ARTIFICIAL INTELLIGENCE OF HUMOR

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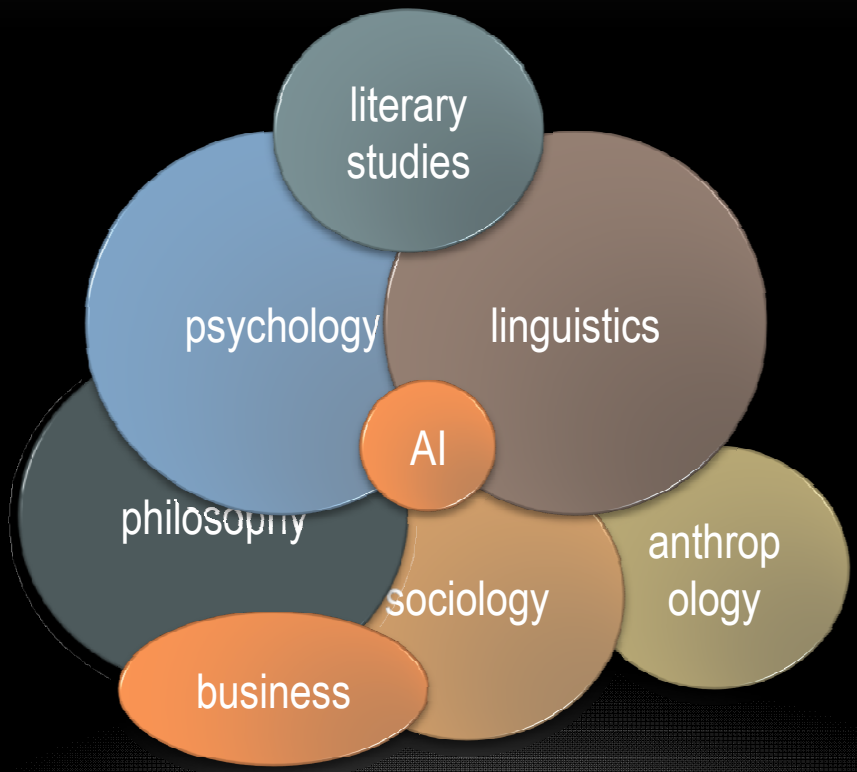
HUMOR IS A WELL-STUDIED AREA



WHAT IS NATURAL LANGUAGE

Language that humans(?) use to communicate with each other naturally

- Image: http://www.iflscience.com/brain/direct-brain-brain-communication-used-humans

WHAT IS ONTOLOGY

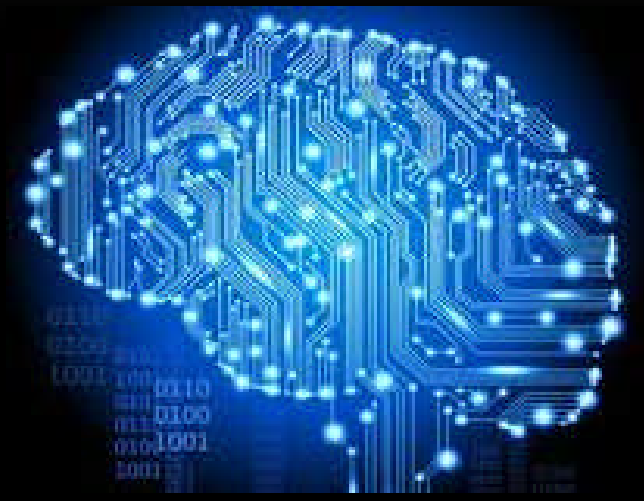
Specification of conceptualization

vs.

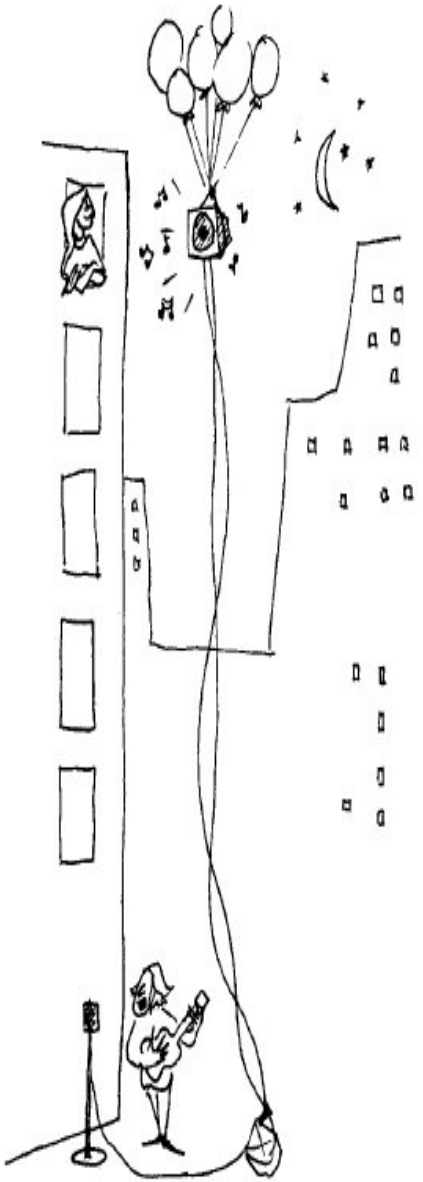
Study of nature of being, existence, reality

- Image: http://www.gizmag.com/ibm-supercomputer-simulates-a-human-sized-brain/25093/

IS THERE ANY OVERLAP?



- If the balloons popped, the sound wouldn't be able to carry since everything would be too far away from the correct floor. A closed window would also prevent the sound from carrying, since most buildings tend to be well insulated. Since the whole operation depends on a steady flow of electricity, a break in the middle of the wire would also cause problems. Of course, the fellow could shout, but the human voice is not loud enough to carry that far. An additional problem is that a string could break on the instrument. Then there could be no accompaniment to the message. It is clear that the best situation would involve less distance. Then there would be fewer potential problems. With face to face contact, the least number of things could go wrong.



- Bransford, J.D., & Johnson, M.K. (1972). Contextual prerequisites for understanding: Some investigations of comprehension and recall. *Journal of Verbal Learning and Verbal Behavior, 11, 717-726.*

WHAT IS HUMOR?

- ✓ No universally accepted definition
- ✓ “What is funny, why it is funny, how it is funny, when it is funny, and to whom it is funny” (Raskin)
- ✓ There are many proposals for humor theories, and it may be difficult for a non-humor scholar to determine the degree of validity and coverage in these proposals.

HUMOR THEORIES

- ✓ Incongruity
  - ✓ humor arises from something that violates an expectation
- ✓ Superiority or aggression
  - ✓ people laugh at other people's infirmities / misfortunes of others, especially if they are enemies
- ✓ Relief or release
  - ✓ laughter provides relief for mental, nervous and psychic energy

INTRODUCTION: THEORY

- Body of the Theory**:** set of explanatory and predictive statement about purview
- Purview**:** the phenomena that the theory takes on itself to deal with—or what it is the theory of
- Premises: the implicit axiomatic statements that the theory takes for granted—these are not stated clearly by many theories and cause most misunderstanding
- Goals: the final results of the successful formulation of a theory;
- Methods of **falsification**: the clearly stated hypothetical situation which would prove the theory wrong, a counterexample—we follow here Karl Popper's (1972) view that a hypothesis that is unfalsifiable in principle is not only not a theory but is actually a faith.
- Method of justification/evaluation: a set of statements on how to check the veracity of the body statements and, wherever possible, on how to compare the theory to its competition, if any.

THEORY IS GOOD IF IT IS…

- adequate, if it provides an accurate account of all the phenomena in its purview;
- effective, if it comes with a methodology for its implementation;
- constructive, if that implementation can be completed in finite time;
- decidable, if there is an algorithm for its implementation in principle;
- computable, if this algorithm can actually be demonstrated,
- explicit, if it is fully aware of all of its components and provides a full account of each of them;
- formal, if it submits itself to logical rules, whether it does or does not use a specific formalism--confusing formality with formalism is one of the worst and unfortunately common offenses in discussing a formal theory;

SCRIPT-BASED SEMANTIC THEORY OF HUMOR (RASKIN, 1985)

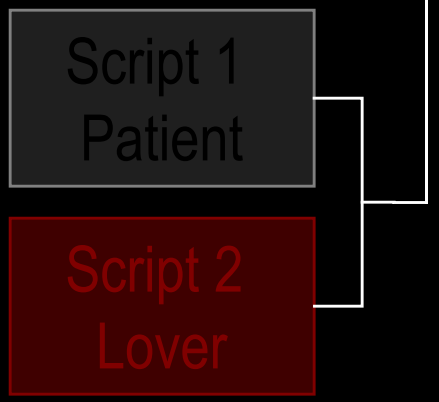
- 2 necessary and sufficient conditions for a text to be humorous:
  - A text has to be compatible, fully or in part, with two different scripts.
  - The two scripts with which the text is compatible are opposite, and must overlap fully or partially.
- Humor is based on ambiguity that is deliberately created
- Scripts must oppose unexpectedly

SCRIPT-BASED SEMANTIC THEORY OF HUMOR (RASKIN, 1985)

- Scripts Overlap
- Scripts Oppose

"Is the doctor home?" the patient asked in his bronchial whisper. "No," the doctor's young and pretty wife whispered in reply.

"Come right in."



GENERAL THEORY OF VERBAL HUMOR (ATTARDO & RASKIN, 1991)

Script-based Semantic Theory of Humor (SSTH)

Script Ov/Op

General Theory of Verbal Humor (GTVH)

GTVH(Attardo & Raskin,1991)

Joke$_1$: *How many Poles does it take to screw in a light bulb? Five. One to hold the light bulb and four to turn the table he's standing on.*

Joke$_2$: *How many Poles does it take to wash a car? Two. One to hold the sponge and one to move the car back and forth.*

Joke$_3$: *The number of Polacks needed to screw in a light bulb? – Five – One holds the bulb and four turn the table.*

Joke: {SO, LM, SI, TA, NS, LA}

	Joke$_1$	Joke$_2$	Joke$_3$
SO	Dumb/Smart		
LM	Figure-ground reversal		
SI	Light bulb	Car wash	Light bulb
TA	Poles		
NS	Riddle		
LA	LA1	LA1	LA2

SEMANTICS HAS CAUGHT UP WITH SSTH

- SSTH (semantic script theory of humor) still needed an automatic (inter-subjective) ST (semantic theory)
- OST (ontological semantic theory) finally is up to being that ST, including S (scripts)
- now powered by OST we can focus on the H (humor): OSTH

SSTH, GTVH … AND NOW OSTH

- proper purview: textual humor, most easily applicable to short canned jokes;
- premises: mostly that a text can be recognized as a humor-carrying in the process of normal linguistic semantic analysis within a certain approach and understood the way humans do;
- goals: mostly to account for how each joke works, which amounts to understanding it the way people do and going beyond that to a full explanation, the way people don't;
- falsification: a joke that is not based on overlapping and opposed scripts—not yet produced, it appears; and
- justification: see Ruch et al. (1993) on a successful psychological experiment that bore out most of the GTVH claims.

WHY FORMAL/COMPUTATIONAL THEORY?

- ✓We think like this
- ✓We leave nothing implicit
- ✓We compute the descriptions for dual purpose of:
  - ✓having working systems taking over human intellectual functions, and
  - ✓using the computer as the ultimate justification of the theory/hypothesis

WHAT IS WRONG WITH HUMAN-LEVEL HUMOR THEORY?

- ✓ Unlike human-level processing, computational processing:
  - ✓Doesn't skip connections from script to script
  - ✓Doesn't discard some scripts unless algorithmically (not ad-hoc) programmed to do it
  - ✓Does not prefer certain scripts to others unless the theory specifies methods for such preference

WISCRAIC

- Created by McKay
- Joke generator that focuses on witticisms based around idioms.
- Produces jokes and explanations for created jokes

The friendly gardener had thyme for the woman!

The word time, which is part of the idiom [have, time, for, someone] is a homonym of the word thyme.

A HOMONYM is a word that sounds like another word.

