Argument Corpora, and Argument Mining and Analytics
(PART 1)

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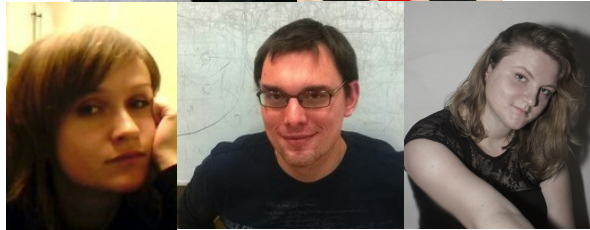
ARG-tech (Warsaw & Dundee)

Kasia Budzynska (PL, UK)

Rory Duthie (UK)

Basia Konat (UK, PL)

Marcin Koszowy (PL)
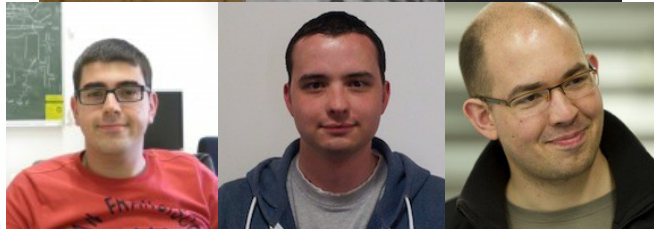
Olena Yaskorska (PL)

Chris Reed (UK, PL)

Mathilde Janier (UK)

John Lawrence (UK)

Martín Pereira Fariña (UK)

Mark Snaith (UK)

Jacky Visser (UK)

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Argument Mining
(Budzynska & Villata 2017)

Before 2014: fewer than 10 papers

After 2014:

1) *From Real Data to Argument Mining*, 12th ArgDiaP Conference, Polish Academy of Sciences, Warsaw, Poland, 23-24 May 2014. (22 papers)

2) *1st Workshop on Argumentation Mining*, 52nd Annual Meeting of the Association for Computational Linguistics, Baltimore, US, June 26, 2014 (18 papers)

3) *SICSA Workshop on Argument Mining: Perspectives from Information Extraction, Information Retrieval and Computational Linguistics,* ARG-tech, Dundee, Scotland, 9-10 July 2014. (ca. 25 participants)

4) *Frontiers and Connections between Argumentation Theory and Natural Language Processing*, Bertinoro (Forlì-Cesena), Italy, 21-25 July 2014.

5) *2nd Workshop on Argumentation Mining*, 53nd Annual Meeting of the Association for Computational Linguistics, Denver, US, June 04, 2015 (16 papers)

6) *Arguments in Natural Language: The Long Way to Analyze the Reasons to Believe and the Reasons to Act*, 1st European Conference on Argumentation, Lisbon, 9-12 July 2015

7) *Natural Language Argumentation: Mining, Processing, and Reasoning over Textual Arguments*, Dagstuhl Seminar, April 17 – 22 , 2016

8) *3rd Workshop on Argumentation Mining*, 54nd Annual Meeting of the Association for Computational Linguistics), Berlin, Aug 12, 2016 (20 papers)

(1/4) Foundations

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(1a/4) Arguments and Dialogue: Theoretical Foundations
(Budzynska & Reed, 2011)

