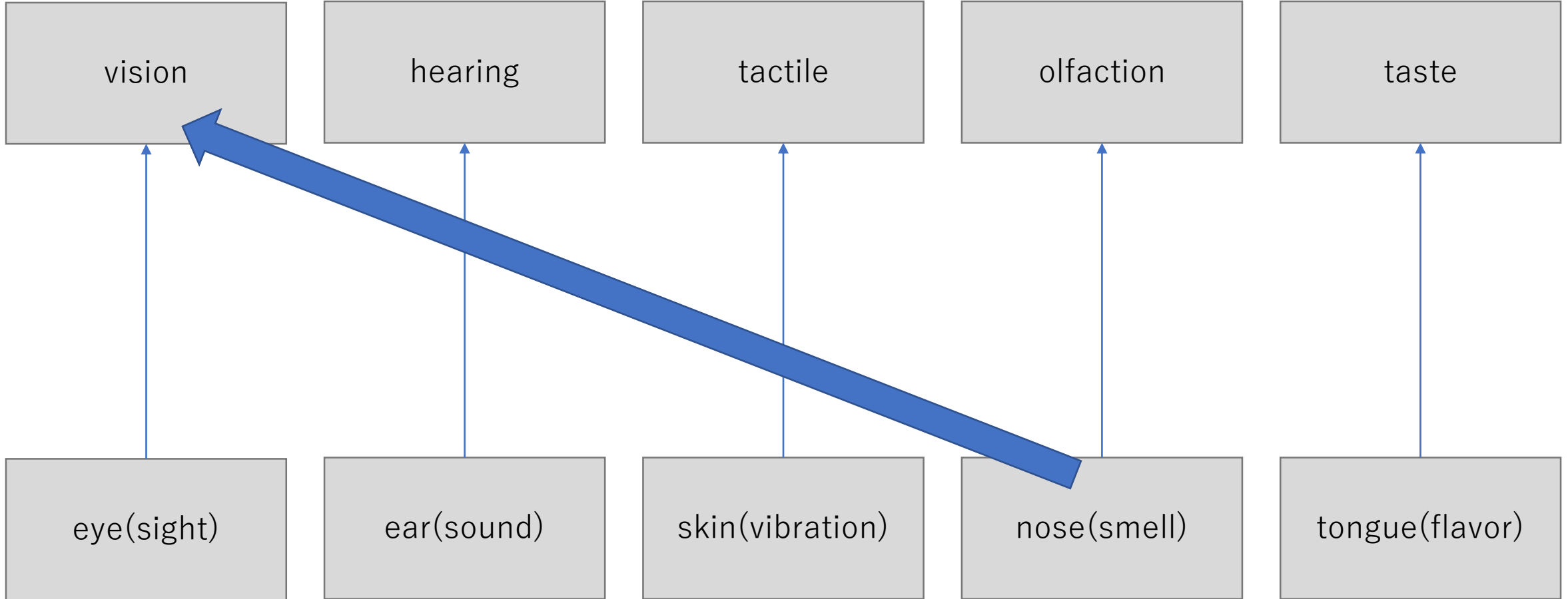
# What is Cross-modal effect ?

The simultaneous perception of several different pieces of information influence each other's senses

