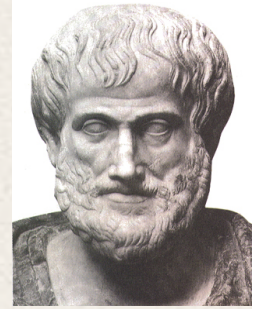


Semantic Internalism

Paul M. Pietroski

University of Maryland

Language: something that connects signals with interpretations



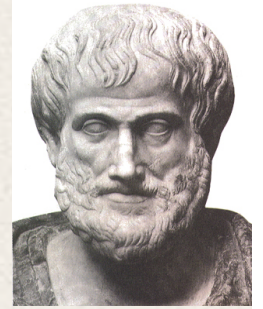
Human Language: a language of a special sort

- (i) connects *boundlessly many pronunciations*—
e.g., the sounds of spoken English, or signs of ASL—
with *boundlessly many meanings*
- (ii) acquirable by children, given ordinary experience

What are these meanings?

What are the “interpretations” that
Human Languages connect pronunciations with?

Language: something that connects signals with interpretations



Human Language: a language of a special sort

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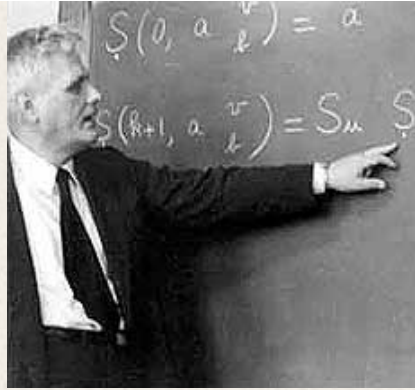
(ii) acquirable by children, given ordinary experience

a Human Language is an I-Language in Chomsky's sense:

a *procedure that generates* pronunciation-meaning (π - μ) pairs,

as opposed to a mere **set of** such pairs





function in intension
(computational procedure)

function in extension
(set of input-output pairs)

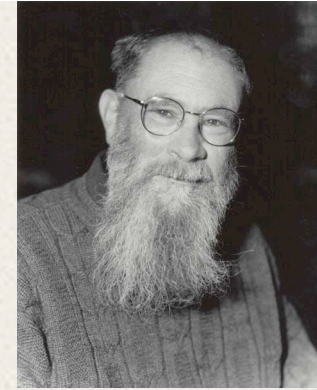
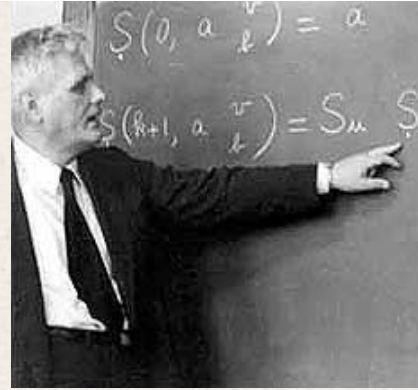
$$|x - 1| \quad +\sqrt{x^2 - 2x + 1}$$

$$\{...(-2, 3), (-1, 2), (0, 1), (1, 0), (2, 1), ...\}$$

$$\lambda x . |x - 1| = \lambda x . +\sqrt{x^2 - 2x + 1}$$

$$\lambda x . |x - 1| \neq \lambda x . +\sqrt{x^2 - 2x + 1}$$

$$\text{Extension}[\lambda x . |x - 1|] = \text{Extension}[\lambda x . +\sqrt{x^2 - 2x + 1}]$$



focus on
languages as intensions:
procedures that generate
pronunciation-meaning pairs

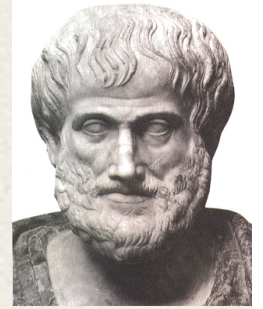
focus on
languages as extensions:
sets of
pronunciation-meaning pairs

In principle, distinct procedures
might generate the same pronunciation-meaning pairs

Language-1 \neq Language-2

Extension[Language-1] = Extension[Language-2]

Language: something that connects signals with interpretations



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Human Language:

a child-acquirable procedure that generates
boundlessly many pronunciation-meaning (π - μ) pairs,

What are these meanings?

