

NLP Intro: Brief History and Context

CSCI 1460: Computational Linguistics
Lecture 0

Ellie Pavlick
Fall 2023

Website and Waitlist!

- <https://csci-1460-computational-linguistics.github.io>
- Also linked from my webpage (Google “Ellie Pavlick”, go to my cs.brown.edu page, click on “Teaching” at the top)
- Sign up for waitlist if you aren’t registered
 - But, unlikely to let many off the waitlist, unfortunately

NLP Intro: Brief History and Context

Lecture Outline

- What is NLP? Current Progress
- A brief history of the field
- NLP Under-the-Hood: The language processing pipeline
- Course Preview

NLP Intro: Brief History and Context

Lecture Outline

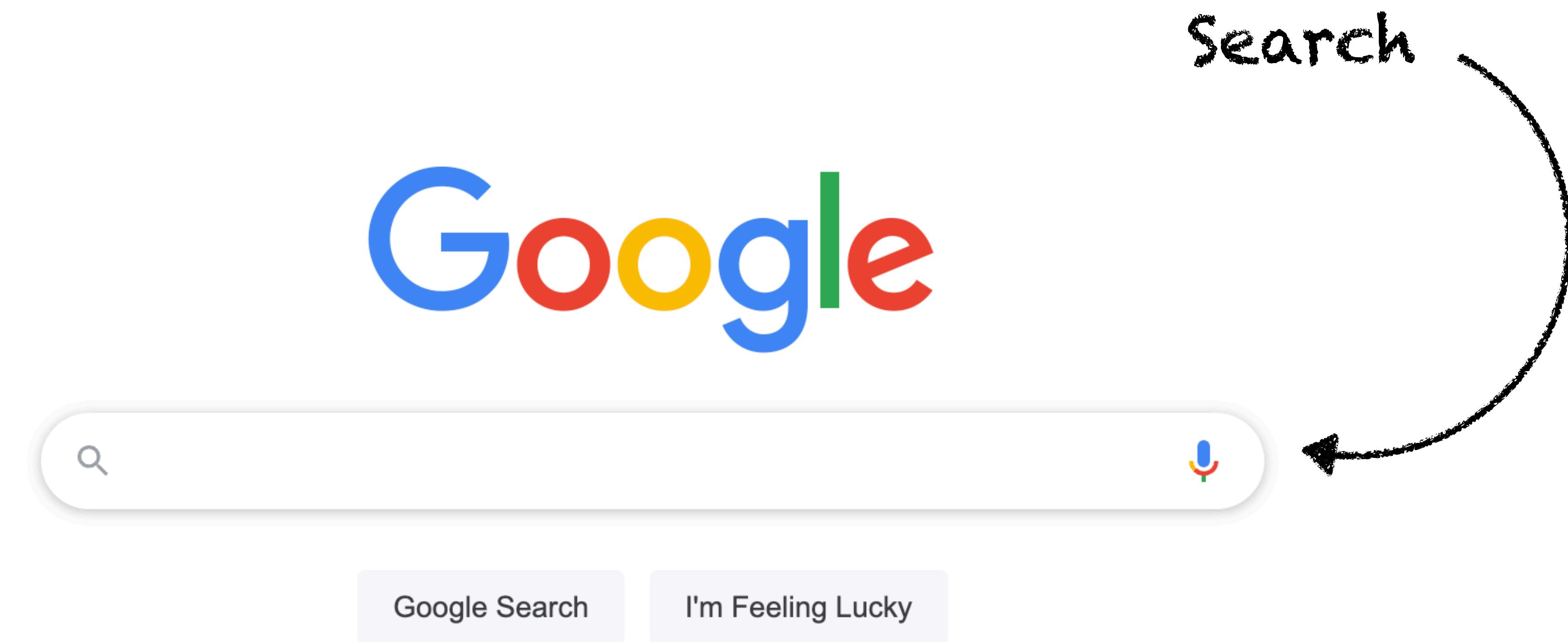
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What is NLP?

“The goal of this new field is to **get computers to perform useful tasks involving human language**, tasks like enabling human-machine communication, improving human-human communication, or simply doing useful processing of text or speech.”

—Jurafsky and Martin, Speech and Language Processing, 2nd Edition

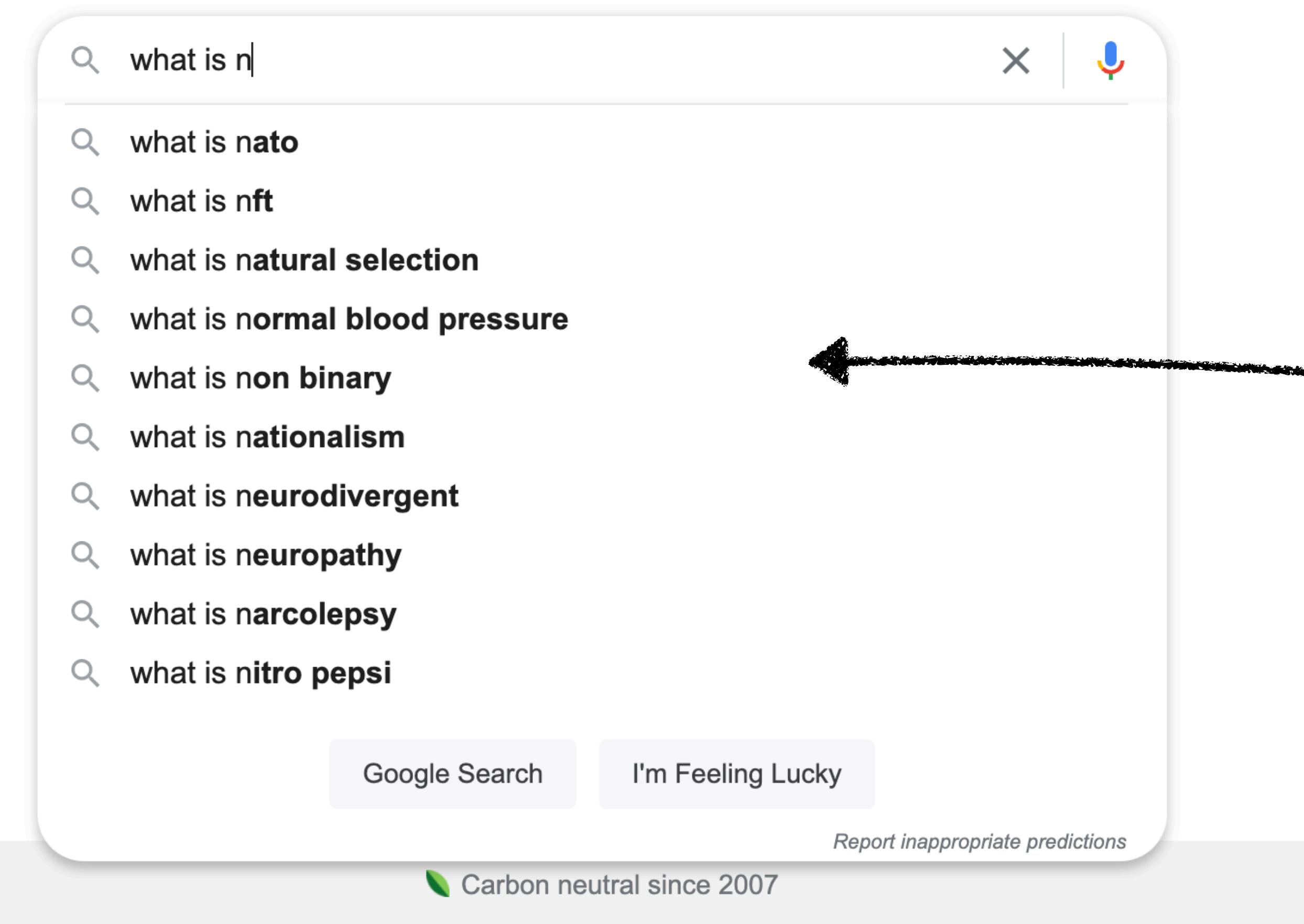
What is NLP?



What is

Google

autocomplete



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Tools

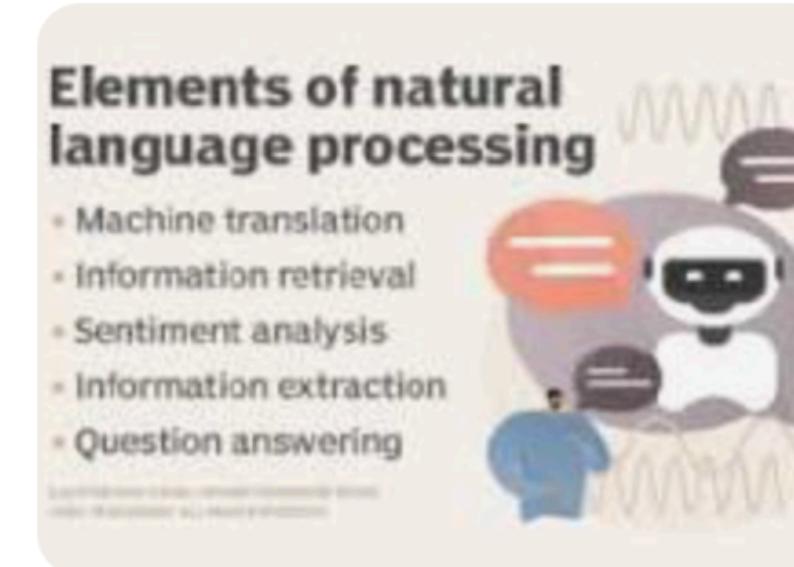
About 138,000,000 results (0.52 seconds)

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Natural Language Processing - Understand Textual Meaning

If You're a Business User, Data Scientist, or Developer, AWS Has AutoML Solutions for You. Build Smarter, Intuitive, and Interactive Applications With Language Services From AWS.

Natural language processing (NLP) is **the ability of a computer program to understand human language as it is spoken and written** -- referred to as natural language. It is a component of artificial intelligence (AI). NLP has existed for more than 50 years and has roots in the field of linguistics.

<https://www.techtarget.com> › [searchenterpriseai](#) › definition ::

What is Natural Language Processing? An Introduction to NLP

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Natural language processing is a subfield of linguistics, ...



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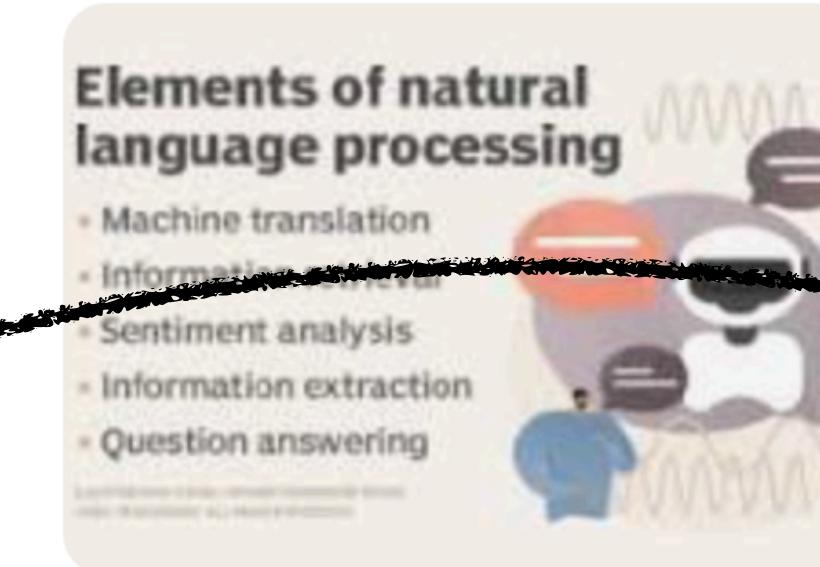
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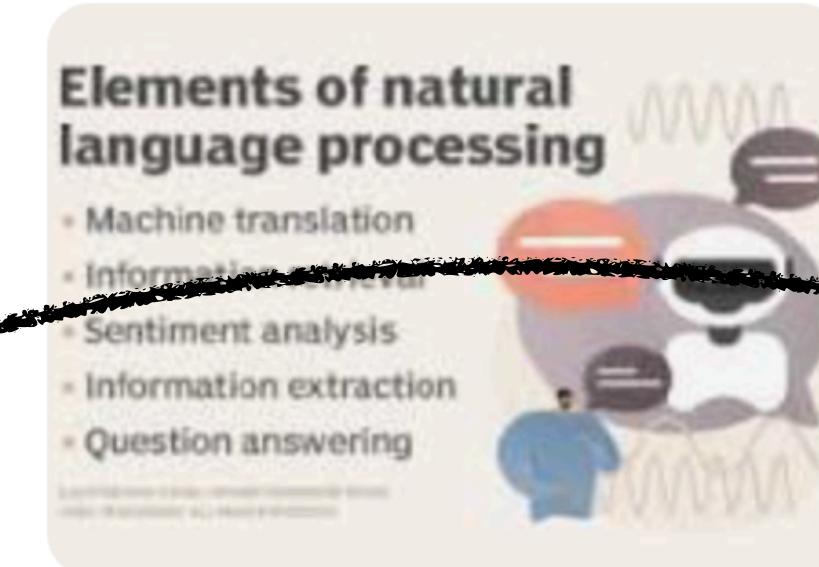
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snippet (Summarization)

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What is NLP?

Language ID

14.pdf | + CSCI 1 | slp2-pc | Speech | slp2-pc | Priority | Search | dp1.LS | landau | download | + CSCI 1 | Search | 2020- | 2952D | 領先 | +

hkust.edu.hk/zh-hant

Add to Babylis

Chinese (Traditional) English : X

Google Translate

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公告 資訊 香港科技大學(廣州) 活動 藝術與文化 到訪科大 捐贈 校友 人才招聘 內聯網

科大新聞 學術概況 入讀資訊 校園生活 科大研究 科大創業 全球挑戰 關於科大

SHAW AUDI

What is NLP?

machine
translation

The image displays a comparison between the original Chinese version of the HKUST website and its English translation. Both versions are shown in separate browser tabs.

Left Tab (Chinese Version):

- Header: 請瀏覽最新大學公告及新型冠狀病
- Logo: 香港科技大學 | 30 成就未來 齊放異彩
- Navigation: 公告 資
- Content: announcement News Hong Kong University of Science and Technology (Guangzhou) Activity arts and culture Visit to HKUST donate Alumni Talent recruitment
- Intranet dropdown
- Search bar

Right Tab (English Translation):

- Header: Please review the latest university announcements and novel coronavirus information.
- Logo: 香港科技大學 | 30 成就未來 齊放異彩
- Content: HKUST NEWS ACADEMIC PROFILE ADMISSION INFORMATION SCHOOL LIFE HKUST RESEARCH HKUST ENTREPRENEURSHIP GLOBAL CHALLENGE
- ABOUT HKUST
- Bottom right corner: Explore HKUST

What is NLP?

Text Generation

Course Name: CSCI 1460

Course Description: This course is an introduction to systems programming and low-level computer architecture. We will explore how to write C/C++ code that interacts with the operating system in interesting ways, and how to write code that is both efficient and secure.

Prerequisites:

CSCI 1200 - Data Structures

CSCI 1201 - Data Structures Laboratory

CSCI 2300 - Computer Science I

CSCI 2301 - Computer Science I Laboratory

Course Length: 16 weeks

Course Materials:

Textbook: C++ Programming: From Problem Analysis to Program Design, 8th Edition, D.S. Malik

Other Required Materials:

A computer with an Internet connection

Goals for the Semester

- Learn how to **build actual NLP** systems, and to understand how commercial systems work under the hood
- Understand **key models and algorithms** from NLP, including both “traditional” and new approaches to solving problems
- Understand the **theoretical and intellectual context** surrounding major technological advances or design decisions
- **Think critically** about interface between NLP systems and society
- Roughly: 25% Application, 50% Applied ML and Algorithms, 25% Linguistics/Theory

Who should take this course?