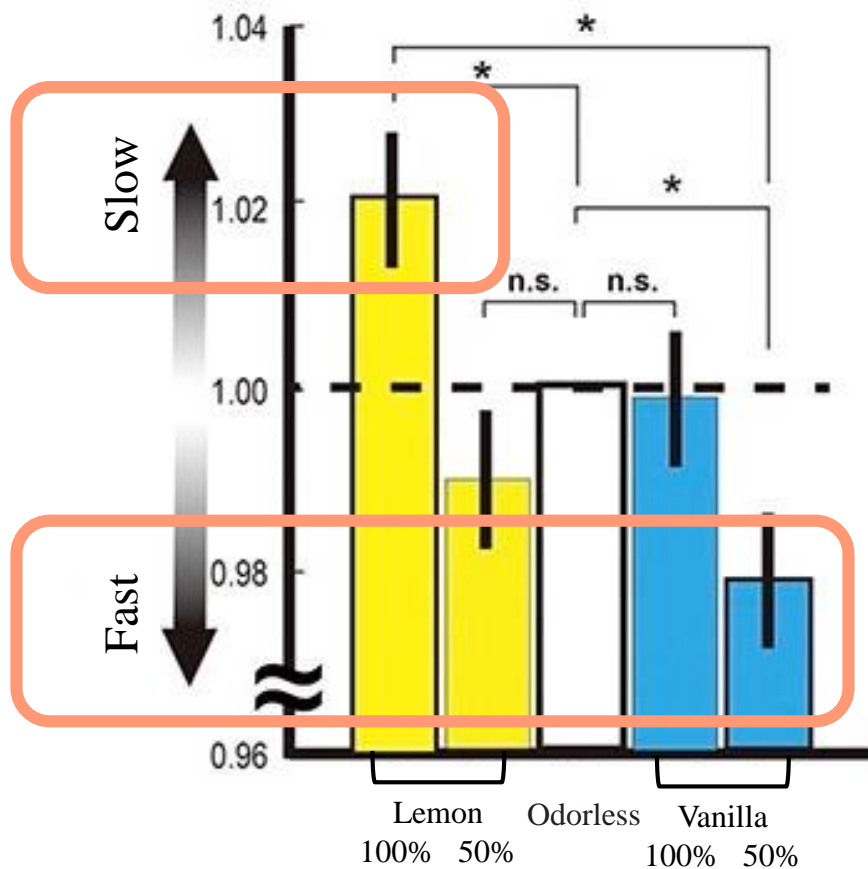


# Olfactory Stimulation Modulates Visual Perception Without Training





# Result : a sense of speed



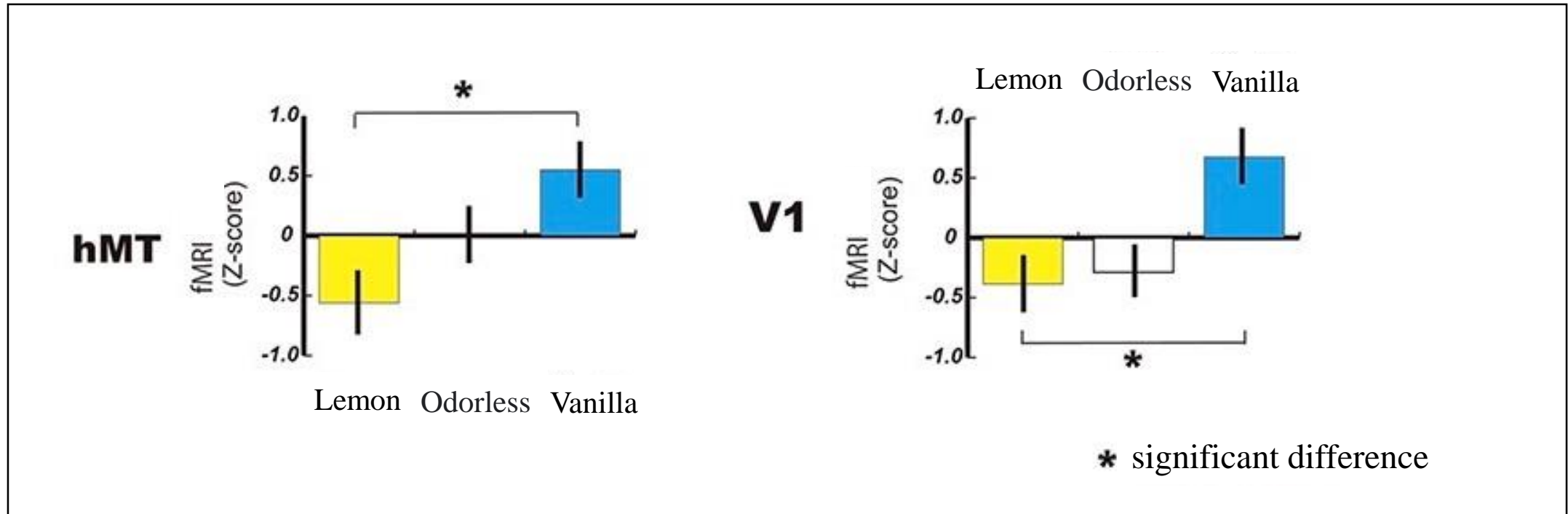
Lemon aroma  
the image is perceived slower

