Introduction to Natural Language Processing
Computational Advertising: popped up this morning
Midterm: Overall very good.

Score Distribution Histogram Report On QUIZ1

Course #: 050214cmps143
Course Title: 050214cmps143
Day/Time: 0502

Instructor: Marilyn Walker
Description: Computer Science 143
Term/Year: s14

No. of students in this group: 11
Student group from: All Students
Total Possible Points: 100.00
Highest Score: 87.00
Mean Score: 78.91
Lowest Score: 71.00
Median Score: 78.00

No. of Students

Percent

0 10 20 30 40 50 60 70 80 90 100
Why Narrative?

Narrative constructs are important elements in human understanding and perception of the world.

Humans seem to be wired to orient to and understand the world in terms of narrative structure.

Who did what to whom? Why did they do it? What will they do next?

Newspapers, stories, conversations full of narrative structure.

Analysis and generation of narrative crucial functionality for natural language processing.
Imagine we want to be able to answer questions from personal narratives or classic stories.
Today was a very eventful work day. Today was the start of the G20 summit. It happens every year and it is where 20 of the leaders of the world come together to talk about how to run their governments effectively and what not. Since there are so many leaders coming together their are going to be a lot of people who have different views on how to run the government they follow so they protest. There was a protest that happened along the street where I work and at first it looked peaceful until a bunch of people started rebelling and creating a riot. Police cars were burned and things were thrown at cops. Police were in full riot gear to alleviate the violence. As things got worse tear gas and bean bag bullets were fired at the rioters while they smash windows of stores. And this all happened right in front of my store which was kind of scary but it was kind of interesting since I've never seen a riot before.
Questions and Answers

- What is the story about?
- What is the G20 summit?
- Where did the protest happen?
- What did the protestors do?
- What happened to the police cars?
- What did the police do?
- What were the police wearing?
- What did the protestors do?
- What was the narrator doing?
- Why did the protestors protest?
- What did the narrator feel about the protest?
- What do you need to do?
- Would classification of utterances help?
- How about POS tagging?
- Are some questions easier than others?
- Is the answer actually there in the raw text?
- Do you need to be able to understand anaphora?
- What about the causes and effects of actions?
Today was a very eventful work day. Today was the start of the G20 summit. It happens every year and it is where 20 of the leaders of the world come together to talk about how to run their governments effectively and what not. Since there are so many leaders coming together their are going to be a lot of people who have different views on how to run the government they follow so they protest. There was a protest that happened along the street where I work and at first it looked peaceful until a bunch of people started rebelling and creating a riot. Police cars were burned and things were thrown at cops. Police were in full riot gear to alleviate the violence. As things got worse tear gas and bean bag bullets were fired at the rioters while they smash windows of stores. And this all happened right in front of my store which was kind of scary but it was kind of interesting since I've never seen a riot before.

- Where did the protest happen? G20 summit location, along a street where I work, right in front of my store.
- What did the protestors do? What did the people do?
- What did the narrator feel about the protest?
A Crow was sitting on a branch of a tree with a piece of cheese in her beak when a Fox observed her and set his wits to work to discover some way of getting the cheese. Coming and standing under the tree he looked up and said, “What a noble bird I see above me! Her beauty is without equal, the hue of her plumage exquisite. If only her voice is as sweet as her looks are fair, she ought without doubt to be Queen of the Birds.”

The Crow was hugely flattered by this, and just to show the Fox that she could sing she gave a loud caw. Down came the cheese, of course, and the Fox, snatching it up, said, “You have a voice, madam, I see: what you want is wits.”

- Where was the fox?
- Where was the crow?
- What did the fox do?
- What did the crow do?
- What did the crow have in her beak?
- Why did the fox flatter the crow?
Questions and Answers

- What is the story about?
- Where was the fox?
- Where was the crow?
- What did the fox do?
- What did the crow do?
- What did the crow have in her beak?
- Why did the fox flatter the crow?
- What do you need to do?
- Would classification of utterances help?
- How about POS tagging?
- Are some questions easier than others?
- Is the answer actually there in the raw text?
- Do you need to be able to understand anaphora?
- What about the causes and effects of actions?
Mob violence March 22 sparked by the death of a 14-year-old stabbed on a TARC bus earlier this month prompted a spate of meetings with city officials and community leaders this week.