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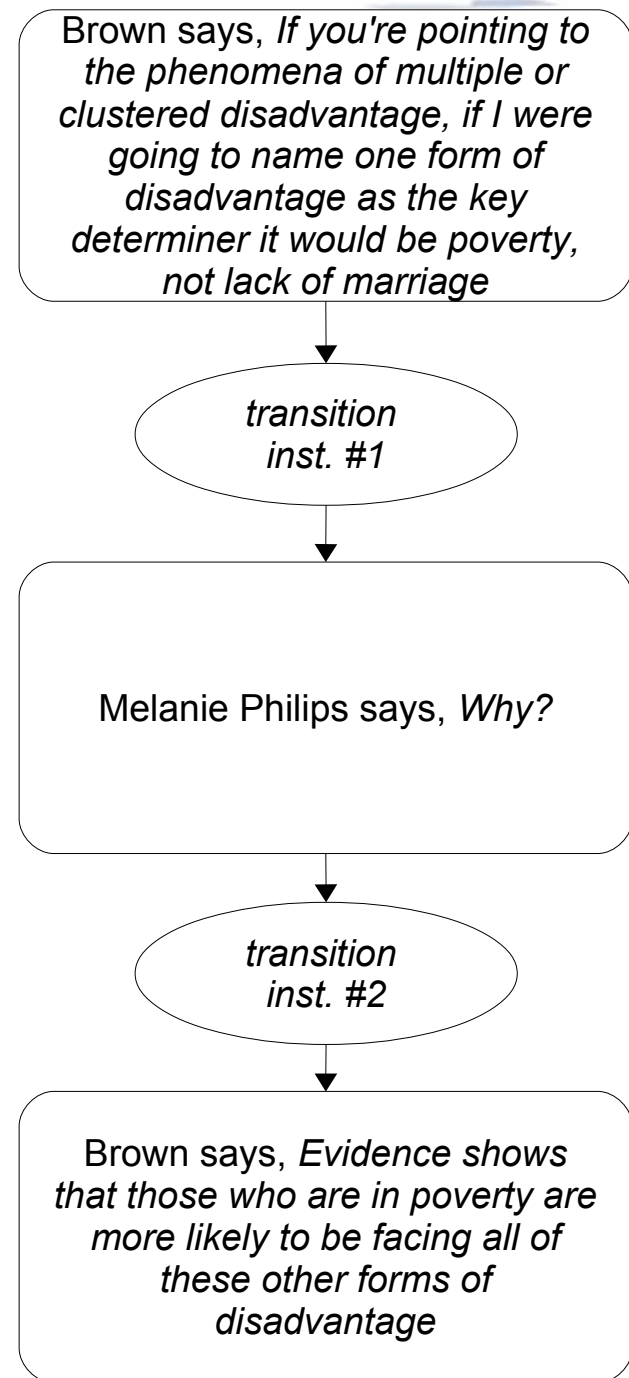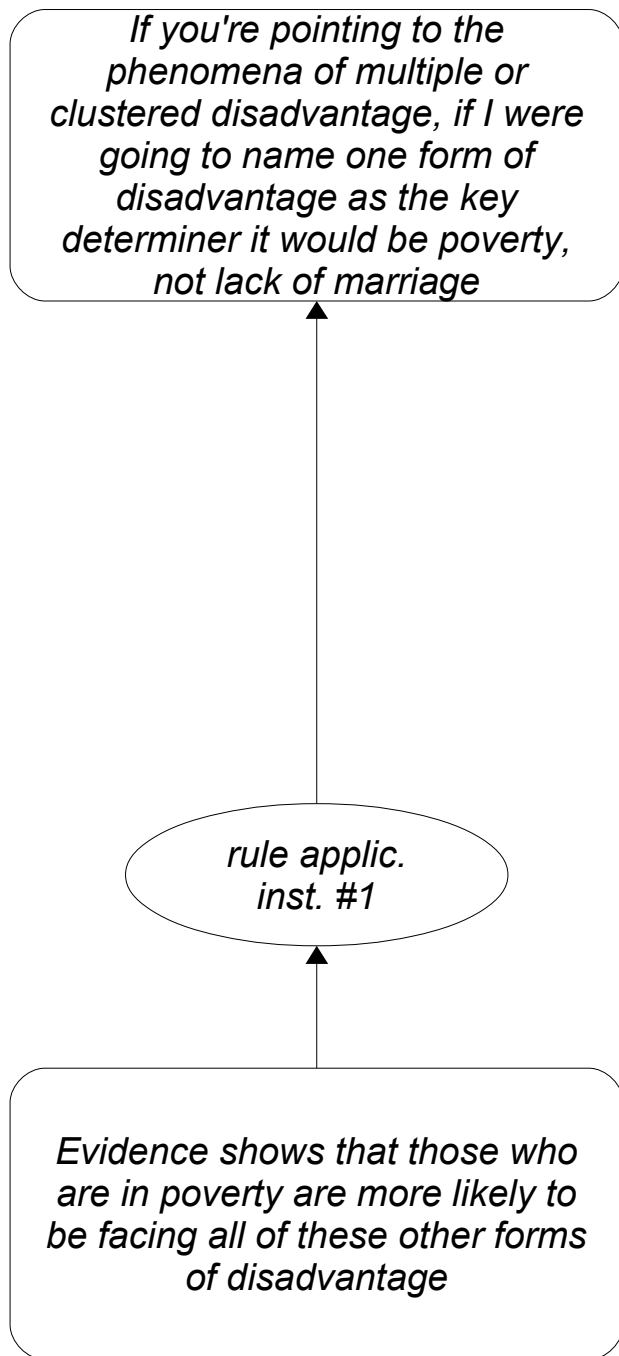
Inference Anchoring Theory, IAT