Vanilla aroma  
the image is perceived faster

\* significant difference

# Results: fMRI

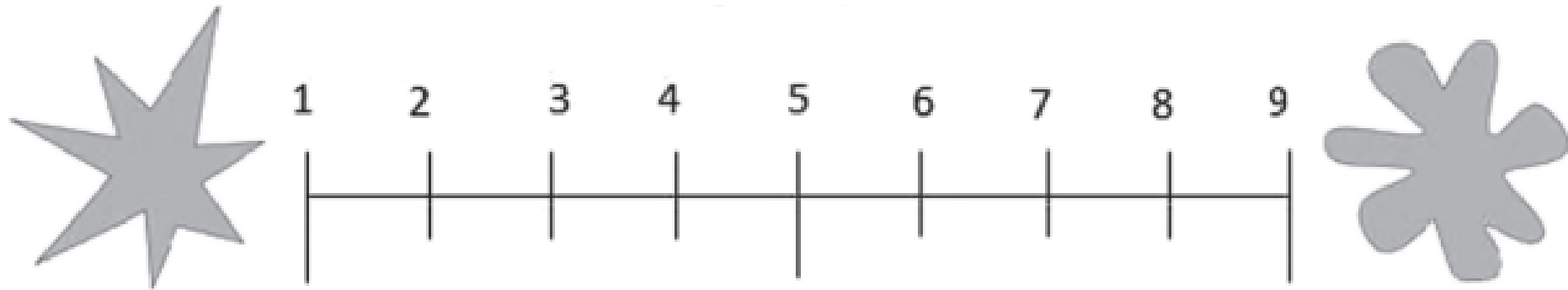
Scent alters brain motor activity in the visual cortex