Just after 7 p.m. on March 22 a band of teenagers who had been at the waterfront attacked a 13-year-old girl because they wanted her sneakers, police said. A 40-year-old man came to her defense and was pummeled by the mob.

Within two hours, 31 people called to report trouble, Chief Steve Conrad said. Groups of teenagers roved the area, looting a store, vandalizing cars and assaulting passers-by. The police department counted 20 criminal incidents within hours downtown.

- Why did the mob attack the girl?
- What did the 40 year old man do?
- What happened to the man?
What if we had a Story Intention Graph (SIG) for these stories?
SIG for Fox and Crow

**DISCOURSE**

- TE: A Fox observed her (the Crow)
- TE: and set his wits to discover some way of getting the cheese
- TE: she (the Crow) gave a loud caw
- TE: (the Fox says) "...what you want is wits"

**FABULA TIMELINE**

- P: see(fox, crow)
- P: try(fox, discover(fox, cheese))
- P: caw(crow)
- P: says(fox, need(crow, wits))

**INTERPRETATIVE**

- GoAL: FOX
  - I: obtain(fox, cheese)
- BELIEF: FOX
  - I: able(sing(crow))
  - I: insult(fox, crow)

**AFFECTUAL**

- A: FOX
- A: CROW

---

Natural Language and Dialogue Systems

http://nlds.soe.ucsc.edu
We build it up LAYER by LAYER

**DISCOURSE**

TE: A Fox observed her (the Crow)

TE: and set his wits to discover some way of getting the cheese

TE: she (the Crow) gave a loud caw

TE: (the Fox says) “..what you want is wits”

**FABULA TIMELINE**

P: see(fox, crow)

P: try(fox, discover(fox, cheese))

P: caw(crow)

P: says(fox, need(crow, wits))

**INTERPRETATIVE**

**GOAL: FOX**

I: obtain(fox, cheese)

**BELIEF: FOX**

I: able(sing(crow))

I: insult(fox, crow)

**AFFECTUAL**

A: FOX

A: CROW

http://nlds.soe.ucsc.edu
A Crow was sitting on a branch of a tree with a piece of cheese in her beak when a Fox observed her and set his wits to work to discover some way of getting the cheese. Coming and standing under the tree he looked up and said, “What a noble bird I see above me! Her beauty is without equal, the hue of her plumage exquisite. If only her voice is as sweet as her looks are fair, she ought without doubt to be Queen of the Birds.”

The Crow was hugely flattered by this, and just to show the Fox that she could sing she gave a loud caw. Down came the cheese, of course, and the Fox, snatching it up, said, “You have a voice, madam, I see: what you want is wits.”
FABULA (PROPOSITIONAL LAYER)

- IA = Interpreted AS
- Semantic Interpretation
- How do we do it?
- We decide on an interpretation (as a speaker of the language)
- We select the VERB category from VERBNET
- Sch uses the VERB to create a propositional skeleton
- We select the types of the arguments from WORDNET
Interpretive and Affectual Layers

- Discourse Relations: followed by (temporal order), precondition, would cause
- Affect: provides for, damages
- Active research: propositional layer (pretty good already), discourse relations, intention recognition, causal inference, sentiment analysis
## Affect Types (Elson, 2012)