DIALOGUE:

(a) Alexander Brown said, *If you're pointing to the phenomena of multiple or clustered disadvantage, if I were going to name one form of disadvantage as the key determiner it would be poverty, not lack of marriage.*

(b) Melanie Philips said, *Why?*

(c) Alexander Brown said, *Evidence shows that those who are in poverty are more likely to be facing all of these other forms of disadvantage.*

ARGUMENTATION (INFERENCE):

(Arg1) *If you're pointing to the phenomena of multiple or clustered disadvantage, if I were going to name one form of disadvantage as t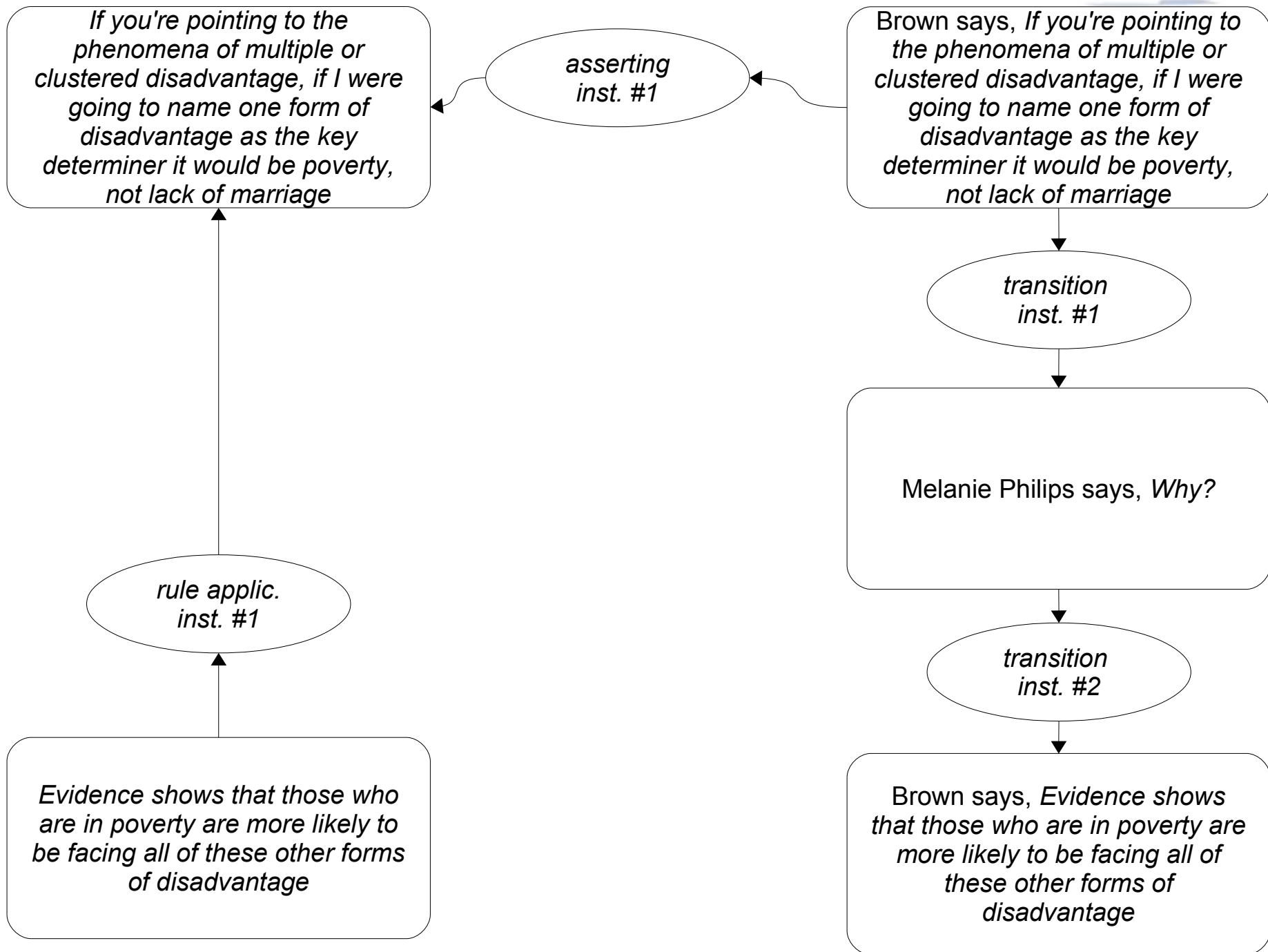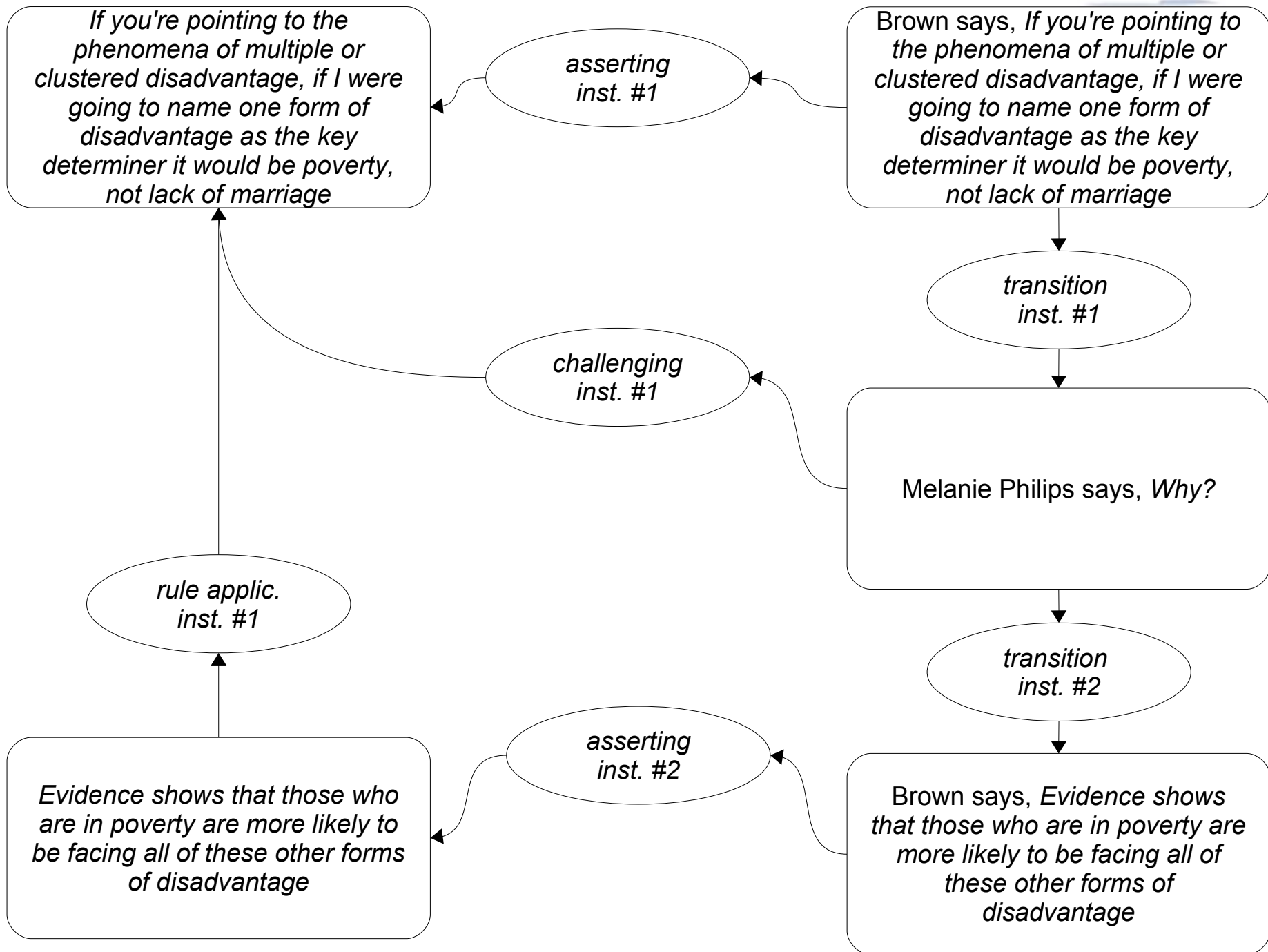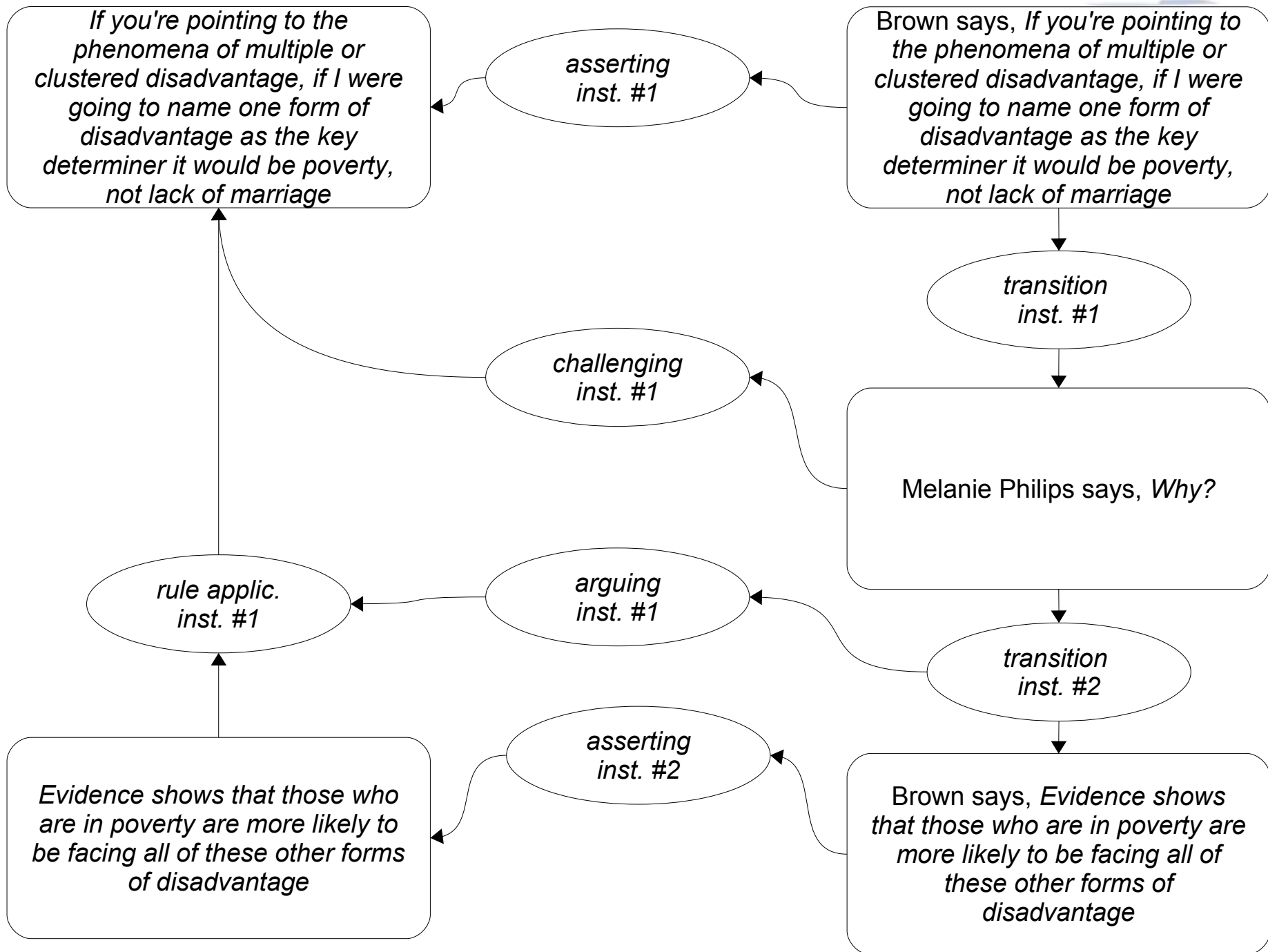he key determiner it would be poverty, not lack of marriage* because *Evidence shows that those who are in poverty are more likely to be facing all of these other forms of disadvantage.*