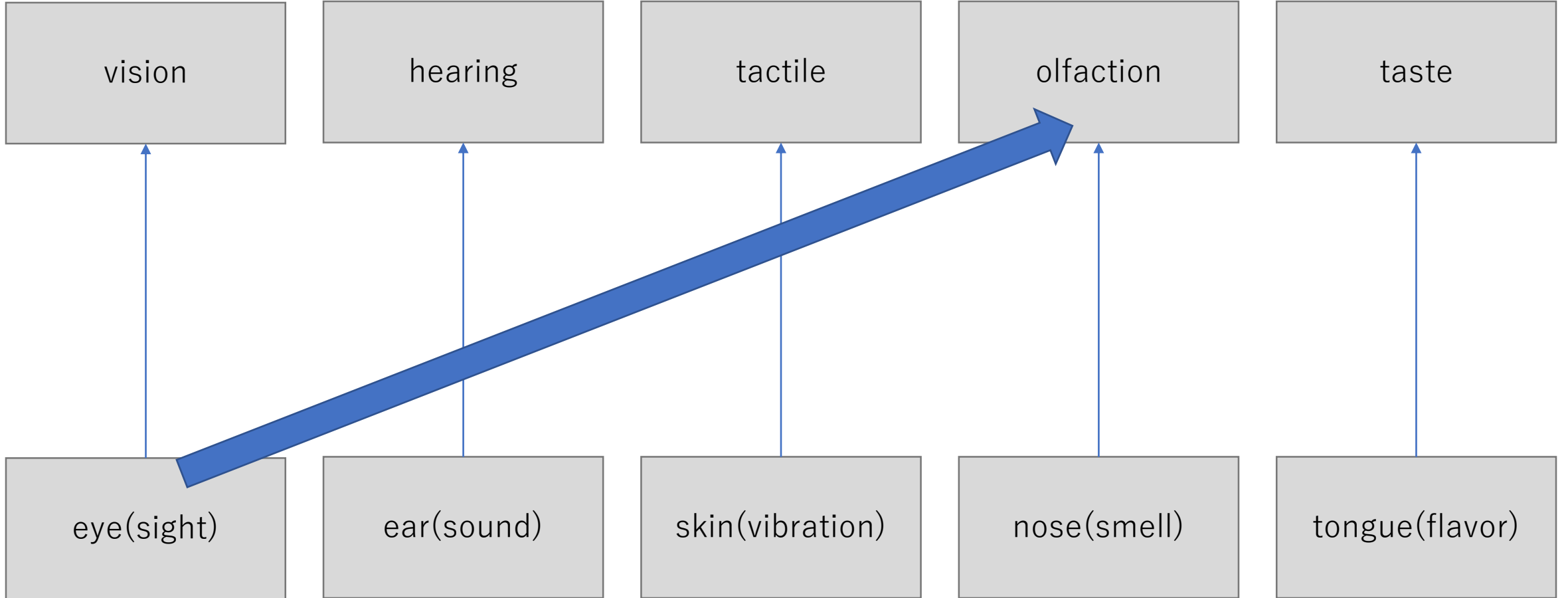




# Smelling Shapes: Cross-modal Correspondences Between Odors and Shapes

Select a number from the scale  
(whether the smell is more angular or more rounded)