<table>
<thead>
<tr>
<th>#</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Life</td>
<td>Continuation of basic life functions; existence vs. non-existence</td>
</tr>
<tr>
<td>2</td>
<td>Health</td>
<td>Freedom from pain, disease, malnutrition or physical/mental ailments. (If a loss permits one to avoid suffering in greater pain, it is a Health matter; however, if it is immediately at stake, it is a Life matter.)</td>
</tr>
<tr>
<td>3</td>
<td>Ego</td>
<td>A positive perception of one’s qualities by oneself and by others.</td>
</tr>
<tr>
<td>4</td>
<td>Wealth</td>
<td>Material possessions or currency, above that necessary for sustenance (those for Health).</td>
</tr>
<tr>
<td>5</td>
<td>Love</td>
<td>Feelings of fondness, warmth, and romance for another person; familial companionship; compassion or a desire to heal the world.</td>
</tr>
<tr>
<td>6</td>
<td>Leisure</td>
<td>Entertainment and enjoyment, whether from peaceful solitude, active socializing, or another form of recreation.</td>
</tr>
<tr>
<td>7</td>
<td>Actualization</td>
<td>Fulfillment of one’s artistic, athletic, spiritual, professional, or other aspirational potential in an elective endeavor. Freedom</td>
</tr>
<tr>
<td>8</td>
<td>Freedom</td>
<td>The state of being unrestricted in movement, action and behavior, whether the restricting force is other characters, natural forces, or an internal struggle.</td>
</tr>
</tbody>
</table>

We've not been bitten by a coral snake.

I pick my audiences wisely.

God, we had fun.
## Relations between Events and Affects

<table>
<thead>
<tr>
<th>Would cause</th>
<th>Link between one I, G or B node and another that is sufficient for its actualization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Would prevent</td>
<td>Link between one I, G or B node and another that is sufficient for its prevention/cessation</td>
</tr>
<tr>
<td>Precondition for</td>
<td>Link between one I, G or B node and another that is necessary for its actualization</td>
</tr>
<tr>
<td>Precondition against</td>
<td>Link between one I, G or B node and another that is necessary for its prevention/cessation</td>
</tr>
<tr>
<td>Provides for</td>
<td>A positive affectual impact of an I, G or B node (traversing to A)</td>
</tr>
<tr>
<td>Damages</td>
<td>A negative affectual impact of an I, G or B node (traversing to A)</td>
</tr>
</tbody>
</table>
**DISCOURSE**

**TE:** Today was a very eventful day. Today was the start of G20 summit.

**TE:** ... a lot of people with different views ... so they protest

**TE:** ... a bunch of people started rebelling creating a riot

**FABULA TIMELINE**

**P:** start(G20 summit)

followed by

**P:** protest(people)

modifies (cause)

**P:** disagree (people, about (view))

**P:** rebel(people)

**INTERPRETATIVE**

**GOAL: GOVERNMENT**

**I:** succeed(G20 summit)

precondition for

**I:** rule(government, people)

**GOAL: PEOPLE**

**I:** not rule(government, people)

**AFFECTUAL**

**A:** GOVERNMENT

provides for

**A:** PEOPLE

provides for

**A:** GOVERNMENT
SIG for Fox and Grapes: have all fables

DISCOURSE

TE: A hungry fox saw some fine bunches of grapes

TE: and did his best to reach them

TE: But it was all in vain

TE: (the fox says) “...I see now that they are quite sour”

FABULA TIMELINE

P: see(fox, grapes)

followed by

P: jump(fox)

followed by

P: not obtain(fox, grapes)

followed by

P: says(fox, sour(grapes))

INTERPRETATIVE

GOAL: FOX

I: eat(fox, grapes)

precondition for

attempt to cause

ceases

BELIEF: FOX

I: unappetizing (grapes)

interpreted as

provides for

AFFECTUAL

A: FOX

A: FOX
Answering Questions:

Story Intention Graph: Can’t build it from scratch

Bottom up: Build up what we can

Going to see what we can do with both
NLP PIPELINE

WORDS (MORPHOLOGY)

PATTERNS OF WORDS (DISTRIBUTIONAL ANALYSIS, LEXICAL SEMANTICS)

PHRASES AND SENTENCES (SYNTAX)

CLASSIFYING TEXTS (SEMANTICS)

SENTENCE MEANING (SEMANTICS)

