Computational Pragmatics
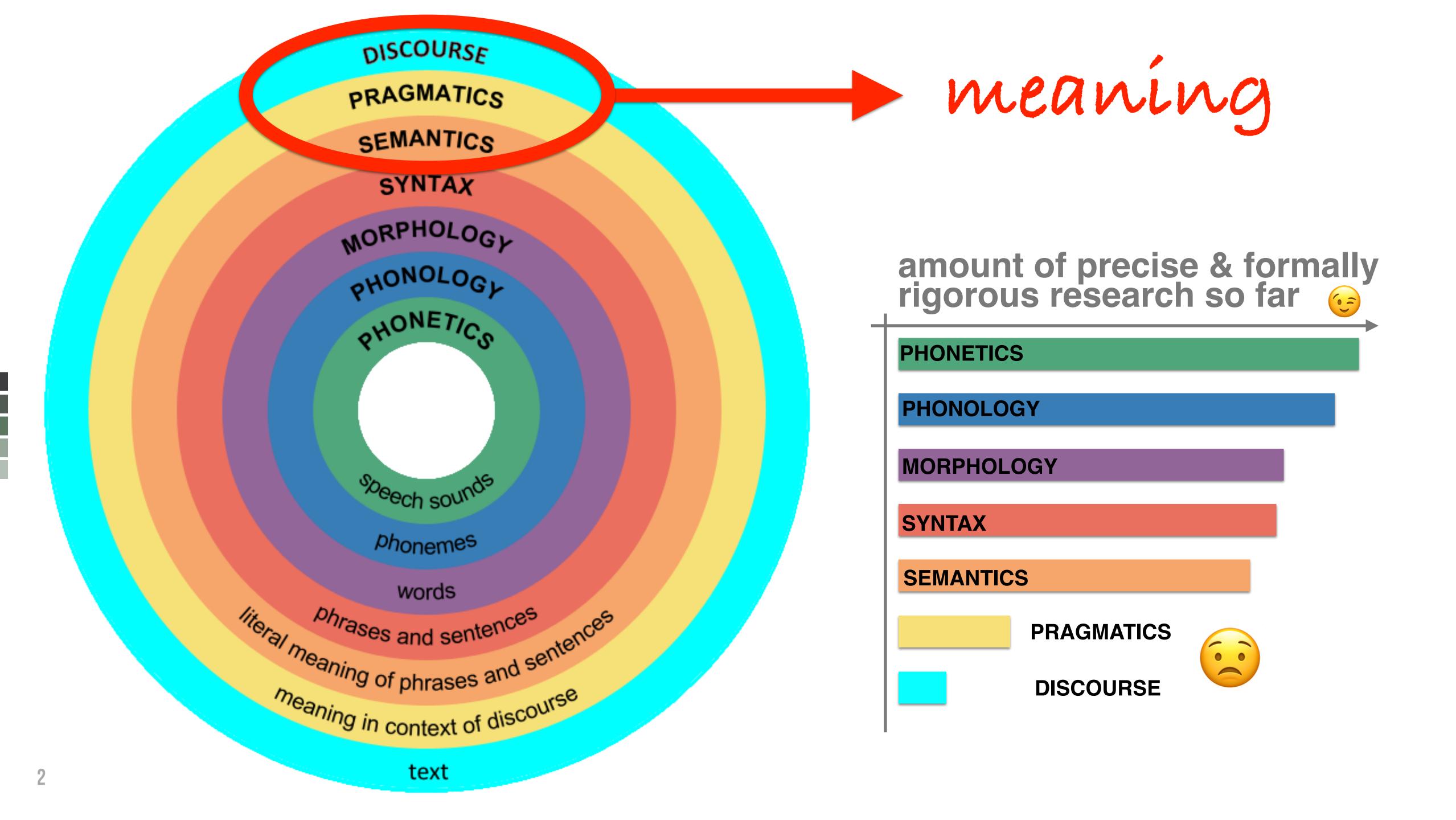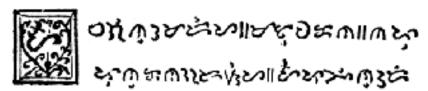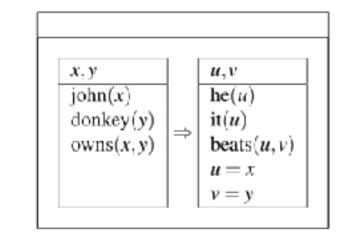
Introduction to Pragmatics
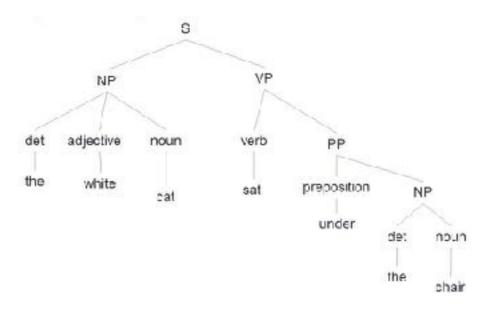
Session 1