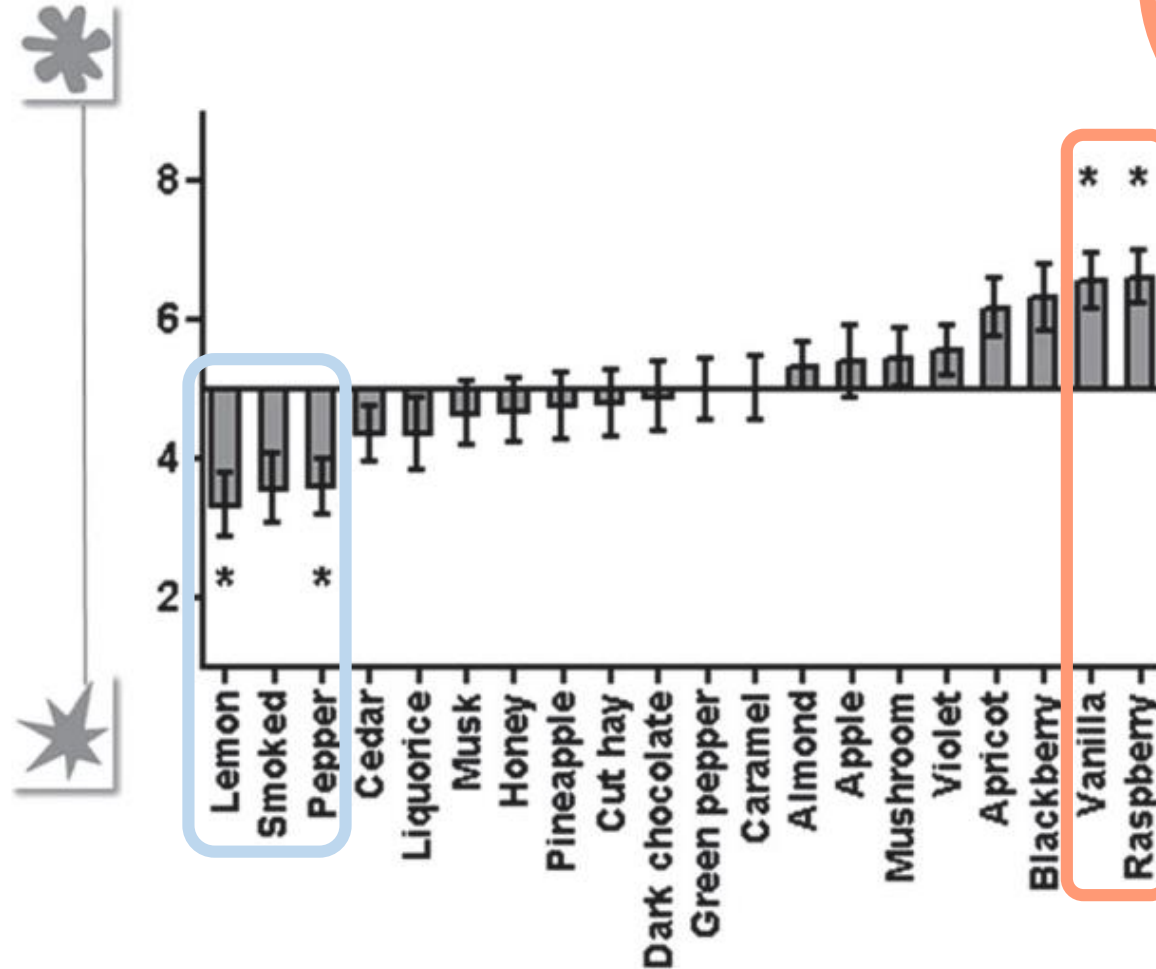




# Result: Olfactory perception



Angular shape



Rounded shape

# application example

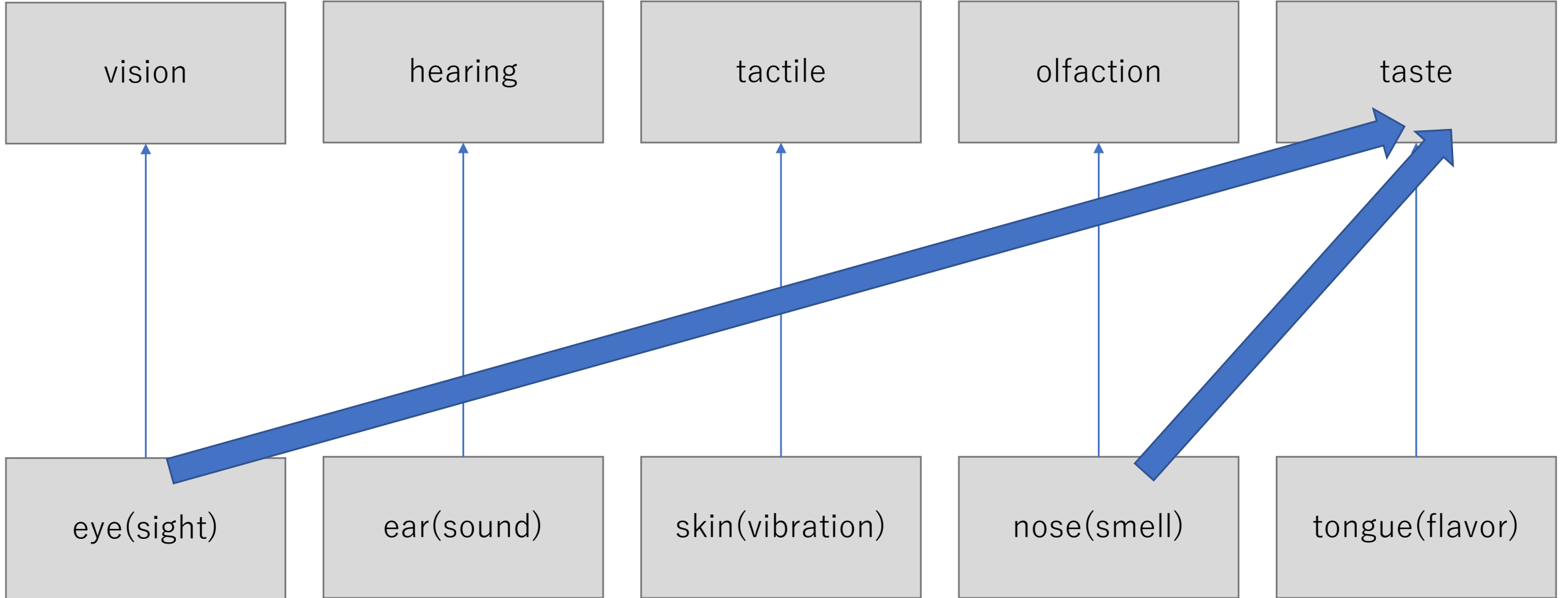
Perfume



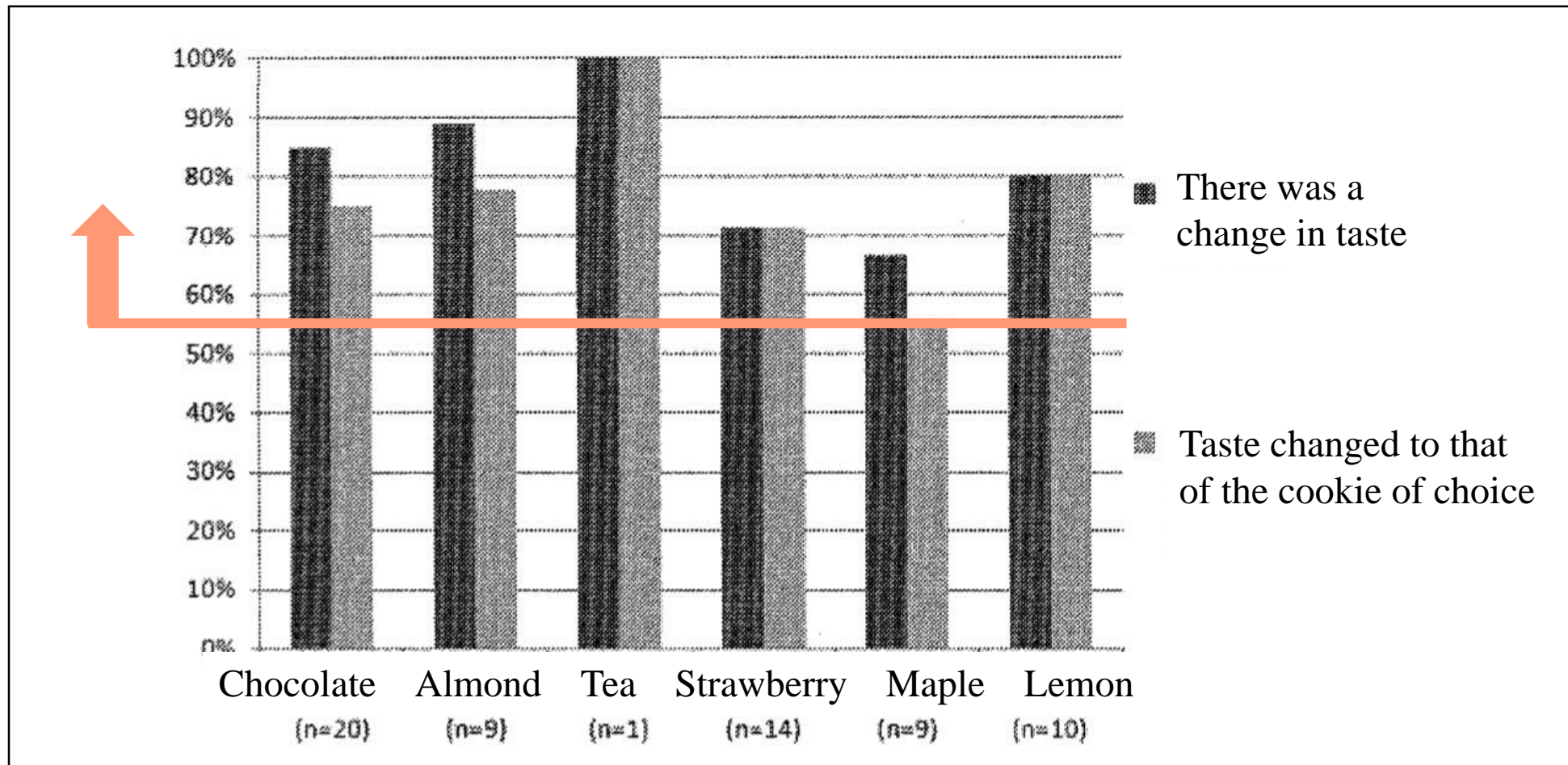
Wine

# Meta Cookie: Pseudo-Gustatory Display Based on Cross-Modal Integration

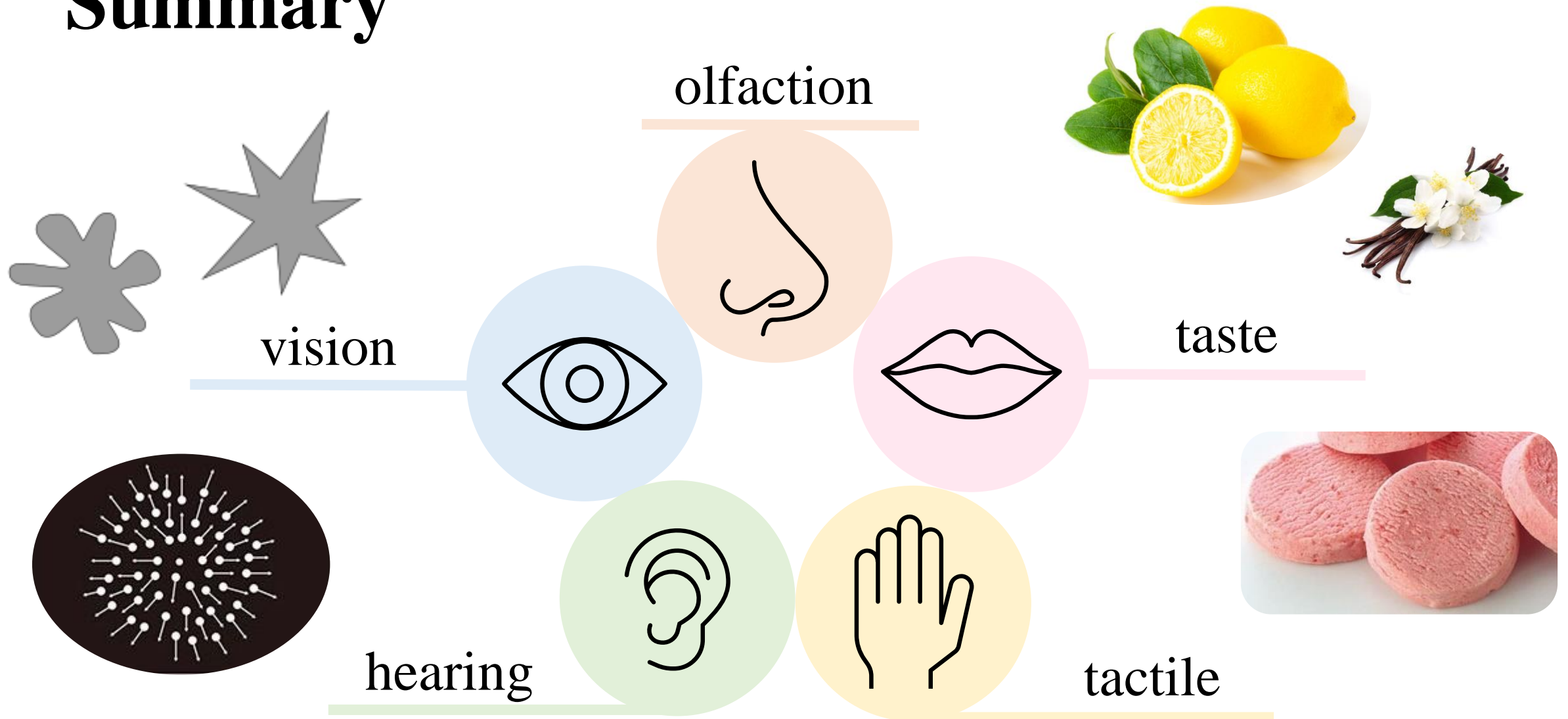




# Result: Flavor perception



# Summary





# Q&A

Do you have any questions?

**Q&A** (We got a question from our friend in advance.)

**Q:** How will the research on smell and speed that was introduced in your talk be applied in the future?

**Finally ...**

I thank you for your kind attention.

# References

- Hanson-Vaux, G., Crisinel, A.-S., & Spence, C. (2013). Smelling shapes: Crossmodal correspondences between odors and shapes. *Chemical Senses*, *38*, 161-166. <https://doi.org/10.1093/chemse/bjs087>
- Narumi, T., Tanikawa, T., Kajinami, T., & Hirose, M. (2010). Meta cookie: Pseudo-gustatory display based on cross-modal integration. *TVRSJ*, *15*, 579-588. [https://doi.org/10.18974/tvrsj.15.4\\_579](https://doi.org/10.18974/tvrsj.15.4_579)
- Tsushima, Y., Nishino, Y., & Ando, H. (2021). Olfactory stimulation modulates visual perception without training. *Frontiers in Neuroscience*, *15*, 642584. <https://doi.org/10.3389/fnins.2021.642584>