TOM SWIFTIES

- Created by Lessard and Levison
- Pun-like utterances. A manner adverb enters into a formal and semantic relation with other elements on the sentence.

"I hate seafood," said Tom crabbily.

HAHACRONYM

- Created by Stock and Strapparava
- Inputs existing acronym, comes up with humorous parody of it
- Loosely based on a theory

MIT (Massachusetts Institute of Technology) -> Mythical Institute of Theology

ACM (Association for Computing Machinery) -> Association for Confusing Machinery

MNEMONIC SENTENCE GENERATOR

- Built by McDonough
- Converts any alphanumeric password into a humorous sentence
- Template: (person name) + (positive verb) + (person name + “s”) + (common noun) + “, while” + (person name) + (negative verb) + (person name + “s”) + (common noun)
- Loosely based on a theory

AjQA3Jtv: Arafat joined Quayle’s Ant, while TARAR Jeopardized thurmond’s vase.

JAPE

- Created by Binsted
- Generates simple punning riddles
- Uses humor-independent lexicon

What do you call a quirky quantifier?
An odd number.

What’s the difference between money and a bottom?

One you spare and bank, the other you bare and spank.

STANDUP

- Extension of JAPE
- Helps children to explore sounds and meanings by making up jokes with computer assistance
- Adapted joke construction method from JAPE

- Practical application of computational humor

CHGS:SUMMARY

- Most generators follow one or several predetermined sentence structures
- Generators do not have to understand meaning of entire sentences, only a preselected part, and generate humorous addition to it
- Can restrict their lexicon or usable background and operational knowledge of the world
- Using a small number of words that are humor independent allows a system to claim "humor independent lexicon" and leaves no hope to scale the system from toy examples to larger scale applications

COMPUTATIONAL DETECTION OF HUMOR

- both from theory-based and corpus-based points of view.
- It can be argued that both approaches are equally valuable:
  - often enough, people identify that something is a joke (whether humorous or not) without being able to tell why it is so,
  - text T is a joke if and only if it has X, Y and Z as its components.
- This suggests that for computational purposes, at least two methodologies have to be tried:
  - one that decides whether T is a joke based on some independent (theoretical) criteria
  - and another that decides whether T is a joke based on its comparison to a known joke T'—on unknown(?) criteria.

ONE LINER RECOGNIZER (MICHALCEA & STRAPPARAVA)

- A one-liner is a short sentence with comic effects
  - Produce humorous effect with very few words
- Recognizer uses Machine Learning techniques
  - Naïve Bayes
    - Based on probability models that incorporate strong independence assumptions
  - Support Vector Machines
    - Finds hyperplane that separates different classes.

ONE LINER RECOGNIZER (MICHALCEA & STRAPPARAVA)

- Quality set
  - 200 one-liners manually collected
  - 200 Reuters titles
  - 200 sentences randomly selected from BNC
  - 200 proverbs
- Quantity set
  - 20,000 one-liners automatically identified on the Web
  - Reuters titles
  - BNC sentences

ONE LINER RECOGNIZER (MICHALCEA & STRAPPARAVA)

One-liners
Take my advice; I don't use it anyway.
I get enough exercise just pushing my luck.
Beauty is in the eye of the beer holder.
Reuters titles
Trocadero expects tripling of revenues.
Silver fixes at two-month high, but gold lags.
Oil prices slip as refiners shop for bargains.
BNC sentences
They were like spirits, and I loved them.
I wonder if there is some contradiction here.
The train arrives three minutes early.
Proverbs
Creativity is more important than knowledge.
Beauty is in the eye of the beholder.
I believe no tales from an enemy's tongue.

ONE LINER RECOGNIZER (MICHALCEA & STRAPPARAVA)

- Quality Set (non-jokes)

Classifier	One-liners Reuters	One-liners BNC	One-liners Proverbs
Naive Bayes	89.75%	56.75%	68.50%
SVM	84.75%	63.75%	70.00%

- Quantity Set (non-jokes

Classifier	One-liners Reuters	One-liners BNC
Naive Bayes	96.89%	73.62%
SVM	96.09%	77.84%

HUMOROUS NEWS ARTICLES (MICHALCEA & STRAPPARAVA)

- Similar approach to one-lines
- Corpus:
  - Humorous: articles from *The Onion*
  - Non-humorous: articles from *LA Times*, *Foreign Broadcast Information Service*, British National Corpus
- Algorithms:
  - Naïve Baise
  - Support Vector Machine (96.8%)
- Humorous features:
  - Human-centric vocabulary, negation, negative orientation, professional communities, human "weakness"

SHORT CHILDREN'S JOKE DETECTOR (TAYLOR & MAZLACK)

- Goal: identify jokes (and the reason for identification)
- 100 jokes
  - 5 categories
    - fairytale jokes
    - monster jokes
    - mammal jokes
    - non-mammal animal jokes (insects, fish, birds)
    - people jokes (doctor and school jokes)
  - 20 jokes each
    - 10 based on words with multiple meanings
    - 10 based on words with similar pronunciation
  - Selected by 3 native speaker of English
- 100 non-jokes

THEORY ADJUSTMENT (SSTH)

- Text is humorous iff:
  - A text has to be compatible, fully or in part, with two different scripts.
  - The two scripts with which the text is compatible are opposite, and must overlap fully or partially.
- Scripts must oppose unexpectedly

WHAT IS OPPOSITENESS?

- Hempelmann (2003):
  - situational, contextual, or local antonyms
- A text can be characterized as a single-joke-carrying text if:
  - The text is compatible with 2 different scripts
  - The 2 scripts are opposite
    - Taylor (2008): Look at goals
      - Expand to:
        - Purpose, result, along the path to purpose, goal, result…

Does This Always Work?

- Jokes in Raskin(1985)
  - About 80% works
- Jokes where situations are not compared, do not
  - An aristocratic lady hired a new chauffeur. As they started out on their first drive, she inquired: "What is your name?" "Thomas, ma'am," he answered. "What is your last name?" she said. "I never call chauffeurs by their first names." "Darling, ma'am," he replied. "Drive on -- Thomas," she said.

PRONUNCIATION COMPONENT

- CMU pronouncing dictionary
  - Contains words and their pronunciations
- Similar-sounding word generator
  - Phoneme distance/cost table (Hempelmann, 2003)
- Database of word frequencies (Kucera & Francis, 1967)
- Database of word familiarity (MRC Psycholinguistic Database

JOKE ANALYSIS IN ACTION

Which fish can perform operations? A sturgeon.

- What word to replace (source)?
- With what (target)?

SOURCE/TARGET SELECTION

- Source is selected based on:
  - Kucera-Fransis frequency (KFF) of all potential sources
    - KFF (source) < median (joke KFF)
    - 49/50 jokes KFF Median(source) < Median(joke)
  - Word familiarity (FAM) of all potential sources
    - FAM (source) < median (joke FAM)
    - 48 jokes FAM Median(source) < Median(joke)

SOURCE/TARGET SELECTION

- Target is selected based on:
  - Kucera-Fransis frequency (KFF) of source and target
    - KFF (source) < KFF (target)
  - Word familiarity (FAM) of source and target
    - FAM (source) < KFF (target)

EXPERIMENTS: QUESTION TO ANSWER

- Is it possible to recognize jokes that are based on word ambiguity?
  - Jokes: 64%, non-jokes: 92%
- Is it possible to recognize jokes that are based on phonological similarity of words?
  - source detection: 96%; target detection: 76%
- Can jokes be recognized by comparing them with already known jokes?
- Can jokes be recognized when an ontology does not have all of the required background knowledge to process the meaning of text?
  - Complete/incomplete ontological info: 57% /12%
- Are some jokes easier to recognize than others?

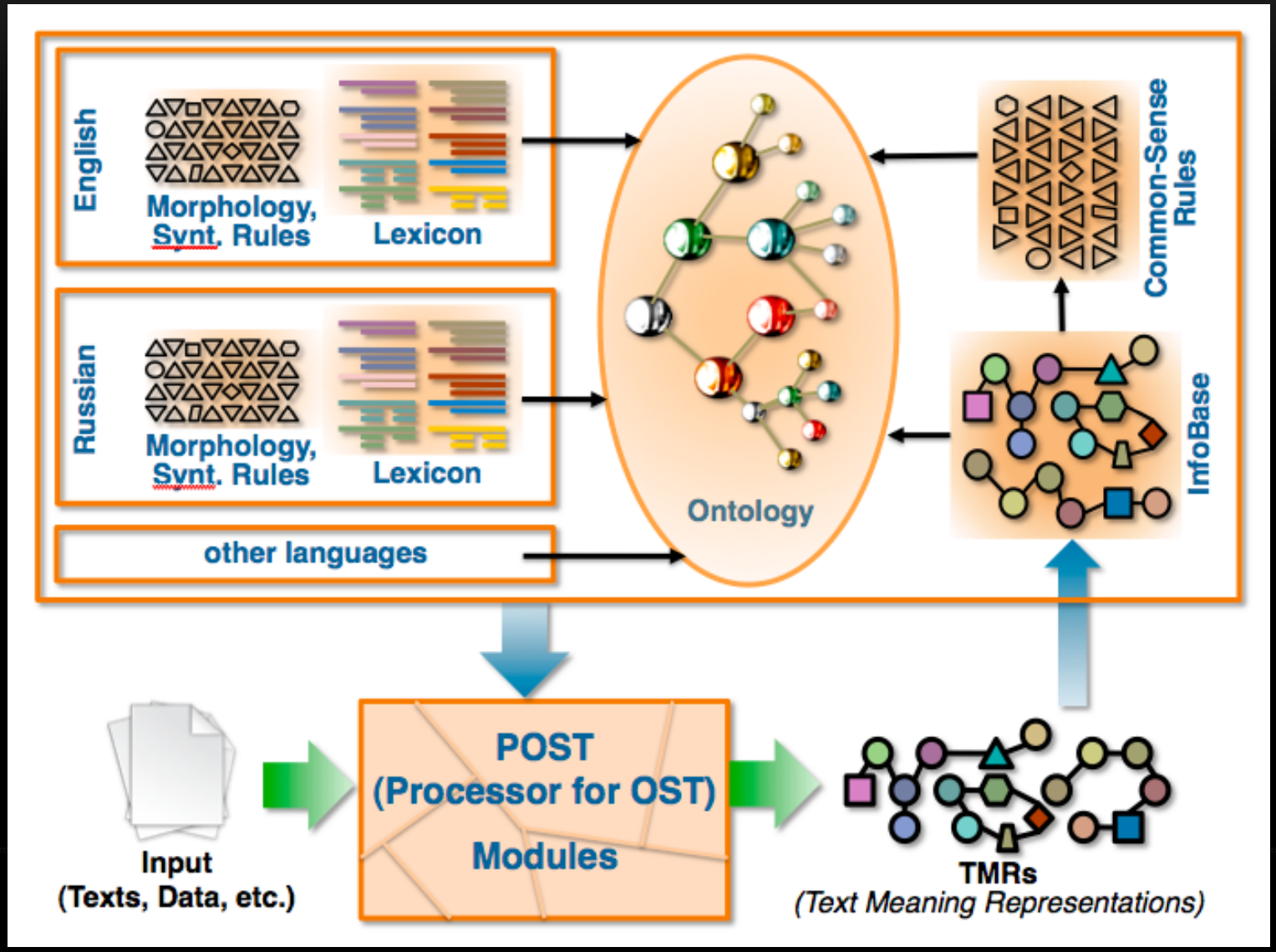
	Fairytale	Monster	Mammal	Non-mammal animal	People
Jokes identified as such	14	15	11	14	13
Jokes identified as non-jokes	6	5	9	6	7
Non-jokes identified as such	18	19	17	18	17
Non-jokes identified as jokes	2	1	3	2	3

A DREAM OF TALKING MACHINE

- Jim Hendler: “When I saw *2001* [in 1968], the idea of the talking computer that understood language was so cool that I decided then and there that I wanted to be an AI scientist someday.”
- Bruce Buchanan: “Turing saw that operational tests of behavior would be more informative than arguing in the abstract about the nature of intelligence […]”
- Paul Cohen: “A large, important problem is to work out the semantics of natural language—including all the required commonsense knowledge—so that machines can read and understand the web.”
- Tom Mitchell: “I […] offer to bet anyone a lobster dinner that by 2015 we will have a computer program capable of automatically reading at least 80 percent of the factual content across the entire English-speaking web, and placing those facts in a structured knowledge base”

- Data should be understood before it becomes information
  - But, what does it mean to “understand”?