Two views of language

structure

function

KNOWLEDGE OF LANGUAGE

/lɪŋˈgwɪstɪks/

$[\![Joe]\!] = \lambda e \, . \, \lambda w \, . \, Joe(e, w)$
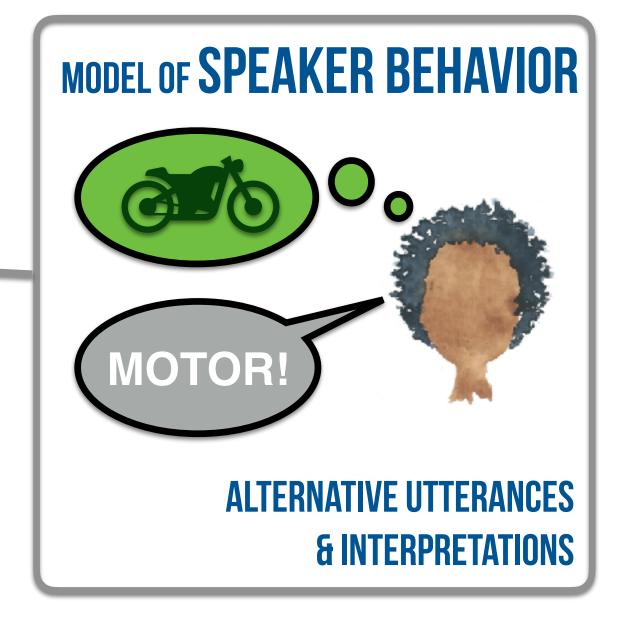
GENERAL WORLD KNOWLEDGE

ACTUAL CONTEXT OF CONVERSATION

probability

ACTUAL SPEAKER

BIKE!

MODEL OF SPEAKER BEHAVIOR

MOTOR!

ALTERNATIVE UTTERANCES & INTERPRETATIONS

PRAGMATIC INTERPRETER

Semantics
^{logical}
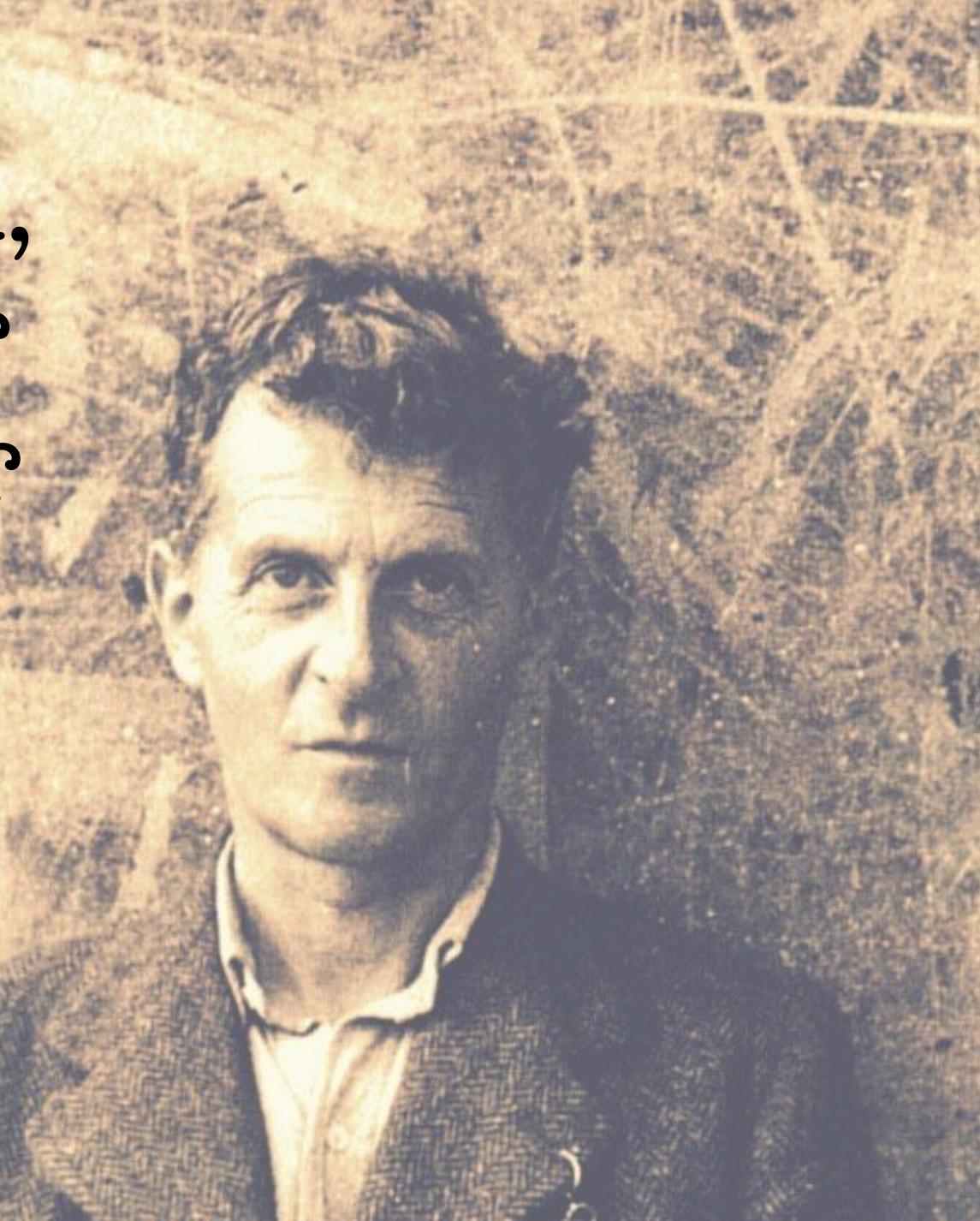
Einen Satz verstehen, heißt, wissen was der Fall ist, wenn er wahr ist.

