Believe Me—We Can Do This!

Annotating Persuasive Acts in Blog Text

Pranav Anand, Joseph King, Jordan Boyd-Graber, Earl Wagner, Craig Martell, Doug Oard, & Philip Resnik
Language as Content
Language as Content

- Online media has created a rich resource of natural language
Language as Content

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- Produced a raft of classification/recognition problems:
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  - question answering, textual entailment
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  - agreement, disagreement, stance towards issues
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  - question answering, textual entailment
  - emotionality, sentiment
  - agreement, disagreement, stance towards issues

- These approaches view language as information, and attempt to extract the content of language
Language as Affecter
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- But language is not just about information exchange
Language as Affecter

* But language is not just about information exchange
* flattery
Language as Affecter

- But language is not just about information exchange
  - flattery
  - insult
Language as Affecter

- But language is not just about information exchange
  - flattery
  - insult
  - scaring
Language as Affecter

* But language is not just about information exchange
  * flattery
  * insult
  * scaring
  * persuasion
Language as Affecter

• But language is not just about information exchange
  • flattery
  • insult about psychological effect on listener
  • scaring
  • persuasion
Language as Affecter

- But language is not just about information exchange
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perlocutionary speech acts (Austin 1962)
Language as Affecter

- But language is not just about information exchange
  - flattery
  - insult
  - scaring
  - persuasion

- Can we automatically classify this kind of intent?

about psychological effect on listener perlocutionary speech acts (Austin 1962)
Language as Affecter

- But language is not just about information exchange
  - flattery
  - insult about psychological effect on listener perlocutionary speech acts (Austin 1962)
  - scaring
  - persuasion
- Can we automatically classify this kind of intent?
  - Focus: persuasion
Our goals
Our goals

• Overarching goal: build systems that recognize text as persuasive
  • requires knowledge of the success of a persuasion attempt
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  - requires knowledge of the success of a persuasion attempt

- Proximate goal: build a corpus of persuasion attempts and resources we suspect will be useful for classification
  - persuasion is like argumentation, but may include non-argumentative techniques of inducing acceptance
Results in brief
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- Corpus of persuasion attempts and lower-level persuasive tactics on monologic blog data
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- 2 types of persuasion attempt (Miller 1980)
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    - attitude revision: to believe a proposition is T/F or hold a category of judgment toward some entity
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* 2 types of persuasion attempt (Miller 1980)
  * **attitude revision**: to believe a proposition is T/F or hold a category of judgment toward some entity
  * **compliance gaining**: commitment toward/against a course of action
Results in brief

- Corpus of persuasion attempts and lower-level persuasive tactics on monologic blog data
  - 2 types of persuasion attempt (Miller 1980)
    - attitude revision: to believe a proposition is T/F or hold a category of judgment toward some entity
    - compliance gaining: commitment toward/against a course of action
  - 16 tactics, drawn from social science literature on influence (Cialdini 2000) and compliance gaining (Marwell & Schmitt 1967)
Results in brief
Results in brief

- Blog data
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- Blog data
  - 40 blogs (25,048 posts)
Results in brief

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  - 457 contained persuasion attempts
Results in brief

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  - 1205 posts contained 1310 persuasive tactics
Results in brief

- Blog data
  - 40 blogs (25,048 posts)
  - 457 contained persuasion attempts
  - 1205 posts contained 1310 persuasive tactics
  - high intercoder agreement for persuasion attempt and many tactics
Results in brief
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- Naive Bayes classifier trained on tactics outperforms simple lexical models
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- Most important tactics are ones most strongly associated with logical argumentation patterns
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  * Arguments based on: Causation, Examples, Source, and Rules
Results in brief

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  - Most important tactics are ones most strongly associated with logical argumentation patterns
    - Arguments based on: Causation, Examples, Source, and Rules
    - Abductive arguments
Results in brief

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- Naive Bayes classifier trained on tactics outperforms simple lexical models

- Most important tactics are ones most strongly associated with logical argumentation patterns

  - Arguments based on: Causation, Examples, Source, and Rules

  - Abductive arguments

- Further work should focus on such argumentation schemes
Outline

* What is persuasion?
Outline

• What is persuasion?