What are the “interpretations” that
Human Languages connect pronunciations with?

What are these “human interpretations” that children
naturally (and generatively) connect with pronunciations?

What are Human Meanings?

Three traditional ideas, and a fourth variant:

- *concepts* (mental representations of some sort),
with *thoughts* as special cases of concepts
- *extensions* of ideal concepts,
with *truth conditions* as special cases of extensions

*think of an ideal concept as a (representation of)
“verification procedure” that determines an extension*

What are Human Meanings?

Three traditional ideas, and a fourth variant:

- *concepts* (mental representations of some sort),
with *thoughts* as special cases of concepts
- *extensions* of ideal concepts,
with *truth conditions* as special cases of extensions
- *instructions* for how to “use” pronunciations
- instructions for how to build concepts of a special sort

Elizabeth, on her side, had much to do. She wanted to ascertain the feelings of each of her visitors, she wanted to compose her own, and to make herself agreeable to all; and in the latter object, where she feared most to fail, she was most sure of success, for those to whom she endeavoured to give pleasure were prepossessed in her favour.

Bingley was ready,
Georgiana was eager, and
Darcy determined to be pleased.

Jane Austen
Pride and Prejudice



Bingley is eager to please.

(a) Bingley is eager to be one who pleases.

#(b) Bingley is eager to be one who is pleased.

Bingley is easy to please.

#(a) Bingley can easily please.

(b) Bingley can easily be pleased.

Bingley is ready to please.

(a) Bingley is ready to be one who pleases.

(b) Bingley is ready to be one who is pleased.

The duck is ready to eat.

(a) The duck is prepared to dine.

(b) The duck is pret a manger.



(1) Bingley is eager to please

(a) Bingley is eager to be one who pleases.

#(b) Bingley is eager to be one who is pleased.

(2) a boy saw a man with a telescope

(a) A boy saw a man who had a telescope.

(b) A boy saw a man by using a telescope.

#(c) A boy saw a man and had a telescope.

In English: the pronunciation of (1) has one meaning, not two;
the pronunciation of (2) has two meanings, but not three.

What are these (sentential) meanings?

Thoughts? Truth Conditions? Instructions of some kind?

‘bank’ is homophonous

two or more English words, each with its own meaning,
share the pronunciation /bæŋk/

‘book’ is polysemous

a single English word, with the pronunciation /bʊk/,
has a meaning that supports more than one “use” or “subsense”

What are these (word) meanings?

Concepts?

Extensions of ideal concepts?

Instructions of some kind?

‘bank’ is homophonous

two or more English words, each with its own meaning,
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‘book’ is polysemous

a single English word, with the pronunciation /bʊk/,
has a meaning that supports more than one “use” or “subsense”

Lexical Homophony is ubiquitous:

‘pen’, ‘duck’, ‘bear/bare’, ‘run’, ‘set’, ...

'bank' is homophonous

two or more English words, each with its own meaning,
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'book' is polysemous

a single English word, with the pronunciation /bʊk/,
has a meaning that supports more than one "use" or "subsense"

Lexical Homophony is ubiquitous

Lexical Polysemy is ubiquitous, even allowing for homophony

'country', 'door', 'language', 'run', 'set', ...

He likes green ones. Green is his favorite color. Greens suit him.

Green paint is green, and so are green apples.

‘bank’ is homophonous

two or more English words, each with its own meaning,
share the pronunciation /bæŋk/

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a single English word, with the pronunciation /bʊk/,
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Lexical Homophony is ubiquitous

Lexical Polysemy is ubiquitous, even allowing for homophony

Structural Homophony is ubiquitous

Visiting relatives can be dangerous when the duck is ready to eat

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Structural Polysemy ???