- Prerequisites: Just the intro sequence!
- However, NLP is a bit of everything:
 - Machine Learning
 - Deep Learning
 - Probability, Statistics, Linear Algebra, Calculus
 - Linguistics (Syntax, Semantics)
 - Formal Language Theory/Theory of Computation
- But I believe learning is a undirected, highly cyclic graph ;) so these are not prereqs
- If you have not taken the above, you might need to do extra reading/spend time in office hours some weeks

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Descartes (c.1630)

If there were **machines** which bore a resemblance to our bodies and imitated our actions as closely as possible for all practical purposes, we should still have two very certain means of recognizing that they were not real men. The first is that **they could never use words, or put together signs, as we do** in order to declare our thoughts to others. For we can certainly conceive of a machine so constructed that it utters words, and even utters words that correspond to bodily actions causing a change in its organs... But **it is not conceivable that such a machine should produce different arrangements of words so as to give an appropriately meaningful answer to whatever is said** in its presence, as the dullest of men can do...

NLP: A brief history



NLP: A brief history

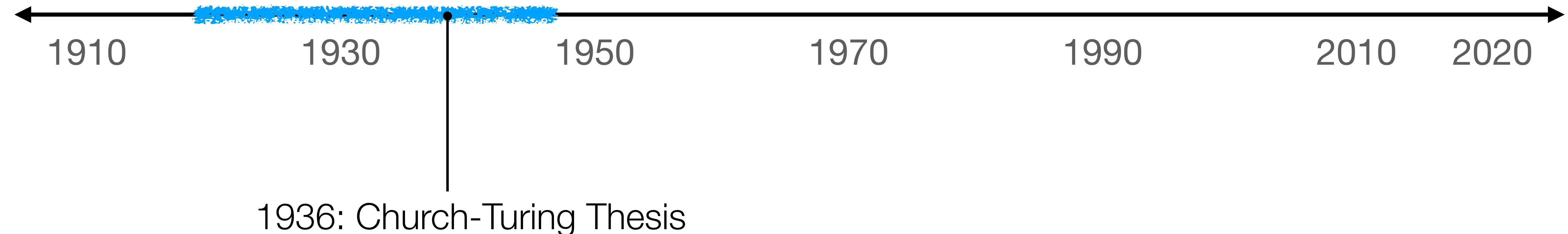
Logic and Computation: Tarski, Church, Turing



NLP: A brief history

Loosely: A function is “computable” iff it can be computed by a Turing Machine

Logic and Computation: Tarski, Church, Turing



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Logic and Computation: Tarski, Church, Turing

1910

1930

1950

1970

1990

2010

2020

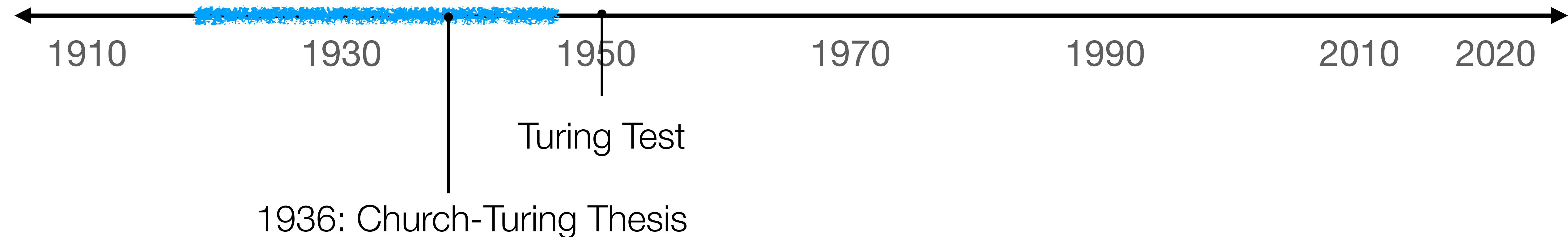
1936: Church-Turing Thesis

λ -calculus invented for defining computable functions

NLP: A brief history

“I believe that in about fifty years' time it will be possible to programme computers, with a storage capacity of about 10^9 , to make them play the **imitation game so well that an average interrogator will not have more than 70 percent chance of making the right identification after five minutes of questioning.** ... I believe that at the end of the century the use of words and general educated opinion will have altered so much that one will be able to speak of machines thinking without expecting to be contradicted.”

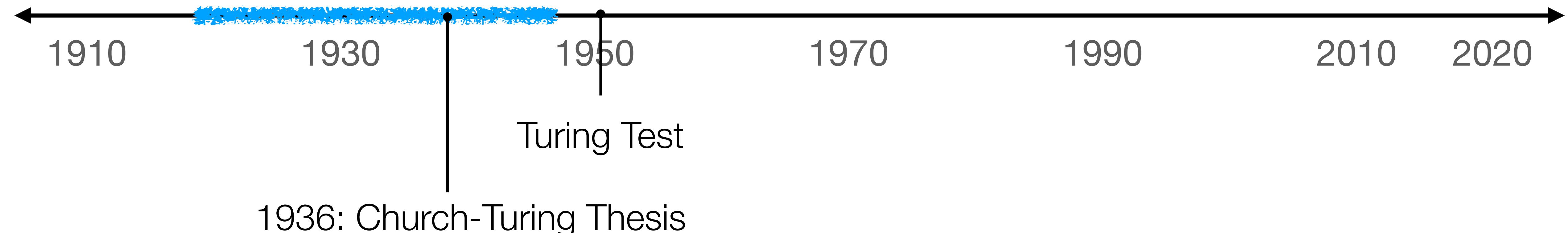
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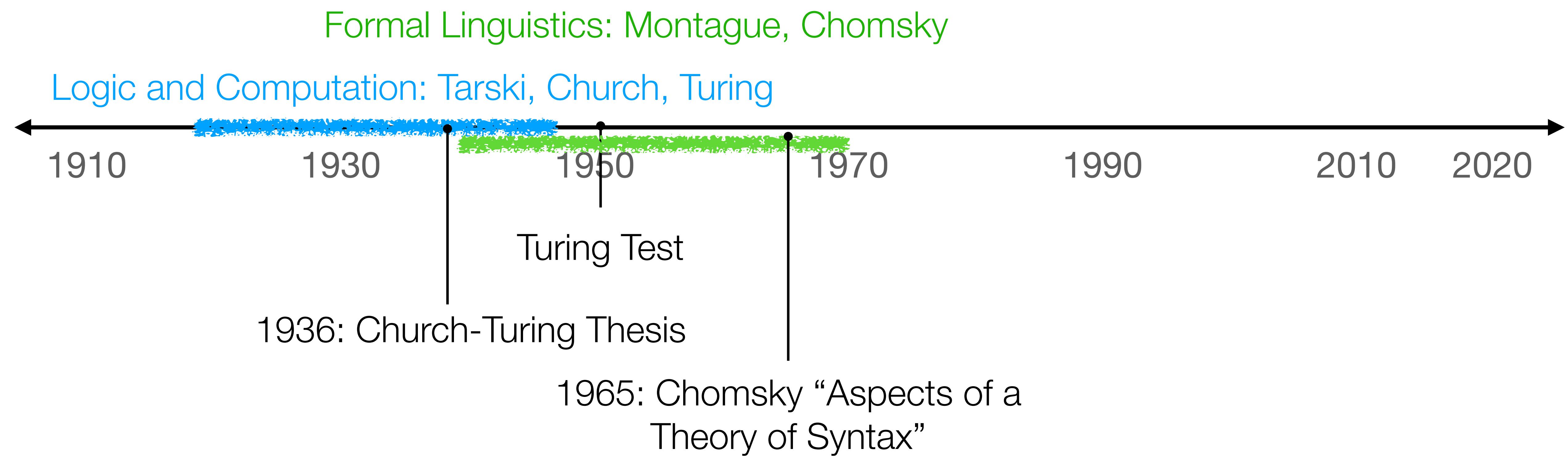
NLP: A brief history

🤔 Is natural language a
“computable function”?

Logic and Computation: Tarski, Church, Turing



NLP: A brief history



NLP: A brief history

“There is in my opinion no important theoretical difference between natural languages and the artificial languages of logicians; indeed I consider it possible to comprehend the syntax and semantics of both kinds of languages with a single natural and mathematically precise theory.”

Logic and Computation

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Turing Test

1936: Church-Turing Thesis

1965: Chomsky “Aspects of a Theory of Syntax”



Career [edit]

At the [University of California, Berkeley](#), Montague earned a B.A. in Philosophy in 1950, an M.A. in Mathematics in 1953, and a Ph.D. in Philosophy in 1957, the latter under the direction of the mathematician and logician [Alfred Tarski](#). Montague, one of Tarski's most accomplished American students, spent his entire career teaching in the [UCLA Department of Philosophy](#), where he supervised the dissertations of [Nino Cocchiarella](#) and [Hans Kamp](#).

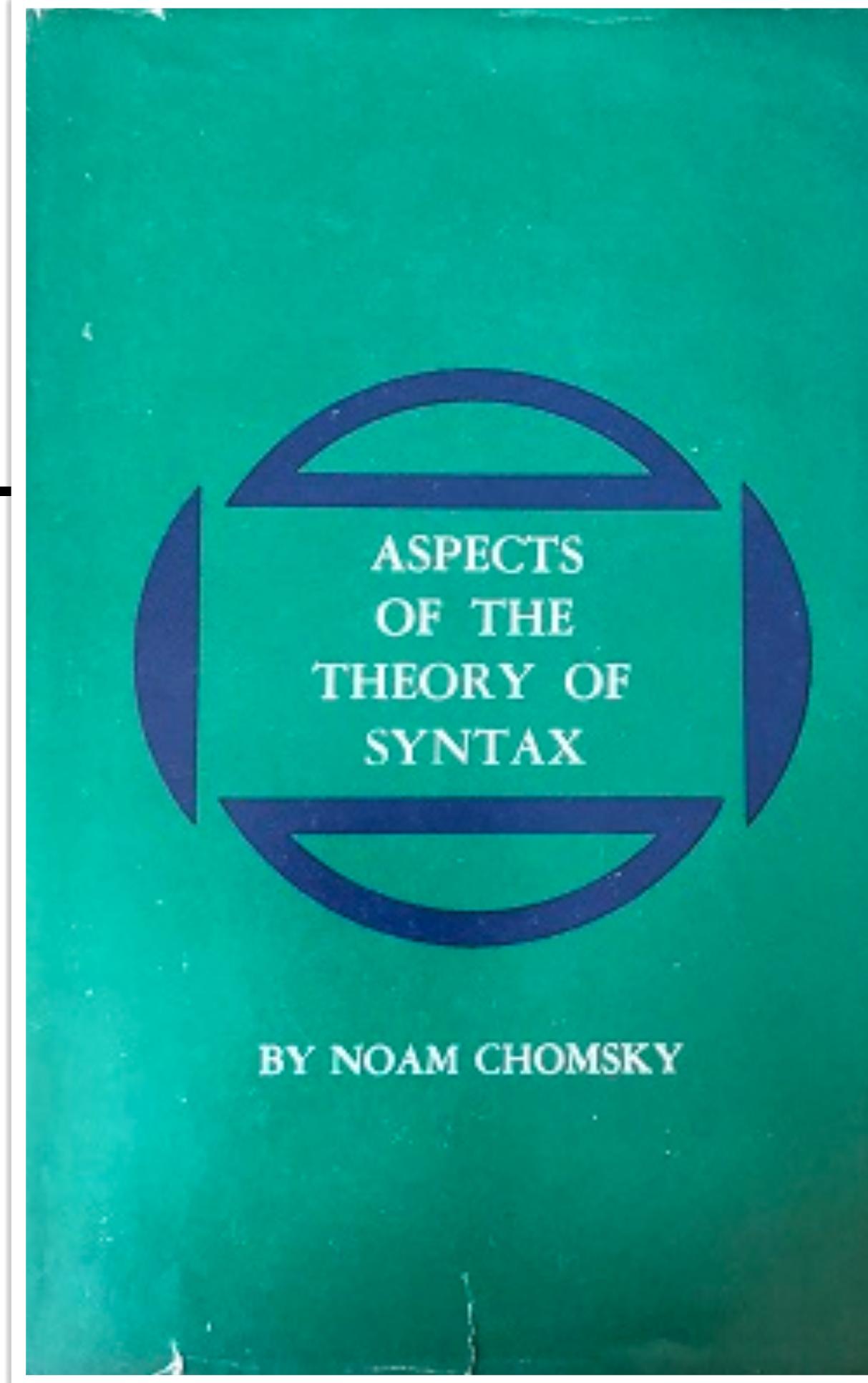
Montague wrote on the foundations of [logic](#) and [set theory](#), as would befit a student of Tarski. His Ph.D. dissertation, titled *Contributions to the Axiomatic Foundations of Set Theory*,^[1] contained the first proof that all possible axiomatizations of the standard [axiomatic set theory ZFC](#) must contain infinitely many axioms. In other words, ZFC cannot be finitely axiomatized.

He pioneered a logical approach to natural language [semantics](#) that became known as [Montague grammar](#). This approach to language has been especially influential among certain [computational linguists](#)—perhaps more so than among more traditional [philosophers of language](#). In particular, Montague's influence lives on in grammar approaches like [categorial grammar](#) (such as Unification Categorial Grammar, Left-Associate Grammar, or [Combinatory Categorial Grammar](#)), which attempt a derivation of syntactic and semantic representation in tandem and the semantics of quantifiers, scope and discourse ([Hans Kamp](#), a student of Montague's, co-developed [Discourse Representation Theory](#)).