• Data source
Outline

- What is persuasion?
- Data source
- Tactic ontologies
Outline

• What is persuasion?
• Data source
• Tactic ontologies
• Annotation
Outline

- What is persuasion?
- Data source
- Tactic ontologies
- Annotation
- Tactic Utilities
What is persuasion?
Persuasion is goal-directed
Persuasion is goal-directed

- Persuasion attempts are (Dolland 1990):
Persuasion is goal-directed

- Persuasion attempts are (Dolland 1990):
  - intentional
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  - intentional
  - goal-directed
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- Persuasion attempts are (Dolland 1990):
  - intentional
  - goal-directed
  - organized around obtaining a particular response from the persuadee
Persuasive goals
Persuasive goals

* Persuasive goal may be to (Miller 1980):
Persuasive goals

* Persuasive goal may be to (Miller 1980):
  * shape an initial response
Persuasive goals

- Persuasive goal may be to (Miller 1980):
  - shape an initial response
  - reinforce a pre-existing response
Persuasive goals

- Persuasive goal may be to (Miller 1980):
  - *shape* an initial response
  - *reinforce* a pre-existing response
  - *change* a response to a more desired category
Persuasive responses
Persuasive responses

* Persuasive response may be:
Persuasive responses

- Persuasive response may be:
  - an *attitude* (Hovland et al. 1949): a set of beliefs and/or opinions on a topic
Persuasive responses

* Persuasive response may be:
  * an *attitude* (Hovland et al. 1949): a set of beliefs and/or opinions on a topic
  * *compliance gaining* (Marwell & Schmitt 1967): commitment toward/against a course of action
Persuasion is tactical
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- recognizes and attempts to reduce *resistance* on part of persuadee
Persuasion is tactical

* recognizes and attempts to reduce *resistance* on part of persuadee

So much for Texas. I almost made it to Dallas tonight, but unfortunately weather and air traffic conspired against my trip. I read most of a novel (Nobody’s Fool by Richard Russo if you’re keeping tabs) and ate the worst food ever. The lettuce on my club sandwich from TGIFridays was so rotten I had to WIPE it off my nasty meats. I couldn’t pick it off. It was that far gone.
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Altruism is an illusion. We are all consumers, operating in our own self-interests and the interests of those like us. Without the constructs of “good” and “evil” we will have a better perspective to interpret the media’s representation of our world. I am not willing to give up the luxuries and conveniences that we Americans consider unalienable rights more than anyone else.
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Ok, some quick suggestions and observations... Go see Avenue Q. If you like Turkish food and you’re in the city, try Sip Sak, but don’t order the Lamb & Okra. Get a salad or something grilled. What was I thinking? Okra? Gap clothes fit better than Banana Rep and Express this fall, for all you metros out there.

Altruism is an illusion. We are all consumers, operating in our own self-interests and the interests of those like us. Without the constructs of “good” and “evil” we will have a better perspective to interpret the representation of our world. I am not willing to give up the luxuries and conveniences that we Americans consider unalienable rights more than anyone else.
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Data source
Blogs: advantages
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* Empirical focus: blog posts from the Blog Authorship Corpus (Koppel et al. 2006)
Blogs: advantages

- Empirical focus: blog posts from the Blog Authorship Corpus (Koppel et al. 2006)

- Advantages
  - widespread, easily accessible genre of online communication
  - clear authorship (unlike speeches or sermons)
  - wide range of topics, registers
Blogs: disadvantages
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- no/indirect indication of uptake
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- unclear audience (lower likelihood of audience-directed tactics vs. dialog)
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- diversity of text may render object of study rare
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- diversity of text may render object of study rare
  - [...and it did]
Tactic ontologies
The importance of tactics

