

# Empiricist Mentalist Semantics

Barry Nouwt

Master's Thesis Cognitive Artificial Intelligence  
Supervised by Dr. H.L.W. Hendriks

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# Introduction

- Computers can speak, read and hear sentences
- Computers cannot understand meaning of sentences
- Semantic theory to implement meaning

# Introduction

- Semantic theory from philosophy.
- Ludwig Wittgenstein and Gottlob Frege are recent and popular.
- However, not suitable for implementation because non-mentalist.
- Let's look at less recent semantic theories!

# Introduction

- Mentalist Semantic theories from 17<sup>th</sup> century.
- John Locke's Empiricist Mentalist Semantic Theory from his book *An Essay Concerning Human Understanding (1690)*.
- Seems more suitable for implementation on computers.
- Let's take it as our starting point!

# Introduction

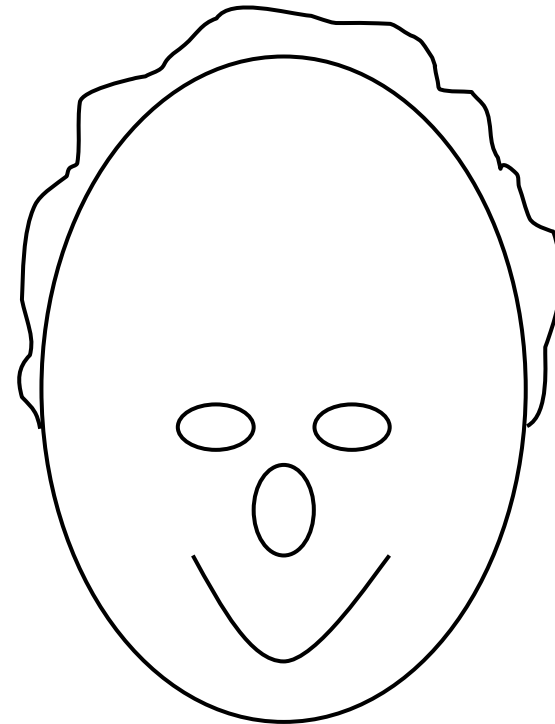
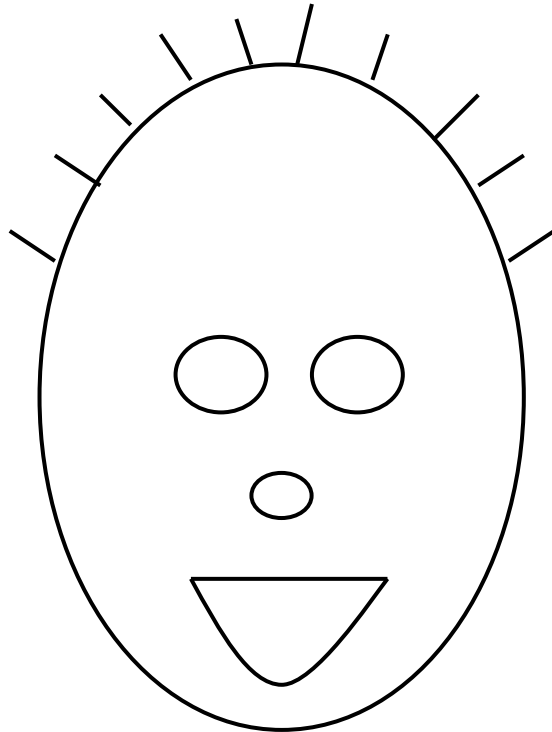
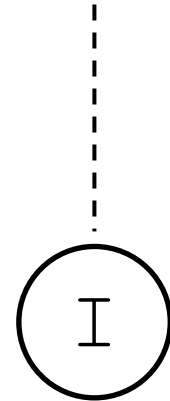
- Three serious objections against Empiricist Mentalist Semantic Theory (**EMST**)
- Intersubjectivity Objection (Frege)
- Self-applicability Objection (Wittgenstein)
- Abstract Ideas Objection (Berkeley)
- How can these three objections be met?

# Intersubjectivity Objection

- Intersubjectivity: two subjects attribute the same information to words (e.g. 'tree').
- Without intersubjectivity, communication is impossible.
- Intersubjectivity and communicating computers.