DISCOURSE MEANING NARRATIVE STRUCTURES (SEMANTICS, PRAGMATICS, DISCOURSE)
NLP Architecture

- WORDS
  - CORPUS READER
  - SENTENCE SPLITTER TOKENIZER
  - STEMMING

- PATTERNS OF WORDS
  - COLLOCATIONS
  - TAGGING WORD CATEGORIES: POS, LIWC
  - REGULAR EXPRESSIONS

- PHRASES AND SENTENCES
  - CHUNKING
  - PARSING
NLP Architecture

CLASSIFYING TEXTS

CATEGORIES OF CLAUSES OR SENTENCES

SENTIMENT ANALYSIS: THUMBS UP OR DOWN?

SENTENCE MEANING

LEXICAL MEANING WIKIFICATION

PARSE TO FIRST ORDER LOGIC

PARSING OR PATTERNS TO SQL

DISCOURSE MEANING NARRATIVE STRUCTURES

ANAPHORA AND COREFERENCE

DISCOURSE RELATIONS

INTENTION RECOGNITION
Stories Are Not Just About The Events That Occur

- Stories are generally situated within a particular **time** and **setting**
- Include **emotional reactions** to those events and their outcomes

**Events and actions** only constitute **about one third of** the clauses in personal narratives
Different Aspects of Narratives

- Settings and Participants
- Events
- Affects
Sociolinguistic theory of oral narrative: L & W

Functions of narrative elements
- story events merely convey the goals and desires of the story characters, as well as the affects, attitudes and themes that give the story its point

Simple narrative analysis scheme, derived from L & W's theory of oral narrative
- (1) clauses that indicate causal relationships: Action
- (2) clauses that provide traits or properties of the setting or characters: Orientation
- (3) clauses describing the story characters' emotional reactions to the events: Evaluation
The Fox and The Grapes

- **Orientation**
  A hungry Fox saw some fine bunches of Grapes hanging from a vine that was trained along a high trellis, and did his best to reach them by jumping as high as he could into the air. But it was all in vain, for they were just out of reach.

- **Action**

- **Evaluation**
Narrative Structure Analysis: Orientation, Action, and Evaluation

- Narrative clauses:
  1. temporal types of narrative clauses
  2. structural types of narrative clauses
  3. evaluation points in narratives

- Structural types:
  - ACTION: events
  - ORIENTATION: scene, setting, time, characters
  - ABSTRACT: summarizing the entire sequence of events
  - CODA: final clause, returns the narrative to the time of speaking
EVALUATION:

- Reason for telling the story (the point of the story)
- Opinion of the narrator and characters
- Information on the consequences of the events as they relate to the goals and desires of the participants
- Describe the events that did not occur, may have occurred, or could occur in the future in the story
Patterns emerging between different types of narrative clause

- An orientation motivating an action
- An evaluation motivating an action
- An action resulting in an evaluation
## Patterns Similar to SIG Units

<table>
<thead>
<tr>
<th>#</th>
<th>Bottom-up Unit</th>
<th>SIG-Relation</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Orientation $\rightarrow$ Action</td>
<td>Precondition</td>
<td>I was in the souvenir shop $\rightarrow$ I bought a shirt</td>
</tr>
<tr>
<td>2</td>
<td>Orientation $\rightarrow$ Action</td>
<td>Would cause</td>
<td>I was hungry $\rightarrow$ I raided the fridge</td>
</tr>
<tr>
<td>3</td>
<td>Evaluation $\rightarrow$ Action</td>
<td>Would cause</td>
<td>She paid me no attention $\rightarrow$ I went back to drinking</td>
</tr>
<tr>
<td>4</td>
<td>Action $\rightarrow$ Evaluation</td>
<td>Damages</td>
<td>A major noticed my visa was expired $\rightarrow$ Damn!</td>
</tr>
<tr>
<td>5</td>
<td>Action $\rightarrow$ Evaluation</td>
<td>Provides for</td>
<td>I also had time before the meeting to run up Inspiration Peak, $\rightarrow$ which is gorgeous this time of year.</td>
</tr>
<tr>
<td>6</td>
<td>Action $\rightarrow$ Evaluation</td>
<td>Would prevent</td>
<td>I was busy experimenting while Regena was collecting the famed smooth stones of Torbay Beach $\rightarrow$ (Laura– I did not monitor her rock acquisitions).</td>
</tr>
</tbody>
</table>
### Patterns Similar to SIG Units

