

Outline

Part 2: Analysis Tasks

2.1 Argument Mining Overview

2.2 Segmenting Texts into Argumentative Units

2.3 Classifying Types of Units

2.4 Identifying Relations between Units

2.5 Classifying Stance and Analyzing Polarity

2.6 Assessing Argumentation Quality

Assessing Argumentation Quality – Overview

Slides by Henning Wachsmuth and Benno Stein

Introduction

- Argumentation quality
- Granularity levels
- Target audience
- Quality aspects

Overview of existing work

- Logical quality
- Rhetorical quality
- Dialectical quality

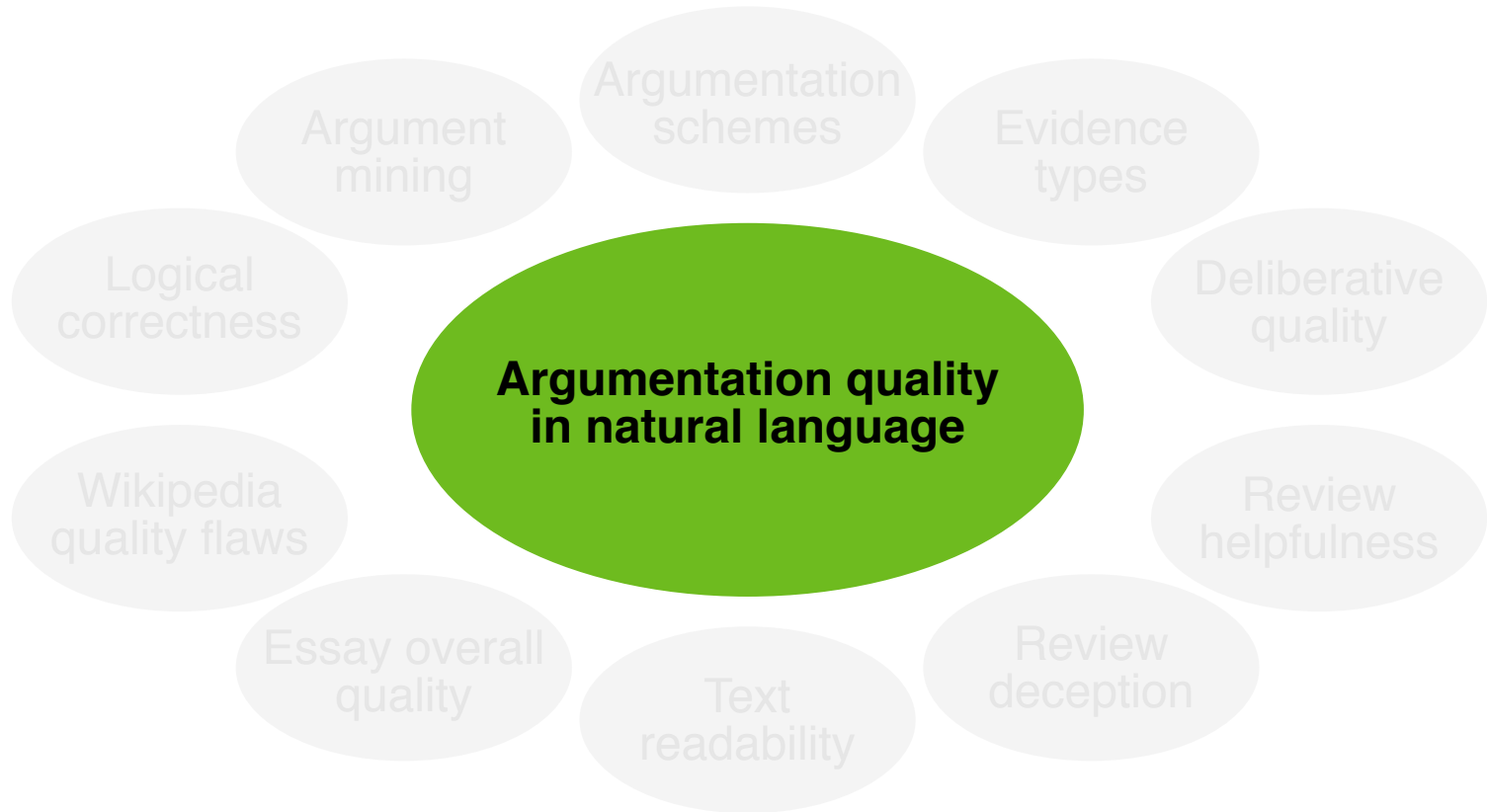
Selected approaches in detail

- Assessing argument relevance

Scope of Discussion

Many related topics not covered here

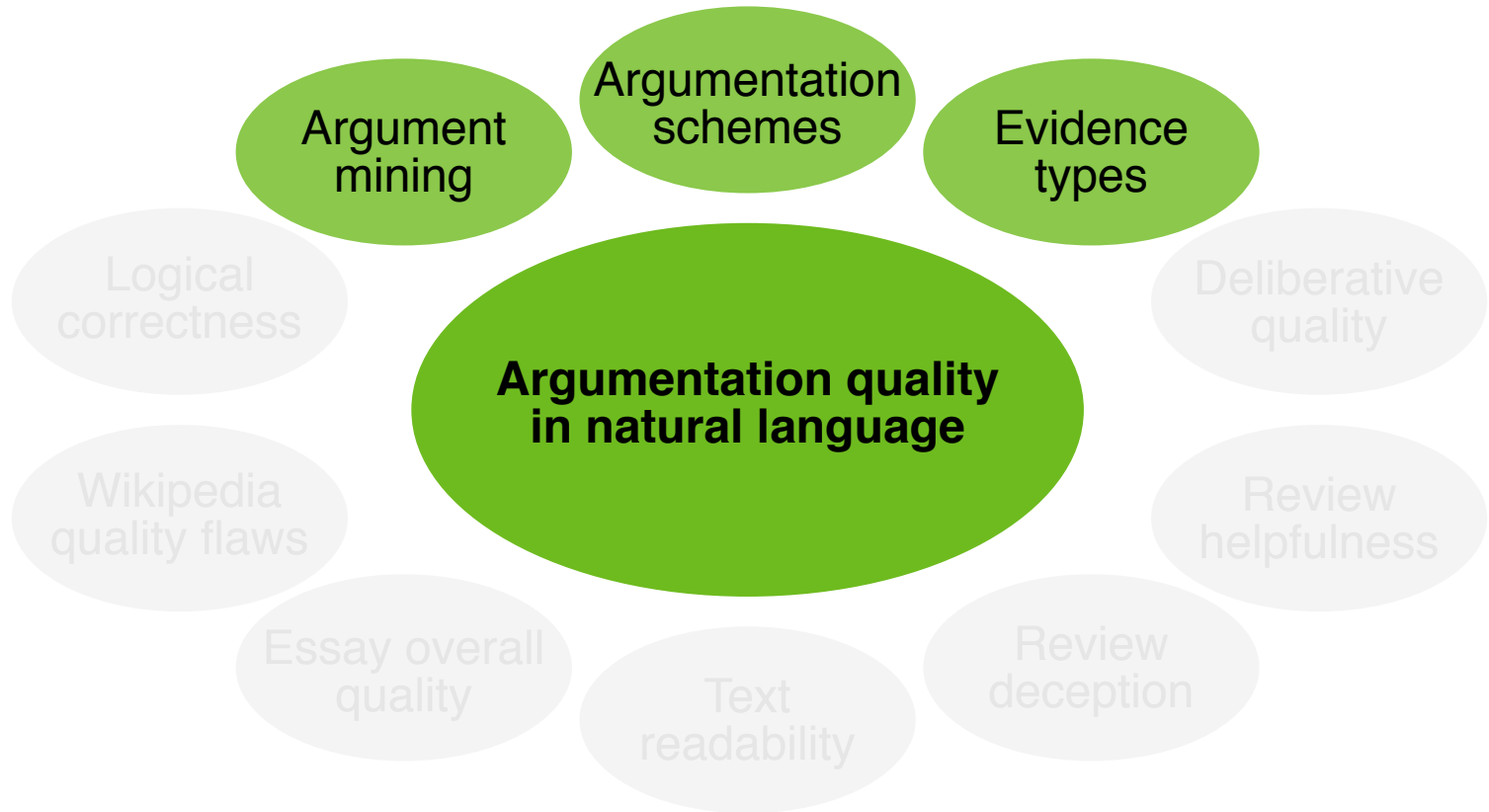
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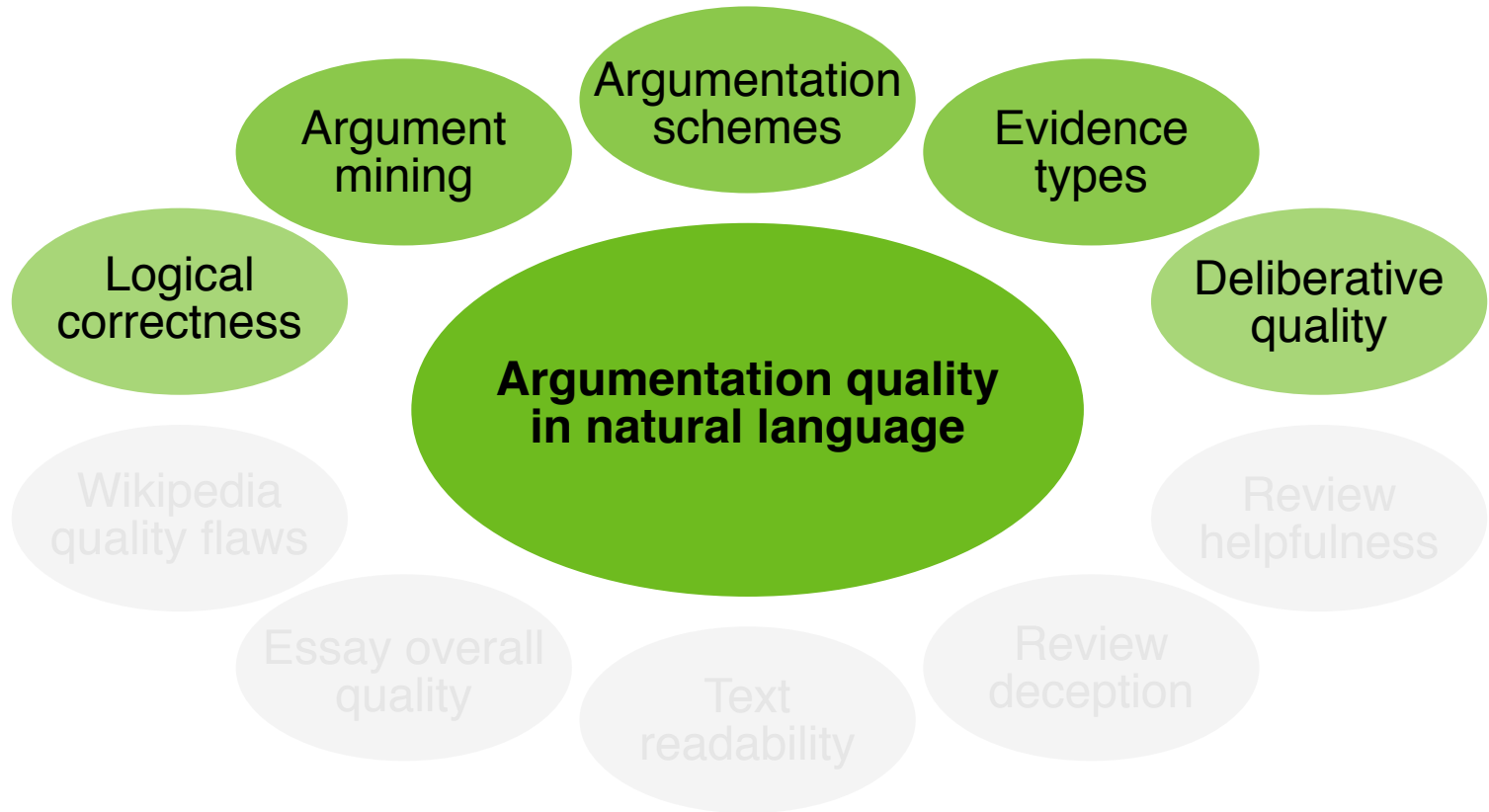