# Intersubjectivity Objection

“TREE”



# Intersubjectivity Objection

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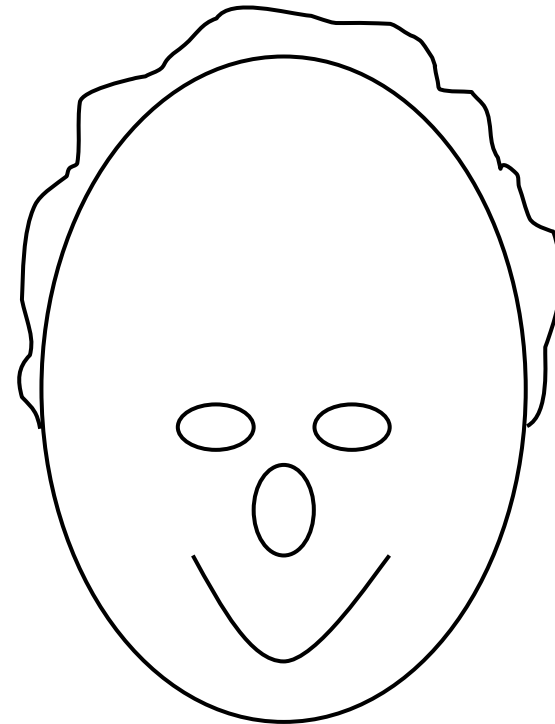
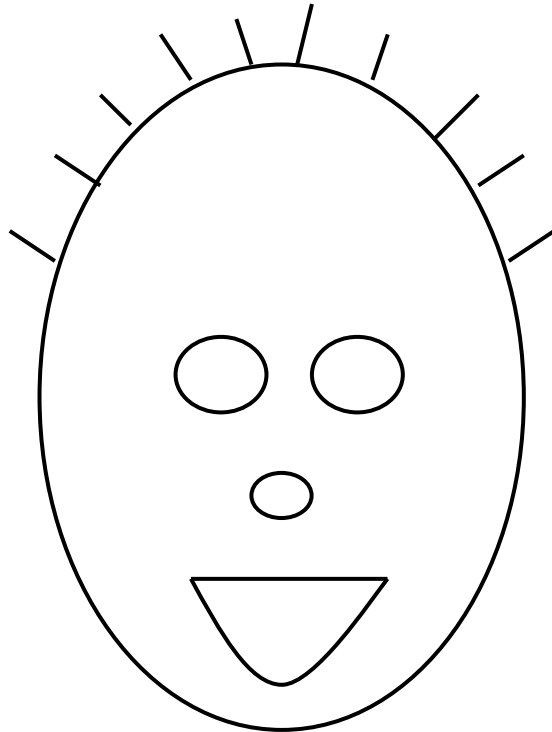
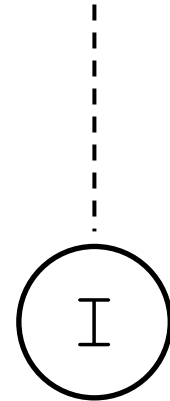
# Intersubjectivity Objection

- Gottlob Frege explains<sup>1</sup> why EMST must be incorrect: *“It would be impossible for something one man said to contradict what another man said, because the two would not express the same thought, but each his own.”*