(TLP 4.024)

BEGRIFFSSCHRIFT,

EINE DER ARITHMETISCHEN NACHGEBILDETE
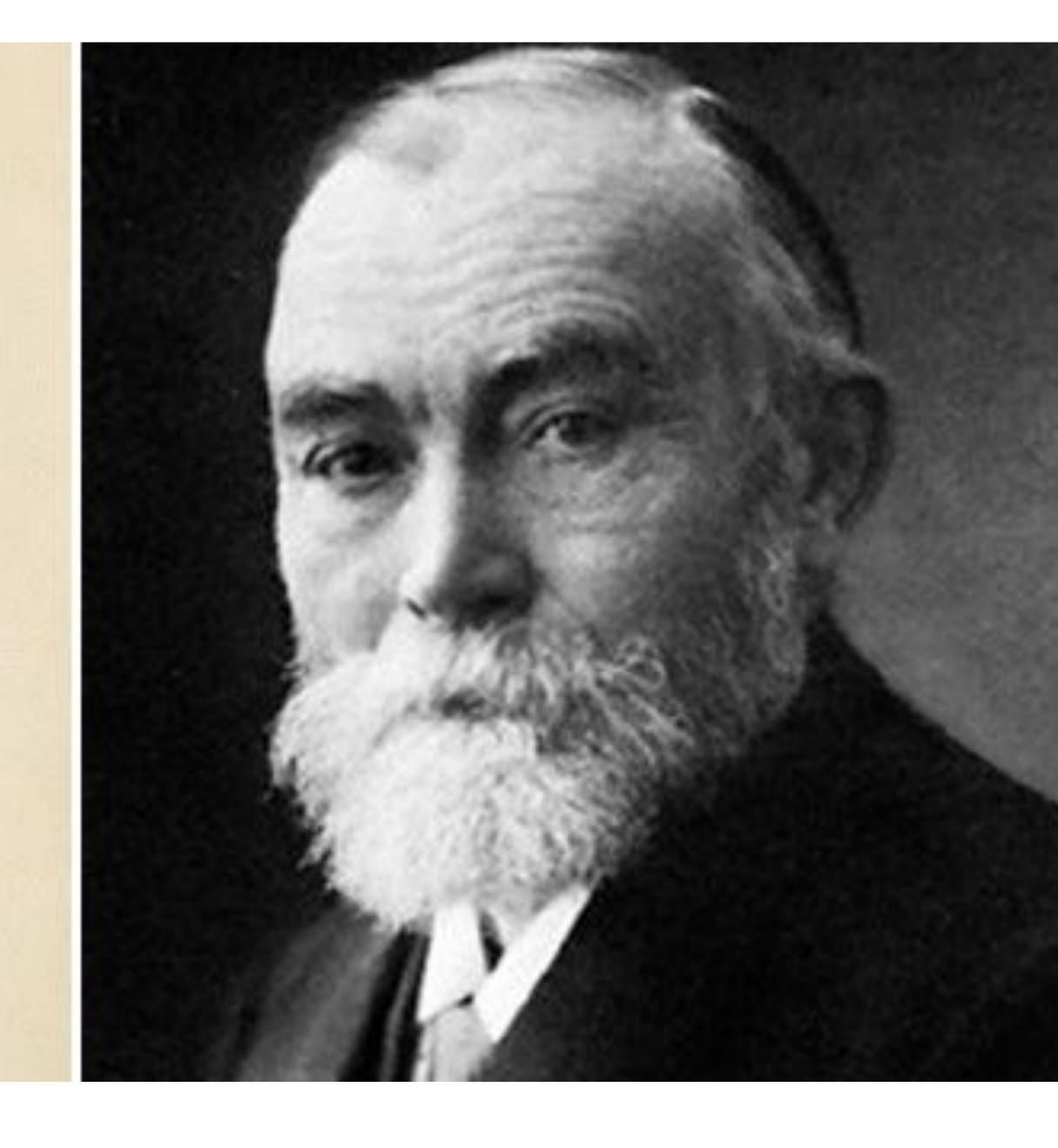
FORMELSPRACHE

DES REINEN DENKENS.

VON

D^{R.} GOTTLOB FREGE,

PRIVATDOCENTEN DER MATHEMATIK AN DER UNIVERSITÄT JENA.

φ	ψ	$\varphi \wedge \psi$	$\varphi \vee \psi$	$\varphi \rightarrow \psi$
1	1	1	1	1
1	0	0	1	0
0	1	0	1	1
0	0	0	0	1

(1) a. They got married and had kids.
    b. They had kids and got married.

(2) One more ukulele song and I'm out.