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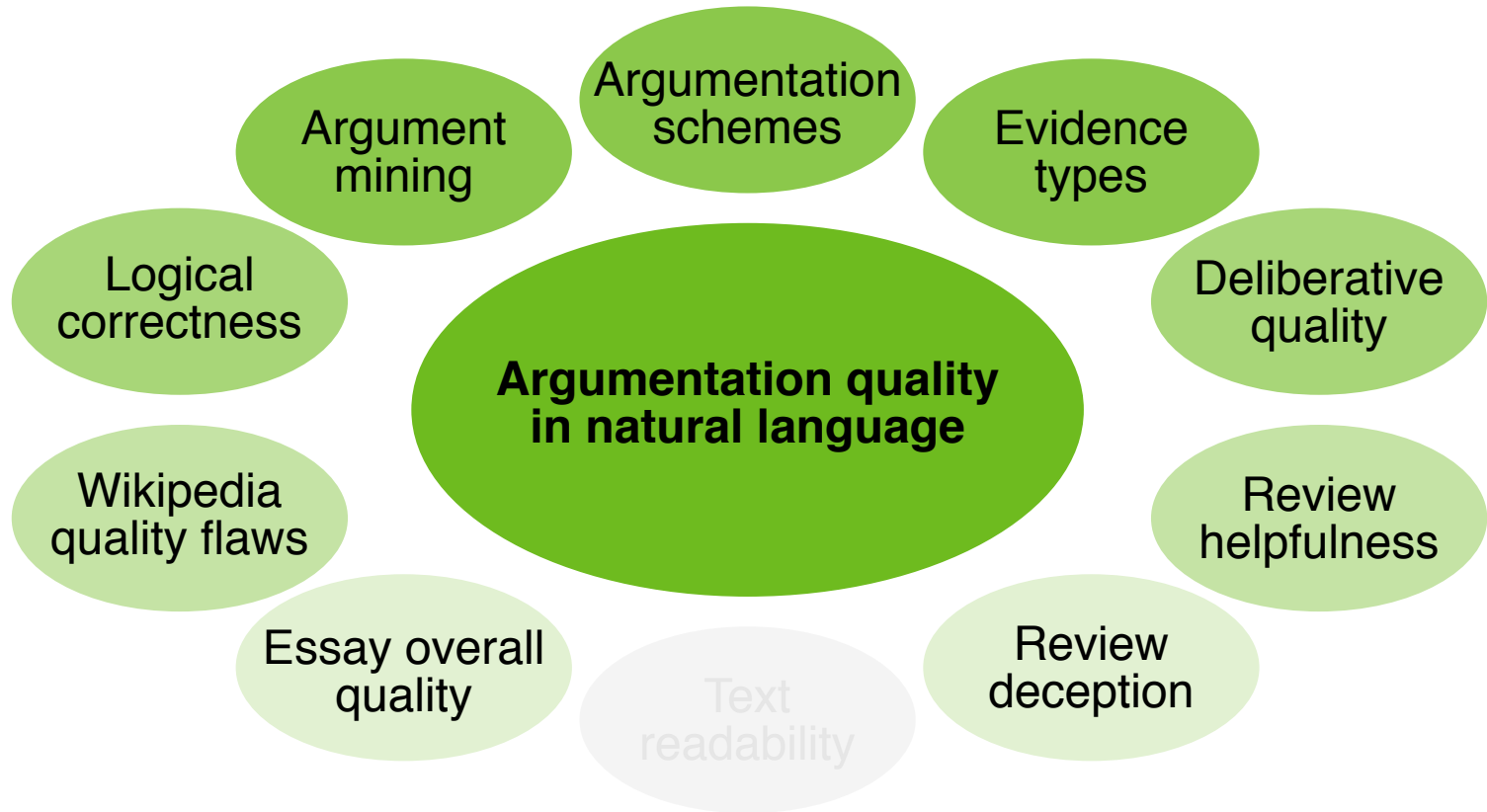
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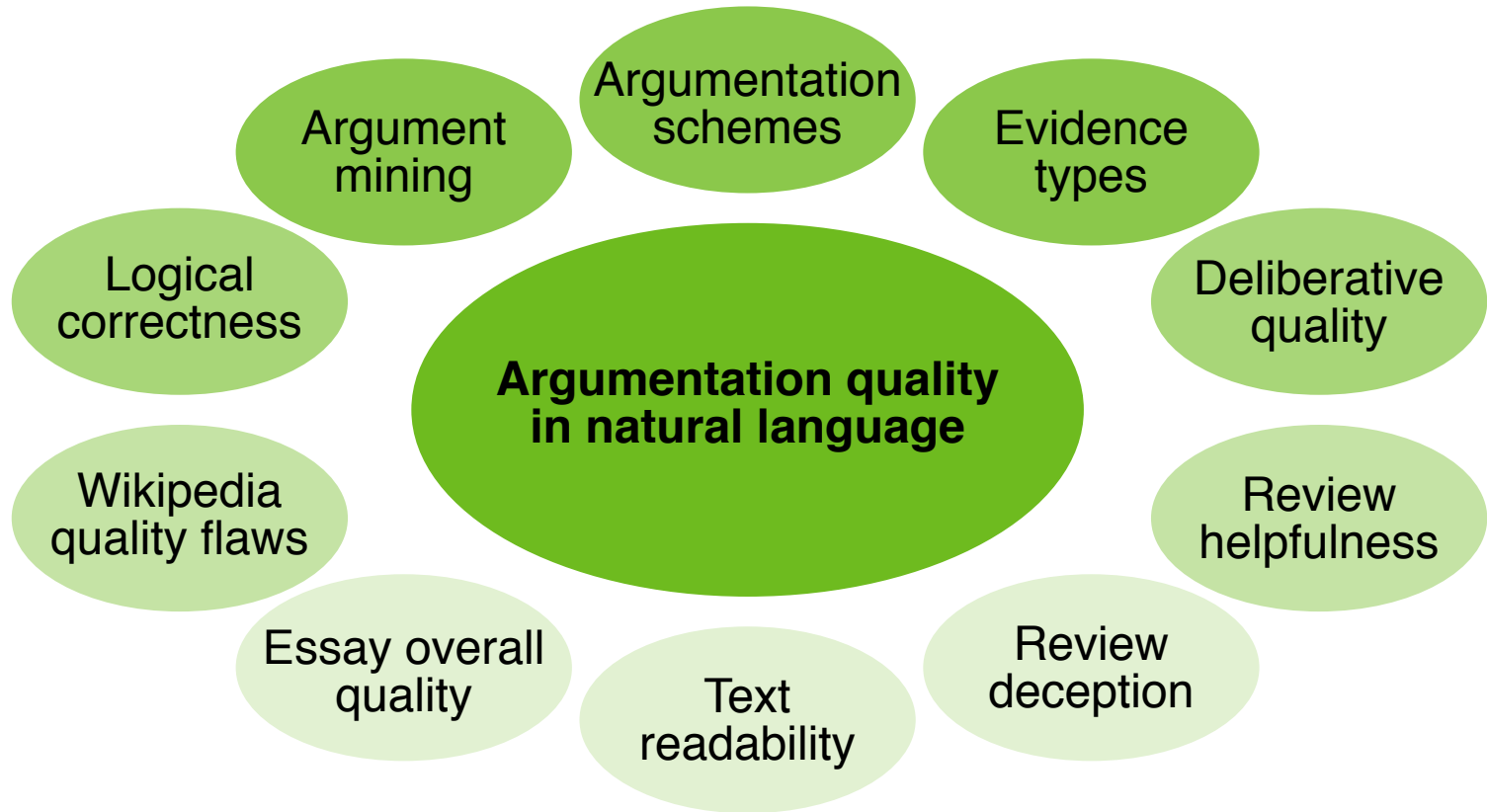
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What Is Argumentation Quality?