ONTOLOGICAL SEMANTIC TECHNOLOGY (BASIC FORM)



ONTOLOGY AND INFOBASE FORM

concept-name

(property(facet(property-filler^{+}))$^{+}$)$^{+}$

property-filler

concept-name | literal value

property

attribute | relation | proper name dictionary relation

facet

sem | value | default | relaxable-to

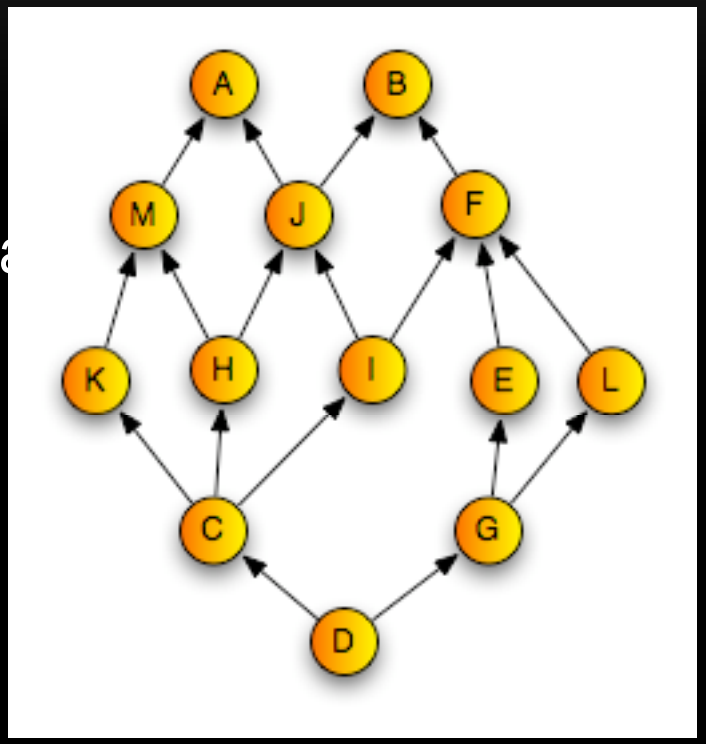
ONTOLOGICAL FORMALISM

- Concept interpretation:
  - Given a set of objects D and given its interpretation function *I*, for every fuzzy concept B, object x is an element of B with some degree *I*[B](x) → [0, 1]; for every relation Rel, *I*[Rel](x, y) $\subseteq$ D x D → [0, 1]; We will assume that x$\in$B if *I*[B](x) → (0, 1].

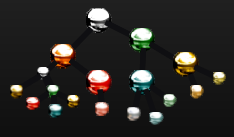
- *I*[C D](x) = max{*I*[C](x), *I*[D](x)}
- *I*[and C D](x) = min{*I*[C](x), *I*[D](x)}
- *I*[(Rel(D))](x)= $\max_{y \in D}${*I*[Rel](y, x)}
- *I*[(Rel(and C D))](x) = min{*I*[Rel(C)](x), *I*[Rel(D)](x)}
- *I*[Rel(C D)](x) = max{*I*[Rel(C)](x), *I*[Rel(D)](x)}
- *I*[C(Rel(D))](x) = min{*I*[C](x), *I*[Rel(D)](x)}
- *I*[C(Rel_1(D))(Rel_2(E))](x) = min{*I*[C(Rel_1(D))](x), *I*[C(Rel_2(E))](x)}

ONTOLOGICAL FORMALISM LESS FORMALLY

- Each node has a number of properties
- Each property comes with a filler or a restriction
  - Cat has 4 legs
  - Computer has CPU, HDD, memory, etc.
  - Cars drive on the roads (to a large extent)



OST AT GLANCE: EXAMPLES OF:



Ontological Concept

go

is-a	motion-event
agent	animal
instrument	body-part, vehicle
source	location
destination	location
start-time	temporal-unit
end-time	temporal unit

Lexical Entry

drive-v1

syn-struc ^var1 subject NP

root V ^var0

object NP ^var2

sem-struc

go

agent $var1 (*sem* human; default adult)

instrument $var2 (default car)

OST at Glance: Simplified TMR

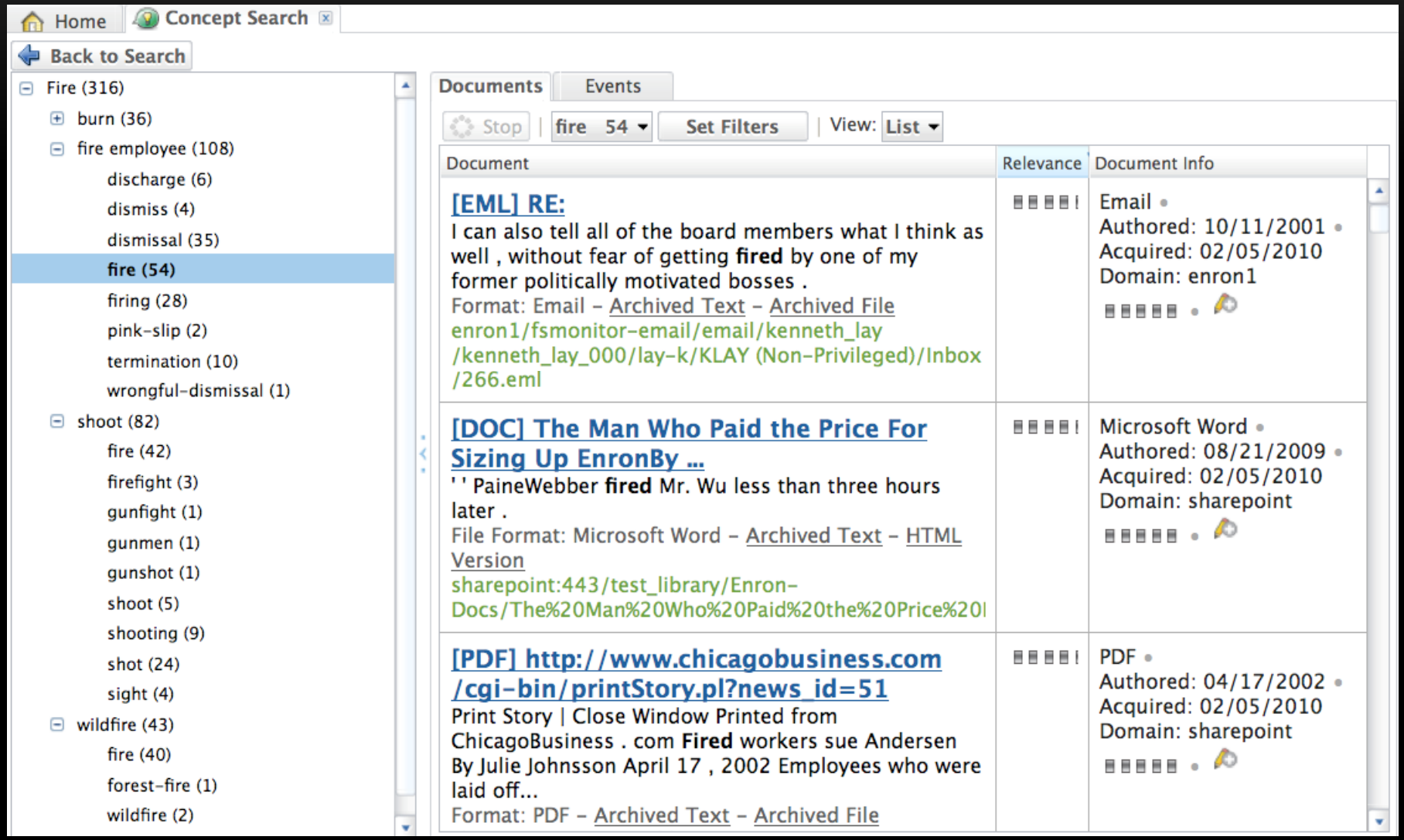
Mary drove from Boston to New York on Wednesday

Go

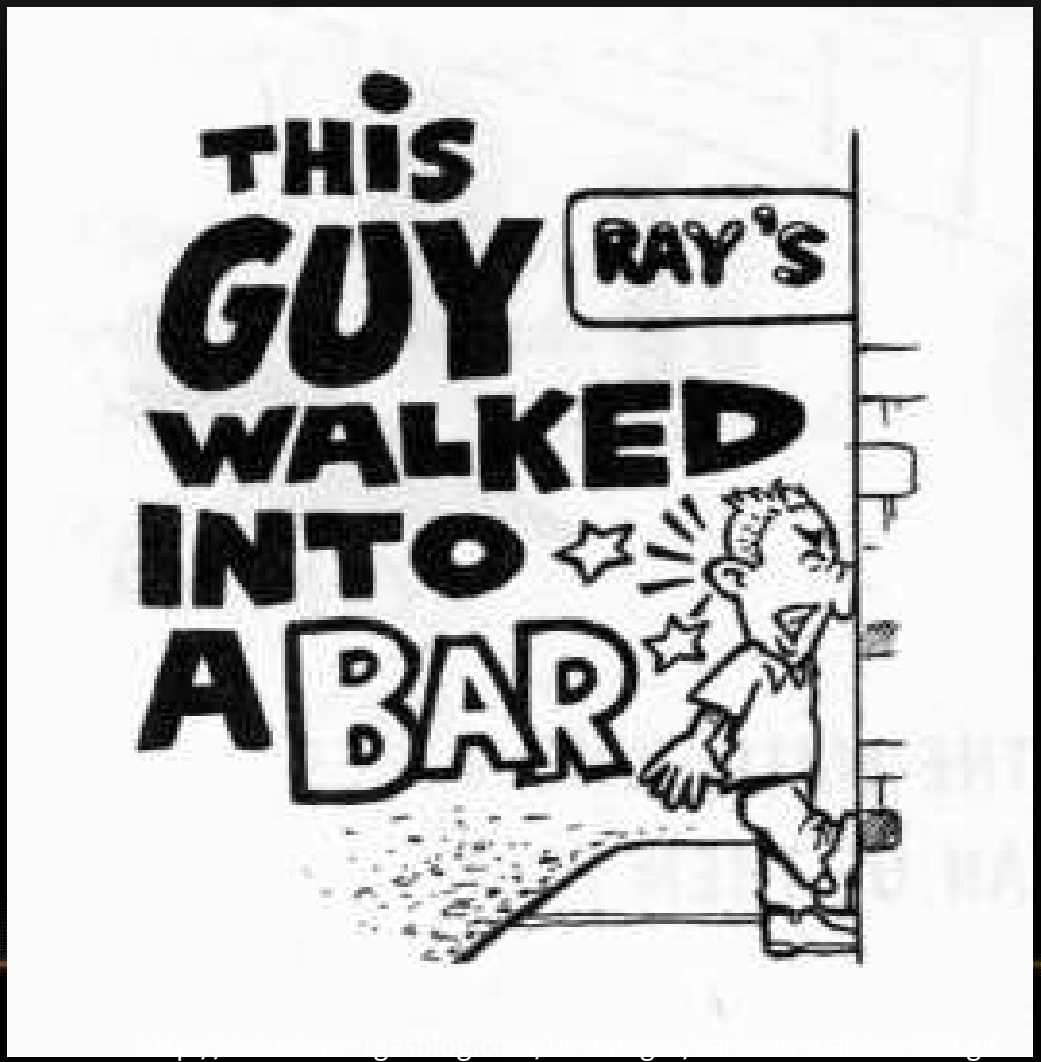
agent	Mary
instrument	car
source	Boston
destination	New York
start-time	Wednesday
end-time	Wednesday

No Longer A Toy, but Hasn't Reached Its Full Potential

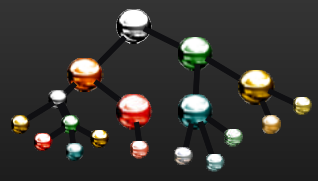
RiverGlass



A man ~~walks~~ runs into a bar. Ouch.