φ	ψ	$\varphi \wedge \psi$	$\varphi \vee \psi$	$\varphi \to \psi$
1	1	1	1	1
1	0	0	1	0
0	1	0	1	1
0	0	0	0	1
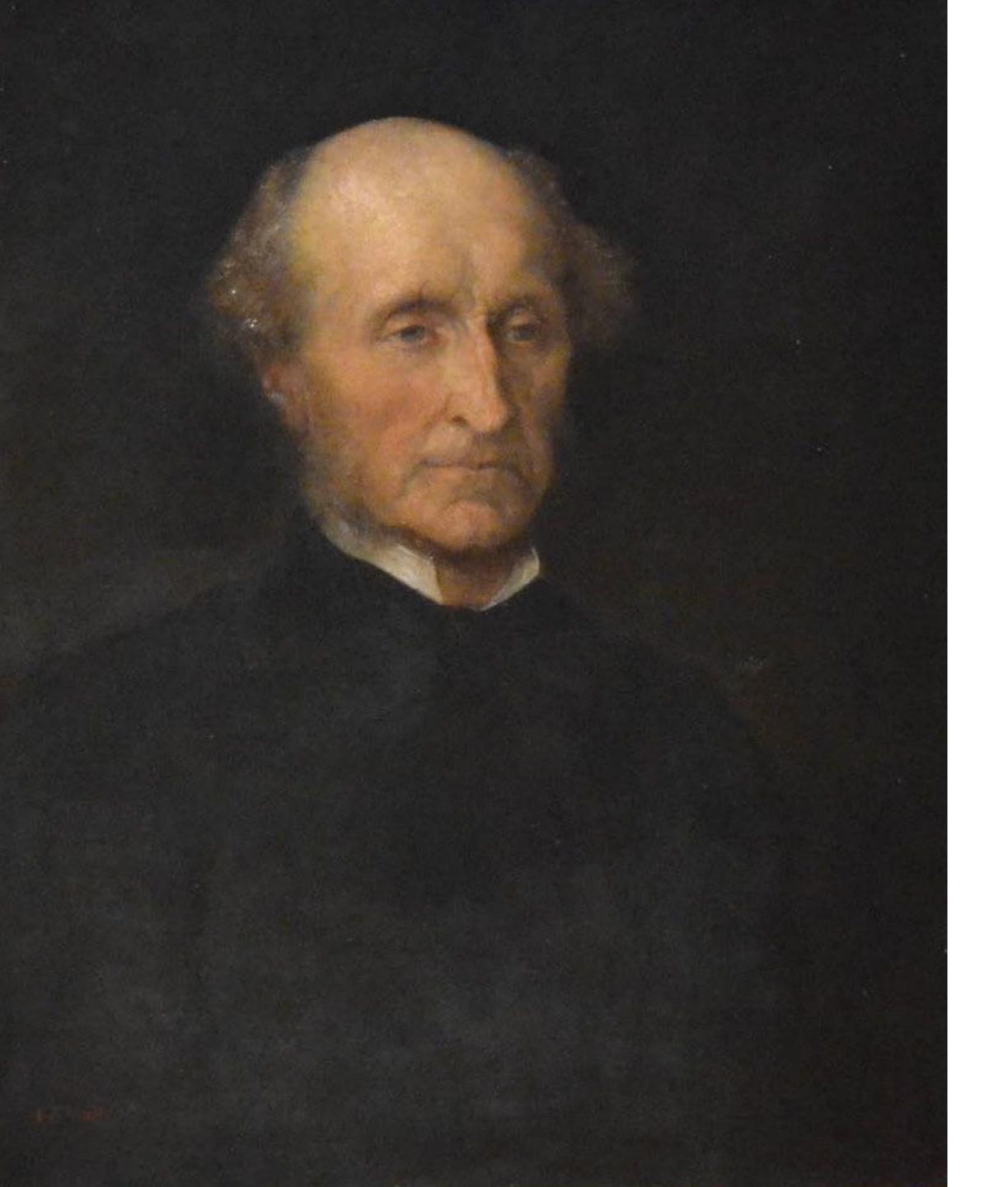
(3) Jon had no coin or he would have given it to him.

(4) If you pour sugar in your coffee, it tastes great.
    But if you pour sugar and gasoline in your coffee, it tastes awful.

(5) **A:** Do you speak Portuguese?
    B: My wife does.

Gricean

Pragmatics

"If I say to any one, **'I saw some of your children to-day'**, he might be justified in inferring that I did not see them all, not because the words mean it, but because, if I had seen them all, it is most likely that I should have said so."

(Mill 1867)

"[O]ne of my avowed aims is to see talking as a special case or variety of purposive, indeed rational, behaviour."

(Grice 1975)

Maxim of Quality

Try to make your contribution one that is true.

(i) Do not say what you believe to be false.

(ii) Do not say that for which you lack adequate evidence.

Maxim of Quantity

(i) Make your contribution as informative as is required for the current purposes of the exchange.

(ii) Do not make your contribution more informative than is required.

Maxim of Relation

(i) Be relevant.

Maxim of Manner

Be perspicuous.