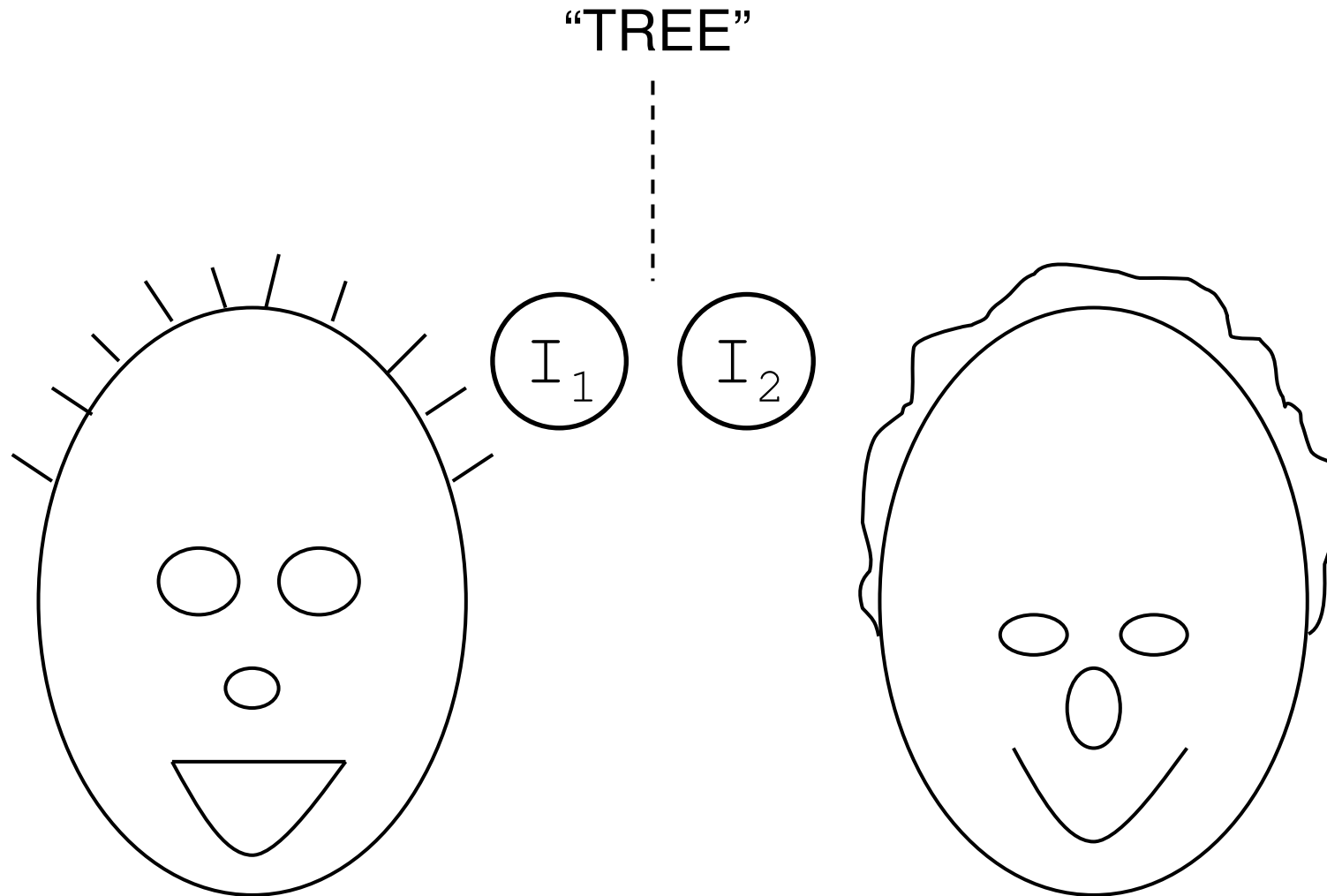
<sup>1</sup>See Picardi (1996, Section ‘Frege’s anti-psychologism’)

# Intersubjectivity Objection

“TREE”

