Empiricist Mentalist Semantics

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Master’s Thesis Cognitive Artificial Intelligence
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June 2008
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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-mentalistic.
• Let’s look at less recent semantic theories!
Introduction

• Mentalist Semantic theories from 17th century.
• 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

• Two subjects attribute the same information to the word ‘tree’.

• Without intersubjectivity, communication is impossible.

• Intersubjectivity and communicating computers.
Intersubjectivity Objection

• Gottlob Frege explains\(^1\) 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."

\(^1\)See Picardi (1996, Section ‘Frege’s anti-psychologism’)

10/29
Intersubjectivity Objection

“TREE”

11/29
Intersubjectivity Objection

“TREE”

I₁  I₂
Intersubjectivity Objection

$I_1 \neq I_2$

EMST

“TREE”
Intersubjectivity Objection

• Similarity plays a crucial role in meeting the objection.

• Jonathan Lowe says\(^1\): “[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.

\(^1\)See Lowe (1995, p. 151)
Intersubjectivity Objection

- Web-similarity criterion: Two ideas are \textit{web-similar} if and only if they are related in the same way to other \textit{web-similar} ideas.

- This criterion assumes two webs-of-ideas within two different subjects A and B.
Intersubjectivity Objection

Web-of-ideas of Subject A

Web-of-ideas of Subject B

$1_A = 1_B$
Intersubjectivity Objection

- Web-similarity = intersubjective, publicly available criterion.

Subject A

- white_A
- snow_A
- black_A

“Snow is white”

Subject B

- snow_B
- black_B
- white_B

“Snow is black”
Self-Applicability Objection

• Application criteria: observable similarity.
• For example the idea ‘tree’.

• However, applying ideas to reality leads to an infinite regress\(^1\) of interpreting the interpretation of an interpretation, etc.

\(^1\)See Lowe (1995, p.164) and Stokhof (2003, pp. 48-49)
Self-Applicability Objection

Reality

Inside subject

?
Self-Applicability Objection

• Only way out: ideas are self-applying.
• Wittgenstein and Stokhof\(^1\): self-applying ideas are not plausible.

• Lowe\(^2\): self-applying ideas *are* plausible.
• Compare ideas with coin-slots in an automatic vending machine.

\(^1\)See Stockhof (2003, p. 40) and Wittgenstein (1958, p. 37)
\(^2\)See Lowe (1995, pp. 164-165)
Self-Applicability Objection
Abstract-Ideas Objection

• According to John Locke\(^1\) 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.

\(^1\)See Locke (1690, Section IV.vii.9)
Abstract-Ideas Objection

Idea ‘triangle’?
Abstract-Ideas Objection

• Therefore\(^1\): “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.

\(^1\)See Bennett (1971, p. 36)
Abstract-Ideas Objection

• What if ideas are not image-like?
• Locke and others¹ hint at ideas being pattern-like, but do not elaborate.

• Maybe pattern-like ideas can be indeterminate and represent all types of triangles.

¹See 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

Source: http://www.carp-technologies.nl/nld/images/stories/q&a/sem2.gif