If you're pointing to the phenomena of multiple or clustered disadvantage, if I were going to name one form of disadvantage as the key determiner it would be poverty, not lack of marriage

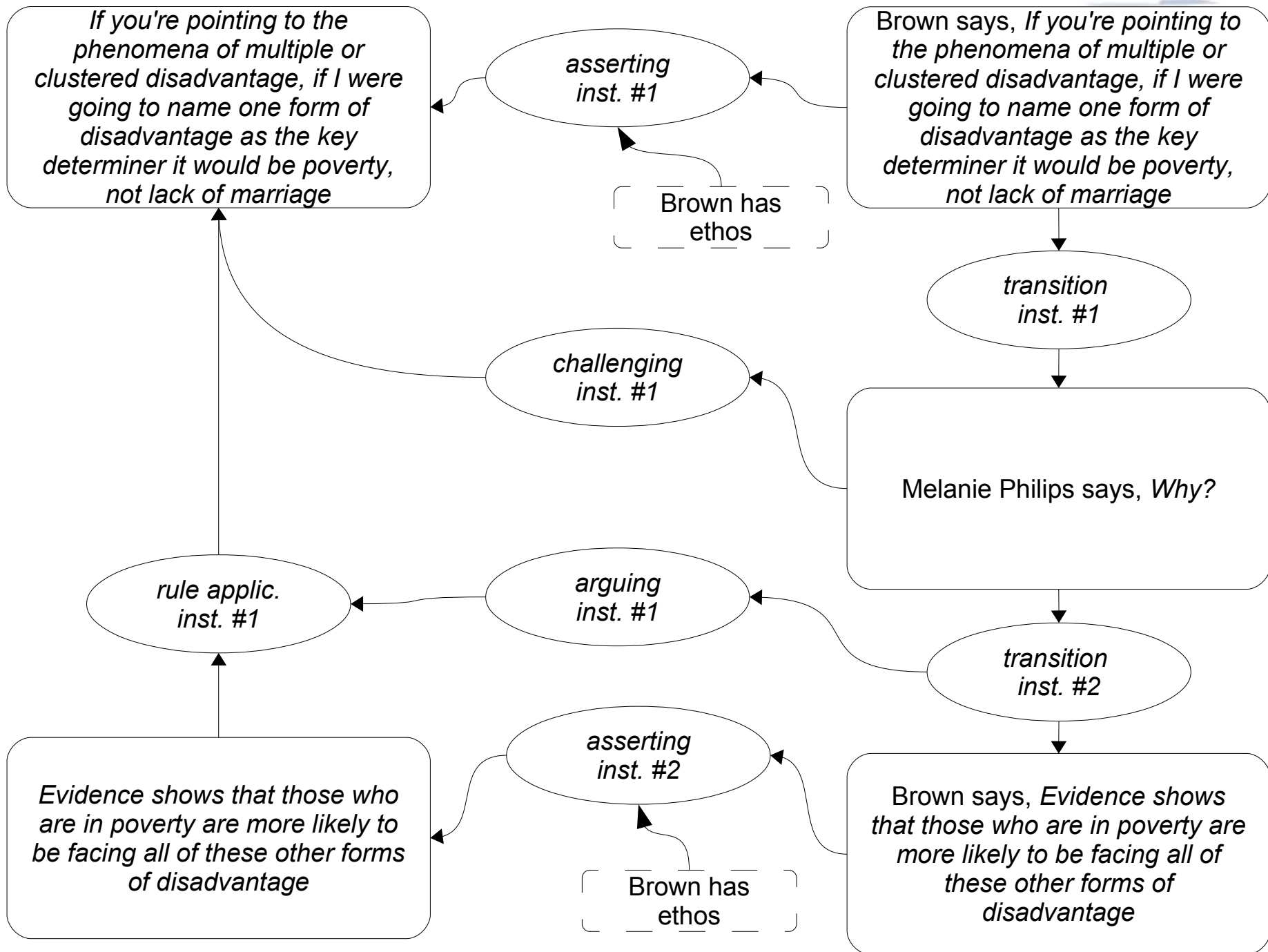Brown says, *If you're pointing to the phenomena of multiple or clustered disadvantage, if I were going to name one form of disadvantage as the key determiner it would be poverty, not lack of marriage*