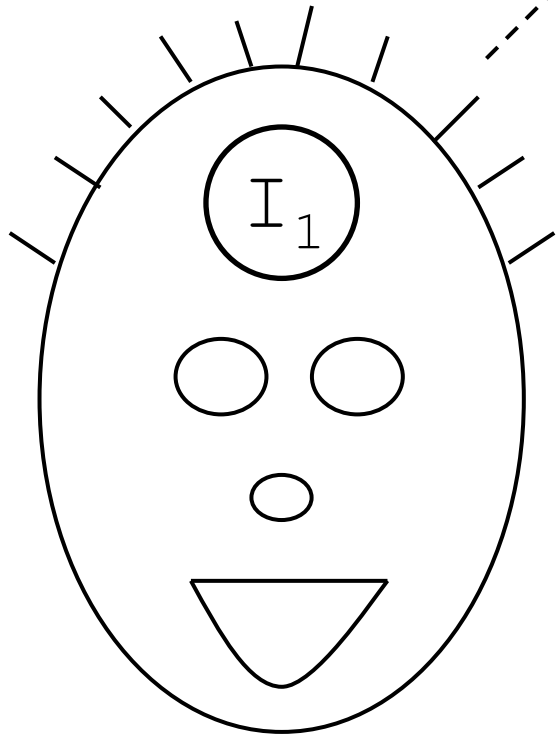


# Intersubjectivity Objection

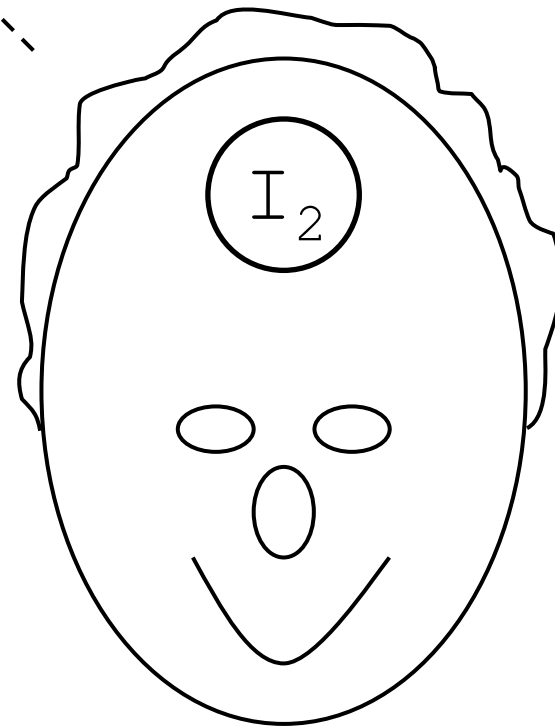


# Intersubjectivity Objection

“TREE”



$I_1 \neq I_2$



EMST

# Intersubjectivity Objection

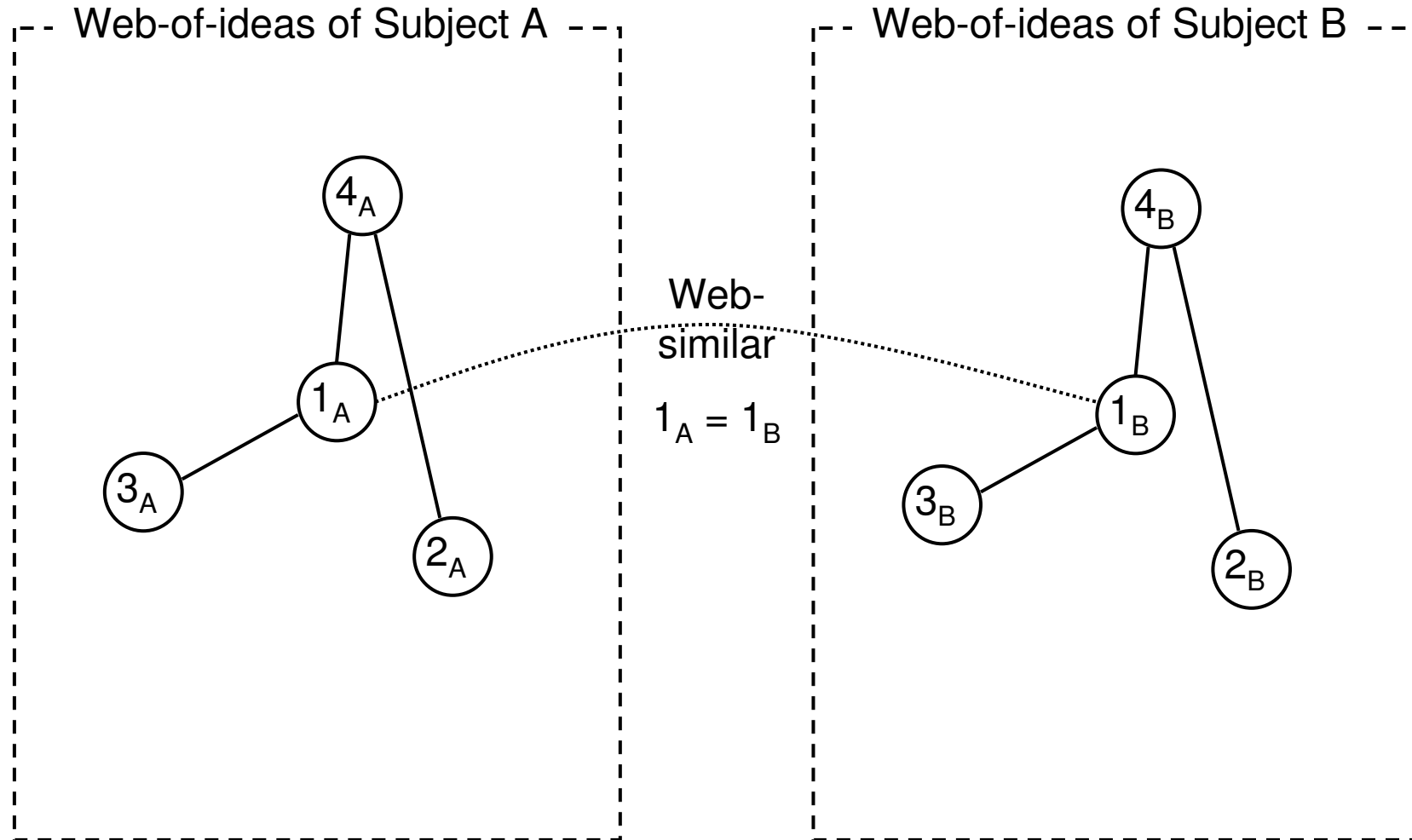
- Similarity plays a crucial role in meeting the objection.
- Jonathan Lowe says<sup>1</sup>: “[I]t is hard to see how there can be any *intersubjective*, publicly available criterion for the similarity of ideas occurring in two different minds.”
- We will suggest such a criterion.