Language Independent Concepts



Ontological Concept

go

is-a	motion-event
agent	animal
instrument	body-part, vehicle
source	location
destination	location
start-time	temporal-unit
end-time	temporal unit

Ontological Concept

meet-with

is-a	interactive-communicative-event
agent	human
beneficiary	human
has-event-as-part	discussion

Language dependent lexicons

```
(run-v6
        (cat(v))
        (anno(comments "...")(def "meet unexpectedly")(ex "i ran into my english
 teacher at the movies last night. she's so nice!"))
        (syn-struc
                ((subject((root($var1))(cat(np))))
                (root($var0))(cat(v))
                (prep((root(into))(cat(prep))))
                (directobject((root($var2))(cat(np))))))
        (sem-struc
                (meet-with(agent(value(^$var1)))
                        (beneficiary(value(^$var2)))
                        (intentionality(value(<0.3)))(relaxable-to(<0.5))))
 )
```

Language dependent lexicons

```
(run-v8
        (cat(v))
        (anno(def "")(ex "he ran down the street")(comments ""))
        (syn-struc
                ((subject((root($var1))(cat(np))))
                (root($var0))(cat(v))))
        (sem-struc
                (run
                        (agent(value(^$var1)))))
)
```

How to select the right *bar*?

```
(bar-n1
   (cat(n))
   (anno(def "a place where alcoholic
 beverages are sold")(comments "")(ex
 ""))
   (syn-struc((root($var0))(cat(n))))
   (sem-struc(barroom))
 )
 (bar-n2
    (cat(n))
    (anno(def "lawyers'
 association")(comments "")(ex ""))
    (syn-struc((root($var0))(cat(n))))
    (sem-struc(organization(has-
 member(default(attorney)))))
 )
```

```
(bar-n3
   (cat(n))
   (synonyms "")
   (anno(def "")(comments "")(ex ""))
   (syn-struc((root($var0))(cat(n))))
   (sem-struc(pillar))
)
(bar-n4
   (cat(n))
   (synonyms "institution")
   (anno(def "")(comments "")(ex ""))
   (syn-struc((root($var0))(cat(n))))
   (sem-struc(bar))
```

Text Meaning Representation

- ✓ A man runs into a bar
  - Run
    (agent(man))
    (location(barroom))
  - Collide
    (agent(man))
    (theme(pillar))
- ✓ A man runs into a woman
  - Meet-with
    - (agent(man))
    - (beneficiary(woman))
    - (intentionality(value(<0.3))(relaxable-to(<0.5))))

HUMOR ANALYZER (COMPUTATIONAL)

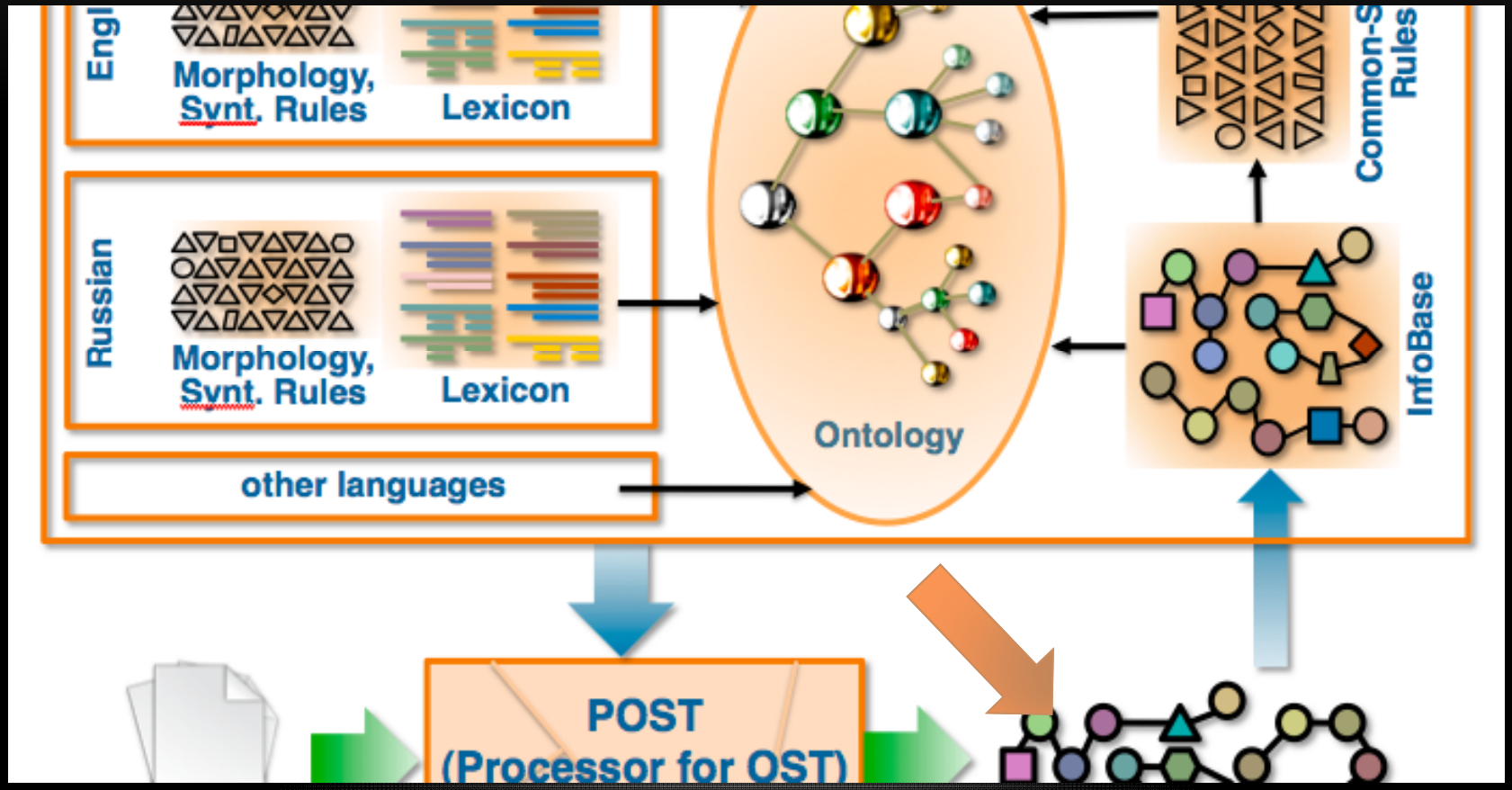
- A text can be characterized as a single-joke-carrying text if:
  - The text is compatible with 2 different scripts
  - The 2 scripts are opposite

- Expand to:
  - Purpose, result, along the path to purpose, goal, result…

Text Meaning Representation

- ✓ A man runs into a bar
  - Run
    (agent(man))
    (location(barroom))
  - Collide
    (agent(man))
    (theme(pillar))
  - When is it a joke?
    - What interpretation should come first?

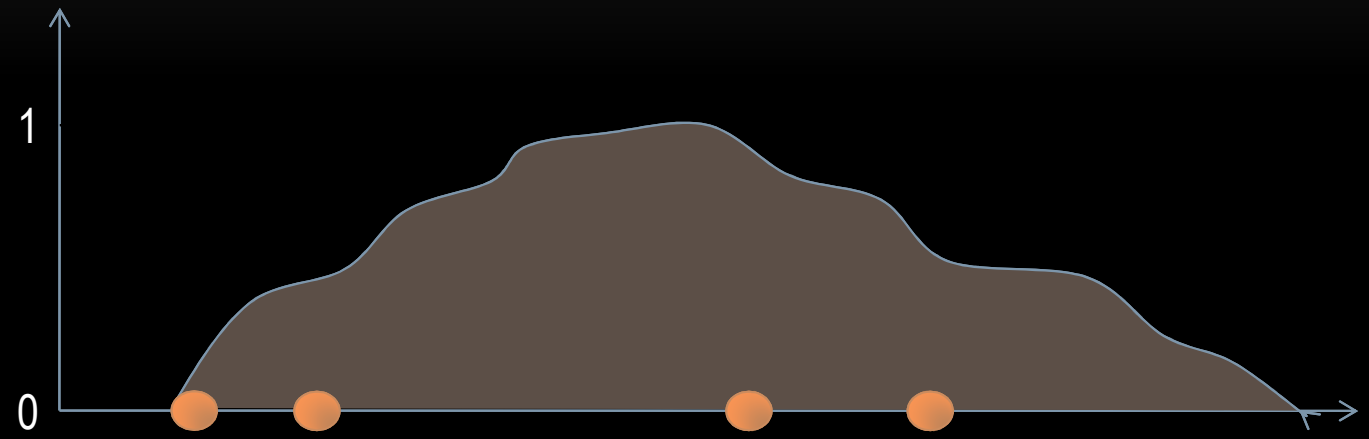
Post-Basic OST:
What happens when a word is unknown?



- "Beware the Jabberwock, my son! The jaws that bite, the claws that catch! Beware the Jubjub bird, and shun The frumious Bandersnatch!"
- He took his vorpal sword in hand: Long time the manxome foe he sought -- So rested he by the Tumtum tree, And stood awhile in thought.
- And, as in uffish thought he stood, The Jabberwock, with eyes of flame, Came whiffling through the tulgey wood, And burbled as it came!
- One, two! One, two! And through and through The vorpal blade went snicker-snack! He left it dead, and with its head He went galumphing back.
- "And, has thou slain the Jabberwock? Come to my arms, my beamish boy! O frabjous day! Callooh! Callay!' He chortled in his joy.

- Lewis Carrol, *Through the Looking-Glass and What Alice Found There*, 1872
- http://www.jabberwocky.com/carroll/jabber/jabberwocky.html

HOW CAN IT WORK?



$$\mu_{\text{SYNTAX}}(\text{sent}) = \min_{phr \in sent} \max_{x,y \in phr} [\mu_{\text{phr}}(x,y)]$$

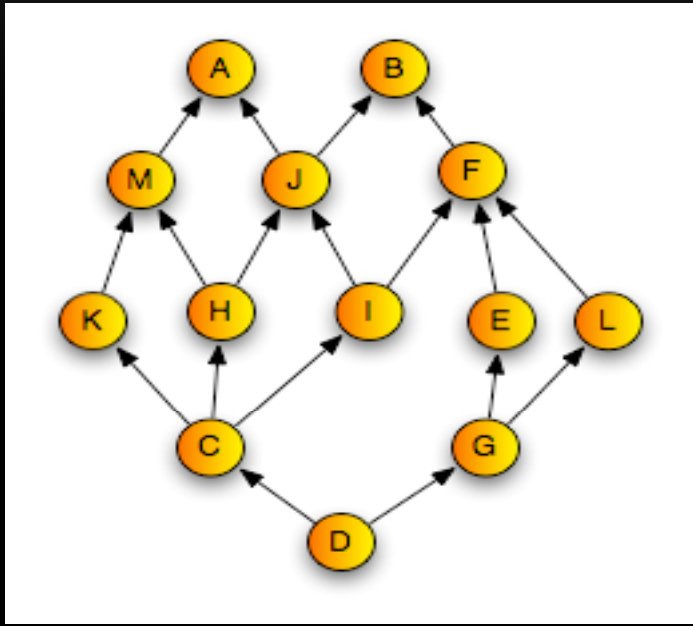
$$\mu_{\text{SEMANTICS}}(\text{sent}) = \min_{R \in sent} \max_{x,y \in R} [\mu_{\text{R}}(x,y)]$$

$$\mu_{\text{ACCEPTABILITY}}(\text{sentence}) = \min[\mu_{\text{SYNTAX}}, \mu_{\text{SEMANTICS}}]$$

- Taylor, JM & Raskin, V. (2011). Understanding the unknown: Unattested input processing in natural language. *Proceedings of Fuzz-IEEE, 2011.*