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a single English word, with the pronunciation /bʊk/,
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Lexical Homophony and Lexical Polysemy are ubiquitous.

There is room for argument about particular cases. But...

one word-sound can be connected with two or more meanings,
each of which may support more than one “use” or “subsense”

Lexical Homophony and Lexical Polysemy are ubiquitous.

There is room for argument about particular cases. But...

one word-sound can be connected with two or more meanings,
each of which may support more than one “use” or “subsense”

Whatever these Human Meanings are, they don't seem to be

- instructions for how to “use” pronunciations, or
- extensions of ideal concepts

One can try to maintain that each Human Meaning is a concept,
by positing very flexible (i.e., polysemous) concepts.

But...

Familiar Reasons for not identifying Meanings with Concepts

- Speakers can, and presumably often do, connect the “same word” with different concepts
standard examples: ‘Venus’, ‘water’, ‘Paderewski’, ‘star’, ...

Familiar Reasons for not identifying Meanings with Concepts

- Speakers can, and presumably often do, connect the “same word” with different concepts
- A single speaker can, and presumably often does, connect a single word with more than one concept
- A speaker may not connect a word in her language with any particular concept

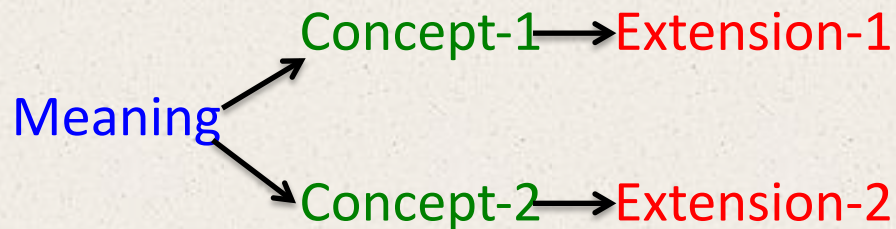
These points can be pushed too far. But I accept the basic moral: meanings do not correspond one-to-one with concepts; one lexical item L may correspond to several concepts, no one of which is the meaning of L

Basic Moral of the Classic Examples:

meanings do not correspond one-to-one with concepts;
one lexical item L may correspond to several concepts,
no one of which is the meaning of L

But this hardly shows that meanings are extensions of concepts.

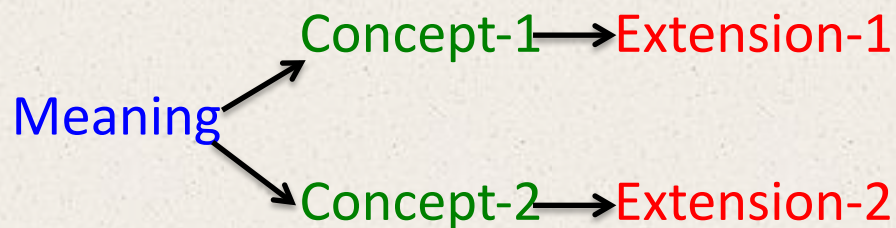
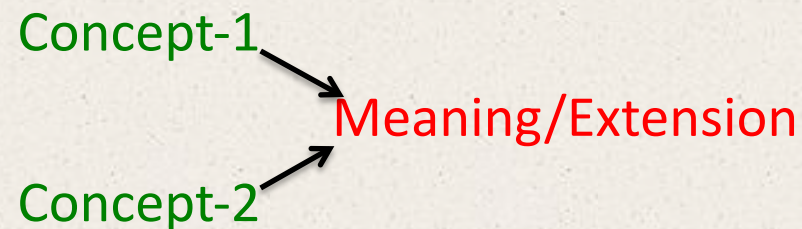
- (1) even if each concept has an extension, a lexical item may correspond to two or more concepts that are not co-extensive
- (2) Meanings may be more abstract than concepts, not less