<sup>1</sup>See Lowe (1995, p. 151)

# Intersubjectivity Objection

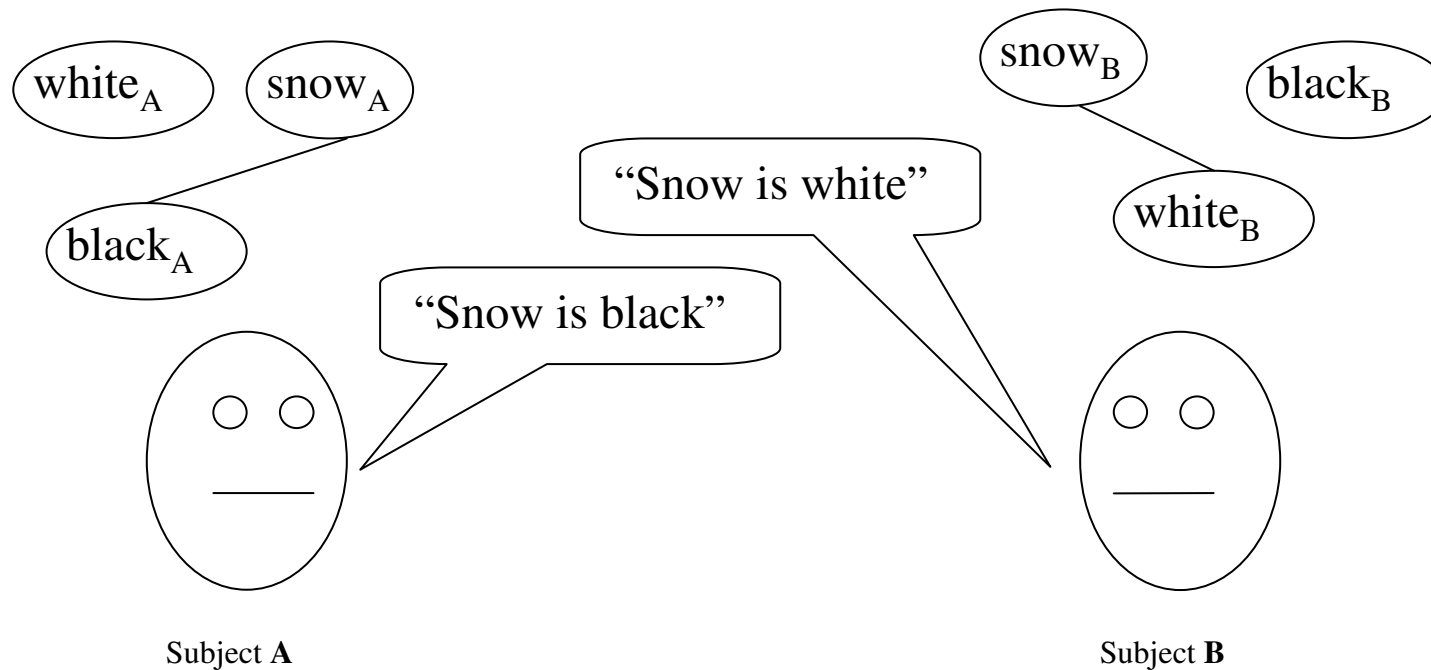
- Web-similarity criterion: Two ideas are ***web-similar*** if and only if they are related in the same way to other ***web-similar*** ideas.
- This criterion assumes two webs-of-ideas within two different subjects A and B.

# Intersubjectivity Objection



# Intersubjectivity Objection

- Web-similarity = intersubjective, publicly available criterion.