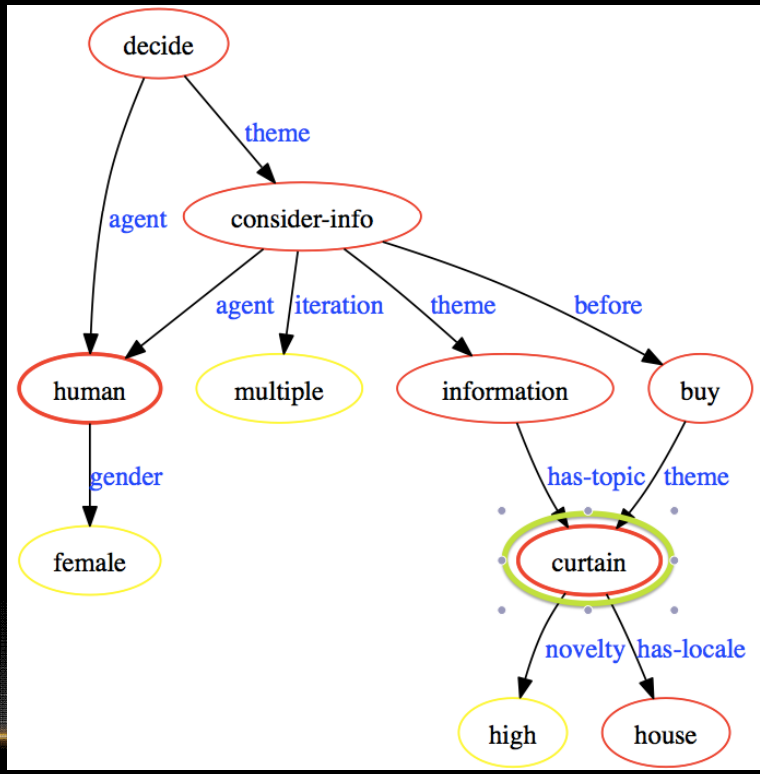
GUESSING THE UNKNOWN

- A man opened the door to his house with xyz
  - A man opened the door to his house with his girlfriend in his arms
  - A man opened the door to his house with the pretty view (not his other house that doesn't have it)
  - A man opened the door to his house with a new keyless remote combination



UNATTESTED INPUT TESTING

- Randomly selected from 4469 transitive verbs, until 100 was reached
  - 189 senses (59 with no examples, 30 unacceptable interpretation)
- Replaced direct objects in examples with *zzz*
  - *She decided she would rethink the new curtains before buying them for the whole house →She decided she would rethink zzz before buying them for the whole house.*
- zzz could take place of any object or events in the ontology, but not a property
  - 34.4% unacceptable
  - 13% no worse that what a human would do



- Taylor, JM, Raskin, V, & Hempelmann, CF. (2011). Towards computational guessing of unknown word meanings: The Ontological Semantics Approach. *Proceedings of Cognitive Science Conference, 2011.*

DEFAULTS: HOW USEFUL ARE THEY FOR ONTOLOGY?

- Sam opened the door to his house with xyz
  - ?Sam opened the door to his house with a key
  - Sam opened the door to his house with a broken key
  - Sam opened the door to his house and …

- Image: http://www.nimh.nih.gov/health/educational-resources/brain-basics/brain-basics.shtml

INTERESTINGLY…

- μ=1 doesn't work for unknown words:
  - A man unlocked the door with his key
  - A man unlocked the door
  - A man unlocked the door with a key in his mouth

$$\mu_{\text{SYNTAX}}(\text{sent}) = \min_{phr \in sent} \max_{x,y \in phr} [\mu_{\text{phr}}(x,y)]$$

$$\mu_{\text{SEMANTICS}}(\text{sent}) = \min_{R \in sent} \max_{x,y \in R} [\mu_{\text{R}}(x,y)]$$

$$\mu_{\text{ACCEPTABILITY}}(\text{sentence}) = \min[\mu_{\text{SYNTAX}}, \mu_{\text{SEMANTICS}}]$$

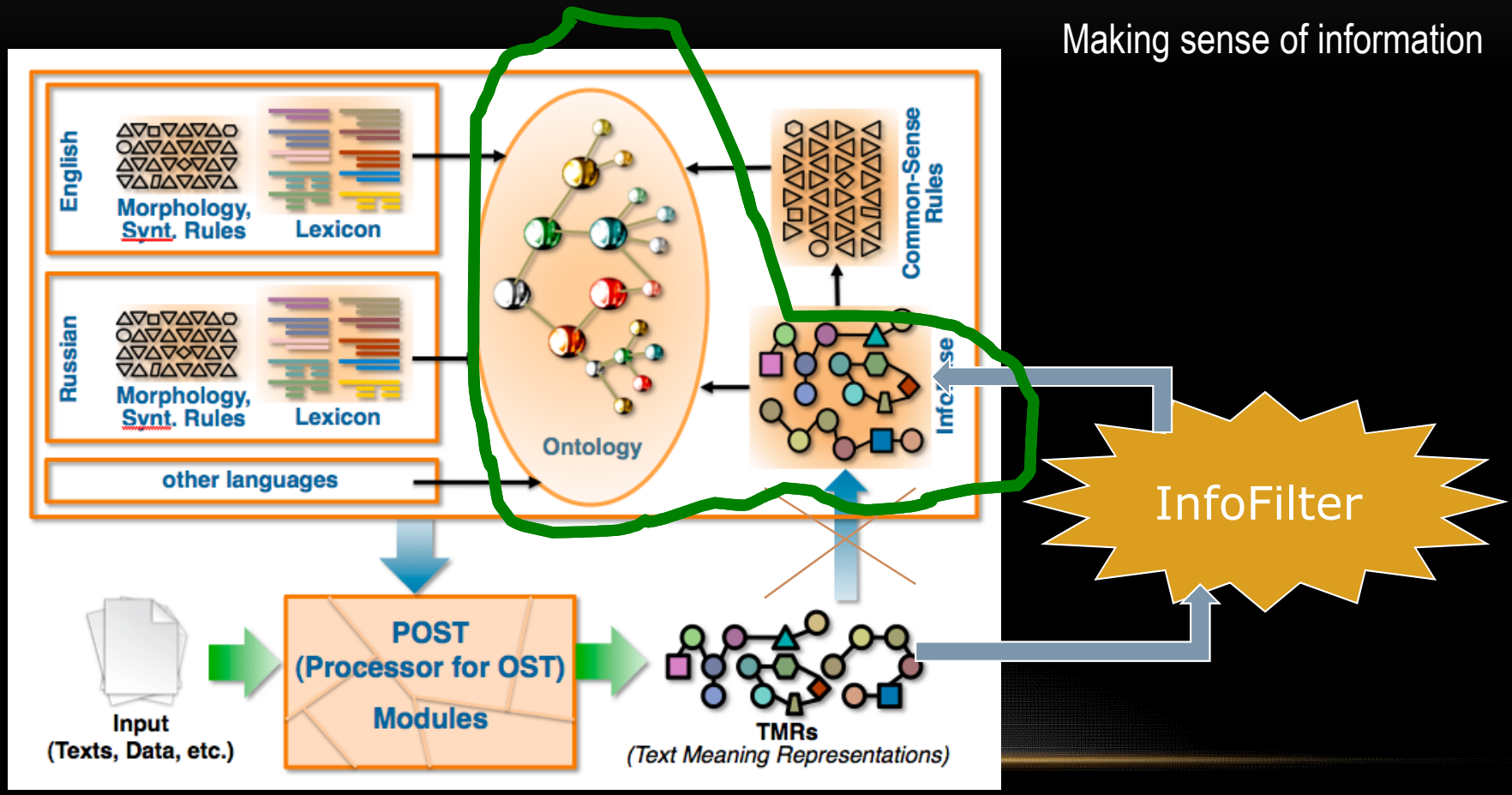
WD-INFERENCE

- Facebook update:
  - A white dude was hitting on me all night

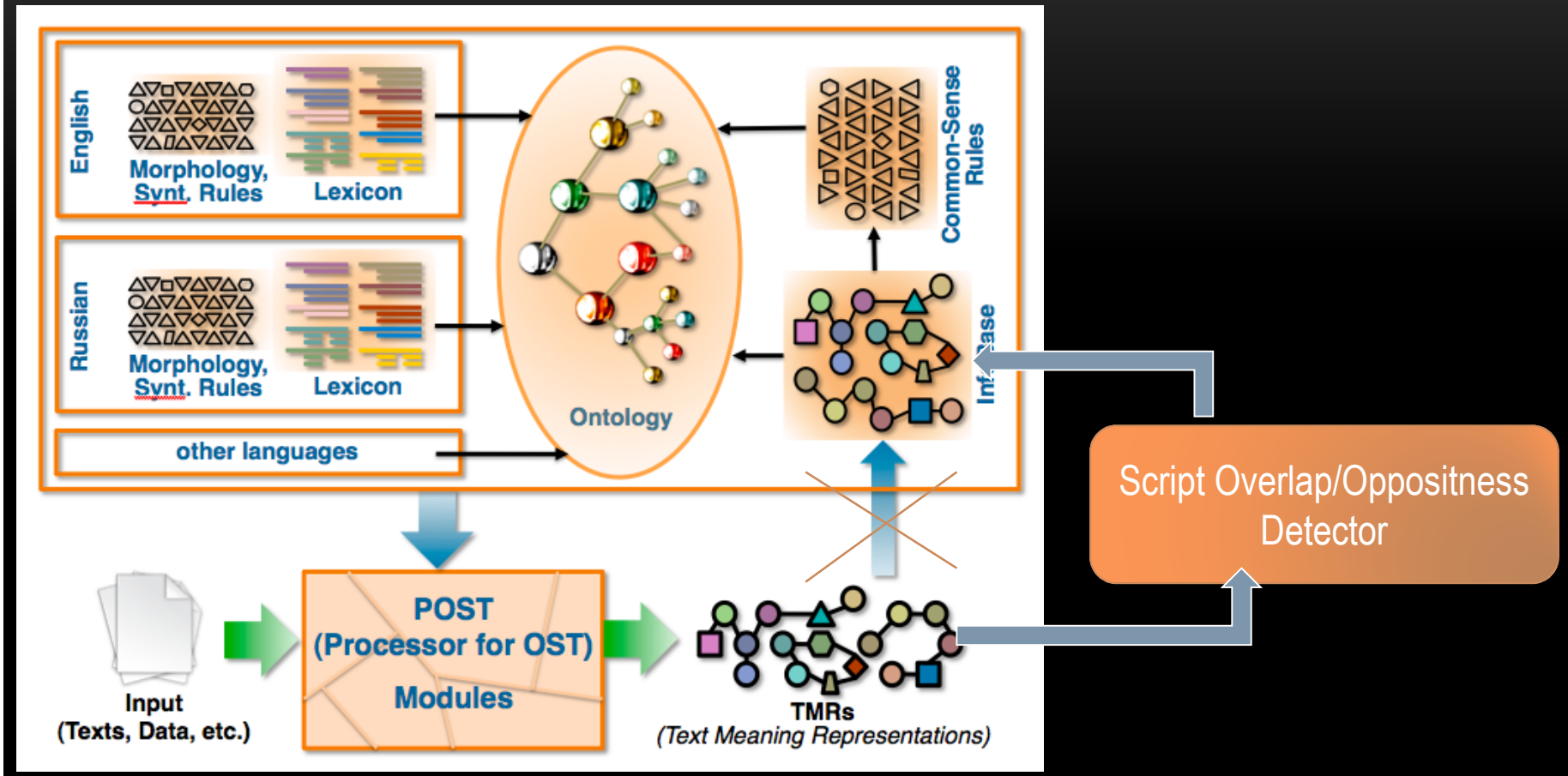
- **Taylor, JM, Raskin, V., Hempelmann, CF & Attardo, S (2010) An unintended inference and ontological property defaults. *Proceedings of IEEE SMC 2010*.**