Montague was an accomplished organist and a successful real estate investor. He died violently in his own home; the crime has never been solved to this day. [Anita Feferman](#) and [Solomon Feferman](#) argue that he usually went to bars "cruising" and bringing people home to his apartment.^[2] On the day that he was murdered, he brought home several people "for some kind of soirée", but they strangled him.^[2]



NLP: A brief history



| Linguistics: Montague, Chomsky

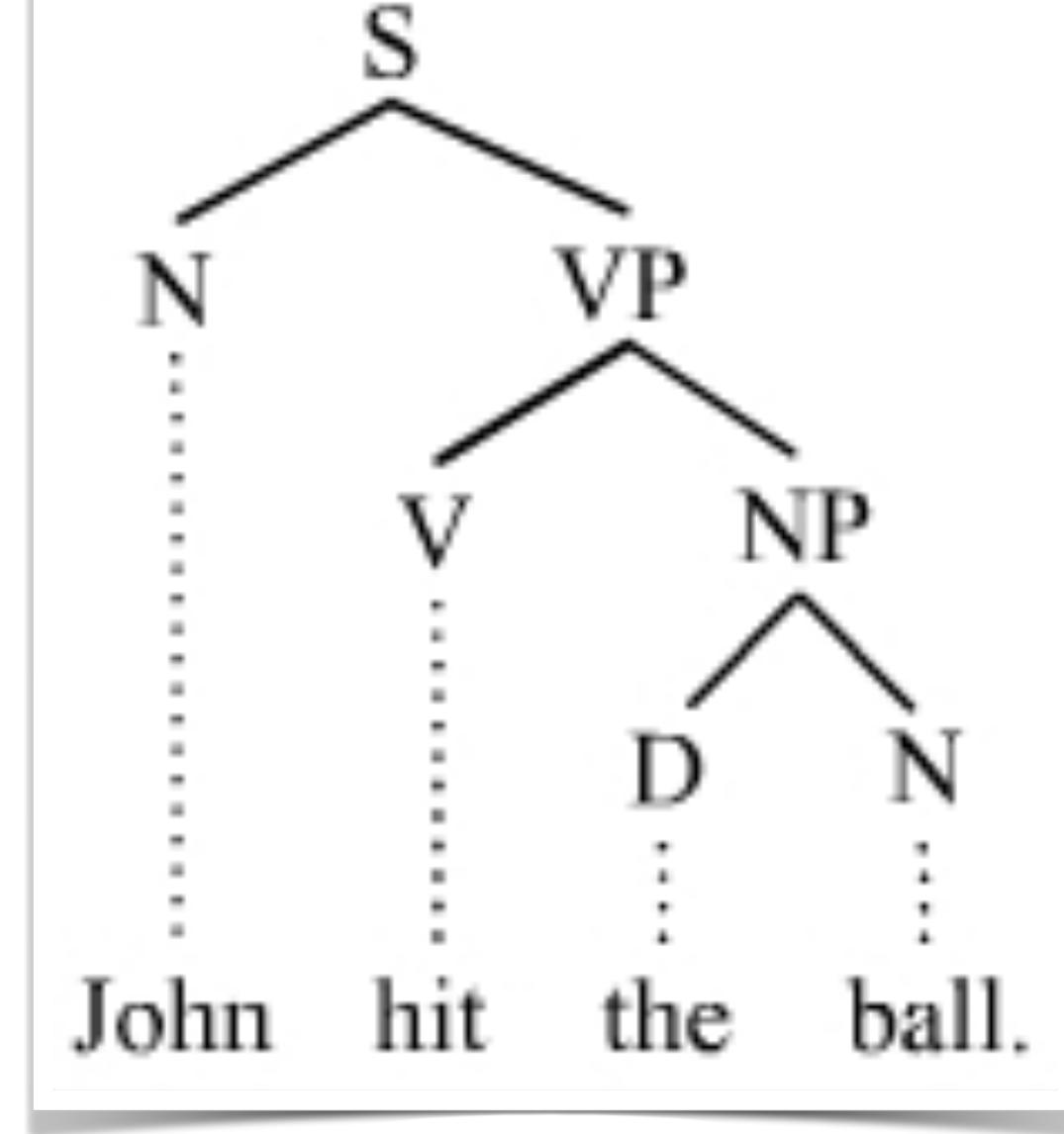
: Tarski, Church, Turing

1950

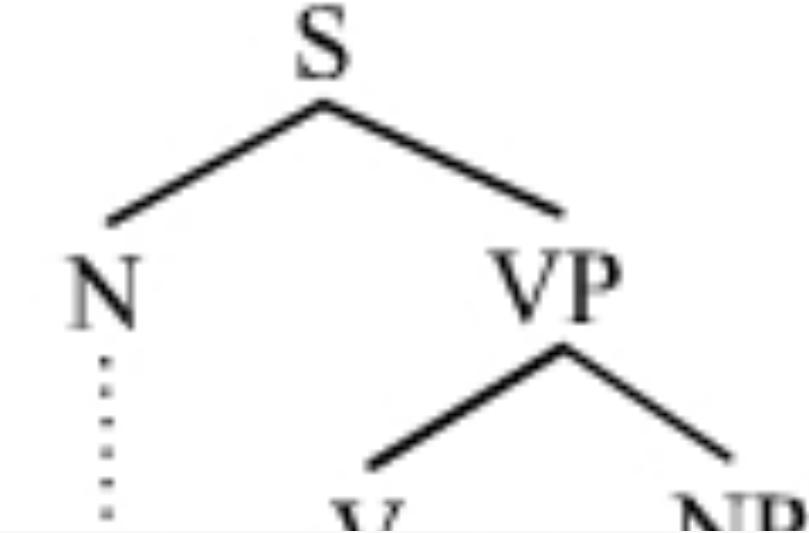
Turing Test

Church-Turing Thesis

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NLP: A brief history

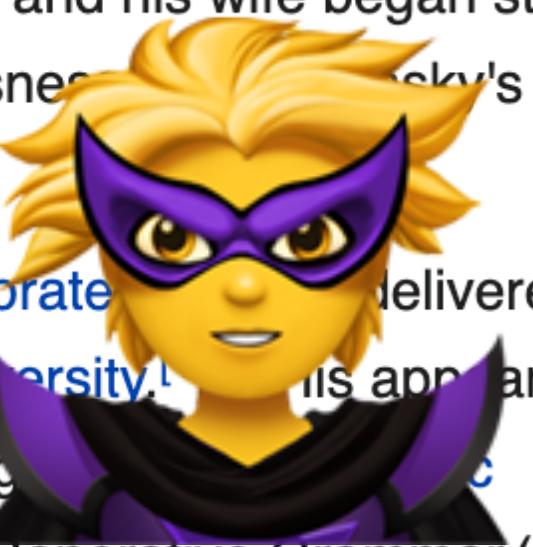


Chomsky on the Vietnam War^[89]

He also became involved in left-wing activism. Chomsky refused to pay half his taxes, publicly supported students who [refused the draft](#), and was arrested while participating in an [anti-war teach-in](#) outside the Pentagon.^[98] During this time, Chomsky co-founded the anti-war collective [RESIST](#) with [Mitchell Goodman](#), [Denise Levertov](#), [William Sloane Coffin](#), and [Dwight Macdonald](#).^[99] Although he questioned the objectives of the [1968 student protests](#),^[100] Chomsky gave many lectures to student activist groups and, with his colleague Louis Kampf, ran undergraduate courses on politics at MIT independently of the conservative-dominated [political science](#) department.^[101] When student activists campaigned to stop weapons and counterinsurgency research at MIT, Chomsky was sympathetic but felt that the research should remain under MIT's oversight and limited to systems of deterrence and defense.^[102] In 1970 he visited southeast Asia to lecture at Vietnam's Hanoi University of Science and Technology and toured war refugee camps in [Laos](#). In 1973 he helped lead a committee commemorating the 50th anniversary of the [War Resisters League](#).^[103]

Because of his anti-war activism, Chomsky was arrested on multiple occasions and included on President Richard Nixon's master list of political opponents.^[104] Chomsky was aware of the potential repercussions of his civil disobedience, and his wife began studying for her own doctorate in linguistics to support the family in the event of Chomsky's imprisonment or joblessness. Chomsky's scientific reputation insulated him from administrative action based on his beliefs.^[106]

His work in linguistics continued to gain international recognition as he received multiple honorary doctorates and delivered public lectures at the [University of Cambridge](#), [Columbia University](#) ([Woodbridge Lectures](#)), and [Stanford University](#).^[107] His appearance in a 1971 debate with French continental philosopher Michel Foucault positioned Chomsky as a symbolic figure in the field of philosophy.^[109] He continued to publish extensively on linguistics, producing *Studies on Semantics in Generative Grammar* (1972),^[106] an enlarged edition of *Language and Mind* (1972),^[110] and *Reflections on Language* (1975).^[110] In 1974 Chomsky became a corresponding fellow of the British Academy.^[108]



External images

[Chomsky participating in the anti-Vietnam War March on the Pentagon, October 21, 1967](#)

[Chomsky with other public figures](#)

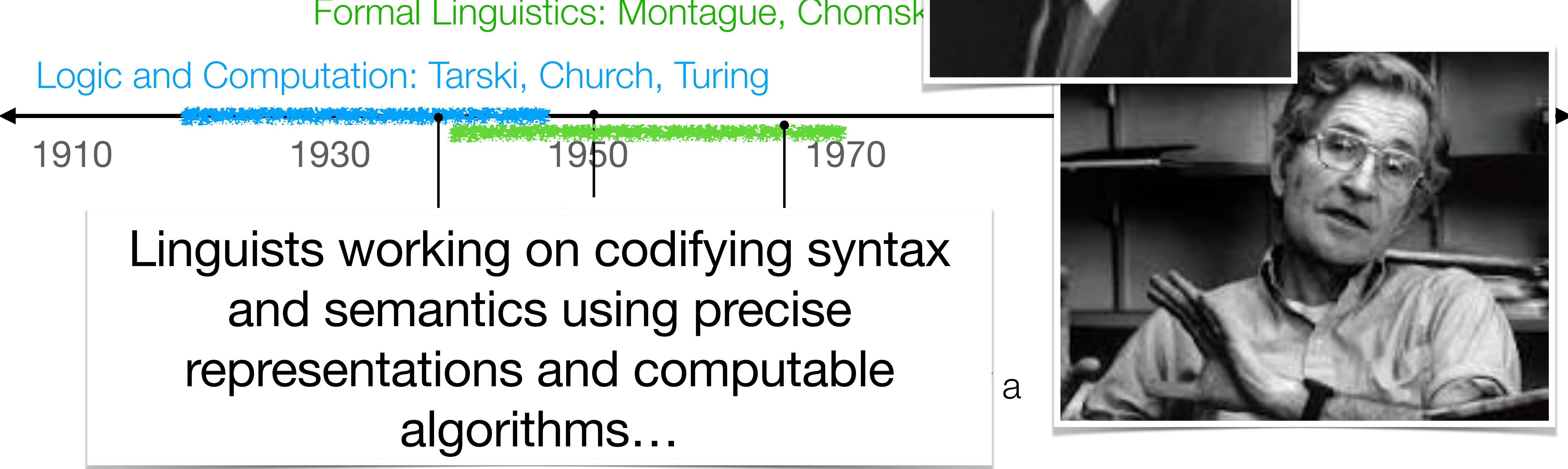
[The protesters passing the Lincoln Memorial en route to the Pentagon](#)

BY NOAM CHOMSKY

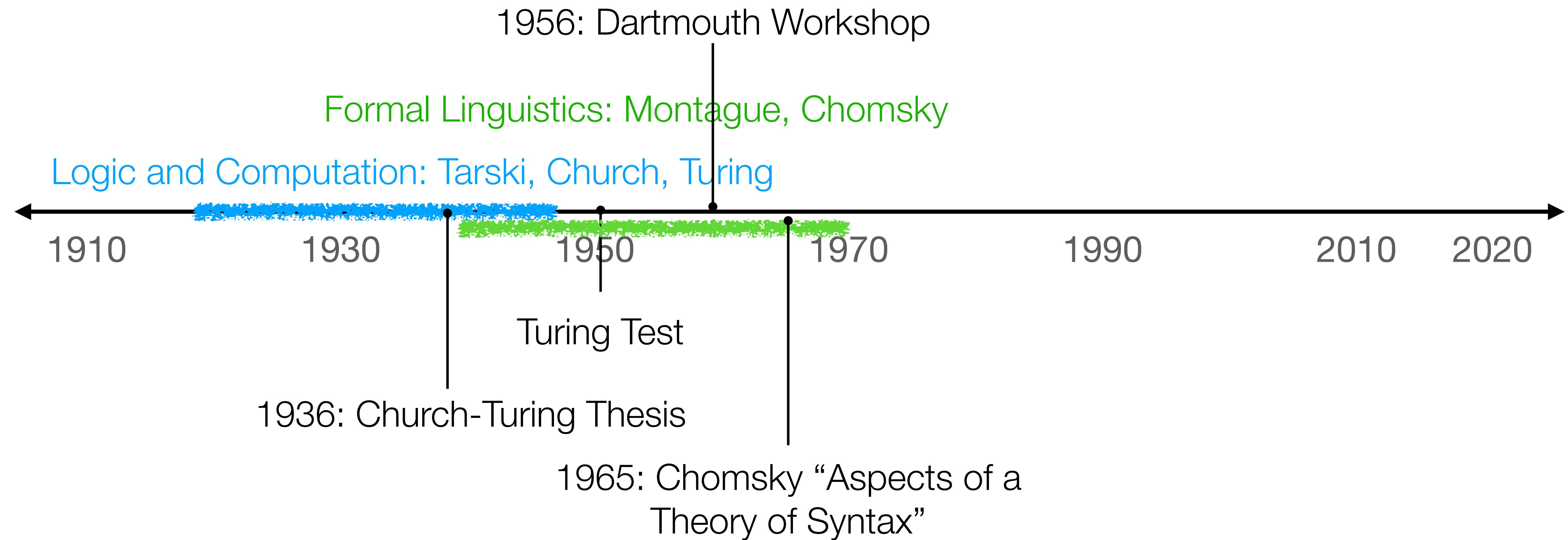
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NLP: A brief history



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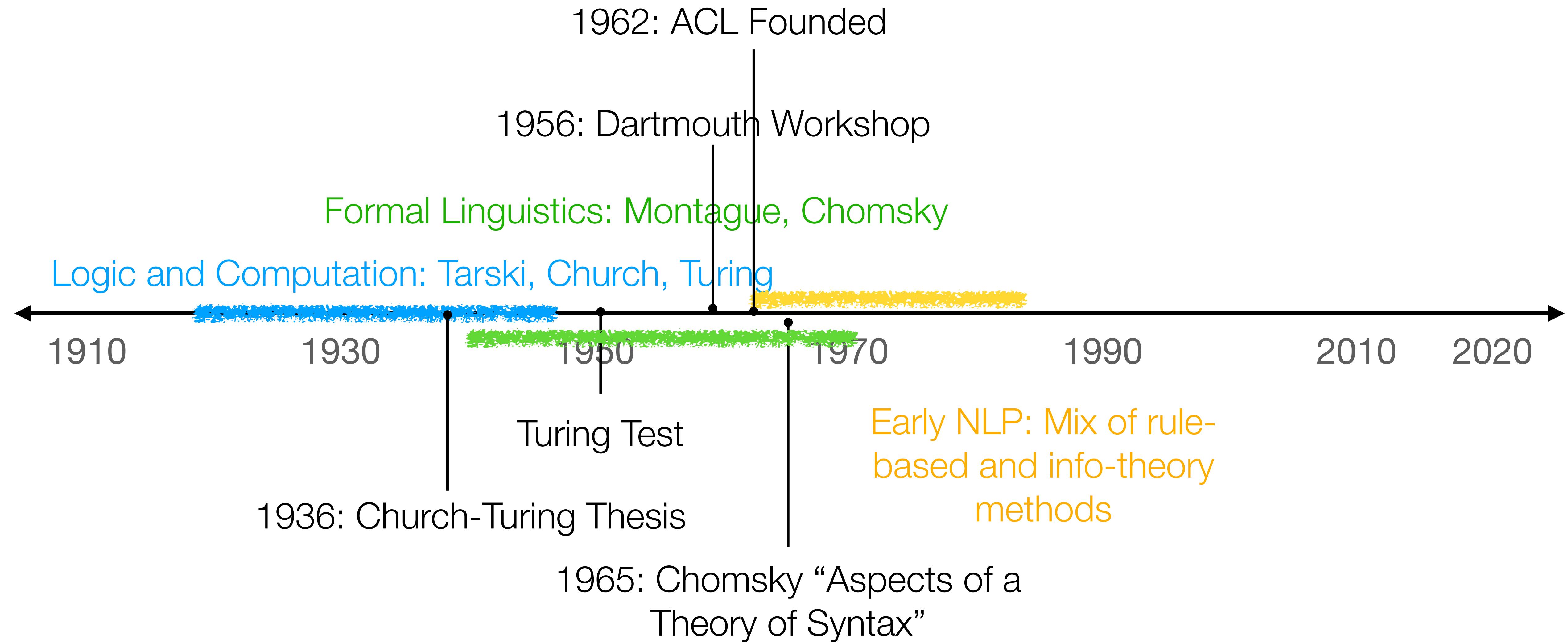
1956: Dartmouth Workshop



“We propose that a **2-month, 10-man study of artificial intelligence** be carried out during the summer of 1956 at Dartmouth College in Hanover, New Hampshire. The study is to proceed on the basis of the conjecture that **every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it**. An attempt will be made to find how to **make machines use language, form abstractions and concepts**, solve kinds of problems now reserved for humans, and improve themselves. We think that a significant advance can be made in one or more of these problems if a carefully selected group of scientists work on it together for a summer.”