* Pilot annotation:
  * 30 blog posts, selected to be half persuasion attempts, half not
  * 5 annotators, given relatively limited guidelines
Sincerely, I must write to you about my situation. I have been unable to sleep at a normal time. Despite trying to wake up at my usual time, I have been unable to get into a regular sleep schedule. It's quite frustrating. In the past, I have found sleeping in the early morning to be more difficult. But I can't. I've tried reducing my caffeine intake and doing a PM routine, but it hasn't helped. Perhaps I am addicted to coffee? I don't feel particularly anxious, but I do have a nagging thought that I am supposed to start by August. And I am working on a few projects for my research assistant. I am not sure what the outcome will be or how much money I will make. I have three presentations due this week. I am single and I hate it. I'm going to buy a new car. I want to lose 5 pounds but I can't seem to get myself motivated enough to do it. My current car is lacking. And I am afraid it will break soon. But seriously, I am not addicted. Maybe I am. I don't know. Tonight I was surprised that I was going to fall asleep. I was almost there and then I thought about how nieuwe Shahs TOLLARE should not have been voted off American Idol since she clearly was the best singer in the whole competition and then it was- whom and couldn't sleep. If stupid American Idol is all I have to keep me awake at night then I should be doing alright. But I'm not.

Does this post contain an attempt to persuade? • Yes • No • Unclear

If I were going to start a website that would be about Amazon.com. I think it's the most amazing website ever. I know that as a general rule people like Amazon. Recently, there was a newspaper article about one of the top inventions of the year (after Apple Computer's iMac). But I don't think these other people have such a strong affection to Amazon.com. I think they shop at Amazon.com because they like the service. They are the smartest marketers out there. I don't know how they do it, but every time I go to their website, they have recommendations for me. And what do you know? Their recommendations are almost always right. Amazon.com introduced me to some very wonderful authors. I discovered Howie Mandel, Dave Streisand, and Vladimir Vamos through Amazon.com's recommendations. I almost always buy my CDs from Amazon.com even if I can find them cheaper elsewhere, just because I love the company so much I WANT to give them my money. In addition to making shopping a pleasure, Amazon.com is great for procrastination. I have wish lists. I think your Amazon.com wish list really says a lot about you as a person. Mine says I have to stuff. Currently there are 125 items on my wish list. I sort of have a shopping problem, and a lack of money problem. Being able to add things to my wish list makes my shopping bag without causing undue financial harm. So make wish lists even better, Amazon.com has the community function.

Does this post contain an attempt to persuade? • Yes • No • Unclear

Oh, the biggest thing that pisses me off about Dexter. The fact that you say you're all over him and so is he. And that fact that he says he can't take flak or he can't say anything which he has to. Sometimes when he called her...
The importance of tactics

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The importance of tactics

- Pilot annotation:
  - 30 blog posts, selected to be half persuasion attempts, half not
  - 5 annotators, given relatively limited guidelines
  - Low IAA ($\kappa = 0.40$)
The importance of tactics

- Pilot annotation:
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  - 5 annotators, given relatively limited guidelines
  - Low IAA ($\kappa = 0.40$)
  - unclarity for expressions of opinion
The importance of tactics

- Pilot annotation:
  - 30 blog posts, selected to be half persuasion attempts, half not
  - 5 annotators, given relatively limited guidelines
  - Low IAA ($\kappa = 0.40$)
    - unclarity for expressions of opinion
    - “weak” persuasion possibility
Annotation scheme design
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• Hope: can improve agreement by making the notion of resistance more precise

• need an ontology of persuasion tactics to build from
Annotation scheme design

- Hope: can improve agreement by making the notion of resistance more precise
  - need an ontology of persuasion tactics to build from