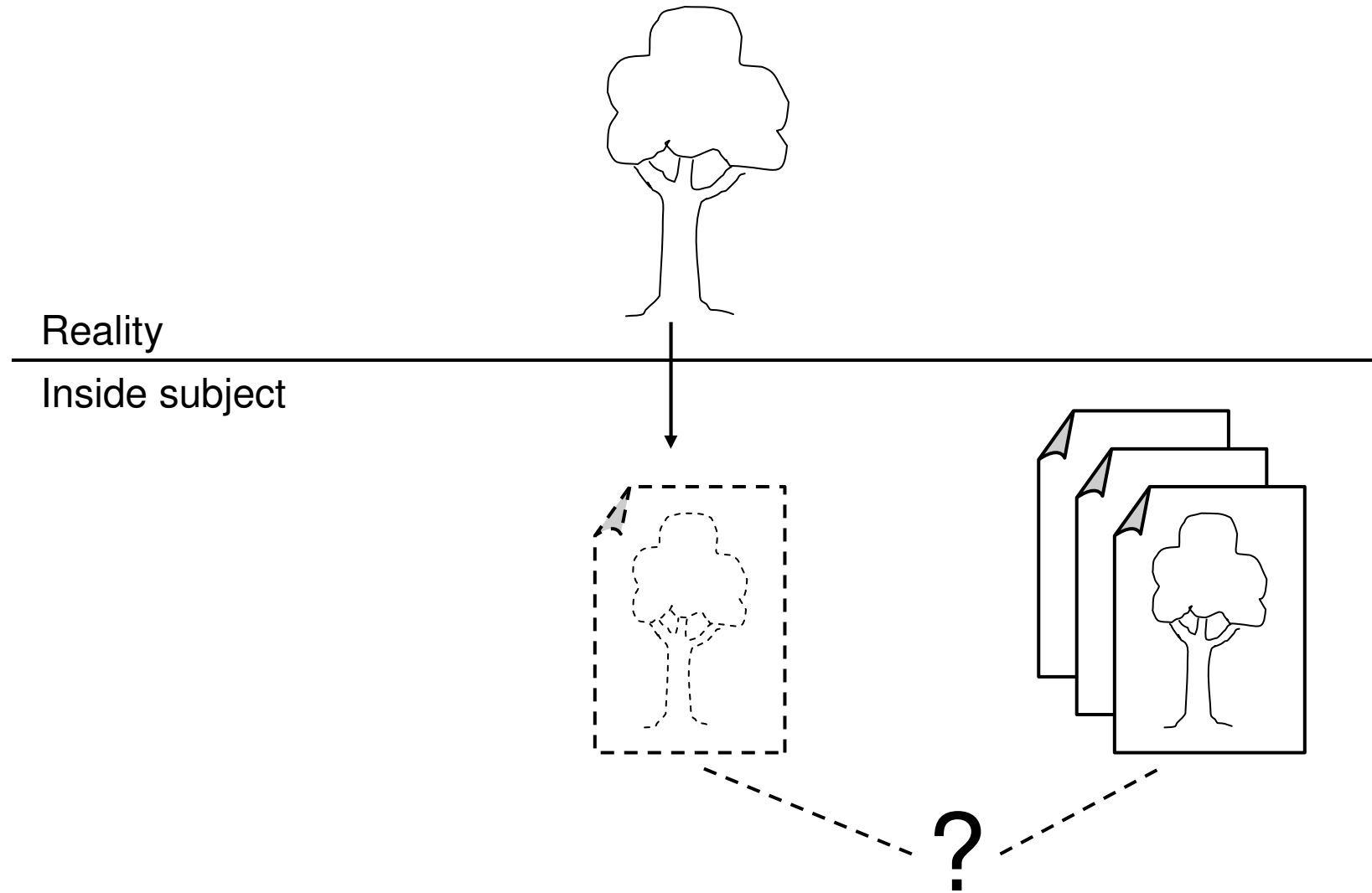


# Self-Applicability Objection

- Application criteria: observable similarity.
- For example the idea 'tree'.
  
- However, applying ideas to reality leads to an infinite regress<sup>1</sup> of interpreting the interpretation of an interpretation, etc.