INTERMEDIATE OST

Making sense of information



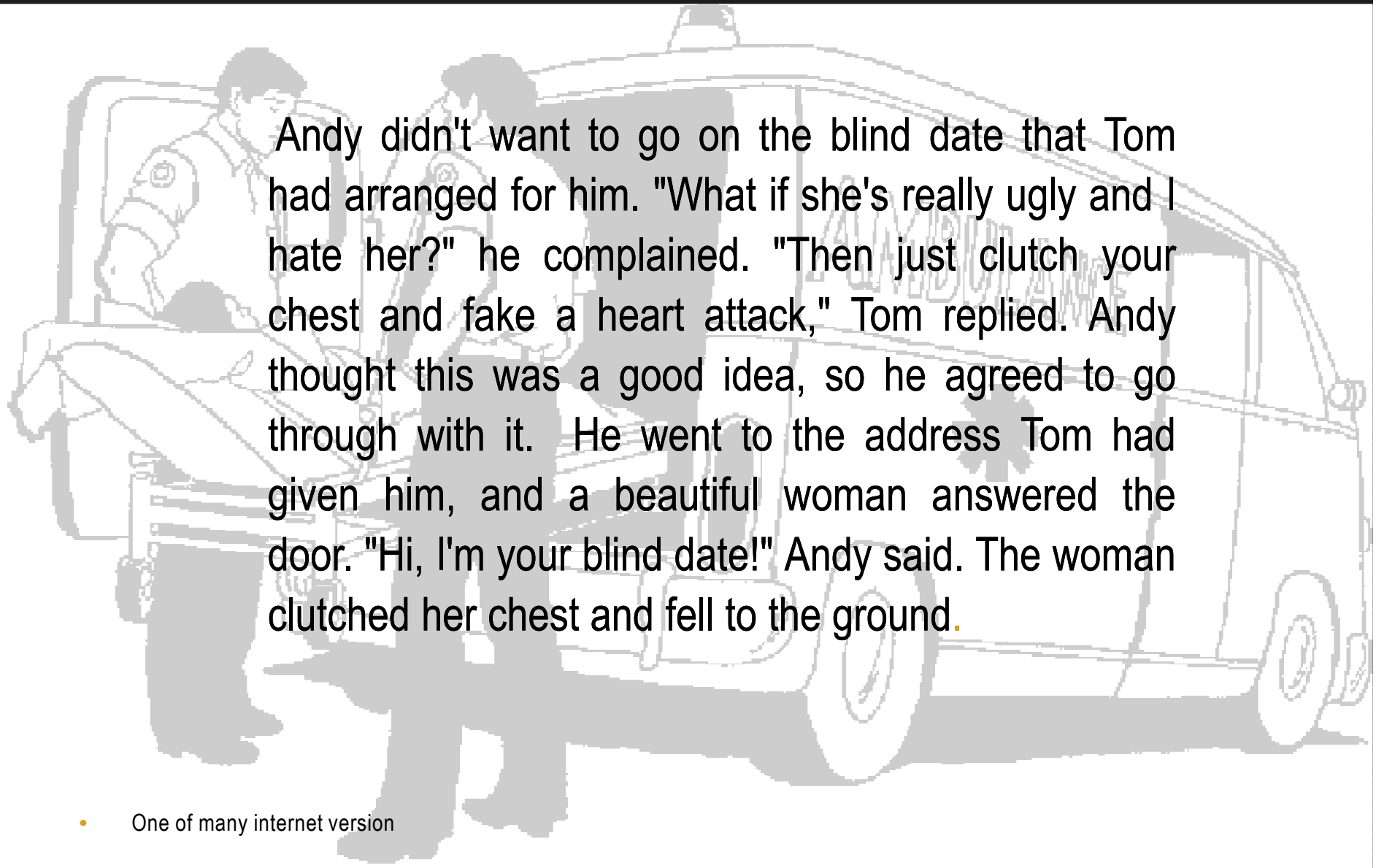
ONTOLOGICAL SEMANTIC THEORY OF HUMOR



SSTH (1985):
Text is humorous iff it is compatible fully or in part with two scripts that overlap and oppose

GTVH (1991):
Adds 5 knowledge resources to SSTH, making it possible to compare jokes

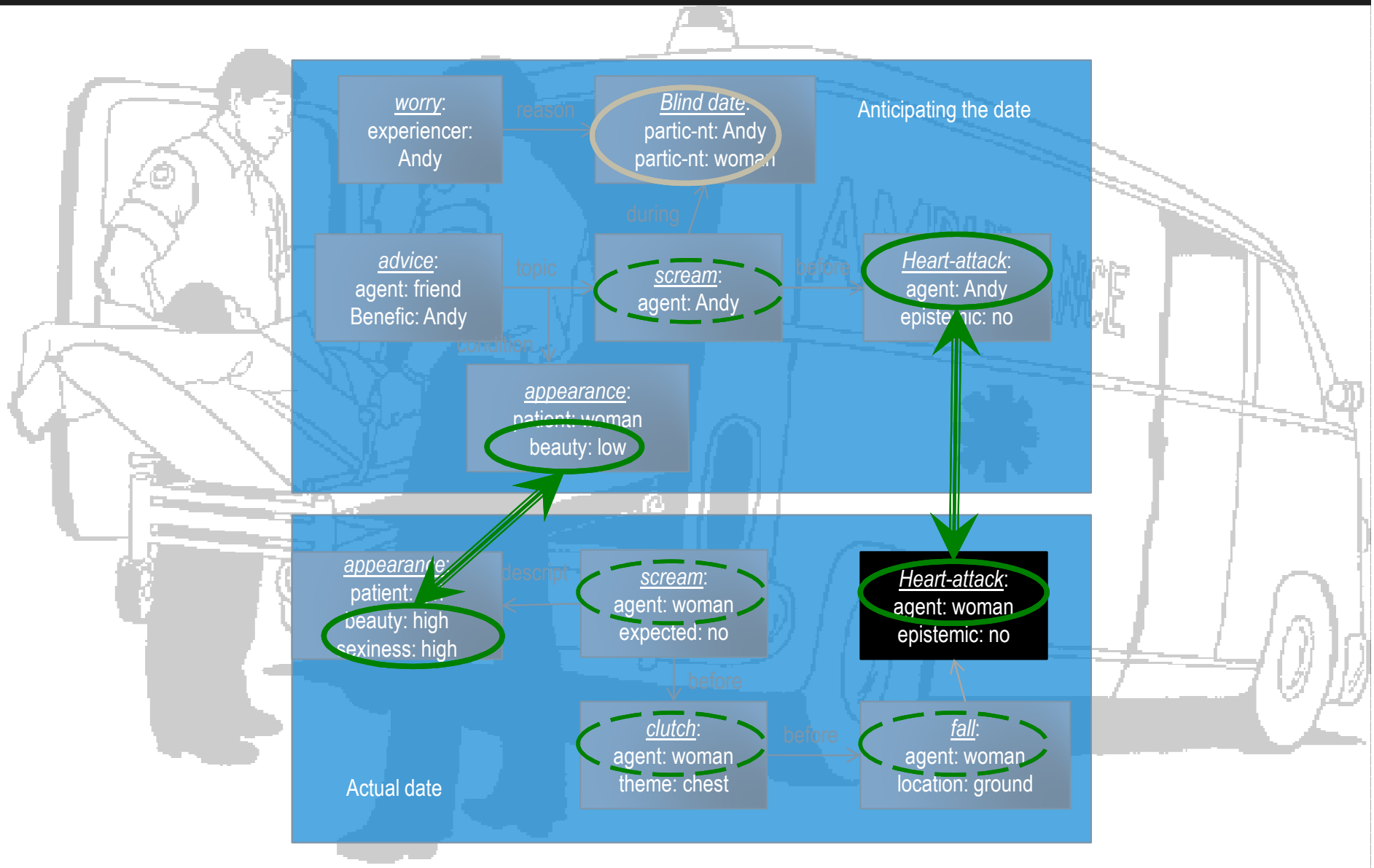
THE SERIOUS BUSINESS OF HUMOR



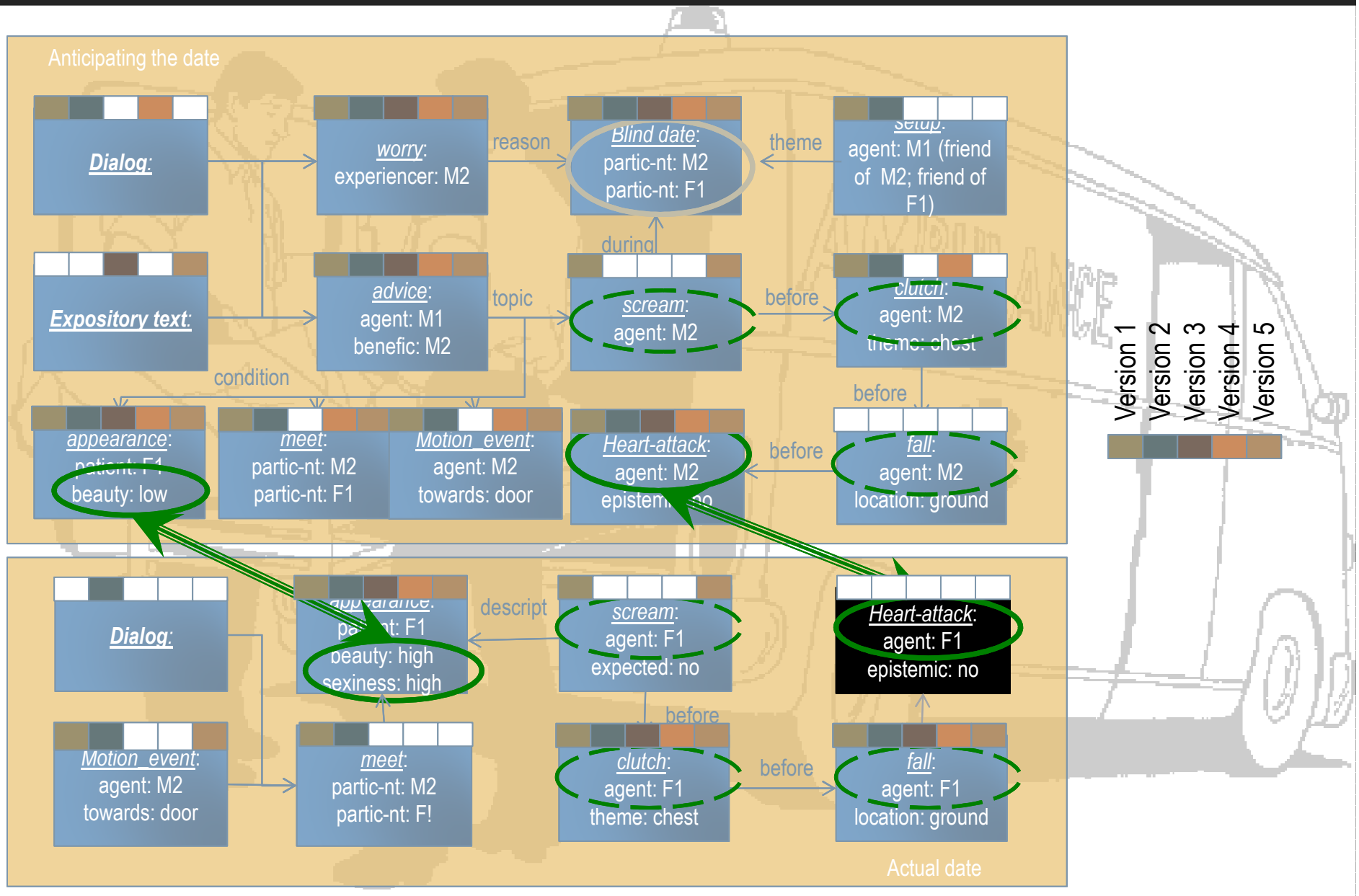
Andy didn't want to go on the blind date that Tom had arranged for him. "What if she's really ugly and I hate her?" he complained. "Then just clutch your chest and fake a heart attack," Tom replied. Andy thought this was a good idea, so he agreed to go through with it. He went to the address Tom had given him, and a beautiful woman answered the door. "Hi, I'm your blind date!" Andy said. The woman clutched her chest and fell to the ground.