- Combined the 6 Influential Tactics from Cialdini (2000) with the 16 compliance-gaining tactics of Marwell & Schmitt (1967)
  - resulted in 14 tactics after combining, simplifying, extending
  - added two more to cover additional logical argumentation schemes
Persuasion in social science: a precis
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- Two threads: Attitude change and Compliance Gaining
Persuasion in social science: a precis

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- Attitude change/Influence (Social Psychology)
Persuasion in social science: a precis

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Persuasion in social science: a precis

- Two threads: Attitude change and Compliance Gaining
- Attitude change/Influence (Social Psychology)
  - grew out of Carl Hovland’s investigation of effective propaganda techniques in 1930s
  - *persuadee focused*: focus on how various variables of persuader, audience, channel, and message encoding influence success
Persuasion in social science: a precis
Persuasion in social science: a precis

* Compliance gaining (sociology / communication sciences)
Persuasion in social science: a precis

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* pioneered by Marwell & Schmitt’s (1967) interest in sociological power structures
Persuasion in social science: a precis

- Compliance gaining (sociology / communication sciences)
  - pioneered by Marwell & Schmitt’s (1967) interest in sociological power structures
  - persuader focused: studies how persuasive agents choose among their ways of controlling others’ behavior
Marwell & Schmitt (1967)

* Collected likelihoods across 4 scenarios for each of 16 tactics, fell into 5 groups by factor analysis

<table>
<thead>
<tr>
<th>Tactic</th>
<th>Group</th>
<th>Definition</th>
</tr>
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<tbody>
<tr>
<td>Promise</td>
<td>Rewarding Activity</td>
<td>If you comply, I will reward you.</td>
</tr>
<tr>
<td>Threat</td>
<td>Punishing Activity</td>
<td>If you do not comply, I will punish you.</td>
</tr>
<tr>
<td>Expertise (positive)</td>
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<td>If you comply, you will be rewarded because of the “nature of things.”</td>
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<td>Expertise (negative)</td>
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<td>Liking</td>
<td>Rewarding Activity</td>
<td>Act friendly and helpful to get the person in a “good frame of mind”</td>
</tr>
<tr>
<td>Pregiving</td>
<td>Rewarding Activity</td>
<td>Reward the person before requesting his or her compliance.</td>
</tr>
<tr>
<td>Aversive Stimulation</td>
<td>Punishing Activity</td>
<td>Continuously punish the person, making cessation contingent on compliance.</td>
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<td>Debt</td>
<td>Personal Commitments</td>
<td>You owe me compliance because of past favors.</td>
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<td>Moral Appeal</td>
<td>Impersonal Commitments</td>
<td>You are immoral if you do not comply.</td>
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<td>Self-Feeling (positive)</td>
<td>Personal Commitments</td>
<td>You will feel better about yourself if you comply.</td>
</tr>
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<td>Self-Feeling (negative)</td>
<td>Personal Commitments</td>
<td>You will feel worse about yourself if you do not comply.</td>
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<tr>
<td>Altercasting (positive)</td>
<td>Impersonal Commitments</td>
<td>A person with “good” qualities would comply.</td>
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<tr>
<td>Altercasting (negative)</td>
<td>Impersonal Commitments</td>
<td>Only a person with “bad” qualities would not comply.</td>
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<tr>
<td>Altruism</td>
<td>Personal Commitments</td>
<td>I need your compliance very badly, so do it for me.</td>
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<tr>
<td>Esteem (positive)</td>
<td>Impersonal Commitments</td>
<td>People you value will think the better of you if you comply.</td>
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<td>Personal Commitments</td>
<td>People you value will think the worse of you if you do not comply.</td>
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### Marwell & Schmitt, collapsed

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<td>A person with “good”/”bad” qualities would/would not comply.</td>
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# Tactic Definitions