<sup>1</sup>See Lowe (1995, p.164) and Stokhof (2003, pp. 48-49)

# Self-Applicability Objection



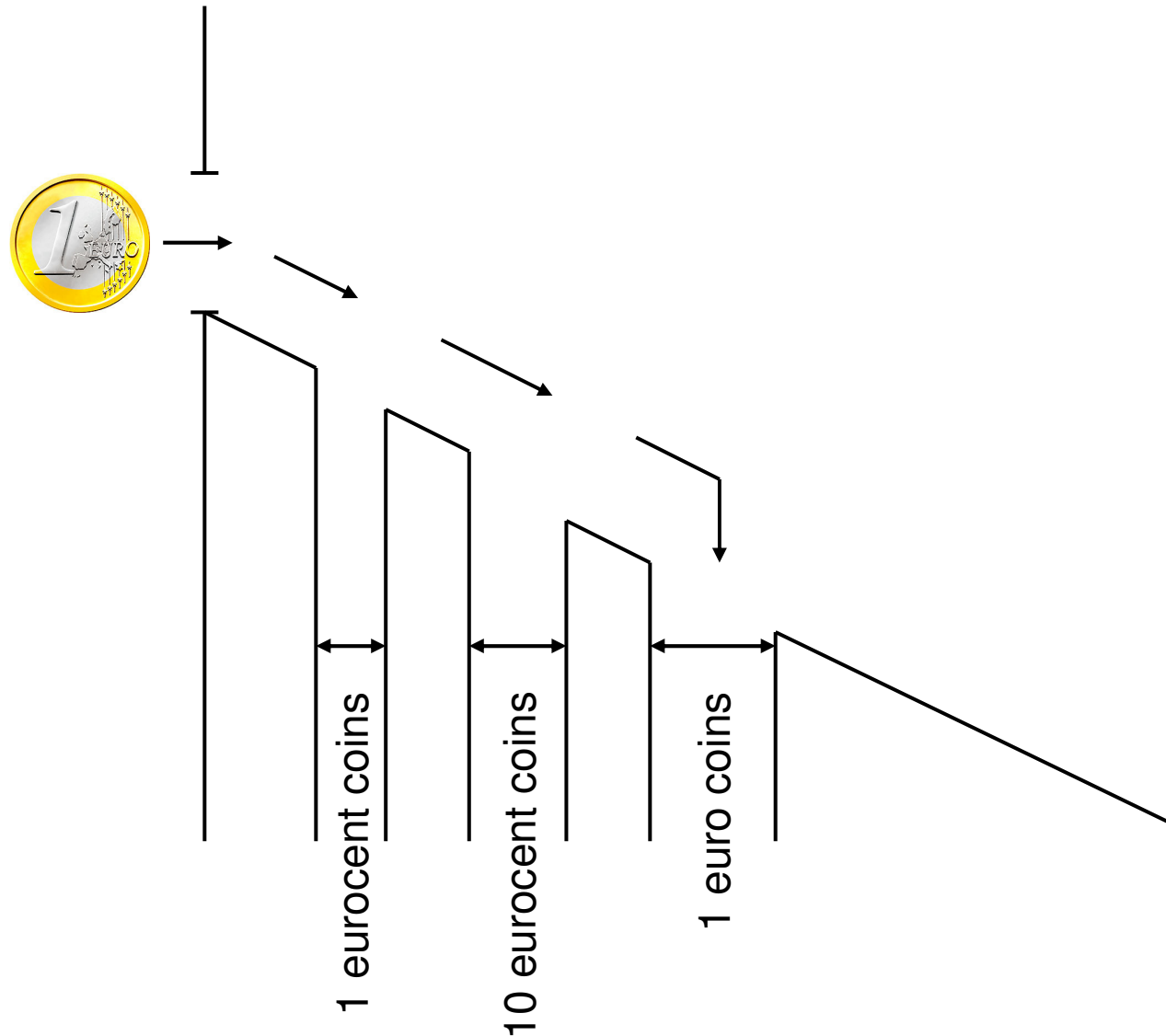
# Self-Applicability Objection

- Only way out: ideas are self-applying.
- Wittgenstein and Stockhof<sup>1</sup>: self-applying ideas are not plausible.
- Lowe<sup>2</sup>: self-applying ideas *are* plausible.
- Compare ideas with coin-slots in an automatic vending machine.