Basic Moral of the Classic Examples:

meanings do not correspond one-to-one with concepts;
one lexical item L may correspond to several concepts,
no one of which is the meaning of L

But this hardly shows that meanings are extensions of concepts.



a **lexical meaning** need not be an **extension** that associated **concepts** share; a **lexical meaning** may be an **instruction** for how to *access* one of the associated **concepts** from a shared “address”

Meaning[*dog*] = **fetch**@address:*dog*

→ DOG(_)

Meaning[*brown*] = **fetch**@address:*brown*

→ BROWN(_)

Meaning[*brown dog*] =

Join(Meaning[*brown*], Meaning[*dog*]) =

Join(**fetch**@address:*brown*, **fetch**@address:*dog*)

→ BROWN(_) ^ DOG(_)

executing a lexical **instruction** accesses a **concept** that can be combined with others via certain (limited) operations

Meaning[*dog*] = **fetch**@address:*dog*

➔ DOG(_)

a fetchable concept
must be combinable
with others, but...

Meaning[*book*] = **fetch**@address:*book*

➔ SPATIAL-BOOK(_)

➔ CONTENT-BOOK(_)

a “lexical address”
need not be the
address of exactly
one concept

James Atlas on Global Warming (NY Times: Nov 25, 2012)

"a good chance that New York City will sink beneath the sea"

but...

"...the city could move to another island, the way Torcello was moved to Venice, stone by stone, after the lagoon turned into a swamp and its citizens succumbed to a plague of malaria. The city managed to survive, if not where it had begun."

Do the proper nouns 'Torcello' and 'Venice'
have extensions (or denotations)?

Torcello was moved to Venice.
Venice is a nice place.

Torcello was moved to a nice place.



some *thing* is such that:
'Venice' denotes *it*;
it is a (nice) *place*; and
the extension/denotation of
'Torcello' was moved to *it*

Torcello was moved to Venice.

Venice is a nice place.

Venice will be moved.

Torcello was moved to a nice place that will be moved.



France is hexagonal.

France is a republic.

There is a hexagonal republic.



$H(f)$

$R(f)$

$\exists x[H(x) \ \& \ R(x)]$



So maybe we shouldn't assume that

'Venice' denotes Venice (*i.e.*, Venice is a thing that 'Venice' denotes)

'Venice' is true of an entity e if and only if e is (identical with) Venice

'Venice is a nice place.' is true if and only if Venice is a nice place

if Venice is a city, then 'Venice' has an extension/denotation

But what about “natural kind terms”?

Water is H₂O.

The water from that well has a high mineral content. ☹️

The H₂O from that well has a high mineral content.

Words that can (sometimes) be used to talk about “natural kinds” do not provide *support* for truth conditional semantics.

They provide *further grief* for the idea that expressions of a natural language have truth/denotation/satisfaction conditions.

Water is H₂O.

‘water’ is true of e if and only if e is (a sample of) H₂O. ☹️

'water' is true of *e* if and only if *e* is 99.5% (or more) H₂O

Club Soda:	99.9	ndb.nal.usda.gov/ndb/foods/show/4240
Diet soda, not cola:	99.8	ndb.nal.usda.gov/ndb/foods/show/4253
Tea:	99.7	ndb.nal.usda.gov/ndb/foods/show/4337
Diet Cola:	99.54	ndb.nal.usda.gov/ndb/foods/show/4361
stuff from my well:	< 99.4	"Quality Water Analysis" from National Testing Laboratories, Ltd. <i>deferring to experts: no arsenic, no fluoride</i>
Coffee:	99.39	ndb.nal.usda.gov/ndb/foods/show/4287
Espresso:	97.8	ndb.nal.usda.gov/ndb/foods/show/4288
Ocean Water:	96.5	average salinity
Michelob Ultra:	95.4	ndb.nal.usda.gov/ndb/foods/show/4159
Bud Light:	95.0	ndb.nal.usda.gov/ndb/foods/show/4156
Distilled vinegar:	94.78	ndb.nal.usda.gov/ndb/foods/show/283