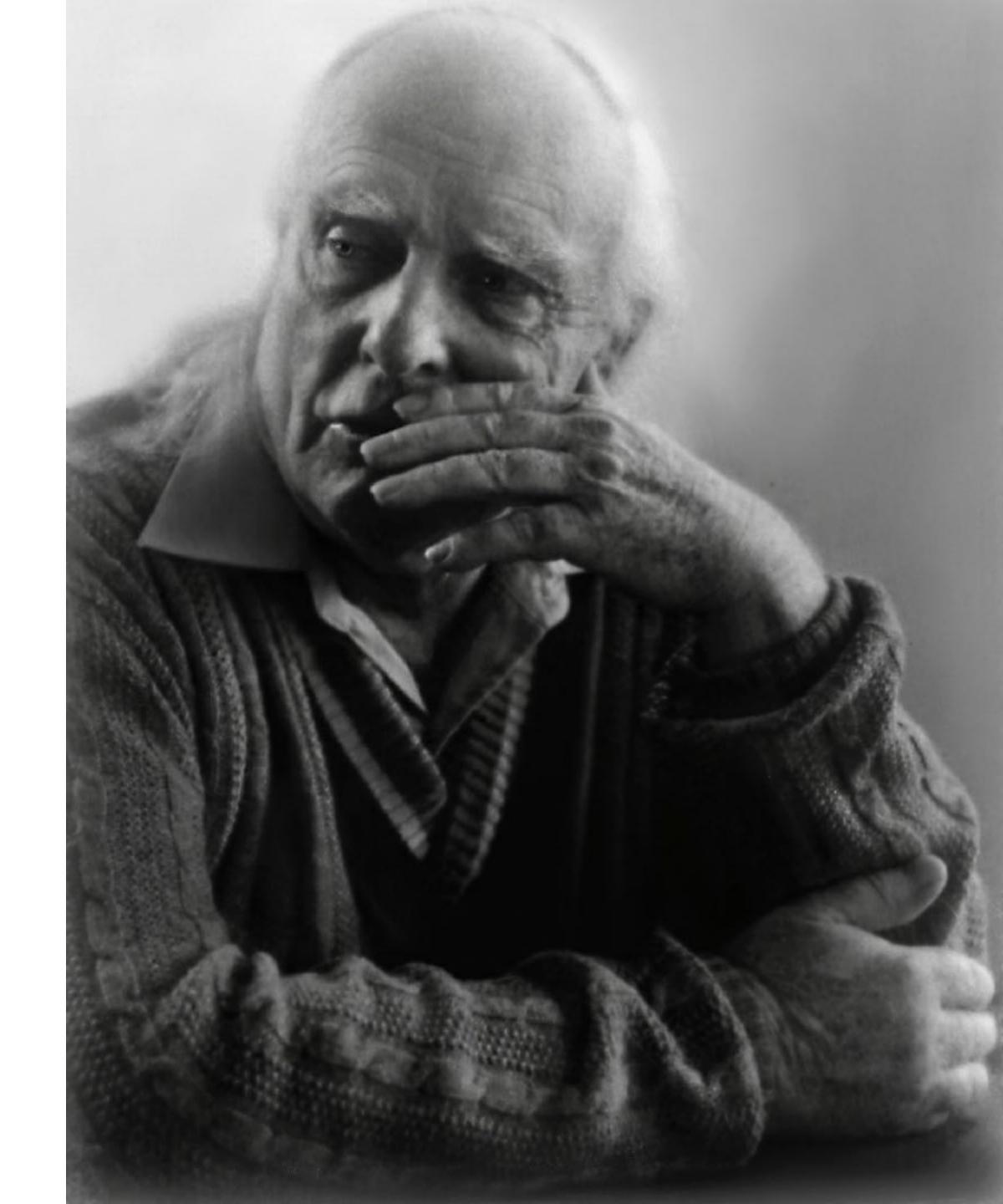(i) Avoid obscurity of expression.

(ii) Avoid ambiguity.

(iii) Be brief (avoid unnecessary prolixity).

(iv) Be orderly.

(1) a. They got married and had kids.
     b. They had kids and got married.

(5) **A:** Do you speak Portuguese?
     B: My wife does.

L assumes **S** obeys Maxims

by Manner, **L** assumes **S** to be "orderly"

L expects **S** to present events in chronological order (unless otherwise indicated)

L assumes **S** obeys Maxims

by Quantity & Relevance, **L** assumes **S** to give all the relevant information **S** is able to

if **S** was able to speak Portuguese, **S** would/ should have said so

Q-Implicatures

(6) I saw some of your children.
  ↳ I saw some but not all of your children.

(7) I saw Jack or Jill.
  ↳ I don't know which one.

I-Implicatures

(8) Every ten minutes a man gets mugged in New York City.
  ↳ Not the same poor fellow every time.

(8) Every ten minutes a light blinks on the machine.
  ↳ The same light every time.

M-Implicatures

(9) Black Bart caused the sherif to die.
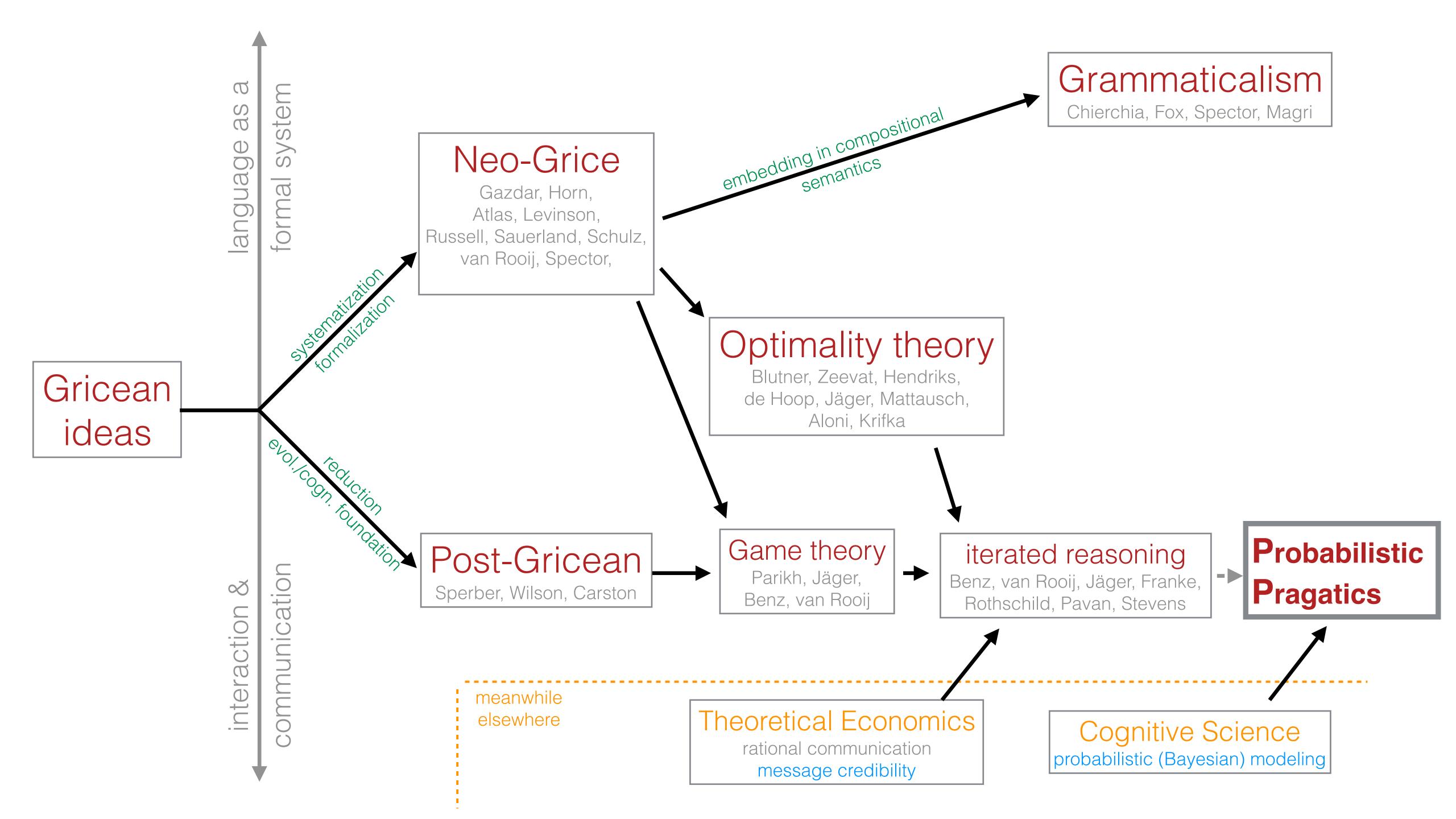 ↳ In some unusual manner, perhaps by accident.