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“will provide enough evidence to make it reasonable to take the conclusion seriously”

(Blair 2012)

“would convince most readers”

(Persing & Ng 2015)

“based on evidence, constructed with perspective, and delivered persuasively”

(http://researcher.watson.ibm.com/researcher/view_group.php?id=5443)

Four Granularity Levels of Quality Assessment

Alice: *Some people say refugees threaten peace, as many of them were criminals.*

In fact, Spiegel Online just reported results from a study of the federal police about numbers of refugees and crimes:

Overall, there is no correlation at all!

Rather, the police confirmed that the main reason for committing crime is poverty.

So, if you believe the police then you shouldn't believe those people.

Syrians are even involved less in crimes than Germans according to the study.

So, the more Syrians come to Germany, the more peaceful it gets there, right?

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Bob: *The question is here why should I believe the police!? Argument failed :-)*

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Dialogical argumentation

- Who is the winner?

The Role of the Target Audience

Argumentation usually has a particular target audience

- Readers of a news paper
- Potential voters of a political party
- Opponents in a debate
- ...



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Different ways of arguing work for different people

- Knowing the audience needed for successful argumentation
- Modeling the audience needed to assess quality?

Three High-level Aspects of Quality

Logic



*“A is known to be
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Therefore, B.”*

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Dialectic

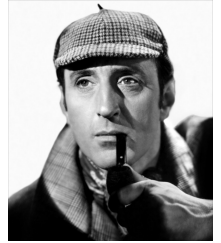


“We agree on A. Also, no one denies that A suggests B. Then, we should conclude B.”

Logical Argumentation Quality – Theory

Soundness rather studied in formal argumentation

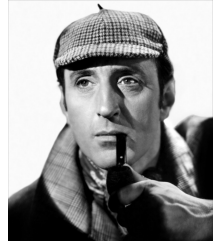
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Cogency: Argument has acceptable premises that are relevant and sufficient

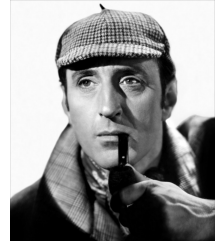
(Johnson & Blair 2006)

- Acceptability: Worthy of being believed by target audience
- Relevance: Support conclusion
- Sufficiency: Provide enough evidence to draw conclusion
- Sometimes also: Rebuttal, well-formedness (Damer 2009, Govier 2010)

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Strength of arguments often discussed but unclear (Perelman et al. 1969)