<table>
<thead>
<tr>
<th>#</th>
<th>Bottom-up Unit</th>
<th>SIG-Relation</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Orientation → Action</td>
<td>Precondition for</td>
<td>I was in the souvenir shop → I bought a shirt</td>
</tr>
<tr>
<td>2</td>
<td>Orientation → Action</td>
<td>Would cause</td>
<td>I was hungry → I raided the fridge</td>
</tr>
<tr>
<td>3</td>
<td>Evaluation → Action</td>
<td>Would cause</td>
<td>She paid me no attention → I went back to drinking</td>
</tr>
<tr>
<td>4</td>
<td>Action → Evaluation</td>
<td>Damages</td>
<td>A major noticed my visa was expired → Damn!</td>
</tr>
<tr>
<td>5</td>
<td>Action → Evaluation</td>
<td>Provides for</td>
<td>I also had time before the meeting to run up Inspiration Peak, → which is gorgeous this time of year.</td>
</tr>
<tr>
<td>6</td>
<td>Action → Evaluation</td>
<td>Would prevent</td>
<td>I was busy experimenting while Regena was collecting the famed smooth stones of Torbay Beach → (Laura– I did not monitor her rock acquisitions).</td>
</tr>
</tbody>
</table>
## Patterns Similar to SIG Units

<table>
<thead>
<tr>
<th>#</th>
<th>Bottom-up Unit</th>
<th>SIG-Relation</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Orientation → Action</td>
<td>Precondition for</td>
<td>I was in the souvenir shop → I bought a shirt</td>
</tr>
<tr>
<td>2</td>
<td>Orientation → Action</td>
<td>Would cause</td>
<td>I was hungry → I raided the fridge</td>
</tr>
<tr>
<td>3</td>
<td>Evaluation → Action</td>
<td>Would cause</td>
<td>She paid me no attention → I went back to drinking</td>
</tr>
<tr>
<td>4</td>
<td>Action → Evaluation</td>
<td>Damages</td>
<td>A major noticed my visa was expired → Damn!</td>
</tr>
<tr>
<td>5</td>
<td>Action → Evaluation</td>
<td>Provides for</td>
<td>I also had time before the meeting to run up Inspiration Peak, → which is gorgeous this time of year.</td>
</tr>
<tr>
<td>6</td>
<td>Action → Evaluation</td>
<td>Would prevent</td>
<td>I was busy experimenting while Regena was collecting the famed smooth stones of Torbay Beach → (Laura– I did not monitor her rock acquisitions).</td>
</tr>
</tbody>
</table>
## Patterns Similar to SIG Units

<table>
<thead>
<tr>
<th>#</th>
<th>Bottom-up Unit</th>
<th>SIG-Relation</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Orientation → Action</td>
<td>Precondition</td>
<td>I was in the souvenir shop → I bought a shirt</td>
</tr>
<tr>
<td></td>
<td></td>
<td>for</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Orientation → Action</td>
<td>Would cause</td>
<td>I was hungry → I raided the fridge</td>
</tr>
<tr>
<td>3</td>
<td>Evaluation → Action</td>
<td>Would cause</td>
<td>She paid me no attention → I went back to drinking</td>
</tr>
<tr>
<td>4</td>
<td>Action → Evaluation</td>
<td>Damages</td>
<td>A major noticed my visa was expired → Damn!</td>
</tr>
<tr>
<td>5</td>
<td>Action → Evaluation</td>
<td>Provides for</td>
<td>I also had time before the meeting to run up Inspiration Peak, → which is gorgeous this time of year.</td>
</tr>
<tr>
<td>6</td>
<td>Action → Evaluation</td>
<td>Would prevent</td>
<td>I was busy experimenting while Regena was collecting the famed smooth stones of Torbay Beach → (Laura– I did not monitor her rock acquisitions).</td>
</tr>
</tbody>
</table>
Types of EVALUATIONs