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<td>Threat/Promise</td>
<td>If you comply, I will reward/punish you.</td>
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<td>Outcome</td>
<td>If you comply, you will be rewarded/punished because of the “nature of things.”</td>
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<td>Butter Up</td>
<td>Act friendly and helpful to get the person in a “good frame of mind”.</td>
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<td>Favor/Injure</td>
<td>Reward/punish the person before requesting/demanding his or her compliance.</td>
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<td>Good/Bad Traits</td>
<td>A person with “good”/”bad” qualities would/would not comply.</td>
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<td>Distress</td>
<td>I need your compliance very badly, so do it for me.</td>
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<tr>
<td>Social Esteem</td>
<td>People you value will think the better/worse of you if you do/don’t comply.</td>
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Cialdini (2000)

- Constructed empirically by observing negotiations in a wide variety of settings

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<td>People are influenced by thoughts, words and actions of authority figures.</td>
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<td>Commitment and Consistency</td>
<td>A person is obligated to fulfill their commitments to perform an act or support an idea.</td>
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<td>Liking</td>
<td>People are influenced by similar people or items/people that bring satisfaction.</td>
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<td>Reciprocity</td>
<td>One party becomes indebted to another, and that debt must be repaid.</td>
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<td>Social Proof</td>
<td>Societal norms impact expectations of outcome from situations and influence how a person should act in a given situation.</td>
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<td>Scarcity</td>
<td>The persuadee believes that an opportunity has a small lifespan.</td>
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## Cialdini, renamed

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Collapsing categories
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- Removed ones unlikely in blogs
  - Marwell & Schmitt: Buttering Up, Distress, Favor/Injure
Collapsing categories

- Removed ones unlikely in blogs
  - Marwell & Schmitt: Buttering Up, Distress, Favor/Injure
- Split up Social Proof
  - Popularity: Invokes popular opinion.
  - Social Generalization: Makes generalizations about how a particular class of people behaves.
Generalizing categories
Generalizing categories

- Generalized others
Generalizing categories

- Generalized others

- Deontic Appeal (from Moral Appeal): Mentions duties and obligations.
Generalizing categories

- Generalized others
  - Deontic Appeal (from Moral Appeal): Mentions duties and obligations.
  - Empathy (from Cialdini’s Liking): Attempts to make the persuadee connect with someone else’s emotional perspective.
Adding categories
Adding categories

- Missing: many “logical” patterns
Adding categories

- Missing: many “logical” patterns
- Created two new categories (via inspection of the data)
Adding categories

- Missing: many “logical” patterns
- Created two new categories (via inspection of the data)
  - Redefinition: Reframes an issue by analogy or metaphor
Adding categories

- Missing: many “logical” patterns
- Created two new categories (via inspection of the data)
  - Redefinition: Reframes an issue by analogy or metaphor
  - Reason: Provides a justification for an argumentative point based upon logical reasoning (e.g., causal reasoning, arguments from absurdity, arguments from example, etc.)
Examples of additional categories

Like the south and slavery, religion is a way of life.

Pandering to Islamic terrorism has only ever resulted in more of it. Case in point: The Phillipines, where a long-dormant Islamic terrorist outfit, revitalised by the Phillipines’ government’s cowing to terrorist demands and pulling troops out of Iraq to free a single hostage, has probably doomed hundreds, if not thousands, to death.

soo, by that logic, ‘only 500’ would be quite acceptable as an argument too. Ridiculous.
Examples of additional categories

Redefinition

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**Reason**

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soo, by that logic, ‘only 500’ would be quite acceptable as an argument too. **Ridiculous.**
# Annotation scheme