- One of many internet version

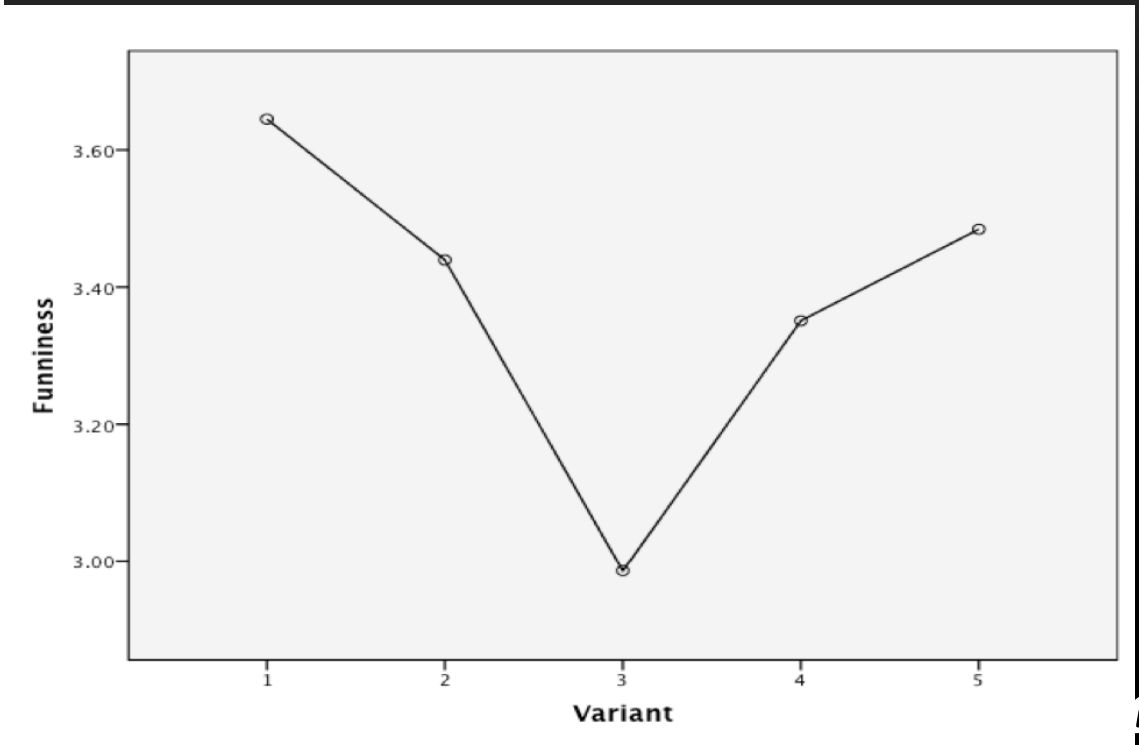
BLIND DATE JOKE: SIMPLIFIED STRUCTURE



5 versions, summarized?



Serious business of humor



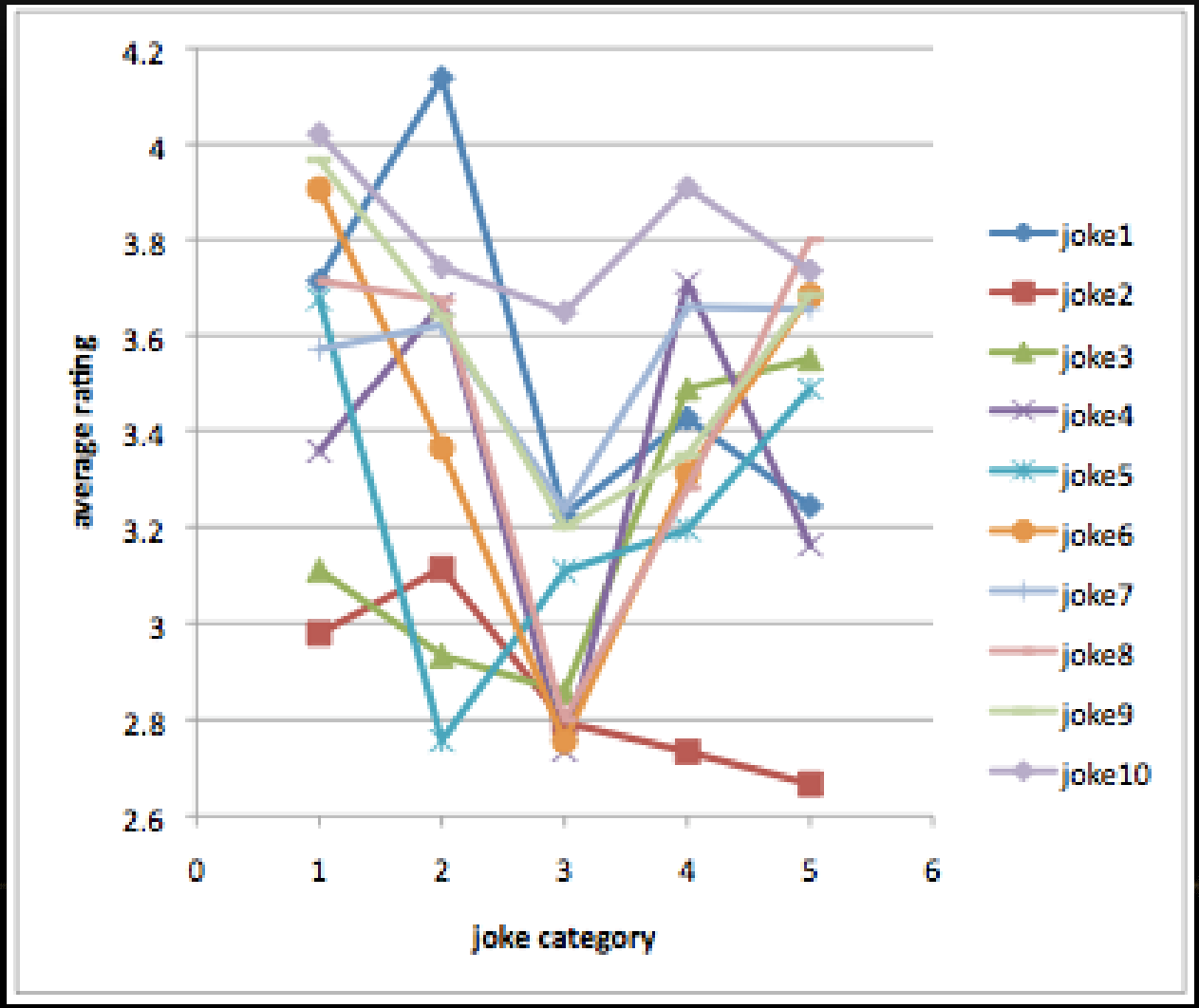
176 subjects

thin-subjects contrasts
for the pairs of joke variant (v) types:

	v 2	v 3	v 4	v 5
v 1	2.71	25.91***	4.18*	1.69
v 2		12.13**	0.41	0.20
v 3			7.30**	19.68***
v 4				1.06

Cells contain *F*-statistics for the contrasts, *F* (1, 64).
*$p < .05$, **$p < .01$, ***$p < .001$.

JOKES AND THEIR VERSIONS



DO THEY VARY?

	Punchline		Overall joke	
	min	max	min	max
Joke1	7	27	10	73
Joke2	3	36	10	113
Joke3	3	22	11	69
Joke4	3	7	3	53
Joke5	2	25	6	55

Table 1: Min and overall punchline and joke footprint

CAN WE FIND SIMILAR JOKES AUTOMATICALLY?

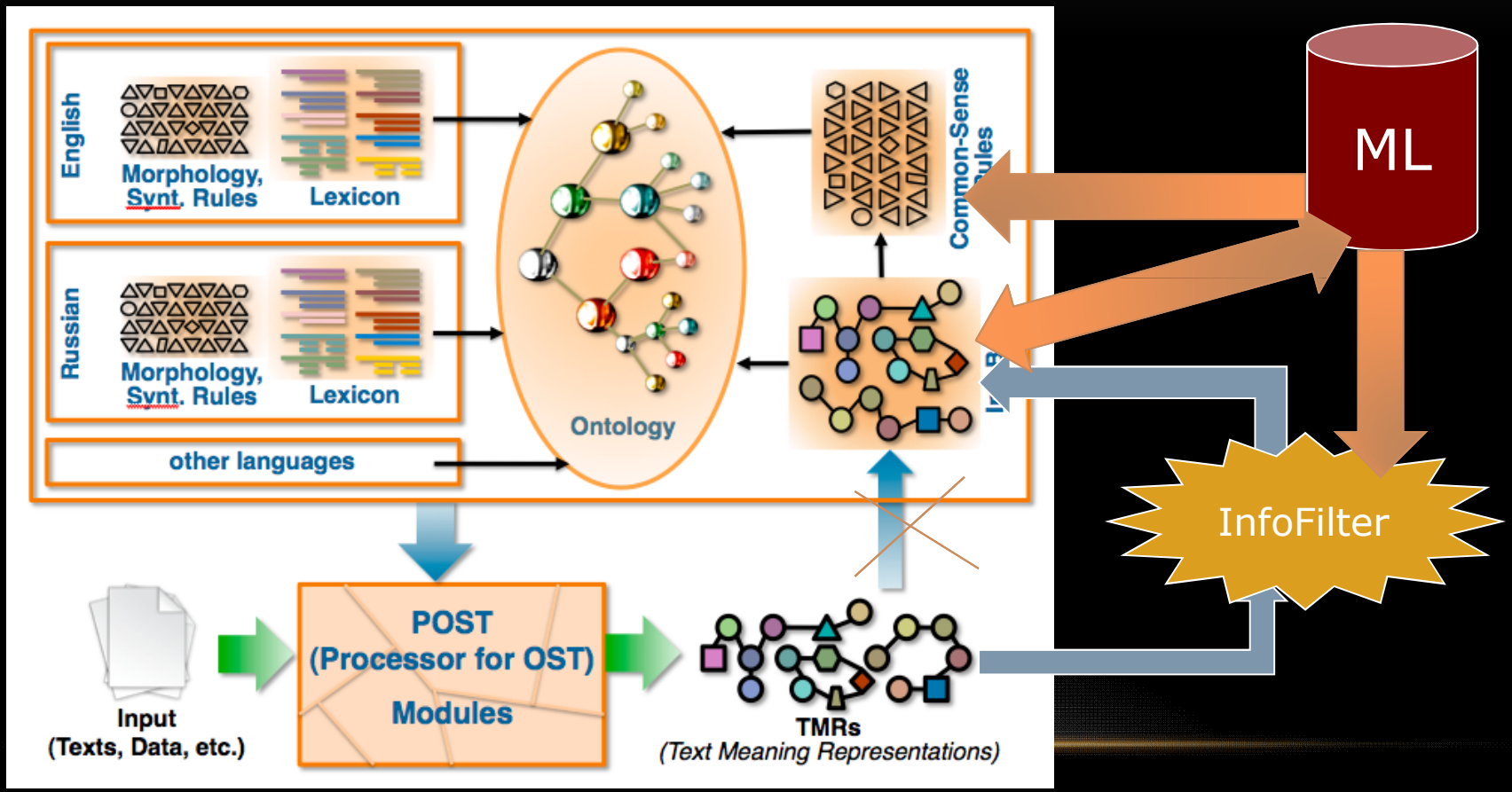
	Min	Max
Minimalist punchline	0	0
Min punchline plus max-weighted concepts	1	7
Min-punchline plus max weighted concepts and lower weighted concepts	0	2

WHAT ARE THESE JOKES ABOUT?

- Human perception
  - Please provide keywords (as many as you wish) that you would use to find a similar joke using a search engine of your choice

Advanced OST

- Is there anything else?