- Categorizing EVALUATIONs:
  - Sentiment analysis
  - LIWC categories
  - Affect typing (Elson, 2012)
    - based on prior works on the psychology of human motivation
    - either motivate or result from actions or events
    - most human behavior across cultures can be explained by a small finite set of motivations
<table>
<thead>
<tr>
<th>#</th>
<th>Category</th>
<th>Story Clause</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Abstract</td>
<td>Today was a very eventful work day.</td>
</tr>
<tr>
<td>2</td>
<td>Orientation</td>
<td>Today was the start of the G20 summit.</td>
</tr>
<tr>
<td>3</td>
<td>Orientation</td>
<td>It happens every year</td>
</tr>
<tr>
<td>4</td>
<td>Orientation</td>
<td>and it is where 20 of the leaders of the world come together to talk about how to run their governments effectively and what not.</td>
</tr>
<tr>
<td>5</td>
<td>Orientation</td>
<td>Since there are so many leaders coming together their are going to be a lot of people who have different views on how to run the government they follow so they protest.</td>
</tr>
<tr>
<td>6</td>
<td>Orientation</td>
<td>This week things started alright and on schedule.</td>
</tr>
<tr>
<td>7</td>
<td>Action</td>
<td>There was a protest that happened along the street where I work</td>
</tr>
<tr>
<td>8</td>
<td>Action</td>
<td>and at first it looked peaceful until a bunch of people started rebelling</td>
</tr>
<tr>
<td>9</td>
<td>Action</td>
<td>and creating a riot.</td>
</tr>
<tr>
<td>10</td>
<td>Action</td>
<td>Police cars were burned</td>
</tr>
<tr>
<td>11</td>
<td>Action</td>
<td>and things were thrown at cops.</td>
</tr>
<tr>
<td>12</td>
<td>Orientation</td>
<td>Police were in full riot gear to alleviate the violence.</td>
</tr>
<tr>
<td>13</td>
<td>Action</td>
<td>As things got worse tear gas and bean bag bullets were fired at the rioters</td>
</tr>
<tr>
<td>14</td>
<td>Action</td>
<td>while they smash windows of stores.</td>
</tr>
<tr>
<td>15</td>
<td>Evaluation</td>
<td>And this all happened right in front of my store</td>
</tr>
<tr>
<td>16</td>
<td>Evaluation</td>
<td>which was kind of scary</td>
</tr>
<tr>
<td>17</td>
<td>Evaluation</td>
<td>but it was kind of interesting</td>
</tr>
<tr>
<td>18</td>
<td>Coda</td>
<td>since I’ve never seen a riot before.</td>
</tr>
</tbody>
</table>
Another Example