Fallacies: Arguments with flaws that undermine the reasoning (Tindale 2007)

- Several types, e.g., ad-hominem attack or red herring
- Partly hard to be addressed computationally

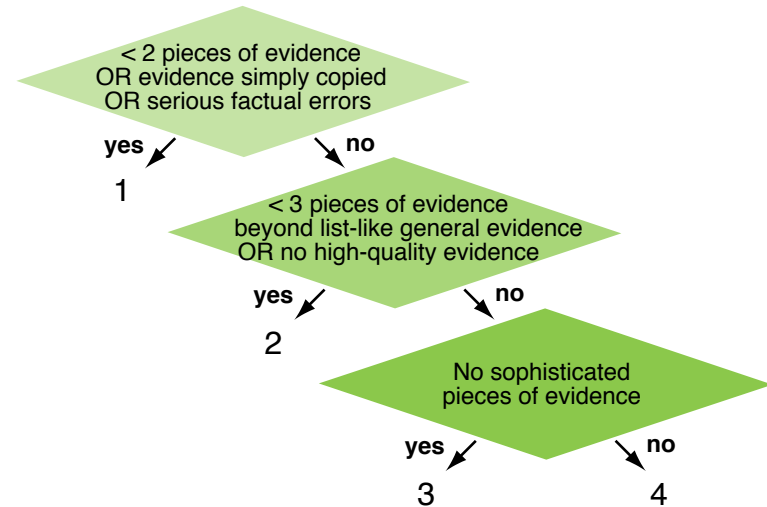
Logical Argumentation Quality – Approaches

Evidence quality of student essays

(Rahimi et al. 2014)

- How well does the provided evidence support the thesis? (→ sufficiency)
- Best features: Density and specificity of prompt-related words

⇒ Accuracy: 62% for 4-point scale



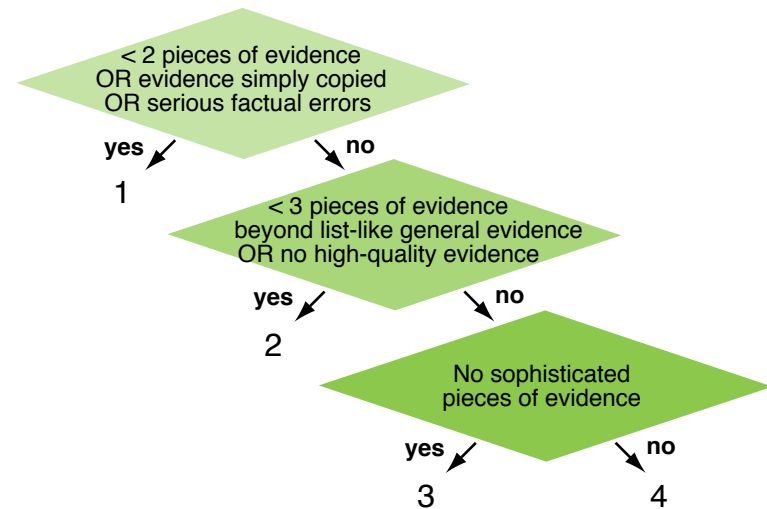
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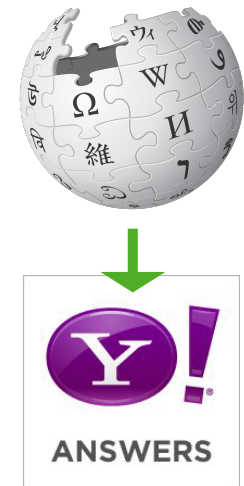


Premise ranking in community question answering

(Braunstain et al. 2016)

- Does evidence from Wikipedia support an answer? (→ relevance)
- Approach: Combining classical retrieval models with support-oriented features

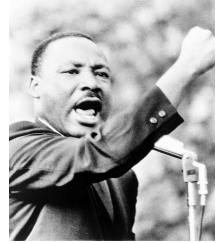
⇒ **Precision@5: 0.52**



Rhetorical Argumentation Quality – Theory

Aristotle's work on rhetoric still prevalent (Aristotle & Kennedy 2007)

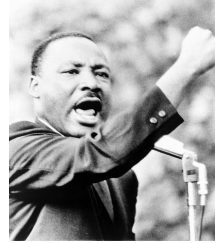
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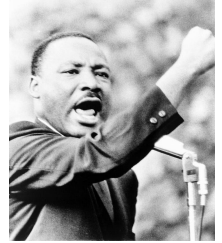
Means of persuasion