McCarthy, Minsky, Shannon

NLP: A brief history



NLP: A brief history

1962: ACL Founded

The Association for Computational Linguistics (ACL) is the premier international scientific and professional society for people working on computational problems involving human language, a field often referred to as either computational linguistics or natural language processing (NLP). The association was founded in

1962, originally named the **Association for Machine Translation and Computational Linguistics (AMTCL)**, and became the ACL in 1968. Activities of the ACL include the holding of an annual meeting each summer and the sponsoring of the journal Computational Linguistics, published by MIT Press; this conference and journal are the leading publications of the field.

<https://www.aclweb.org/portal/what-is-cl>

1965: Chomsky “Aspects of a Theory of Syntax”

NLP: A brief history

1962: ACL Founded

These are the proceedings of the 17th Annual Meeting of the Association for Computational Linguistics. The field which began as a study of mechanical translation has broadened to include much more. The Program Committee tried to have as many areas represented here as possible. In the conference's sessions are papers on topics as varied as speech perception, the formal definition of knowledge representations, the reality of a cognitive model of spatial knowledge, and computer-assisted dialect adaption. At the same time, we have tried to highlight current trends. So there are several papers on topics like word-driven versus rule-driven parsers, graph representations of knowledge, dialogue models, and natural language access to databases.

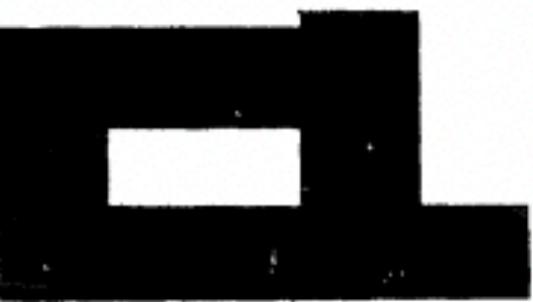
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Monte Carlo
based and info-theory
methods

2020



PROGRAM 1974

ASSOCIATION
FOR
COMPUTATIONAL
LINGUISTICS

Twelfth Annual Meeting
Amherst, Massachusetts
July 26-27, 1974

SYNTAX AND SEMANTICS

Automatic creation of an ATN grammar from a transformational grammar. *Perry Miller, Massachusetts Institute of Technology*

String transformations in the REQUEST system. *Warren J. Plath, IBM Research*

A computational treatment of coordinate conjunctions. *Carol Raze, New York University*

Toward formal solutions to philosophical problems. *James Dunn, Princeton University*

An investigation of algorithmic translation procedures from standard semantic feature representation to predicate logic. *Robert M. Harnish and Michael Houghtaling, University of Arizona.*
Lana's progress. Ernst von Glaserfeld, University of Georgia.

19 NATURAL LANGUAGE SYSTEMS

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SOPHIE: A knowledge based CAI system using an analogical inference mechanism. *Richard R. Burton, Bolt Beranek and Newman Inc.*

Linguistics and graphics: a compatible system. *Christina Davis and Jeffrey Eastman, North Carolina State University.*

CLET: A computer program that learns arithmetic from an elementary textbook. *Nagib Badre, IBM.*

Construct. *Robert Smith, F. L. Rawson, and Nancy Smith, Stanford University.*

The believer system. *Geoffrey Brown, Rutgers University.*

Junction grammar as a base for automatic language processing. *Eldon Lytle, Brigham Young University.*

More

DISCOURSE AND COMPREHENSION

Simulating processes of verbalization and translation. *Wallace Chafe, University of California at Berkeley*

Episode understanding and belief guided parsing. *Bertram Bruce and C. F. Schmidt, Rutgers University*

Computer understanding of metaphorical phrases. *Sylvia Russell*

Understanding by conceptual inference. *Charles Rieger, University of Maryland*

Paraphrasing paragraphs. *Roger Schank, Institute for Semantics-Cognition, Switzerland*

Cybernetic model of conscious behavior. *Answim Vinje-Morpurgo*

SPEECH PRODUCTION AND UNDERSTANDING

Simple digital speech synthesis. *William Fisher and A. M. Engebretson, Central Institute for the Deaf, St. Louis, Missouri*

Fundamental frequency contours of auxiliary phrases in English. *Jonathan Allen and D. O'Shaughnessy, Massachusetts Institute of Technology*

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Computer testing of fast speech rules. *Douglas B. Moran, University of Michigan*

The role of lexical semantics in automated speech understanding. *Tim Diller, System Development Corporation*

An experiment in the use of iconic language to present graphic structures via the auditory channel. *John B. Eulenberg and Morteza Amir Rahimi, Michigan State University*

Phonological rules for a text-to-speech system. *Sharon Hunnicutt, Massachusetts Institute of Technology*



PROGRAM

1974

ASSOCIATION
FOR
COMPUTATIONAL
LINGUISTICS

Linguists using computational
tools to study theories of
syntax/semantics

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Linguists using computational
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An investigation of algorithmic translation procedures from standard semantic feature representation to predicate logic. *Robert M. Harnish and Michael Houghtaling, University of Arizona.*
Lana's progress. *Ernst von Glaserfeld, University of Georgia.*

NATURAL LANGUAGE SYSTEMS

Computer as model and metaphor. *Stephan Isard, University of Edinburgh.*

SOPHIE: A knowledge based CAI system using an analogical inference mechanism. *Richard R. Burton, Bolt Beranek and Newman Inc.*

Linguistics and graphics: a compatible system. *Christina Davis and Jeffrey Eastman, North Carolina State University.*

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Construct. *Robert Smith, F. L. Rawson, and Nancy Smith, Stanford University.*

The believer system. *Geoffrey Brown, Rutgers University.*

Junction grammar as a base for automatic language pr
Eldon Lytle, Brigham Young University.

Engineers building systems to
“do stuff with language”

DISCOURSE AND COMPREHENSION

Simulating processes of verbalization and translation. *Wallace Chafe, University of California at Berkeley*

Episode understanding and belief guided parsing. *Bertram Bruce and C. F. Schmidt, Rutgers University*

Computer understanding of metaphorical phrases. *Sylvia Russell*

Understanding by conceptual inference. *Charles Rieger, University of Maryland*

Paraphrasing paragraphs. *Roger Schank, Institute for Semantics-Cognition, Switzerland*

Cybernetic model of conscious behavior. *Answim Vinje-Morpurgo*

SPEECH PRODUCTION AND UNDERSTANDING

Simple digital speech synthesis. *William Fisher and A. M. Engebretson, Central Institute for the Deaf, St. Louis, Missouri*

Fundamental frequency contours of auxiliary phrases in English. *Jonathan Allen and D. O'Shaughnessy, Massachusetts Institute of Technology*

Non-deterministic phonetic transcription of speech. *Richard Schwartz, Bolt Beranek and Newman Inc.*

Computer testing of fast speech rules. *Douglas B. Moran, University of Michigan*

The role of lexical semantics in automated speech understanding. *Tim Diller, System Development Corporation*

An experiment in the use of iconic language to present graphic structures via the auditory channel. *John B. Eulenberg and Morteza Amir Rahimi, Michigan State University*

Rules for a text-to-speech system. *Sharon Hunnicutt, Institute of Technology*



PROGRAM 1974

ASSOCIATION
FOR
COMPUTATIONAL
LINGUISTICS

Twelfth Annual Meeting
Amherst, Massachusetts
July 26-27, 1974

SYNTAX AND SEMANTICS

Automatic creation of grammar. *Perry*
String transformation. *IBM Research*
A computational model of language. *Raze*, New York University.

Toward formal solutions to philosophical problems. *James Dunn*, Princeton University.

An investigation of algorithmic translation procedures from standard semantic feature representation to predicate logic. *Robert M. Harnish and Michael Houghtaling*, University of Arizona.
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Typically (not always):
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Phonological rules for a natural language. *Massachusetts Institute of Technology*

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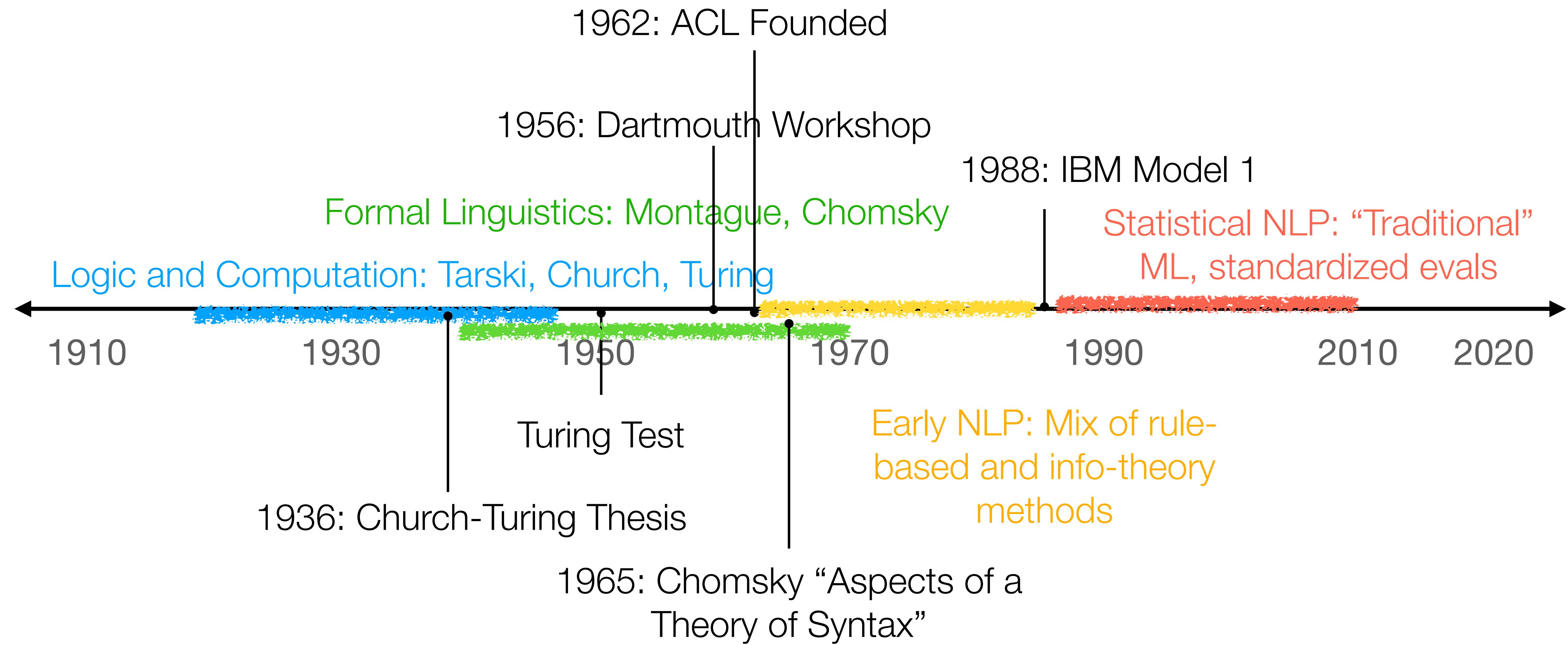
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Phonological rules for a language. Massachusetts Institute



Typically (not always):
Statistical/information-theoretic
approaches

NLP: A brief history



NLP. A brief history.

A STATISTICAL APPROACH TO LANGUAGE TRANSLATION

P. BROWN, J. COCKE, S. DELLA PIETRA, V. DELLA PIETRA,
F. JELINEK, R. MERCER, and P. ROOSSIN

IBM Research Division
T.J. Watson Research Center
Department of Computer Science
P.O. Box 218
Yorktown Heights, N.Y. 10598

Logic a

1910

1936: Church-Turing Thesis

Turing Test

1965: Chomsky “Aspects of a
Theory of Syntax”

Early NLP: Mix of rule-based and info-theory methods

BM Model 1

Statistical NLP: “Traditional”
ML, standardized evals

1990

2010

2020

NLP. A brief history.

A STATISTICAL APPROACH TO LANGUAGE TRANSLATION

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Logic and
computation

1910

1936: Church-Turing Thesis

1965: Chomsky "Aspects of the Theory of Syntax"

	OBTAIN		OBTENIR	
1.	obtenir	0.457	get	0.301
2.	pour	0.050	obtain	0.108
3.	les	0.033	have	0.036
4.	de	0.031	getting	0.032
5.	trouver	0.026	seeking	0.023
6.	se	0.025	available	0.021
7.	obtenu	0.020	obtaining	0.021
8.	procurer	0.020	information	0.016

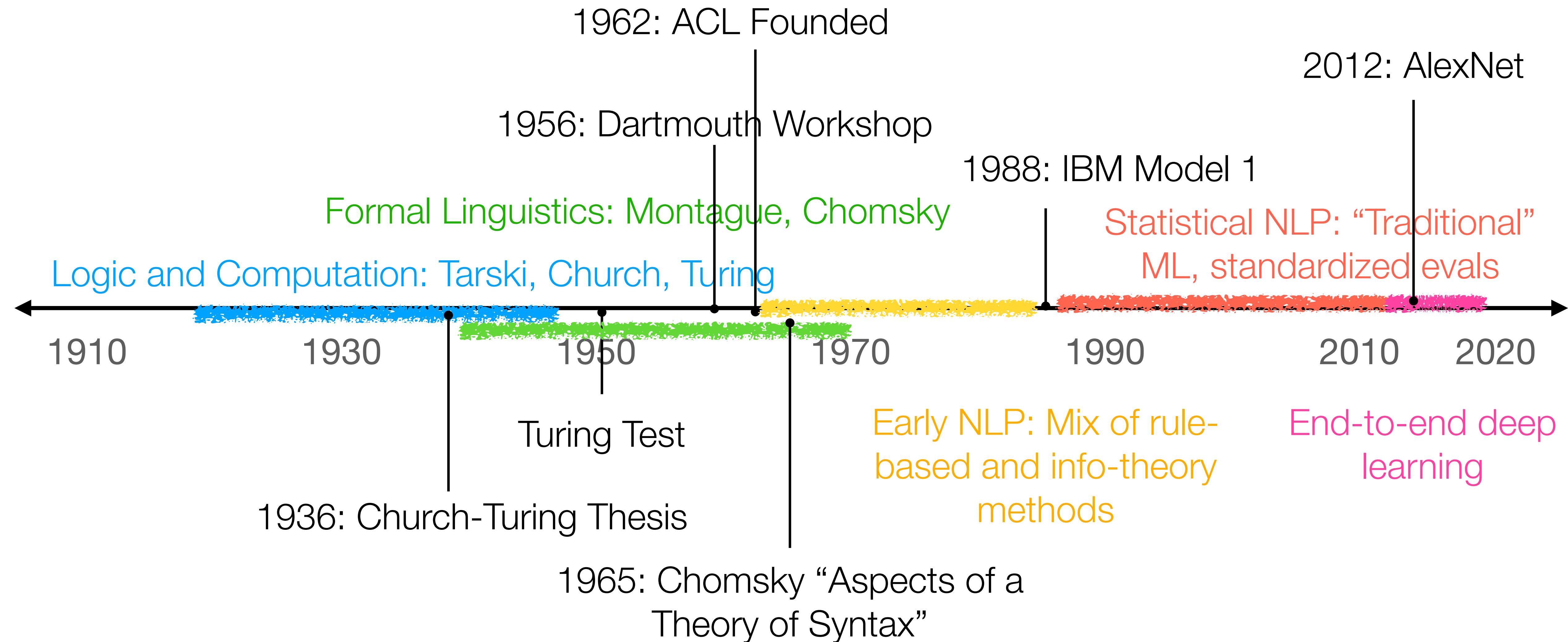
	QUICKLY		RAPIDEMENT	
1.	rapidement	0.508	quickly	0.389
2.	vite	0.130	rapidly	0.147
3.	tot	0.042	fast	0.052
4.	rapide	0.021	quick	0.042
5.	briement	0.019	soon	0.036
6.	aussitot	0.013	faster	0.035
7.	plus	0.012	speedy	0.026
8.	bientot	0.012	briefly	0.025