<table>
<thead>
<tr>
<th>Class</th>
<th>Tactic</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outcomes</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Threat/Promise</td>
<td>Poses a direct threat or promise to the persuadee.</td>
<td></td>
</tr>
<tr>
<td>Social Esteem</td>
<td>States that people the persuadee values will think more highly of them.</td>
<td></td>
</tr>
<tr>
<td>Self-Feeling</td>
<td>States that uptake will result in a better self-valuation by the persuadee.</td>
<td></td>
</tr>
<tr>
<td>Outcome</td>
<td>Mentions some particular consequences from uptake or failure to uptake</td>
<td></td>
</tr>
<tr>
<td><strong>Generalizations</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deontic Appeal</td>
<td>Mentions duties or obligations.</td>
<td></td>
</tr>
<tr>
<td>Moral Appeal</td>
<td>Mentions moral goodness, badness, etc.</td>
<td></td>
</tr>
<tr>
<td>Social Generalization</td>
<td>Makes generalizations about how some particular class of people tendentially behaves.</td>
<td></td>
</tr>
<tr>
<td>Good/Bad Traits</td>
<td>Associates the intended mental state with a “good” or “bad” person's traits.</td>
<td></td>
</tr>
<tr>
<td><strong>External</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Popularity</td>
<td>Invokes popular opinion as support for uptake.</td>
<td></td>
</tr>
<tr>
<td>Important Person</td>
<td>Appeals to authority (bosses, experts, trend-setters).</td>
<td></td>
</tr>
<tr>
<td><strong>Interpersonal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Favors/Debts</td>
<td>Mentions returning a favor or injury.</td>
<td></td>
</tr>
<tr>
<td>Consistency</td>
<td>Mentions keeping promises or commitments.</td>
<td></td>
</tr>
<tr>
<td>Empathy</td>
<td>Attempts to make the persuadee connect with someone else's emotional perspective</td>
<td></td>
</tr>
<tr>
<td>Scarcity</td>
<td>Mentions rarity, urgency, or opportunity of some outcome.</td>
<td></td>
</tr>
<tr>
<td><strong>Other</strong></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>Reframes an issue by analogy or metaphor.</td>
<td></td>
</tr>
<tr>
<td>Reason</td>
<td>Provides justification for an argumentative point based upon logical reasoning.</td>
<td></td>
</tr>
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</table>
# Argumentation schemes

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<tr>
<th>Class</th>
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<th>Definition</th>
<th>Argumentation scheme</th>
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<td>Threat/Promise</td>
<td>Poses a direct threat or promise to the persuadee.</td>
<td>Arg. from Threat</td>
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<td></td>
<td>Social Esteem</td>
<td>States that people the persuadee values will think more highly of them.</td>
<td>Rhetoric of Belonging <em>Ad Populum</em></td>
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<tr>
<td></td>
<td>Self-Feeling</td>
<td>States that uptake will result in a better self-valuation by the persuadee.</td>
<td>Arg. from Consequences</td>
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<td>Outcome</td>
<td>Mentions some particular consequences from uptake or failure</td>
<td>Arg. from Consequences</td>
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<td>Associates the intended mental state with a “good” or “bad”</td>
<td>Appeal to Vanity <em>Ad Populum</em></td>
</tr>
<tr>
<td>External</td>
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<td>Invokes popular opinion as support for uptake.</td>
<td>Arg. from Pop. Acceptance</td>
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<td>Important Person</td>
<td>Appeals to authority (bosses, experts, trend-setters).</td>
<td>Arg. from Expert Op./Model</td>
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<td>Other</td>
<td>Redefinition</td>
<td>Reframes an issue by analogy or metaphor.</td>
<td>Arg. from Analogy</td>
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<tr>
<td></td>
<td>Reason</td>
<td>Provides justification for an argumentative point based upon logical reasoning.</td>
<td>tbd</td>
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Donnerstag, 11. August 2011
Annotation
Basic Procedure
Basic Procedure

* Training: 8 annotators, 30 post selection, ($\kappa = 0.82$)

  * annotators asked to focus on *blatant* persuasion attempts (no reading into the text)
Basic Procedure

- Training: 8 annotators, 30 post selection, (κ = 0.82)
  - annotators asked to focus on blatant persuasion attempts (no reading into the text)

- Annotation:
  - 40 blogs > 200 posts selected randomly (25,048 blog posts total)
  - each annotator annotated 7 blogs, 20% overlap between annotators
  - 3 annotators per overlapping blog
Persuasion attempt results
Persuasion attempt results