<sup>1</sup>See Stockhof (2003, p. 40) and Wittgenstein (1958, p. 37)

<sup>2</sup>See Lowe (1995, pp. 164-165)

# Self-Applicability Objection

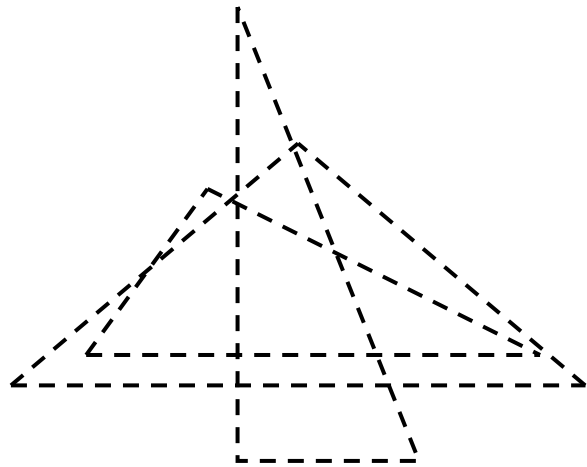


# Abstract-Ideas Objection

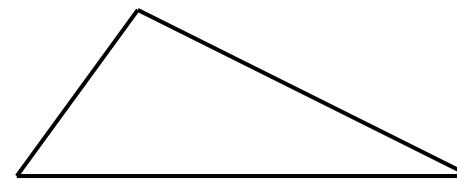
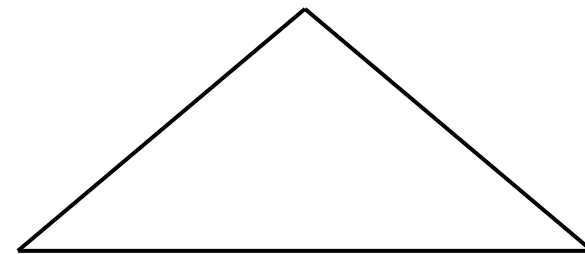
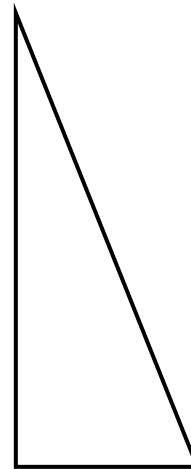
- According to John Locke<sup>1</sup> the idea ‘triangle’: *“must be neither Oblique, nor Rectangle, neither Equilateral, Equicrural, nor Scalenon; but all and none of these at once.”*
- That is: the idea ‘triangle’ must be indeterminate with respect to certain properties.

<sup>1</sup>See Locke (1690, Section IV.vii.9)

# Abstract-Ideas Objection



Idea 'triangle'?



# Abstract-Ideas Objection

- Therefore<sup>1</sup>: *“the idea of man I frame to my self, must be either of a white, or a black, or a tawny, a straight, or a crooked, a tall or a low, or a middle-sized man.”*
- Since image-like ideas cannot be indeterminate, EMST is incorrect because it cannot explain the existence of abstract ideas.

<sup>1</sup>See Bennett (1971, p. 36)

# Abstract-Ideas Objection

- What if ideas are not image-like?
- Locke and others<sup>1</sup> hint at ideas being pattern-like, but do not elaborate.
- Maybe pattern-like ideas can be indeterminate and represent all types of triangles.

<sup>1</sup>See Lowe (1995, p. 156) and Locke (1690, Section III.iii.19 and Section III.iv.2)

# Abstract-Ideas Objection

- Regular Expression = definition of a pattern in strings of characters.
- For example:
  - `^[a-z0-9._%+-]+@[a-z0-9.-]+\.[a-z]{2,4}$`
  - “abcd012@abcd.ab”
  - “johndoe@hotmail.co.uk”
  - **“this@is.not.a.match”**
- Regular Expression can be indeterminate with respect to certain properties.

# Abstract-Ideas Objection

- Suggestion: Similar pattern definitions only not for strings of characters.
- Just like RegEx, can these patterns be indeterminate with respect to certain properties.
- These patterns might be able to represent all types of triangles.

# Conclusion

- Intersubjectivity Objection:
  - Web-of-ideas
  - Web-similarity
- Self-Applicability Objection:
  - Ideas are slot-like (as coin-slots in vending machines)
- Abstract-Ideas Objection:
  - Ideas are pattern-like (analogous to RegEx)
- Updated EMST is just a first step!

# Further Research / Discussion

- Web-of-ideas: Is it plausible and what are their properties?
- Slot-like ideas: Are they compatible with current knowledge about the brain?
- Pattern-like ideas: Are they powerful enough to account for meanings of all words?
- Web-of-ideas: What is their relation to semantic structures?

# Semantic Structure