<table>
<thead>
<tr>
<th>#</th>
<th>Category</th>
<th>Story Clause</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Orientation</td>
<td>Now, on with this week's story...</td>
</tr>
<tr>
<td>2</td>
<td>Orientation</td>
<td>The last month has been hectic.</td>
</tr>
<tr>
<td>3</td>
<td>Orientation</td>
<td>Turbo charged.</td>
</tr>
<tr>
<td>4</td>
<td>Orientation</td>
<td>Lot’s of work because I was learning from Tim, my partner in crime.</td>
</tr>
<tr>
<td>5</td>
<td>Orientation</td>
<td>This hasn’t been helped by the intense pressure in town due to the political</td>
</tr>
<tr>
<td></td>
<td></td>
<td>transition coming to an end.</td>
</tr>
<tr>
<td>6</td>
<td>Orientation</td>
<td>This week things started alright and on schedule.</td>
</tr>
<tr>
<td>7</td>
<td>Action</td>
<td>But I managed to get myself arrested by the traffic police (roulage) early</td>
</tr>
<tr>
<td></td>
<td></td>
<td>last Wednesday.</td>
</tr>
<tr>
<td>8</td>
<td>Action</td>
<td>After yelling excessively at their outright corrupted methods and asking</td>
</tr>
<tr>
<td></td>
<td></td>
<td>incessantly for what law I actually broke,</td>
</tr>
<tr>
<td>9</td>
<td>Action</td>
<td>they managed to bring me in at the police HQ.</td>
</tr>
<tr>
<td>10</td>
<td>Action</td>
<td>I was drawing too much of a curious crowd for the authorities.</td>
</tr>
<tr>
<td>11</td>
<td>Action</td>
<td>In about half an hour at police HQ I had charmed every one around.</td>
</tr>
<tr>
<td>12</td>
<td>Action</td>
<td>I had prepared my “gift” as they wished.</td>
</tr>
<tr>
<td>13</td>
<td>Evaluation</td>
<td>Decision withheld, they decided that I needn’t to bother,</td>
</tr>
<tr>
<td>14</td>
<td>Evaluation</td>
<td>they liked me too much.</td>
</tr>
<tr>
<td>15</td>
<td>Evaluation</td>
<td>I should go free.</td>
</tr>
<tr>
<td>16</td>
<td>Action</td>
<td>I even managed to meet famous Raus, the big chief.</td>
</tr>
<tr>
<td>17</td>
<td>Evaluation</td>
<td>He was too happy to let me go when he realized I was no one.</td>
</tr>
<tr>
<td>18</td>
<td>Action</td>
<td>But then, a Major at his side noticed my Visa was expired.</td>
</tr>
<tr>
<td>19</td>
<td>Evaluation</td>
<td>Damn!</td>
</tr>
<tr>
<td>20</td>
<td>Orientation</td>
<td>My current Visa is being renewed in my other passport at Immigration’s.</td>
</tr>
<tr>
<td>21</td>
<td>Evaluation</td>
<td>Fuck.</td>
</tr>
<tr>
<td>22</td>
<td>Evaluation</td>
<td>In custody, for real.</td>
</tr>
</tbody>
</table>

Sequence of ACTIONS

ORIENTATION

EVALUATION
Story Intention Graph

SIG (Elson & McKeown 2007, 2009, and Elson 2012)

- rich symbolic representation for narrative
- a set of discourse relations designed specifically for modeling narrative discourse
- Link between an event and an affectually impacted agent

**Provides for: positive affectual impact of an event in the story**
Identifying SIG Subgraphs

- SIG-refined representation of Plot Units

Modeling Events and Affects in Social Media Stories

March 24, 2014
Bottom-up Learning of Narrative Representations

- Orientation
- Action
- Evaluation

- Settings and Characters
- Events
- Affects

Gain

Precondition for

Provides for

Blog Stories

Natural Language and Dialogue Systems
http://nlds.soe.ucsc.edu
Labels are L&W Categories

http://www.nltk.org/howto/classify.html
Classification using L&W’s Theory

- What Features Would Help?
- Would you predict any difference in performance between Aesop's Fables and the Blog stories?
  - Short, well-written
  - Nearly every clause serves a purpose to the story
  - Easy for annotators to agree?
Part of Speech: Verbs and Nouns

- **WORDS** (MORPHOLOGY)
- **PATTERNS OF WORDS** (DISTRIBUTIONAL ANALYSIS, LEXICAL SEMANTICS)
- **PHRASES AND SENTENCES** (SYNTAX)
- **CLASSIFYING TEXTS** (SEMANTICS)
- **SENTENCE MEANING** (SEMANTICS)
- **DISCOURSE MEANING NARRATIVE STRUCTURES** (SEMANTICS, PRAGMATICS, DISCOURSE)

http://nlds.soe.ucsc.edu
What might LIWC be good for?