MORE INTERESTING TOPIC: POLITICS

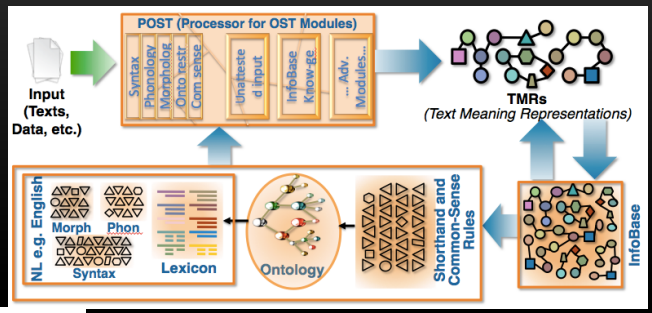
- Posting on a public group forum: "Somebody threw a book at President Obama. If you're trying to scare a president by throwing a book at him, you're one president too late." —David Letterman
- The 29 comments that followed the posting displayed the usual full range of Bush haters, Bush defenders, Obama haters and defenders, and comments on the joke itself as well as on the inappropriateness of the action.
  - Target
  - Situation
  - Language
  - Perception of severity of action

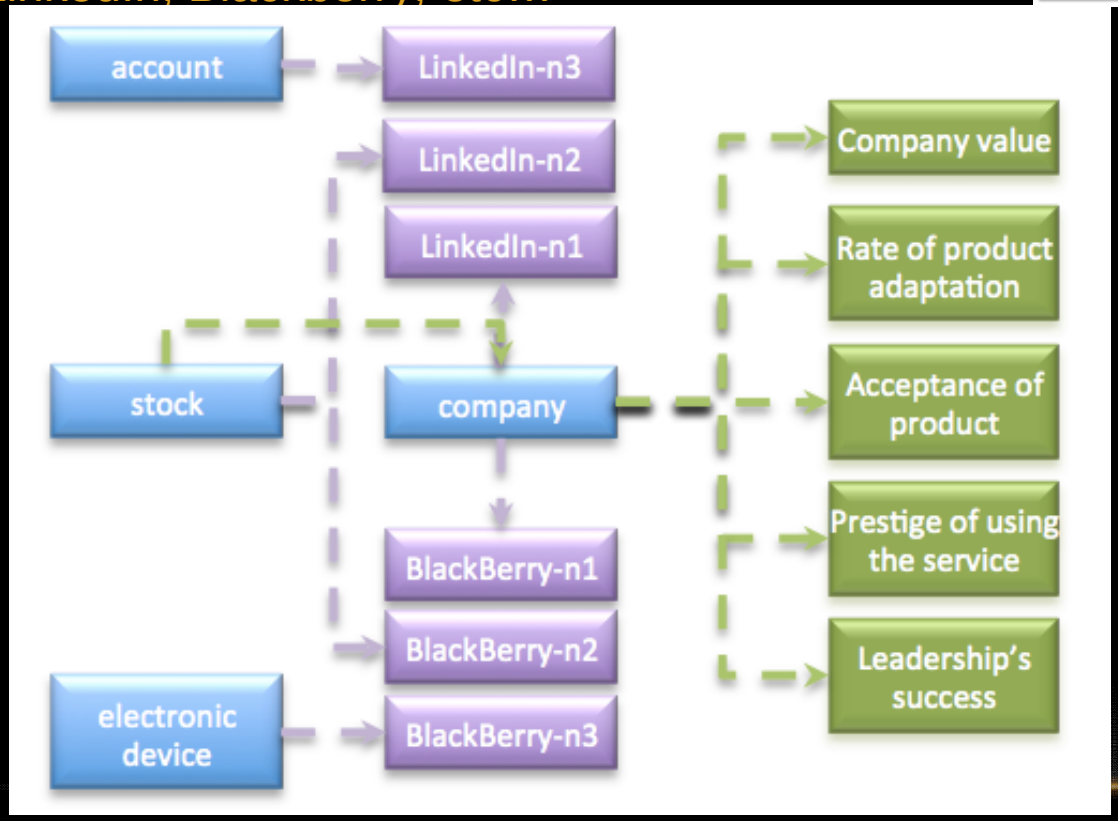
AN INTERESTING HUMOR TWIST

- Any text may have more than 2 opposing scripts
  - Thus, a joke can be a joke on several different levels
- Combination of posting and comments may create a new joke that must be recognized as well if we are to judge seriousness of the intent in comments/emotions involved
  - So, scripts oppositeness detection has to be dynamic

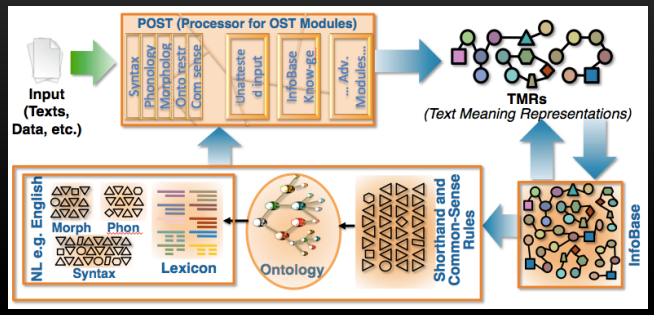
- [Friend 1:]So, I'm one of the last dinosaurs who just opened the LinkedIn profile. Not sure if I knew what I was doing but I think it's up and running. I am pretty sure I selected a terrific profile picture and connected with strangers that apparently were in my Gmail account It's great to be connected :))) […]
- […]
- [Friend 2:] just call yourself a CEO of power solutions junk on LinkedIn […] but.. u are kind of late in the game. Wanna buy a blackberry?
- […]
- [Friend 1:] I dumped all my cash for Apple, I may spare some change for BB, a few cents now should be enough:)

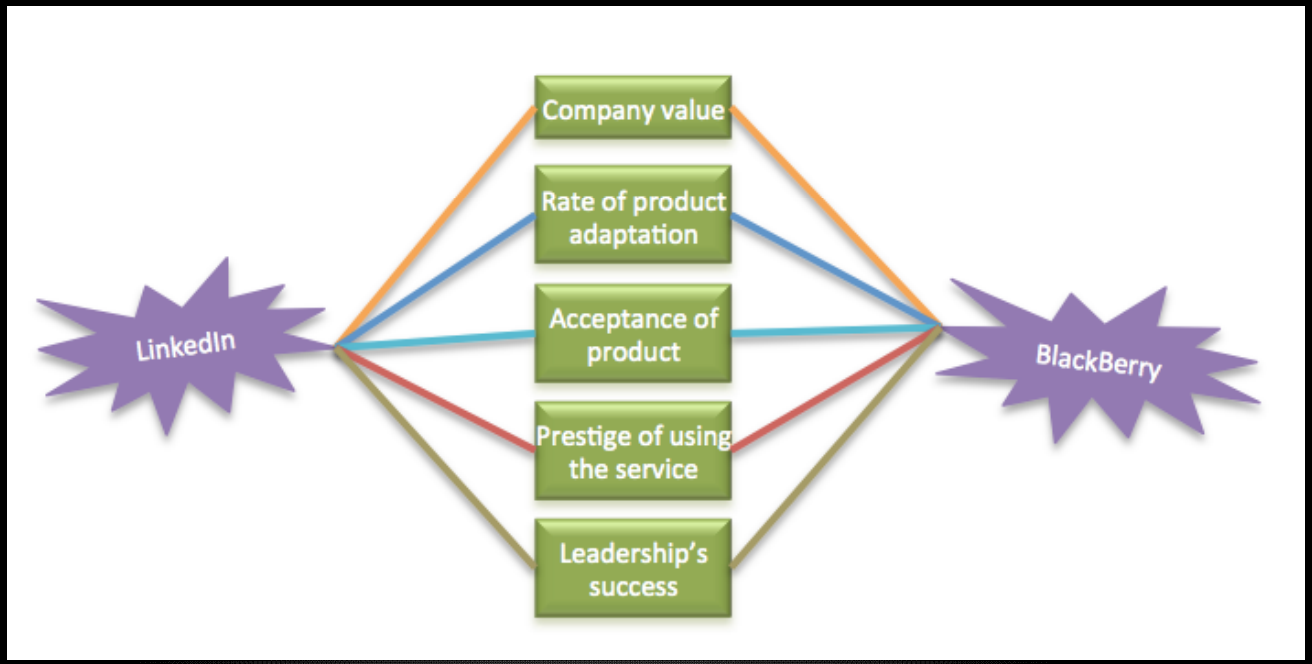
LinkedIn, Blackberry, etc…

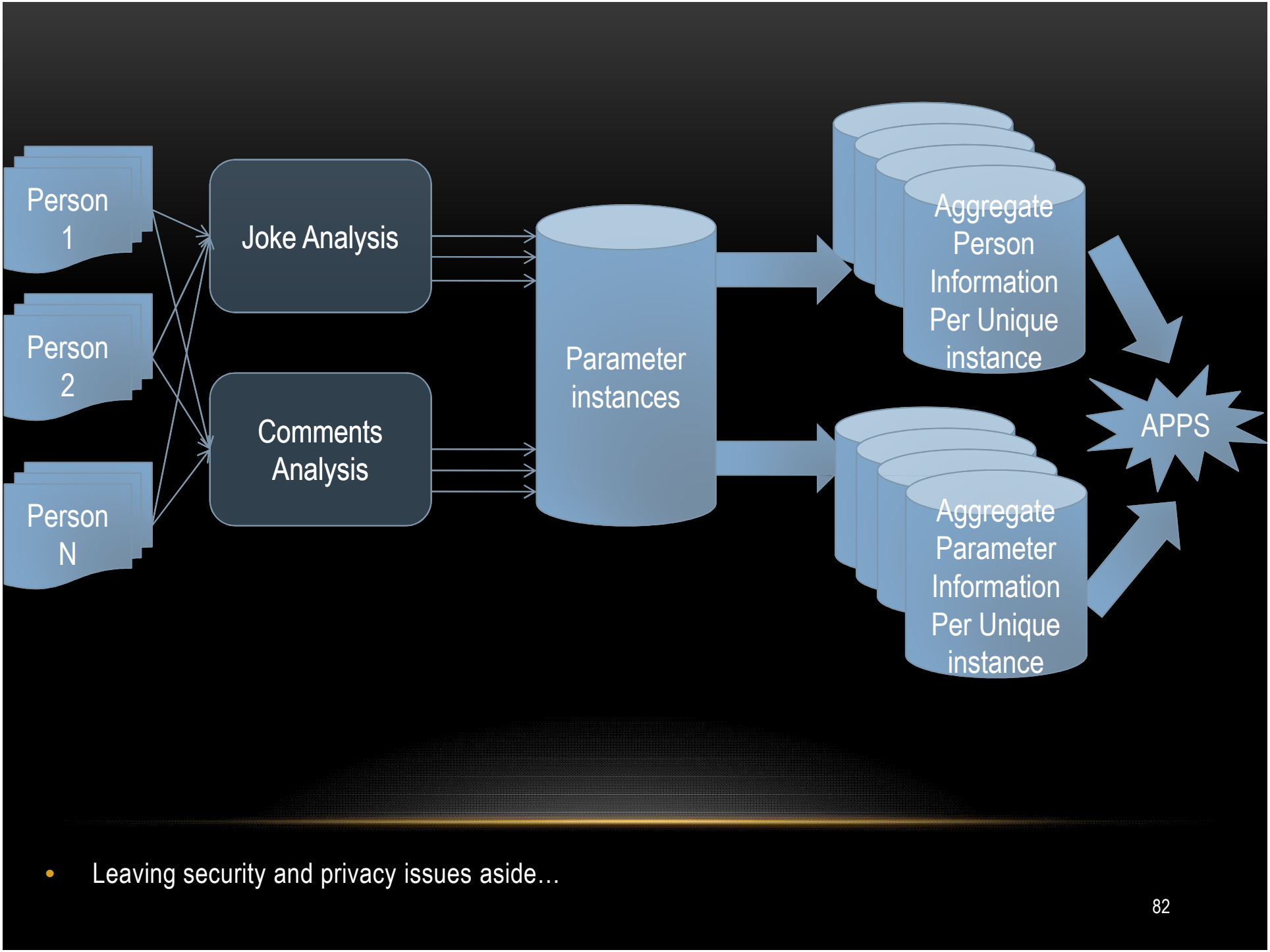




LinkedIn, Blackberry, etc…







- Leaving security and privacy issues aside…

- **SO, now what?**
  - Computational humor *could* do theory verification, but before we get there, computers must be on the same page with people
  - Computational humor could have applications, but then, again, how synchronized is computer “perception” with human?
  - And, as often, a lot more to be done…

THANK YOU!

- Questions?