Chomsky, “Language and Nature” (*Mind* 1995)

Suppose cup-1 is filled from the tap. It is a cup of water, but if a tea bag is dipped into it, that is no longer the case. It is now a cup of tea, something different. Suppose cup-2 is filled from a tap connected to a reservoir in which tea has been dumped (say, as a new kind of purifier). What is in cup-2 is water, not tea, even if a chemist could not distinguish it from the present contents of cup-1....

In cup-2, the tea is an “impurity” in Putnam’s sense, in cup-1, it is not, and we do not have water at all (except in the sense that milk is mostly water, or a person for that matter). If cup-3 contains pure H₂O into which a tea bag has been dipped, it is tea, not water, though it could have a higher concentration of H₂O molecules than what comes from the tap or is drawn from a river.



Chomsky, “Language and Nature” (*Mind* 1995)

Quite typically, words offer conflicting perspectives....

We have no problem understanding a report in the daily press about the unfortunate town of Chelsea, which is “preparing to move” ... with some residents opposed because “by moving the town, it will take the spirit out of it”, while others counter that “unless Chelsea moves, floods will eventually kill it”. There is a city called both “Jerusalem” and “al-Quds”, much as London is called “London” and “Londres” ...The government that claims it as its capital city has been considering plans to move al-Quds, while leaving Jerusalem in place....The discussion would pose puzzles...if, failing to observe some of Wittgenstein's good advice, we were to suppose that words like “London” or “Jerusalem” refer to things in the world in some public language, and were to try to sharpen meanings and ideas for conditions under which the presuppositions of normal use do not hold.

Meaning[*dog*] = **fetch**@address:*dog*

→ DOG(_)

a fetchable concept
must be combinable
with others, but...

Meaning[*book*] = **fetch**@address:*book*

→ SPATIAL-BOOK(_)

→ CONTENT-BOOK(_)

a “lexical address”
need not be the
address of exactly
one concept

Meaning[*water*] = **fetch**@address:*water*

→ FUNCTIONAL-WATER(_)

→ SCIENCE-WATER(_)

an **instruction** may
be executable in
two or more ways

It's not exactly a new idea that a lexical meaning can “manifest” in more than one way

Lexicalized
Concept

MONTAGUE_{<e>}

Lexical
Item

Montague_{NP}

Lexical
Meaning



$\lambda X . T \text{ iff } X(\text{Portrait}) = T$



$\lambda x . T \text{ iff } x =$



*Lexicalized
Concept*

*Lexical
Item*

*Lexical
Meaning*

BOTTLE(____)_{<e, t>}

bottle_N

$\lambda x . T$ iff x is a bottle

GREEN(____)_{<e, t>}

green_{Adj}

$\lambda x . T$ iff x is green

$\lambda X . \lambda x . T$ iff x is green &
 $X(x) = T$

Meaning[*hexagonal*] = **fetch@address:hexagonal**

→ HEXAGONAL(_)

Meaning[*France*] = **fetch@address:France**

→ FRANCE-LAND

→ FRANCE-INSTITUTION

Meaning[*France is hexagonal*] →

Saturate(Meaning[*hexagonal*], Meaning[*France*])

→ HEXAGONAL(FRANCE-LAND)

→ HEXAGONAL(FRANCE-INSTITUTION)

Meaning[*republic*] = **fetch@address:republic**

→ REPUBLIC(_)

Meaning[*France*] = **fetch@address:France**

→ FRANCE-LAND

→ FRANCE-INSTITUTION

Meaning[*France is a republic*] →

Saturate(Meaning[*republic*], Meaning[*France*])

→ REPUBLIC(FRANCE-LAND)

→ REPUBLIC(FRANCE-INSTITUTION)

What are the Human Meaning Types?