* 457 posts contained persuasion attempts ($\alpha=0.84$)
* 457 posts contained persuasion attempts ($\alpha=0.84$)

* 329 attitude revision
Persuasion attempt results

- 457 posts contained persuasion attempts ($\alpha=0.84$)
- 329 attitude revision
- 77 compliance gaining
Persuasion attempt results

- 457 posts contained persuasion attempts ($\alpha=0.84$)
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- 51 both
Persuasive tactic results
Persuasive tactic results

* 1205 posts labeled with 1310 tactic labels
Persuasive tactic results

- 1205 posts labeled with 1310 tactic labels
- 1294 posts labeled with persuasion and/or tactics
**Persuasive tactic results**

- 1205 posts labeled with 1310 tactic labels
- 1294 posts labeled with persuasion and/or tactics

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*IAA seems to correlate with lexicalization: Good/Bad Traits & Popularity vs. Important Person & Outcome*
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- IAA seems to correlate with lexicalization: Good/Bad Traits & Popularity vs. Important Person & Outcome
- Self-feeling, Social Esteem, Scarcity very rare: 100% of the time with compliance gaining
Persuasive tactic results

IAA seems to correlate with lexicalization: Good/Bad Traits & Popularity vs. Important Person & Outcome

Self-feeling, Social Esteem, Scarcity very rare: 100% of the time with compliance gaining

Consistency 92% and Favors/Debts 85% & w/ c.g.

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<td>NA</td>
<td>100.0%</td>
</tr>
<tr>
<td>Self-feeling</td>
<td>1</td>
<td>NA</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

- IAA seems to correlate with lexicalization: Good/Bad Traits & Popularity vs. Important Person & Outcome
- Self-feeling, Social Esteem, Scarcity very rare: 100% of the time with compliance gaining
- Consistency 92% and Favors/Debts 85% & w/ c.g.
- Reason, Deontic, and Outcome most predictive of persuasion
Tactic Utilities
Exploring via machine learning
Exploring via machine learning

- Examined tactic utility via machine learning
Exploring via machine learning

- Examined tactic utility via machine learning
  - baseline system: stemmed unigrams
Exploring via machine learning

- Examined tactic utility via machine learning
  - baseline system: stemmed unigrams
  - word class features (MPQA and LIWC)
Exploring via machine learning

- Examined tactic utility via machine learning
  - baseline system: stemmed unigrams
  - word class features (MPQA and LIWC)
  - topic features (Latent Dirichlet Allocation)
Examining tactic utility via machine learning

- baseline system: stemmed unigrams
- word class features (MPQA and LIWC)
- topic features (Latent Dirichlet Allocation)
- tactic labels
Tactics carry valuable information

- Examined tactic utility via machine learning
  - baseline system: stemmed unigrams
  - word class features (MPQA and LIWC)
  - topic features (Latent Dirichlet Allocation)
  - tactic labels

<table>
<thead>
<tr>
<th></th>
<th>Precision</th>
<th>Recall</th>
<th>F-score</th>
</tr>
</thead>
<tbody>
<tr>
<td>stemmed</td>
<td>0.742</td>
<td>0.174</td>
<td>0.282</td>
</tr>
<tr>
<td>MPQA and LIWC</td>
<td>0.079</td>
<td>0.174</td>
<td>0.282</td>
</tr>
<tr>
<td>Latent Dirichlet Allocation</td>
<td>0.114</td>
<td>0.271</td>
<td>0.161</td>
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<tr>
<td>tactic labels</td>
<td>0.505</td>
<td>0.677</td>
<td>0.579</td>
</tr>
</tbody>
</table>

- Tactic labels are helpful: they outperform all unsupervised features
Relative tactic utility
Relative tactic utility