Levinson
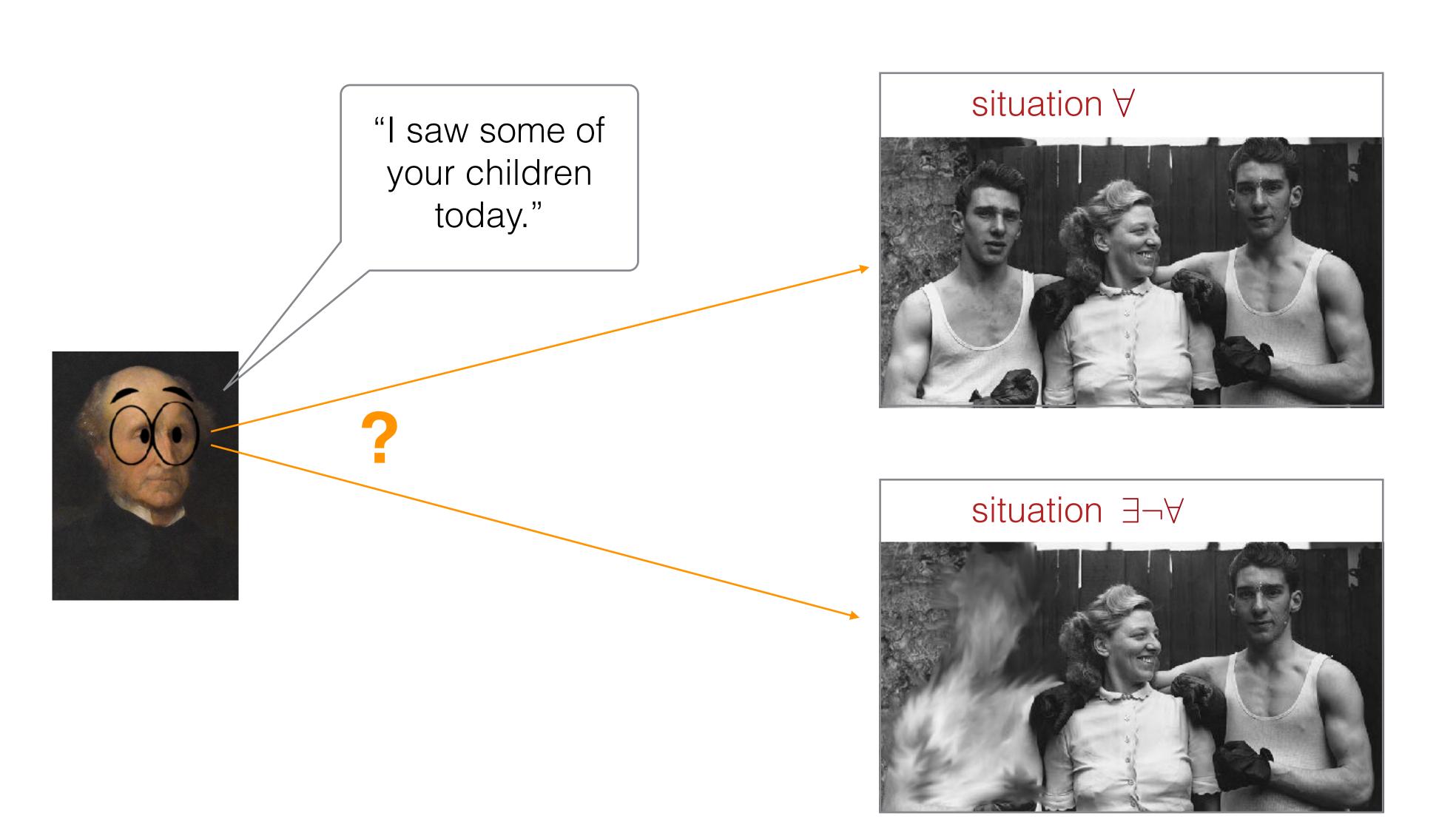
Horn
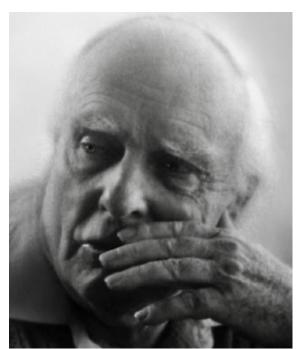
Atlas