- Logos: Use true and valid arguments (→ soundness / cogency)
- Ethos: Achieve credibility as a speaker/author
- Pathos: Put target audience into adequate emotional state

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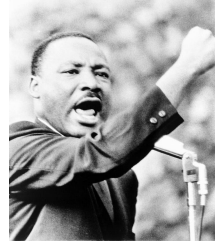
Linguistic delivery

- Clarity: Use correct language, avoid complexity
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- Arrangement: Order topics and arguments properly

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Effectiveness in achieving persuasion main rhetorical quality (van Eemeren 2015)

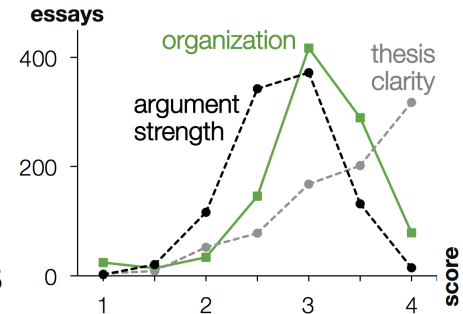
- Depends strongly on target audience

Rhetorical Argumentation Quality – Approaches

Argumentation-related essay scoring

(Persing et al. 2010, Persing & Ng 2013, 2015, Rahimi et al. 2015)

- Organization, thesis clarity, argument strength
(→ arrangement, clarity, effectiveness)
- Tailored features, e.g., discourse function sequences

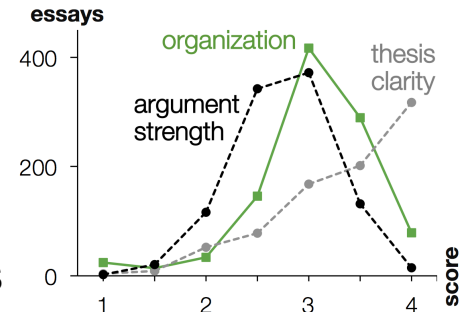


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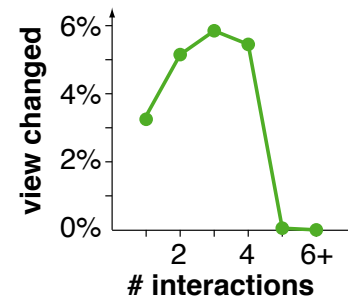
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Persuasive arguments in “change my view” forums

(Tan et al. 2016)

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- Beneficial: Multiple interactions, appropriate style, high number of participants

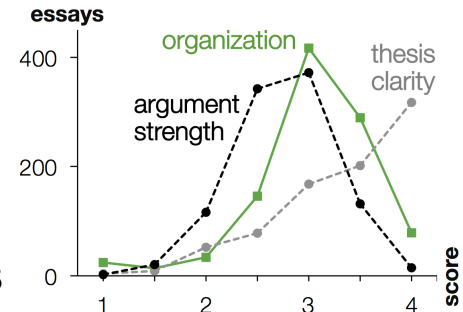


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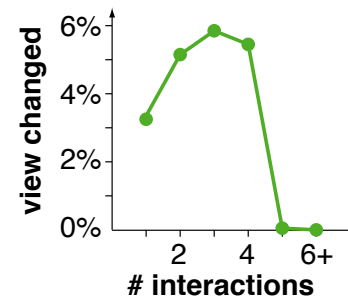
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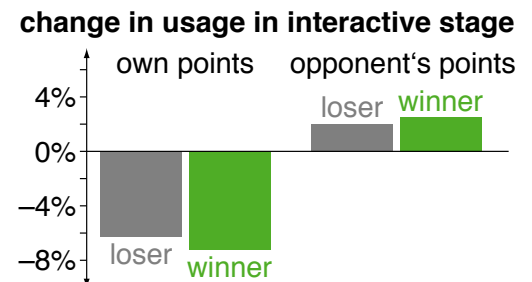
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Conversational flow in Oxford-style debates

(Zhang et al. 2016)

- How to win a debate? (→ effectiveness)
- Attacking the opponent's points better than focus on own points



Dialectical Argumentation Quality – Theory

Dialectical view of argumentation: Resolving differences of opinions on the merit (van Eemeren and Grootenhorst 2004)

- Considered for discussions that aim at agreement



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Reasonableness main dialectical quality; emerges from two dimensions (van Eemeren and Grootenhorst 2004)

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- Problem-solving validity: Contribution to resolution
- Effectiveness remains underlying goal (van Eemeren 2015)

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Convincingness sometimes discussed as “rational persuasiveness” (Perelman et al. 1969)