FIGURE 3 (PART II)
EXAMPLES OF PARTIAL GLOSSARY LISTS OF MOST LIKELY WORD TRANSLATES AND THEIR PROBABILITIES

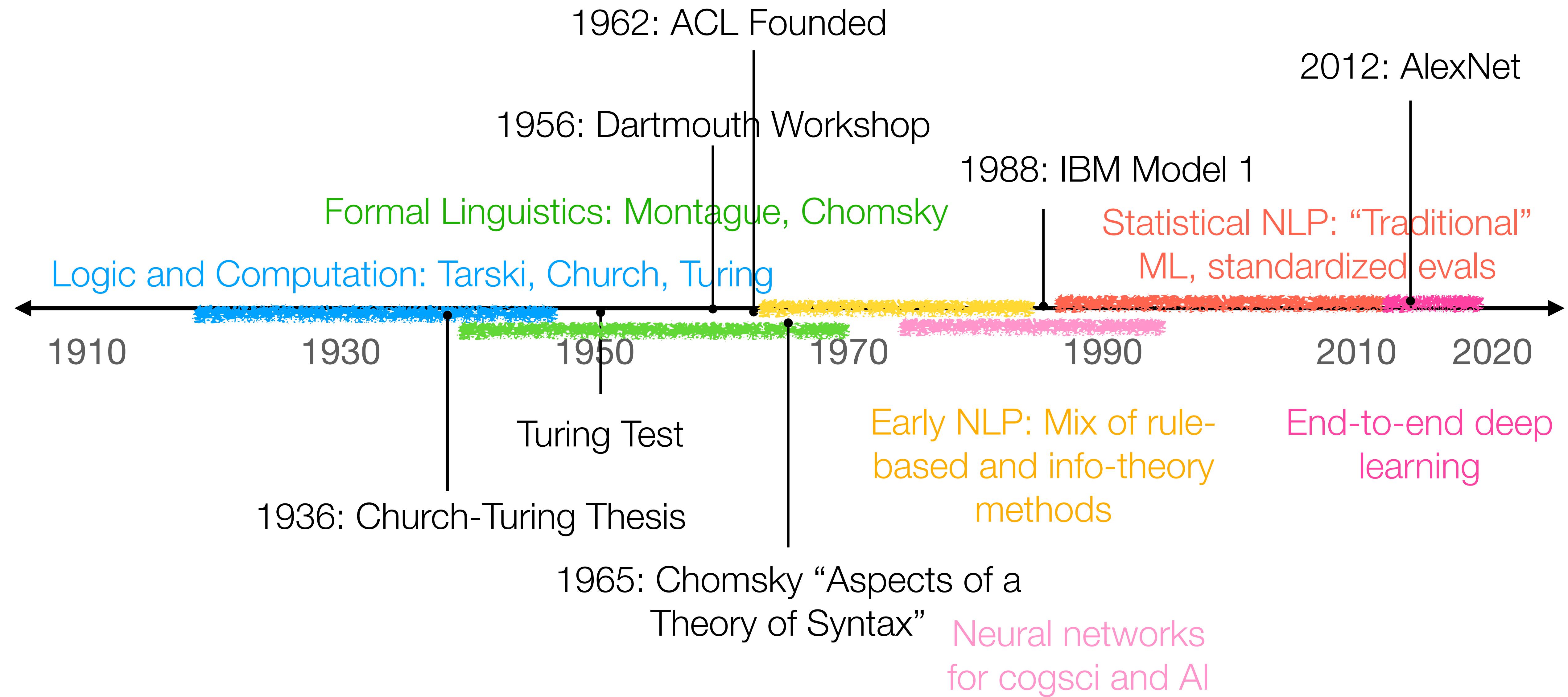
NLP: A brief history

- IBM Model 1 – Statistical alignment model that replaced hand-written dictionaries
- Kicked off the “statistical revolution” in NLP
 - Focus on more data rather than theory/linguistic expertise
 - Prioritization on empirical evaluation
 - Benchmarking: standardized metrics and test sets to enable stable tracking of progress over time
 - 1996: First EMNLP (*“Empirical* Methods for Natural Language Processing)

NLP: A brief history

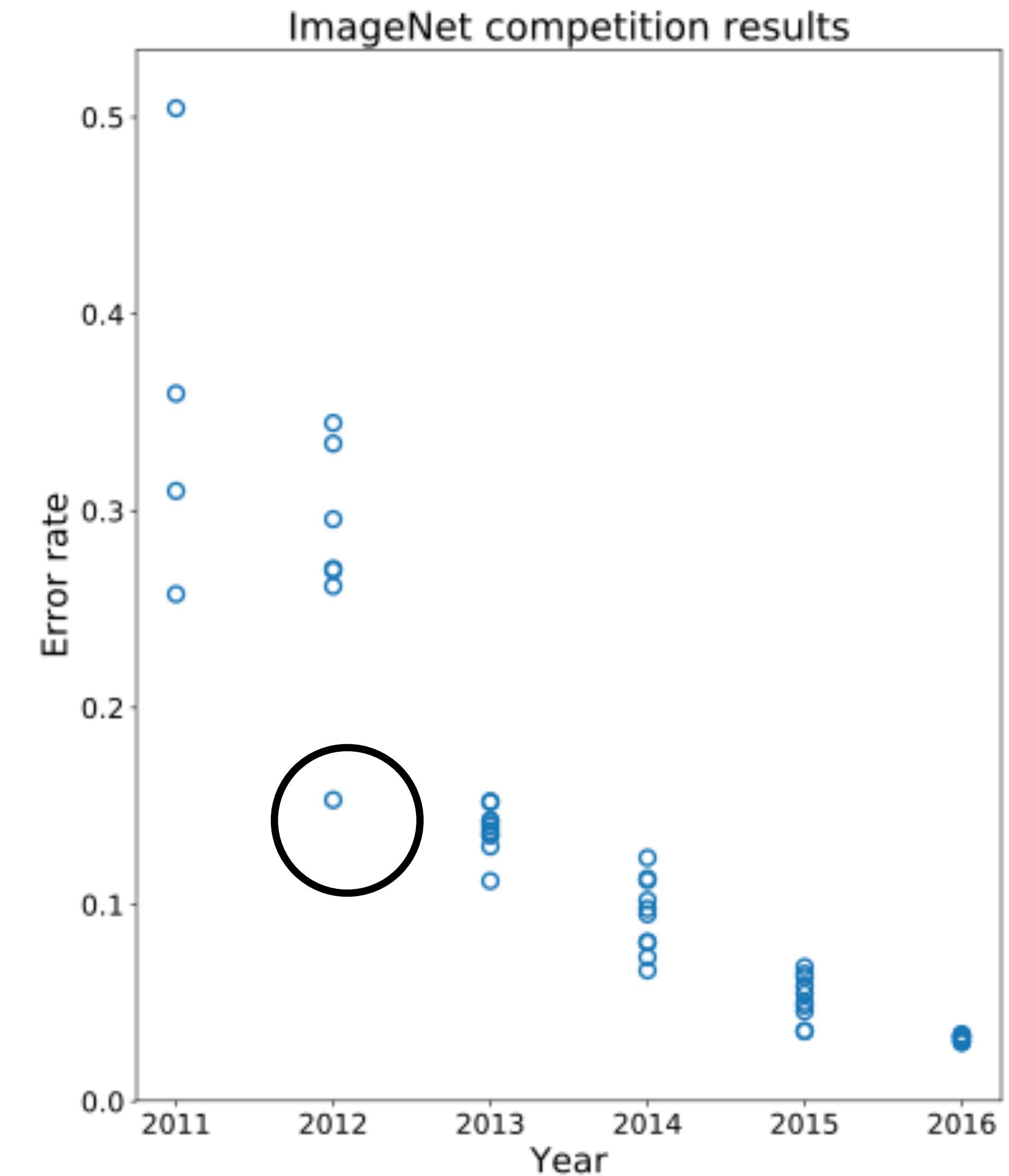


NLP: A brief history

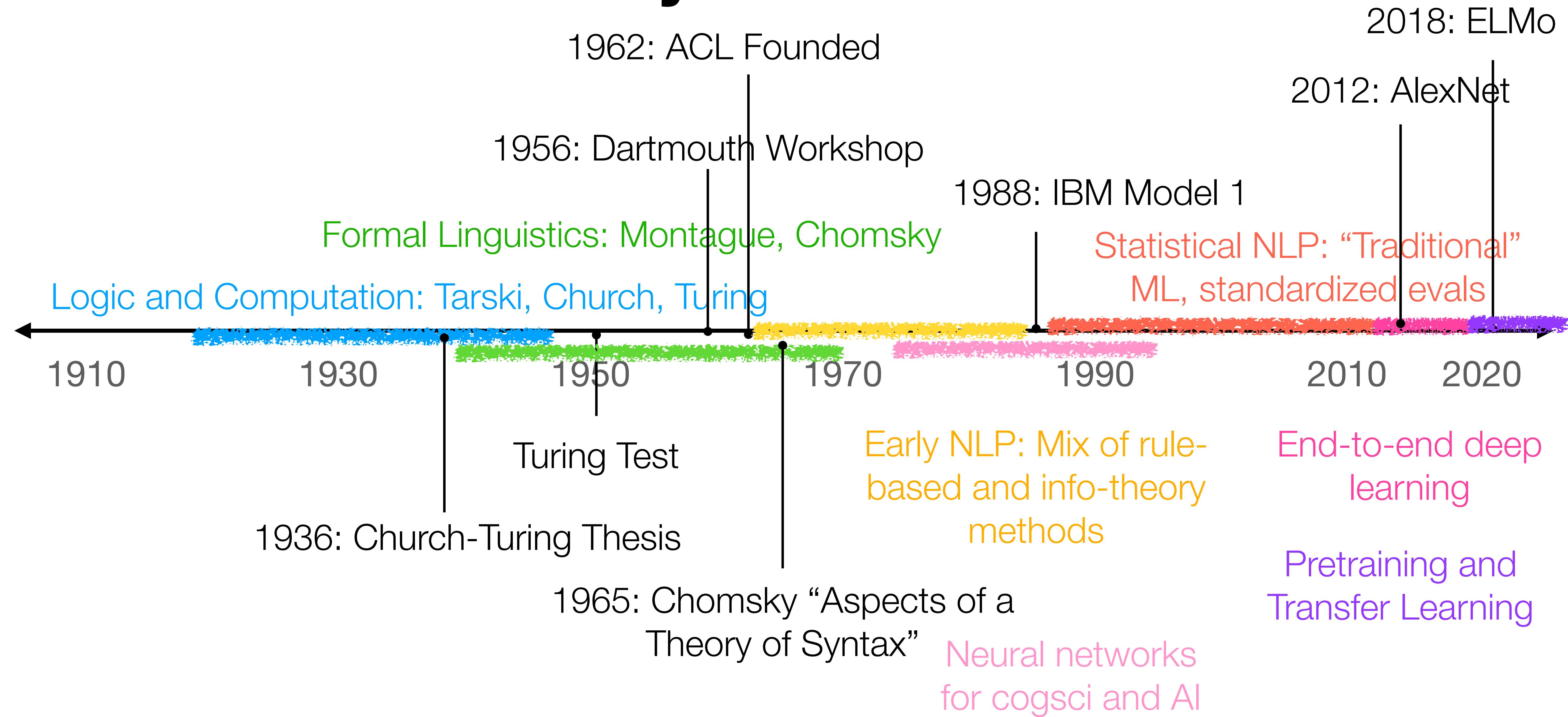


NLP: A brief history

- Deep CNNs take over Computer Vision with AlexNet in 2012
- Resource improvements—GPUs, big data, auto-differentiation—make NNs viable
- Enters NLP a bit later...
 - 2013: word2vec for representing words
 - 2015: “end-to-end” MT with seq2seq models