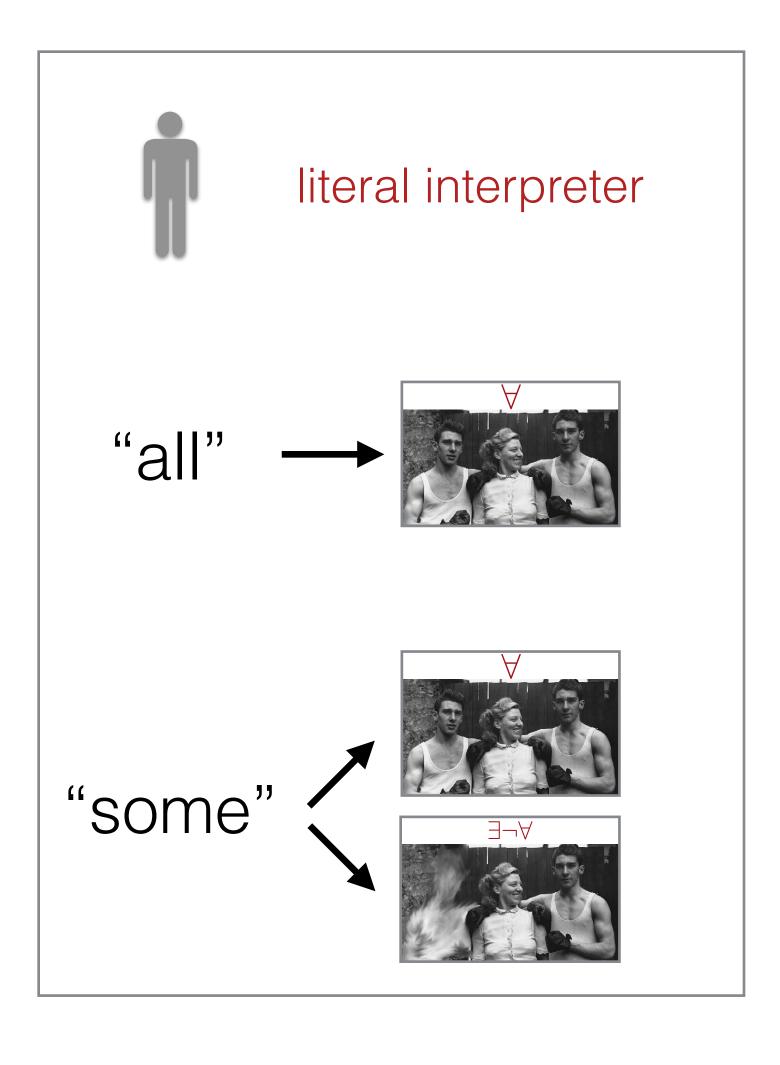probabilistic Pragmatics

"I saw some of your children today."

situation ∀

situation ∃¬∀

literal interpreter

"all" →

"some"

rational speaker

→ "all"

→ "some"