- one familiar answer, via Frege's conception of ideal languages
 - (i) a basic type $\langle e \rangle$, for entity denoters
 - (ii) a basic type $\langle t \rangle$, for thoughts or truth-value denoters
 - (iii) if $\langle \alpha \rangle$ and $\langle \beta \rangle$ are types, then so is $\langle \alpha, \beta \rangle$

Fido, Garfield, Zero, ...

Fido barked.

Fido chased Garfield.

Zero precedes every positive integer.



What are the Human Meaning Types?

- one familiar answer, via Frege's conception of ideal languages
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That's a lot of types

a basic type $\langle e \rangle$, for entity denoters
 a basic type $\langle t \rangle$, for truth-value denoters
 if $\langle \alpha \rangle$ and $\langle \beta \rangle$ are types, then so is $\langle \alpha, \beta \rangle$

at Level 5,
 more than 5×10^{12}

0.	$\langle e \rangle$	$\langle t \rangle$	(2) types at Level Zero			
1.	$\langle e, e \rangle$	$\langle e, t \rangle$	$\langle t, e \rangle$	$\langle t, t \rangle$	(4) at Level One, all $\langle 0, 0 \rangle$	
2.	eight of $\langle 0, 1 \rangle$	eight of $\langle 1, 0 \rangle$	(32), including $\langle e, et \rangle$	sixteen of $\langle 1, 1 \rangle$	and $\langle et, t \rangle$	
3.	64 of $\langle 0, 2 \rangle$	64 of $\langle 2, 0 \rangle$	(1408), including	128 of $\langle 1, 2 \rangle$	128 of $\langle 2, 1 \rangle$	$\langle e, \langle e, et \rangle \rangle$; $\langle et, \langle et, t \rangle \rangle$;
	1024 of $\langle 2, 2 \rangle$		and $\langle \langle e, et \rangle, t \rangle$			
4.	2816 of $\langle 0, 3 \rangle$	2816 of $\langle 3, 0 \rangle$	(2,089,472), including	5632 of $\langle 1, 3 \rangle$	5632 of $\langle 1, 3 \rangle$	$\langle e, \langle e, \langle e, \langle et \rangle \rangle \rangle$ and
	45,056 of $\langle 2, 3 \rangle$	45,056 of $\langle 3, 2 \rangle$	$\langle \langle e, et \rangle, \langle \langle e, et \rangle, t \rangle \rangle$	1,982,464 of $\langle 3, 3 \rangle$		

Three glosses of truth conditional semantics

(1) for each natural language **L**, there is a theory of truth that is the core of a correct theory of meaning for **L**

(2) the declarative sentences of a natural language have compositionally determined truth conditions

True('Jupiter spins.') \equiv Spins(Jupiter)

(3) in a natural language, the words have semantic properties that determine truth conditions for the sentences, given the rules that govern sentence formation

Denotes('Jupiter', Jupiter) $\forall x$ [Satisfies(x, 'spins') \equiv Spins(x)]

(P1) 'My favorite sentence is not true.' is true
if and only if my favorite sentence is not true.

(P2) 'My favorite sentence is not true.' is my favorite sentence.

(C) My favorite sentence is true
if and only if my favorite sentence is not true.

Larry is true if and only if **P**.

Larry is my favorite sentence.

My favorite sentence is true if and only if **P**.

(P1) 'My favorite sentence is not true.' is true
if and only if my favorite sentence is not true.

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(C) My favorite sentence is true
if and only if my favorite sentence is not true.

So maybe we shouldn't adopt hypotheses that imply (P1).

And if my favorite sentence doesn't have a truth condition,
then maybe other sentences don't have truth conditions.



Snow is white.

'Snow is white.' is true.

'Snow is white.' is true if and only if snow is white.

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2. René Magritte, *La Condition humaine*, 1933.