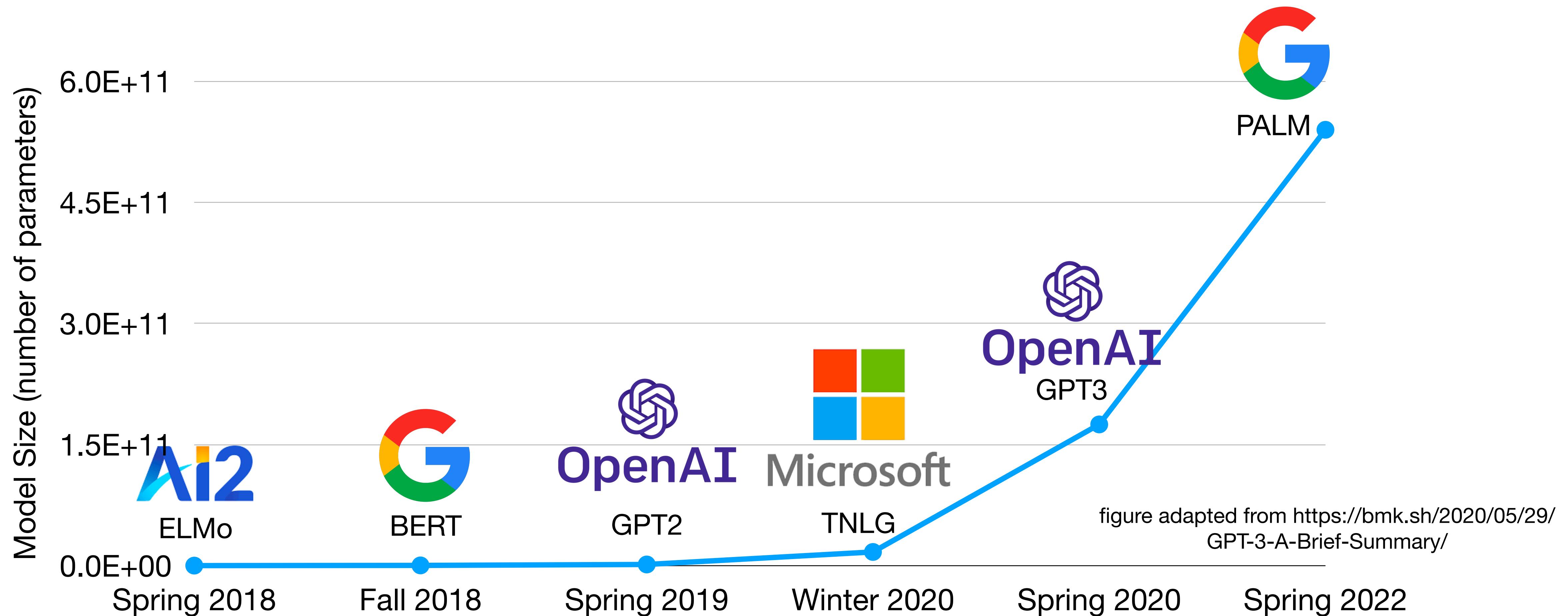


NLP: A brief history

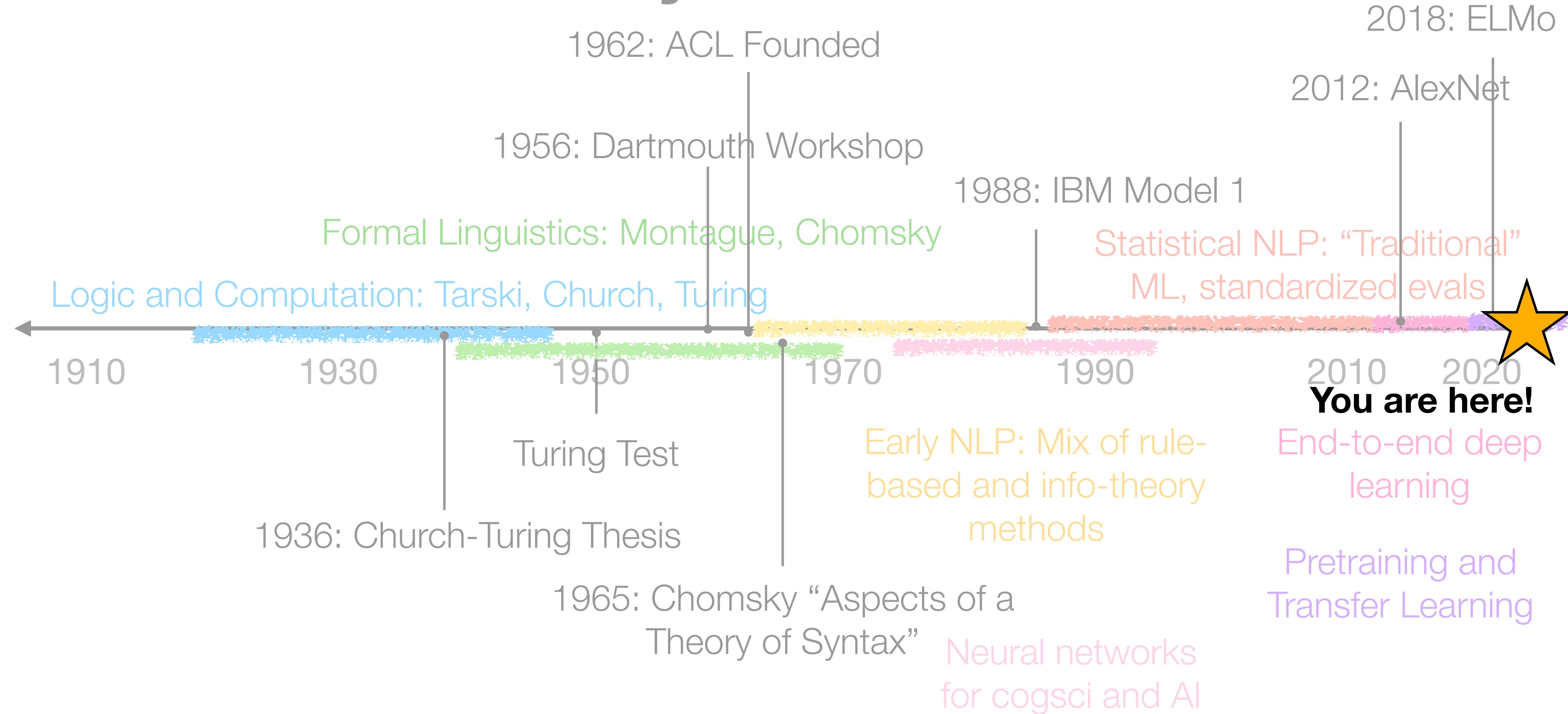


NLP: A brief history

- Very large models trained without a specific task in mind
- Later adapted (ideally using a small amount of data) for specific tasks



NLP: A brief history

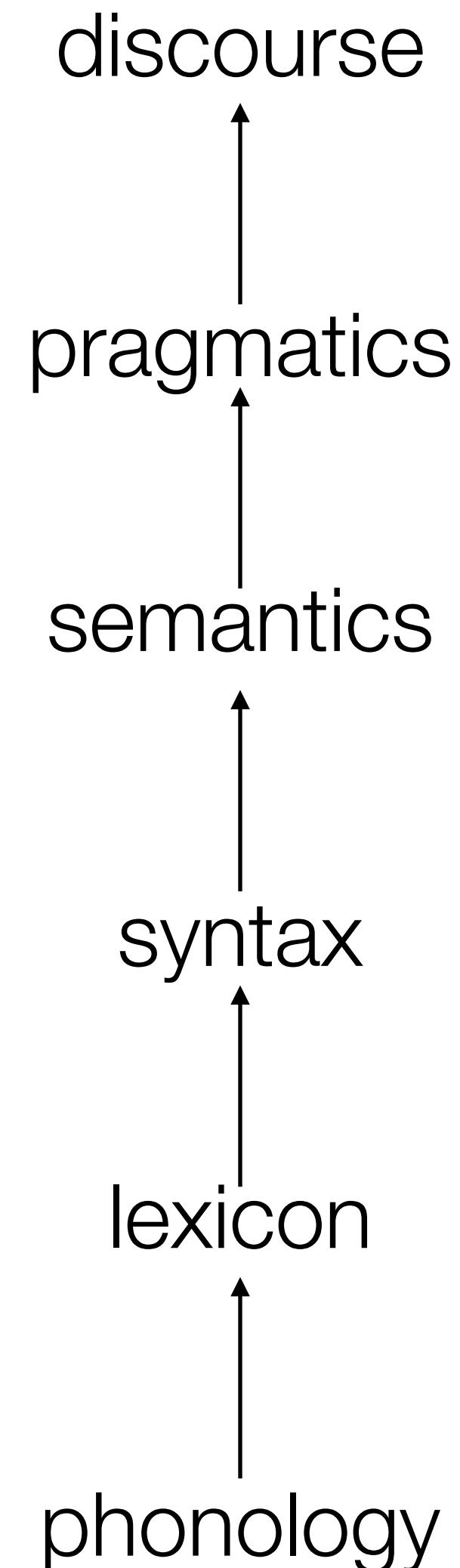


NLP Intro: Brief History and Context

Lecture Outline

- What is NLP? Current Progress
- A brief history of the field
- **NLP Under-the-Hood: The language processing pipeline**
- Course Preview

The Language Processing Pipeline



The Language Processing Pipeline



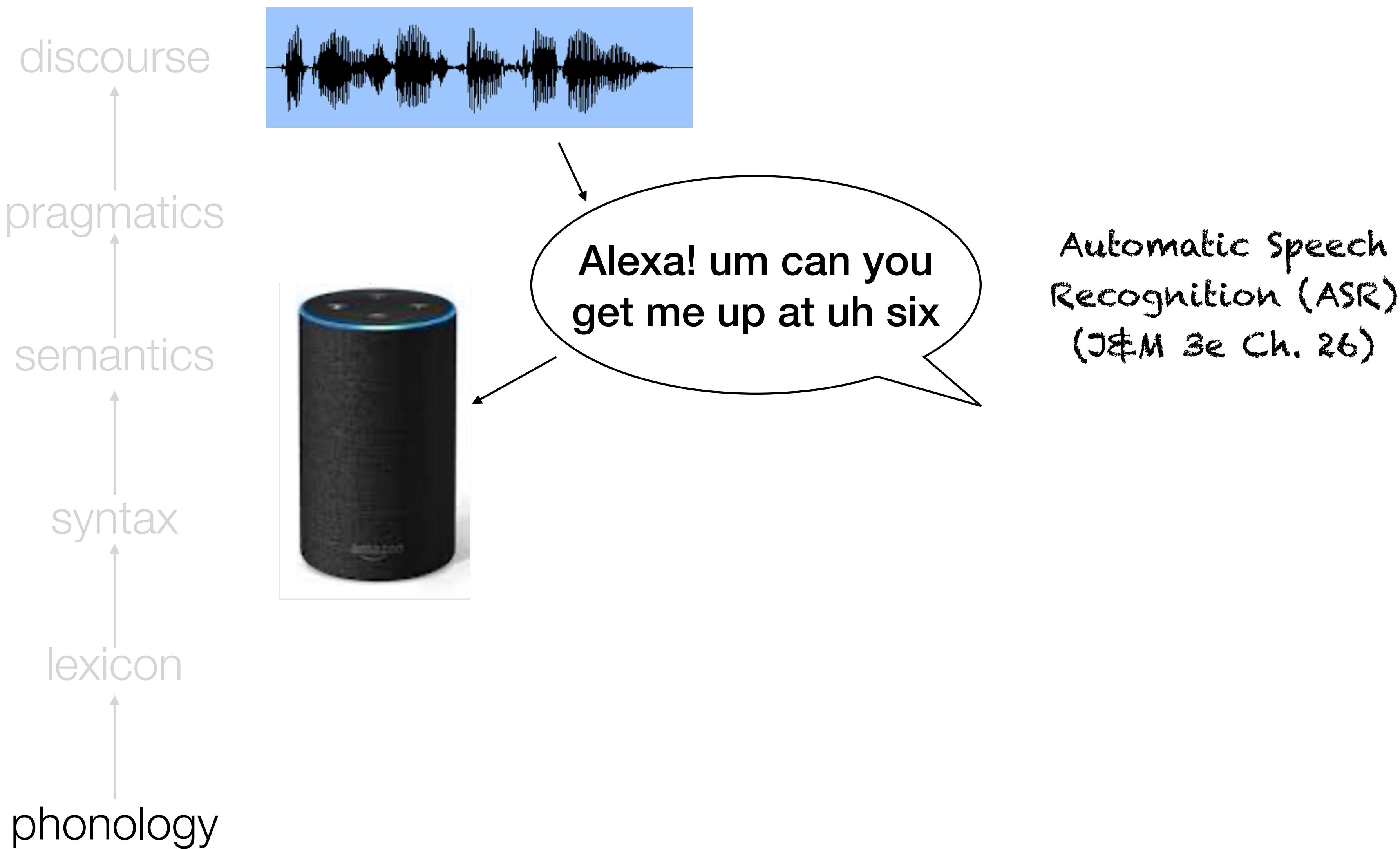
The Language Processing Pipeline



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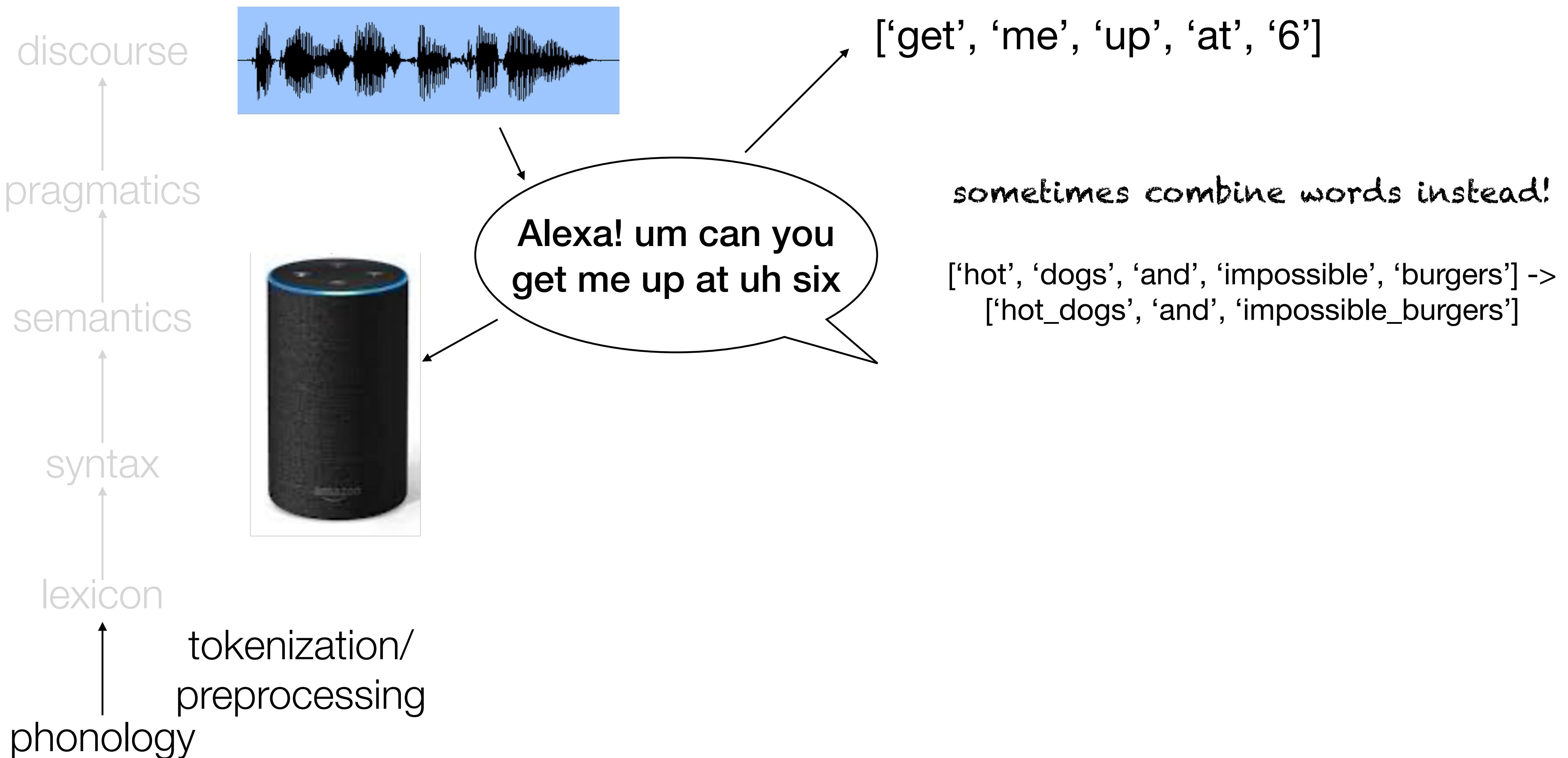
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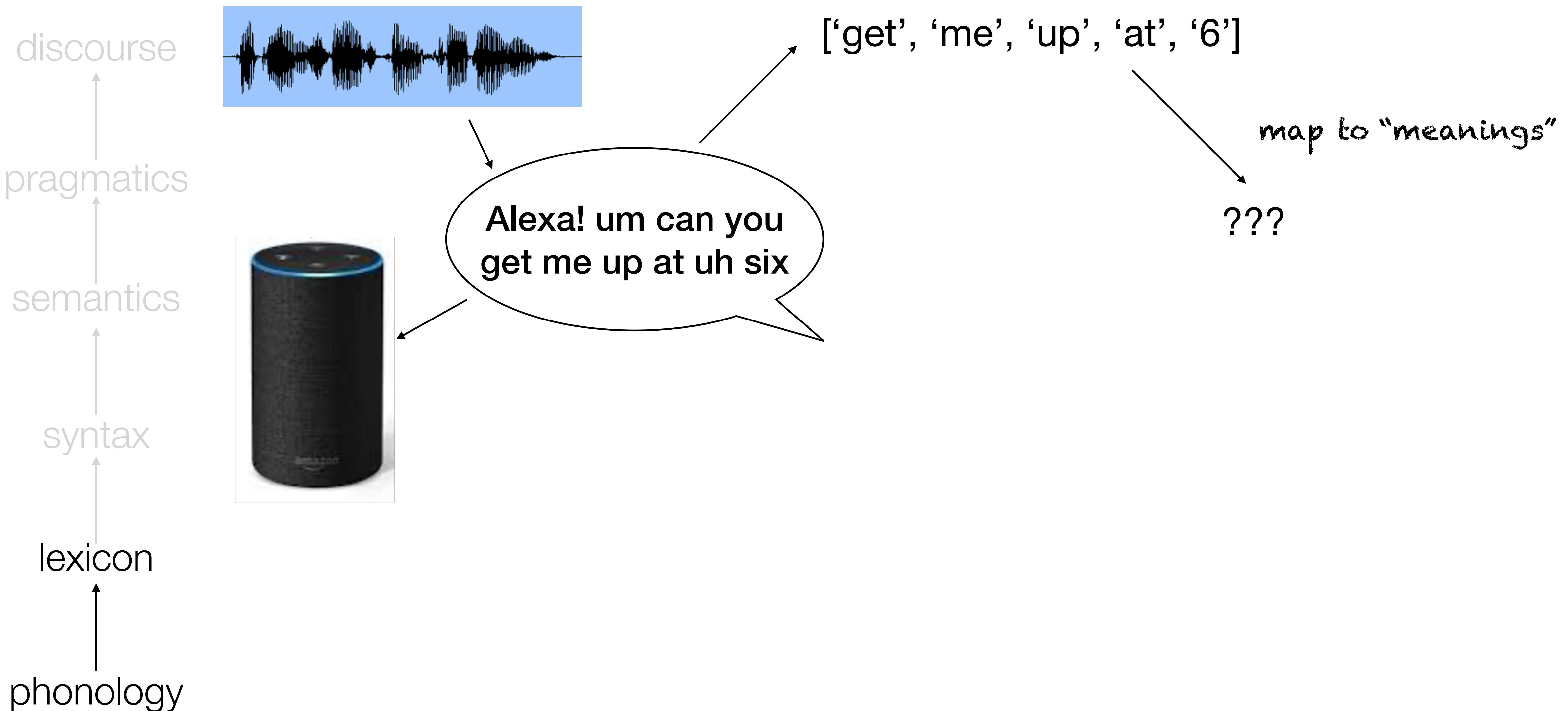
The Language Processing Pipeline