rational interpreter

"all" →

"some" →
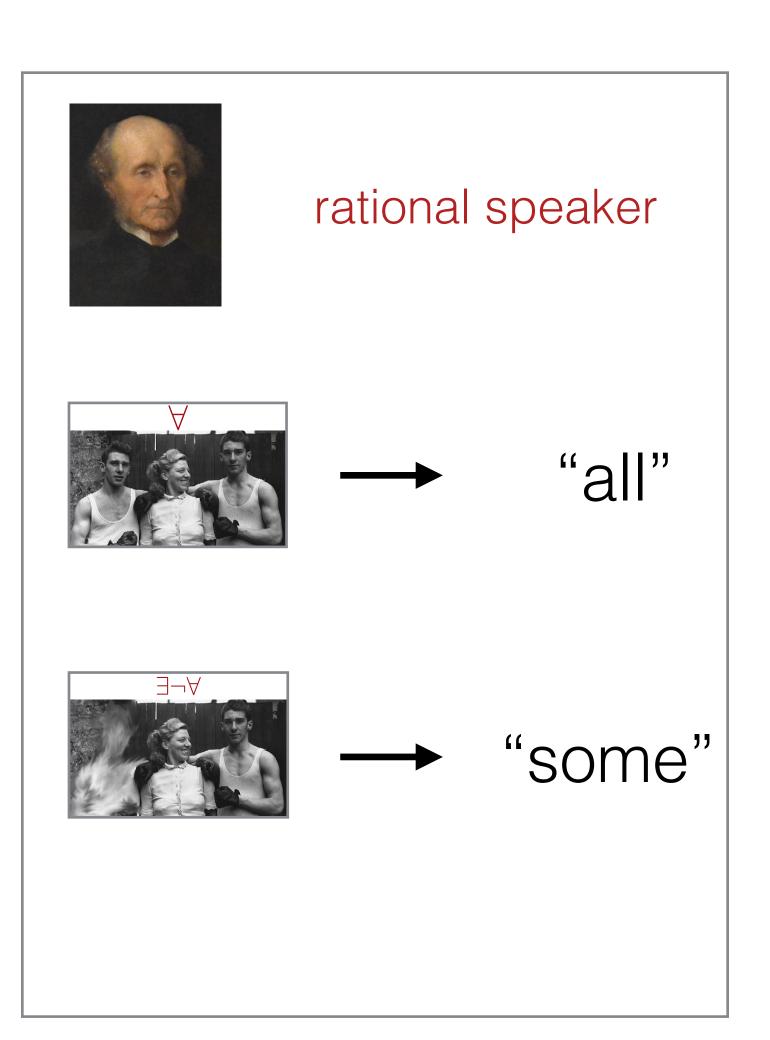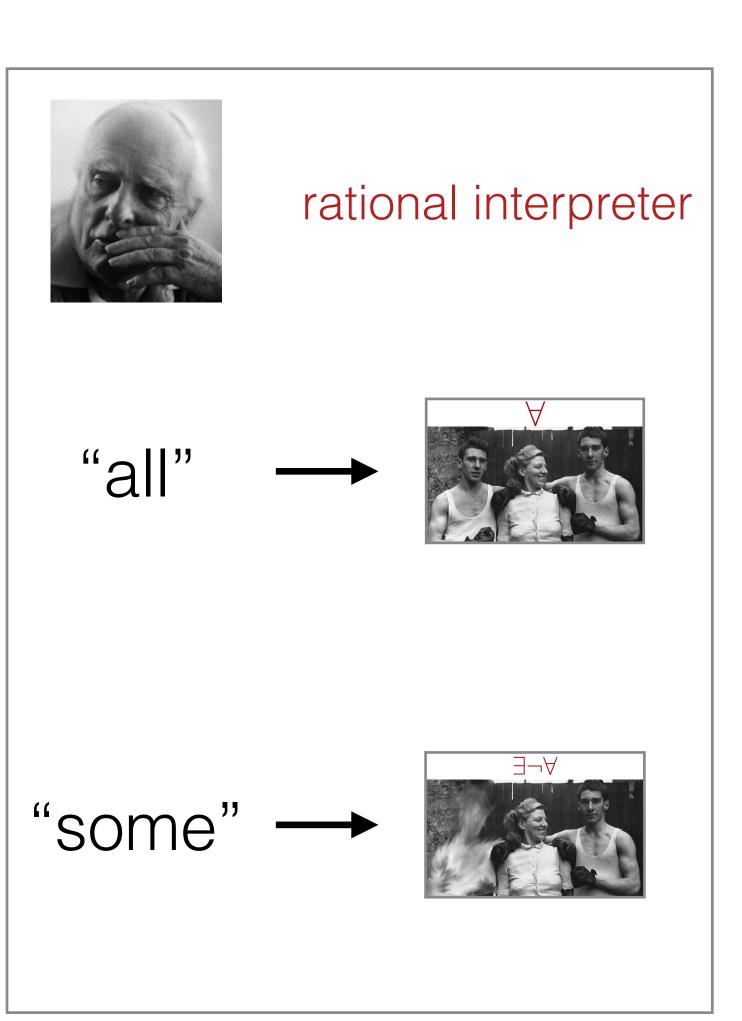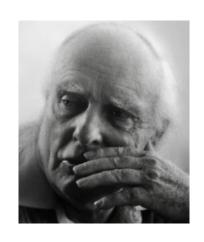
rational interpreter

rational speaker

literal interpreter

rational interpreter

	$\forall$	$\exists\neg\forall$
"all"	1	0
"some"	0	1

rational speaker

	"all"	**"some"**
$\forall$	1	0
$\exists\neg\forall$	0	1

literal interpreter
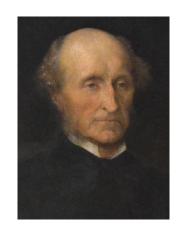
	$\forall$	$\exists\neg\forall$
"all"	1	0
"some"	.5	.5

rational interpreter

	∀	∃¬∀
"all"	.9	.1
"some"	.1	.9

approximately rational speaker

	"all"	**"some"**
∀	.9	.1
∃¬∀	.1	.9

literal interpreter

	∀	∃¬∀
"all"	1	0
"some"	.5	.5

	$\forall$	$\exists\neg\forall$
"all"	.9	.1
"some"	.1	.9

rational interpreter

	"all"	**"some"**
$\forall$	.9	.1
$\exists\neg\forall$	.1	.9

approximately rational speaker

	$\forall$	$\exists\neg\forall$
"all"	1	0
"some"	.5	.5

literal interpreter

listener behavior

$$U \to \Delta(S)$$

speaker behavior

$$S \to \Delta(U)$$

Rational Speech Act model

L_0

LITERAL INTERPRETATION STRATEGIC DEPTH 0

$$P_{lit}(s \mid u) = P(s \mid [[u]])$$

S_1

GRICEAN SPEAKER STRATEGIC DEPTH 1

$$P_S(u \mid s) \propto \exp\left(\alpha\left(\log P_{lit}(s \mid u) - C(u)\right)\right)$$

L_1

GRICEAN INTERPRETATION STRATEGIC DEPTH 2

$$P_L(s \mid u) \propto P(s)\, P_S(u \mid s)$$

This course

applications

referential communication
(epistemic) scalar implicatures
non-literal language use
vagueness
politeness
…

technicalities

WebPPL
Bayesian Data Analysis
…