- Aims at universal audience, which has been criticized (van Eemeren 2015)
- Needs global sufficiency: All objections countered (Damer 2009, Blair 2012)

Dialectical Argumentation Quality – Approaches

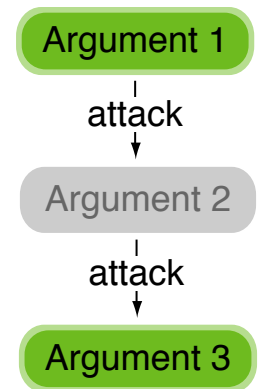
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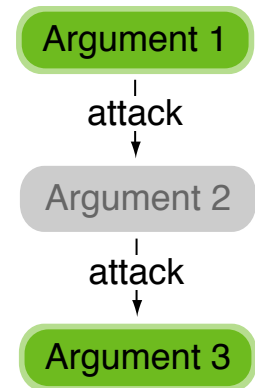
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Popular arguments in online debates (Boltužić & Šnajder 2015)

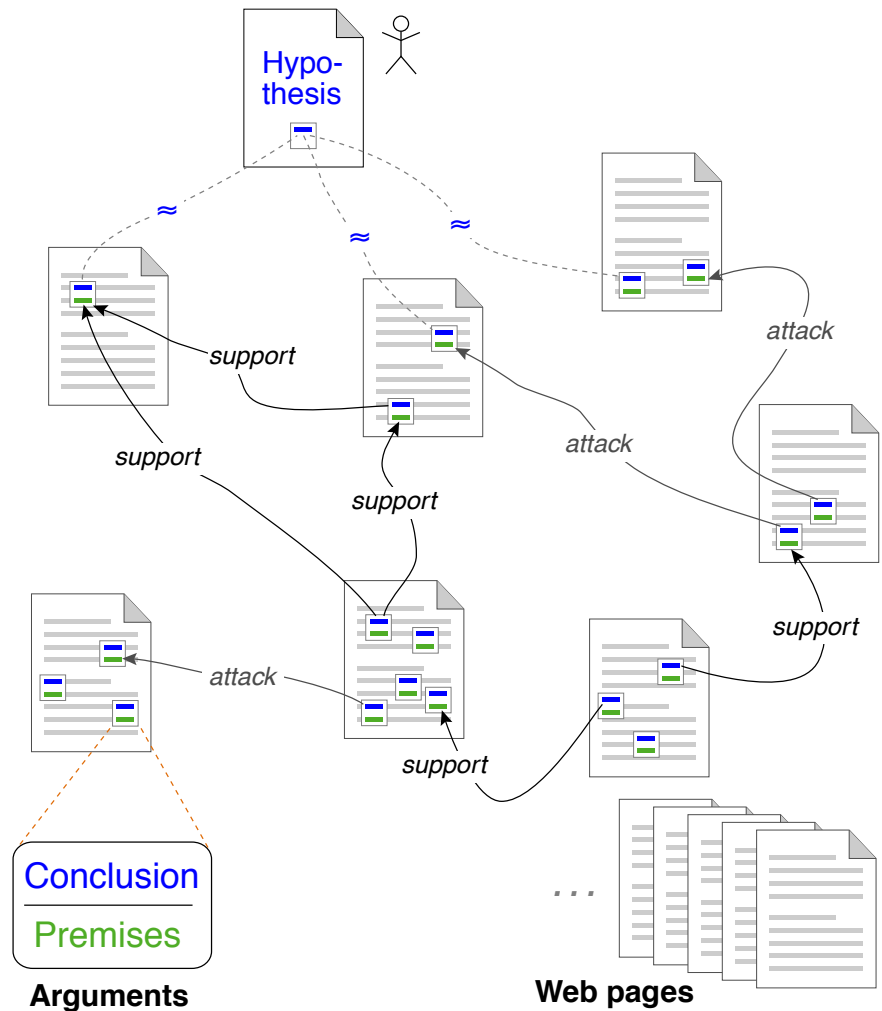
- Clustering to determine popular arguments
- Quality nature of popularity questionable (Govier 2010)

Assessing Objective Argument Relevance at Web Scale

Relevant arguments on the web

(Al-Khatib et al. 2016, more to come)

- Construct graph based on arguments mined from all web pages
- Adapt PageRank to assess global argument relevance objectively
(\rightarrow problem-solving validity)
- Recursive weighting:
Argument relevant if many relevant arguments use its conclusion as a premise



Conclusion

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- Also, general text quality important

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Assessment important in argument search, writing support, ...

- Much theory, not many corpora and approaches yet
- Common view still missing ... but we are working on it :-)

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