The Language Processing Pipeline



The Language Processing Pipeline



The Language Processing Pipeline

discourse

pragmatics

semantics

syntax

lexicon

phonology



WordNet Search - 3.1
- [WordNet home page](#) - [Glossary](#) - [Help](#)

Word to search for:

Display Options:

Key: "S:" = Show Synset (semantic) relations, "W:" = Show Word (lexical) relations
Display options for sense: (gloss) "an example sentence"

Noun

- S: (n) get (a return on a shot that seemed impossible to reach and would normally have resulted in a point for the opponent)

Verb

- S: (v) get, acquire (come into the possession of something concrete or abstract) "She got a lot of paintings from her uncle"; "They acquired a new pet"; "Get your results the next day"; "Get permission to take a few days off from work"
- S: (v) become, go, get (enter or assume a certain state or condition) "He became annoyed when he heard the bad news"; "It must be getting more serious"; "her face went red with anger"; "She went into ecstasy"
- S: (v) get, let, have (cause to move; cause to be in a certain condition) "He got his squad on the ball"; "This let me in for a surprise"; "He got a girl into trouble"
- S: (v) receive, get, find, obtain, incur (receive a specified thing) "These aspects of civilization do not find expression or recognition in our interpretation"; "His movie received a good review"; "I got into trouble for my good intentions"
- S: (v) arrive, get, come (reach a destination; arrive by moving) "She arrived home at 7 o'clock"; "She didn't get to Chicago in time"

['get', 'me', 'up', 'at', '6']

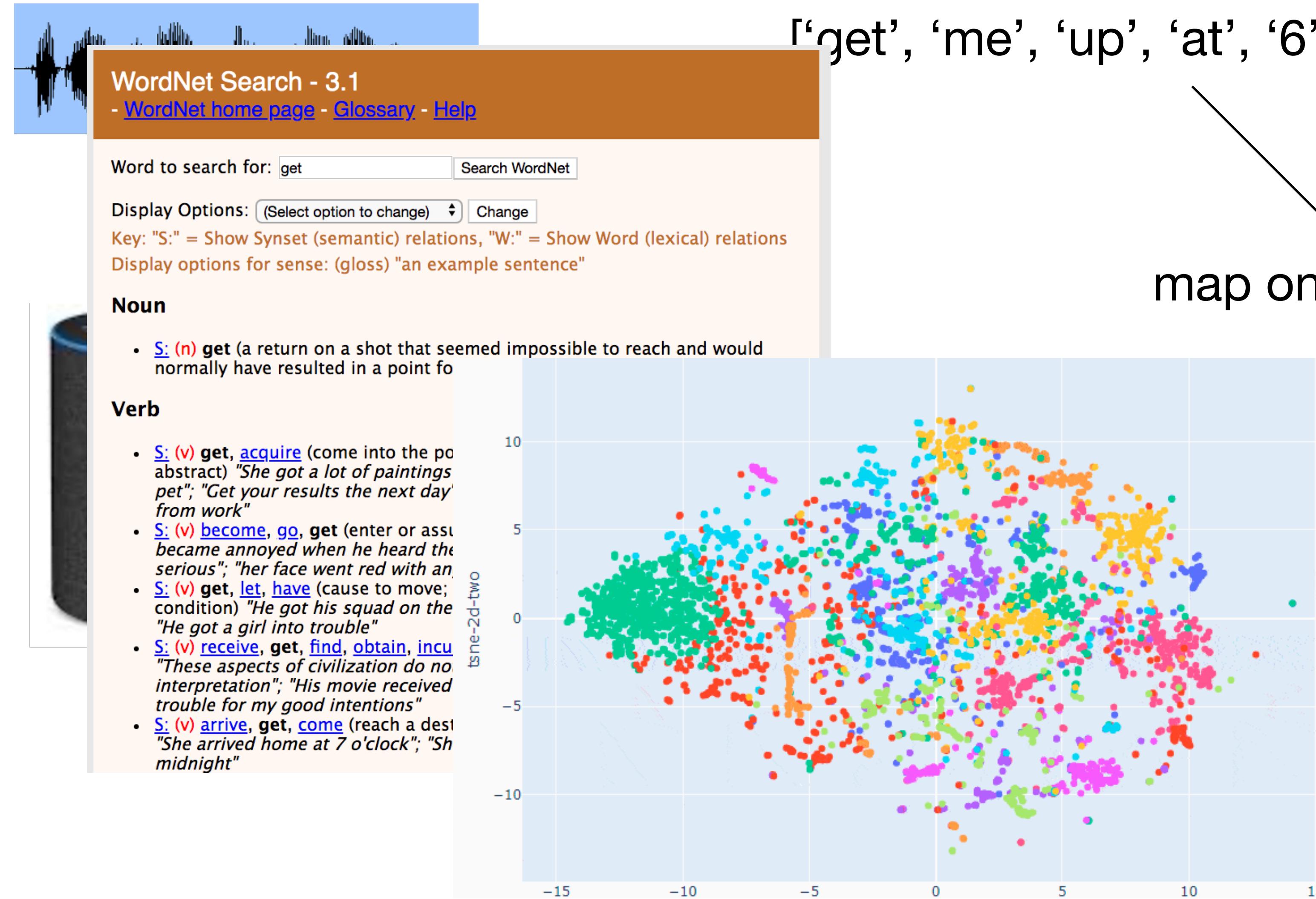
map to "meanings"

lookup in a database
(e.g., WordNet, PropBank,
custom “intent” database)

play	play_music(song)
set	set_time(time)
set	set_temp(temperature)
weather	check_weather(day, location)

The Language Processing Pipeline

discourse
↑
pragmatics
↑
semantics
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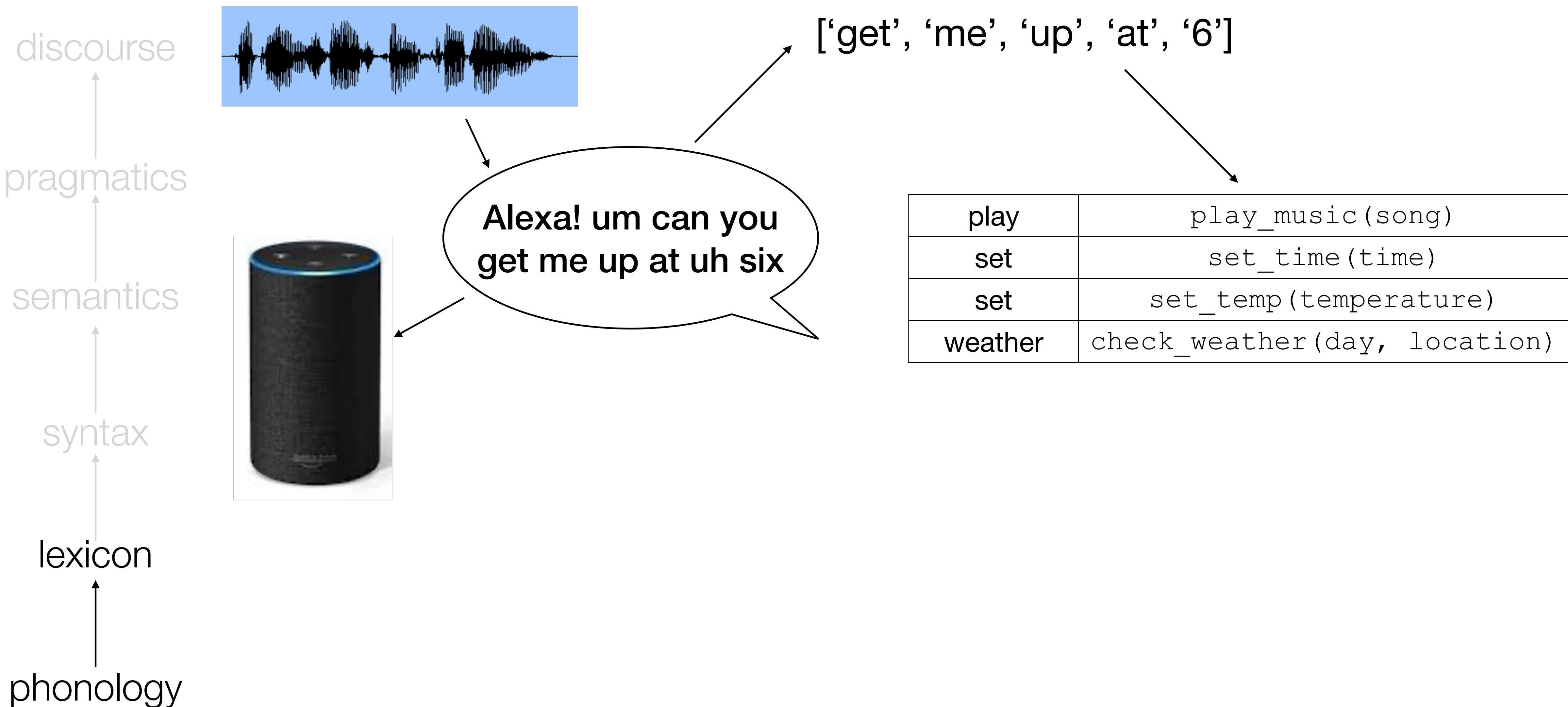


[‘get’, ‘me’, ‘up’, ‘at’, ‘6’]

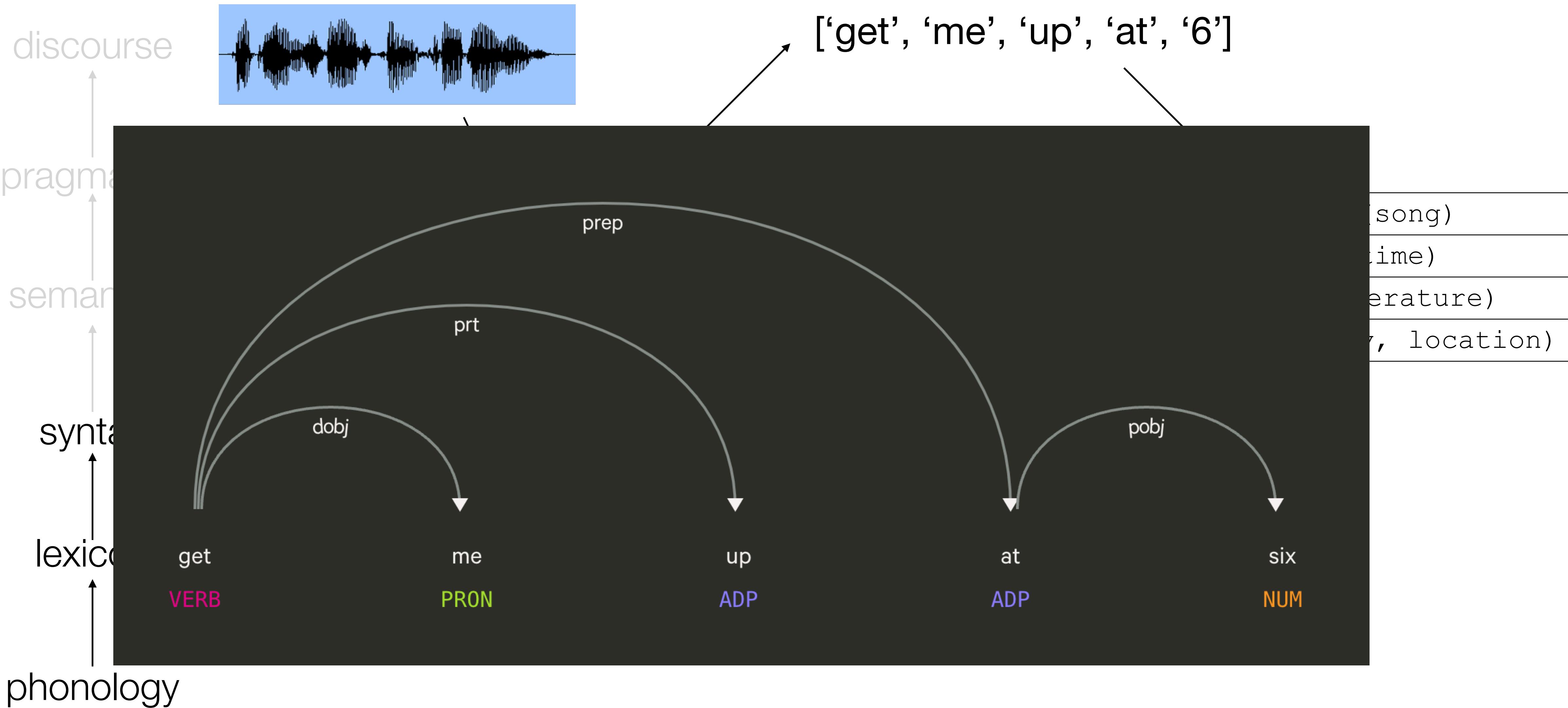
map to “meanings”