- By removing combinations of tactics, we find that
Relative tactic utility

- By removing combinations of tactics, we find that
  - Reason is the primary contributor to accuracy
Relative tactic utility

- By removing combinations of tactics, we find that
  - Reason is the primary contributor to accuracy
  - Deontic and Outcome distant second
Four Lesser Features
Four Lesser Features

- Empathy, Recharacterization, Threat/Promise, and Good/Bad Traits
Four Lesser Features

- Empathy, Recharacterization, Threat/Promise, and Good/Bad Traits

- *negatively correlated* with Persuasion with Reason
Four Lesser Features

- Empathy, Recharacterization, Threat/Promise, and Good/Bad Traits

  - negatively correlated with Persuasion with Reason

  - 65% of such cases are ones where Reason marks a narrative discourse relation (*I did this because she wouldn’t talk to me.*)
Four Lesser Features

- Empathy, Recharacterization, Threat/Promise, and Good/Bad Traits
  - negatively correlated with Persuasion with Reason
  - 65% of such cases are ones where Reason marks a narrative discourse relation (*I did this because she wouldn’t talk to me.*)
  - Upshot: discriminative tactics are not necessarily signs of Persuasion!
Decomposing Reason
Decomposing Reason

* Reason contributed the lion’s share of tactic classifier success
Decomposing Reason

- Reason contributed the lion’s share of tactic classifier success
- examining its distribution further
Decomposing Reason

- Reason contributed the lion’s share of tactic classifier success
- examining its distribution further
- 224 instances of Reason examined by authors
Decomposing Reason

- Reason contributed the lion’s share of tactic classifier success
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  - 224 instances of Reason examined by authors
  - 86 were instances of argumentation schemes
Decomposing Reason

- Reason contributed the lion’s share of tactic classifier success

- examining its distribution further

  - 224 instances of Reason examined by authors
  
  - 86 were instances of argumentation schemes

  - 84% of these were in persuasion attempts (64% attitude revision, 20% compliance gaining)
## Decomposing Reason

<table>
<thead>
<tr>
<th>Argument scheme</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arg. from Example</td>
<td>20</td>
</tr>
<tr>
<td>Abductive Argument</td>
<td>19</td>
</tr>
<tr>
<td>Arg. from Values</td>
<td>8</td>
</tr>
<tr>
<td>Arg. from Consequences</td>
<td>6</td>
</tr>
<tr>
<td>Arg. from Correlation to Cause</td>
<td>5</td>
</tr>
<tr>
<td>The Group and its members</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Argument class</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applying Rules to Cases</td>
<td>26</td>
</tr>
<tr>
<td>Abductive Reasoning</td>
<td>20</td>
</tr>
<tr>
<td>Source-based Arguments</td>
<td>20</td>
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<tr>
<td>Practical Reasoning</td>
<td>9</td>
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<tr>
<td>Causal Reasoning</td>
<td>7</td>
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<tr>
<td>Applying Rules to Cases [Deontic/Moral]</td>
<td>178</td>
</tr>
<tr>
<td>Causal Reasoning [Outcome]</td>
<td>76</td>
</tr>
</tbody>
</table>
Decomposing Reason

- Upshot: for persuasion in blog posts, we can perhaps focus on a subset of annotation schemes
  - Arguments based on: Causation, Examples, Source, and Rules
  - Abductive arguments
Conclusion
Results

- Persuasion attempts and compliance gaining categories can be annotated in blog posts with acceptable precision.

- The tactics are useful proxies for high-level information, and give a reasonable upper-bound for more sophisticated machine learning.
  
  - of these, Reason, Deontic, and Outcome are primary.
Moving Forward

• Blogs are a challenging domain for persuasion attempts
  • rarity of the phenomena suggests more intelligent initial filtering of posts sent to annotators
  • see compliance gaining even more rarely

• Focus in this domain should be on exploiting knowledge from prior literature on discovering arguments (Mochales & Ieven 2009, Palau & Moens 2011)