Linguistic Inquiry and Word Count

LIWC2001

James W. Pennebaker Martha E. Francis and Roger J Booth
<table>
<thead>
<tr>
<th>LIWC Word Categories</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>Abortion, Acne, Addict, Advil, Aids, Bandage, Bleed, Blind</td>
</tr>
<tr>
<td>Leisure</td>
<td>Actress, Art, Ballet, Bar, Baseball, Beach, Beer, Cards, Casino</td>
</tr>
<tr>
<td>Affect</td>
<td>Cheer, Clever, Comfort, Damn, Dear, Easily, Embarrass, Emotion</td>
</tr>
<tr>
<td>Negate</td>
<td>Hadn’t, Haven’t, Hasn’t, Isn’t, Mustn’t, Neither, Never</td>
</tr>
<tr>
<td>Posemo</td>
<td>Accept, Admire, Adore, Benefit, Best, Brave, Bright, Harmless, Handsome</td>
</tr>
</tbody>
</table>
L&W on Aesop’s Fables

- Feature set:
  - structural features: more closely align with the high level analysis of L&W
  - do not require a large amount of training data

<table>
<thead>
<tr>
<th>No.</th>
<th>Feature</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Stative verbs</td>
<td>There was once a house,</td>
</tr>
<tr>
<td>2</td>
<td>Non-stative verbs</td>
<td>and then climbed up the wall,</td>
</tr>
<tr>
<td>3</td>
<td>Future</td>
<td>you will certainly be found out,</td>
</tr>
<tr>
<td>4</td>
<td>Conditional</td>
<td>that she should pay him a high fee if he cured her,</td>
</tr>
<tr>
<td>5</td>
<td>Quotes</td>
<td>“That’s awkward,”</td>
</tr>
<tr>
<td>6</td>
<td>Questions</td>
<td>who is going to bell the cat?</td>
</tr>
<tr>
<td>7</td>
<td>Indefinite articles</td>
<td>A hungry Fox saw some fine bunches of Grapes</td>
</tr>
<tr>
<td>8</td>
<td>Time entity</td>
<td>a Goose which laid a Golden Egg every day.</td>
</tr>
</tbody>
</table>
L&W Experiments on Blogs

- **Dataset:**
  - 50 stories from Internet weblogs
  - Basic unit of discourse: independent clause
    - manually segmented: 1,602 independent clauses

- **Annotation:**
  - Divided the 50 stories into 4 groups
  - Annotated in batches among 3 annotators
  - Personal narratives provide a more challenging context

<table>
<thead>
<tr>
<th>Clause Type</th>
<th>Orientation</th>
<th>Action</th>
<th>Evaluation</th>
<th>Not Story</th>
</tr>
</thead>
<tbody>
<tr>
<td># instances</td>
<td>421</td>
<td>436</td>
<td>719</td>
<td>26</td>
</tr>
</tbody>
</table>
### L&W Experiments on Blogs

- Binary valued 3,510 unique features
- Chi Squared measure: find the features with highest correlation over all the labels

<table>
<thead>
<tr>
<th>#</th>
<th>Feature</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>POS:INDEP-VBD</td>
</tr>
<tr>
<td>2</td>
<td>STEM:INDEP-be</td>
</tr>
<tr>
<td>3</td>
<td>INDEP-LIWC-Motion</td>
</tr>
<tr>
<td>4</td>
<td>POS:INDEP-VBZ</td>
</tr>
<tr>
<td>5</td>
<td>POS:INDEP-RP</td>
</tr>
<tr>
<td>6</td>
<td>INDEP-Negate</td>
</tr>
<tr>
<td>7</td>
<td>POS:INDEP-VBP</td>
</tr>
<tr>
<td>8</td>
<td>INDEP-Copula</td>
</tr>
<tr>
<td>9</td>
<td>STEM:INDEP-up</td>
</tr>
<tr>
<td>10</td>
<td>STEM:INDEP-then</td>
</tr>
</tbody>
</table>

#### Part of Speech Tag

- **Lexical semantic categories**

#### Negation

- **Lexical unigrams**