map onto vectors

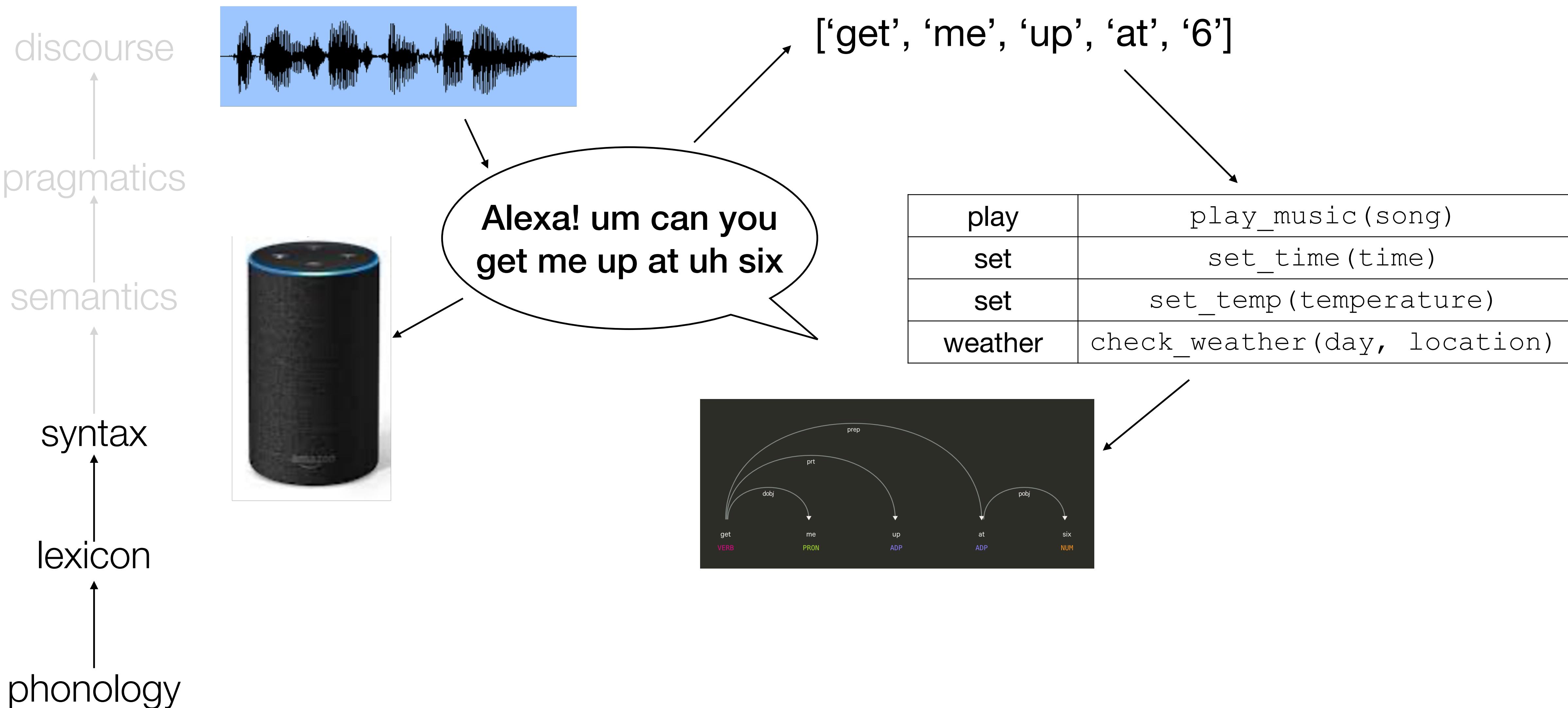
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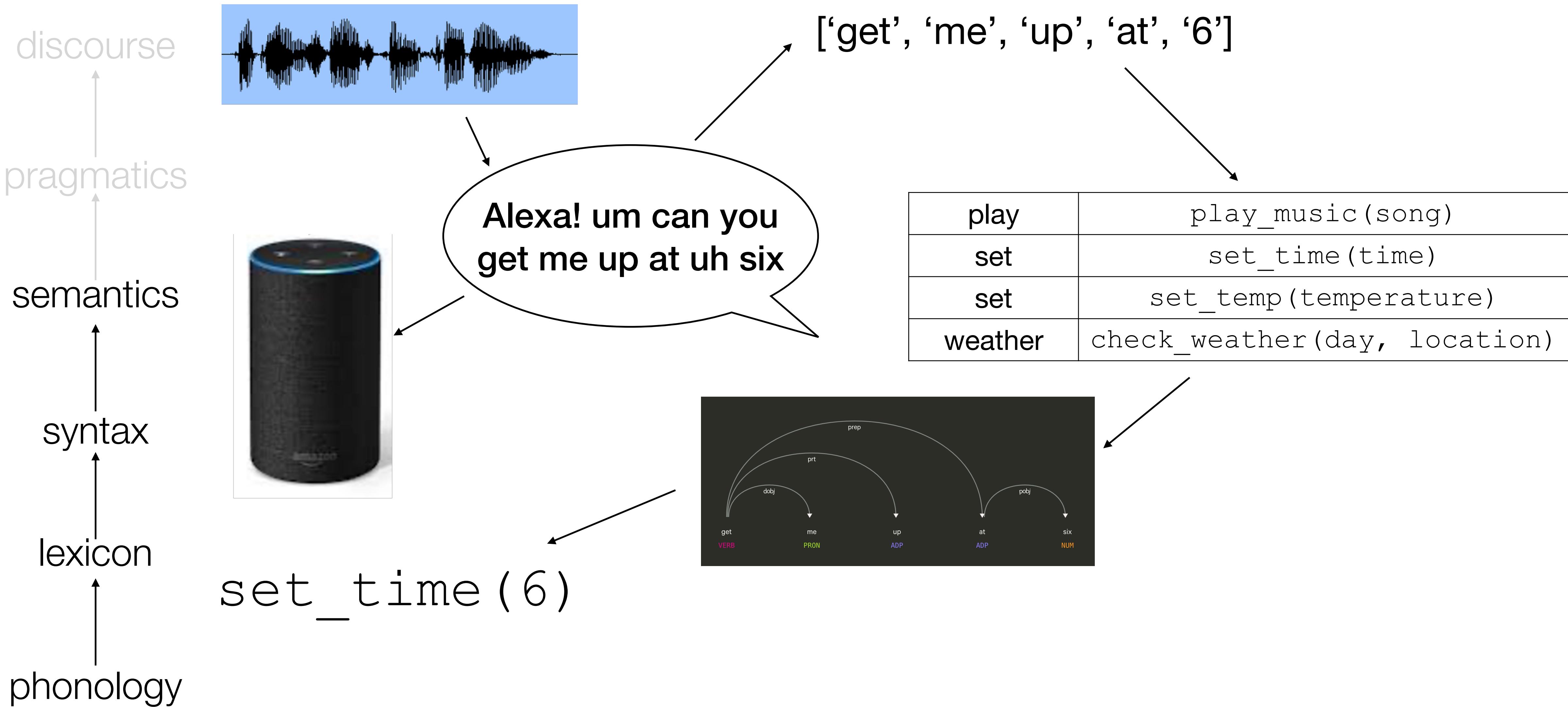
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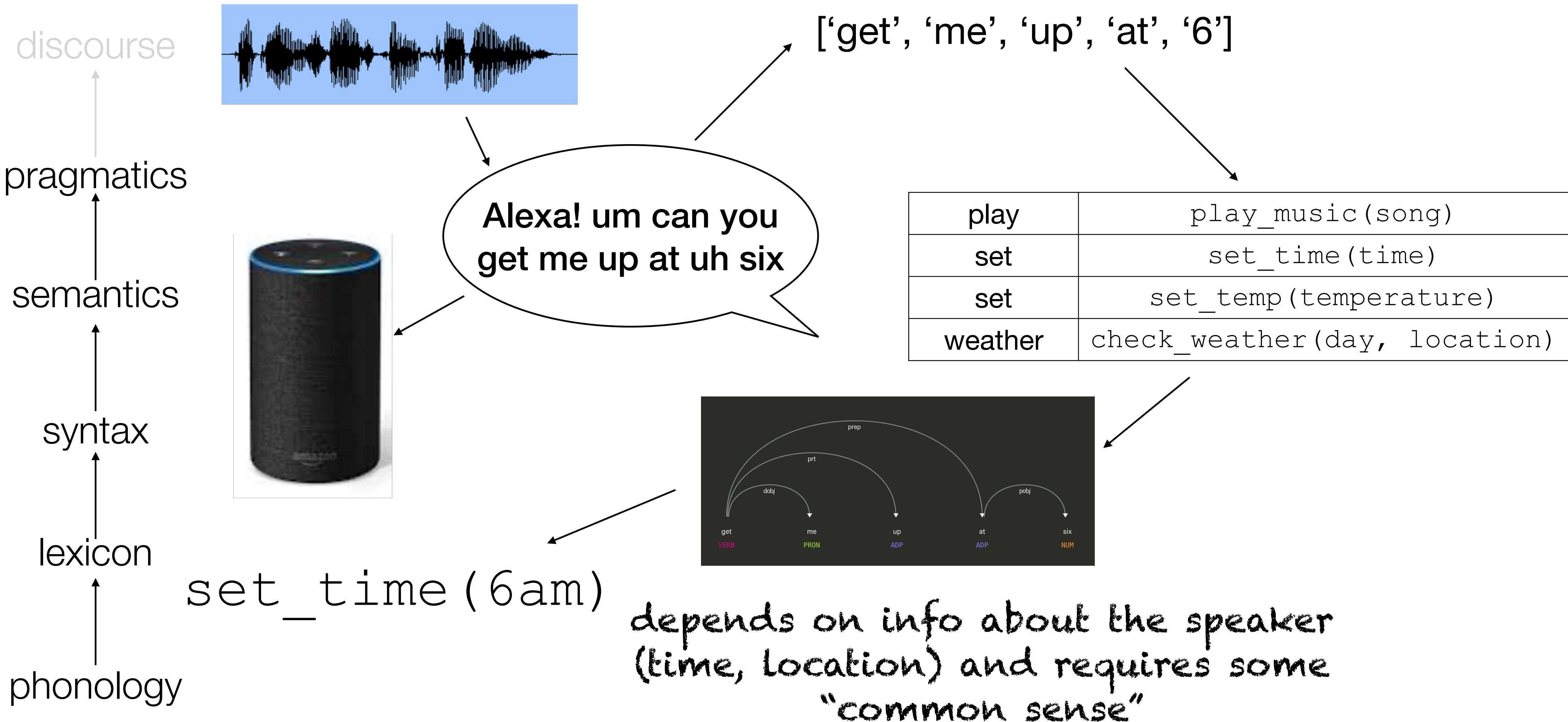
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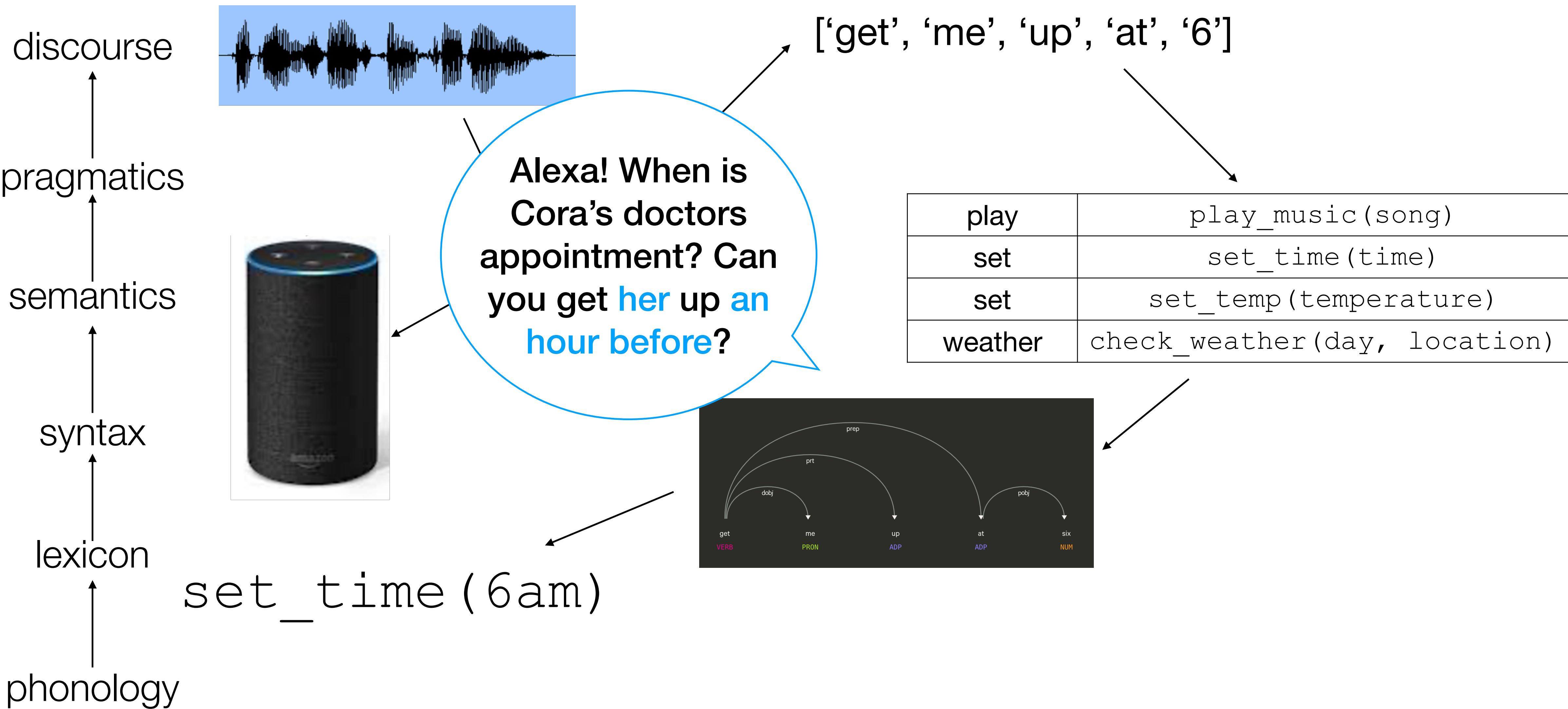
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The Language Processing Pipeline



NLP Intro: Brief History and Context

Lecture Outline

- What is NLP? Current Progress
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Lectures

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Words, word representations, and building text classifiers

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Language Models and Text Generation

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The Traditional
Language
Processing Pipeline

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Machine Learning

Ling: Morphology

Ling: Lexical
Semantics

Deep Learning

Machine Learning

Deep Learning

Ling: Syntax

Ling: Semantics

Deep Learning

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SRC Guest
Lectures

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Research Lectures

Assignments

- Machine Learning: Basic Text Classifier
- Data Science: Topic Modeling
- Deep Learning: Fine-Tuned BERT Classifier
- Deep Learning: Machine Translation
- Algorithms: Dependency Parsing

Final Project

- Reimplement a recent/classic research result!
- I will choose a set of papers you can select from
- You can propose your own idea, but need to clear it with me
- More details later in the semester!

Grading

- 65% Assignments:
 - 5 Technical Assignments (12% each)
 - 1 SRC Writing Assignment (5%)
- 15% Project
- 20% Quizzes
 - 20 lectures, each equally weighted
 - Graded on correctness
 - Lowest 3 scores dropped

Late Days

- Assignments are “due” at 11:59pm on the listed due date
- No late days, no extensions, but hear me out...
 - Grading dates will be posted on the website. If your assignment is in before we start grading, I don’t care when you turned it in
 - If you turn in your assignment after we start grading, we will most likely still grade it. But I cap TA’s work hours every week, and on-time assignments take precedence, so its not 100% guaranteed it will be graded.
 - So, the only sure thing is to turn it in before the posted “grading” date.
- I believe that this policy is logically equivalent to what happens when I use a more standard late days+extensions policy. But, I think it is more transparent and more fair. If you disagree, let’s chat! Perhaps you can convince me otherwise.

Should you take the course? Let's ask GPT3...

Should you take the course?

Brown Critical Review.

Course: 1460 Natural Language Processing
Instructor: Ellie Pavlick

Review: This course was extremely difficult, and I struggled a lot throughout the semester. The assignments were often very convoluted and required a lot of outside research. The exams were even worse, and I felt like I needed to spend an unreasonable amount of time studying for them. Overall, I would not recommend this course to anyone.

Brown Critical Review.

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Review:

The course was very well organized and the lectures were clear and informative. The assignments were challenging and required a good understanding of the material. The instructor was always available to answer questions. Overall, the course was very enjoyable and I learned a lot.

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Review:

Brown is a great NLP course that covers a lot of material in a very short amount of time. The course is very densely packed, but it is still possible to understand the concepts if you are willing to put in the effort. The assignments are very challenging, but they are also very rewarding. I would definitely recommend this course to anyone interested in NLP.

Brown Critical Review.

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Instructor: Ellie Pavlick

Review:

I found this book to be an interesting and insightful read. It was very informative and provided a lot of detail on the topic of natural language processing. The author did a great job of explaining the various concepts and algorithms in a way that was easy to understand. However, I did find the book to be somewhat dense and heavy on the technical details. Overall, I would recommend this book to anyone interested in learning more about natural language processing.

Instructor: Ellie Pavlick

Review:

The Brown Critical Review is a well-written and informative overview of current research in natural language processing. The author provides a clear and concise explanation of the state of the field, and offers thoughtful critiques of recent work. The review is clearly structured and easy to follow, and the author does a good job of highlighting the key points of each article.

The only downside of the review is that it is somewhat brief, and thus may not provide enough detail for readers who are new to the field. However, overall, the Brown Critical Review is an excellent resource for anyone interested in keeping up with the latest developments in natural language processing.

Brown Critical Review.

Course: 1460 Natural Language Processing
Instructor: Ellie Pavlick

Review:

This course was difficult for me. I struggled with the readings and the assignments. I found the TAs to be unhelpful and the instructor was often unresponsive to questions. Overall, I did not enjoy this course.

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Fake news! Do not trust!

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Okay! Let's do it!