transition inst. #1

Melanie Philips says, *Why?*

transition inst. #2

rule applic. inst. #1

Evidence shows that those who are in poverty are more likely to be facing all of these other forms of disadvantage

Brown says, *Evidence shows that those who are in poverty are more likely to be facing all of these other forms of disadvantage*

If you're pointing to the phenomena of multiple or clustered disadvantage, if I were going to name one form of disadvantage as the key determiner it would be poverty, not lack of marriage

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challenging inst. #1

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rule applic. inst. #1

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asserting inst. #2

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asserting inst. #2

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asserting inst. #1

Brown has ethos

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transition inst. #1

challenging inst. #1

Melanie Philips says, *Why?*

rule applic. inst. #1

arguing inst. #1

transition inst. #2

Evidence shows that those who are in poverty are more likely to be facing all of these other forms of disadvantage

asserting inst. #2

Brown has ethos

Brown says, *Evidence shows that those who are in poverty are more likely to be facing all of these other forms of disadvantage*

Inference Anchoring Theory, IAT

DIALOGUE:

(a) Alexander Brown said, *If you're pointing to the phenomena of multiple or clustered disadvantage, if I were going to name one form of disadvantage as the key determiner it would be poverty, not lack of marriage.*

(b) Melanie Philips said, ***Why?***

(c) Alexander Brown said, *Evidence shows that those who are in poverty are more likely to be facing all of these other forms of disadvantage.*

ARGUMENTATION (INFERENCE):

(Arg1) *If you're pointing to the phenomena of multiple or clustered disadvantage, if I were going to name one form of disadvantage as the key determiner it would be poverty, not lack of marriage* **because** *Evidence shows that those who are in poverty are more likely to be facing all of these other forms of disadvantage.*

(1b/4) Arguments and Dialogue: Technical Foundations

(Lawrence et al. 2017b; Reed et al. 2017)

Treat it like any other text mining problem:

Annotate data, train classifier or build rules, tweak & repeat.

Moens, Boiy, Palau & Reed, 2007

Basic **approach**

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Annotate __data__, train classifier or build rules, tweak & repeat.

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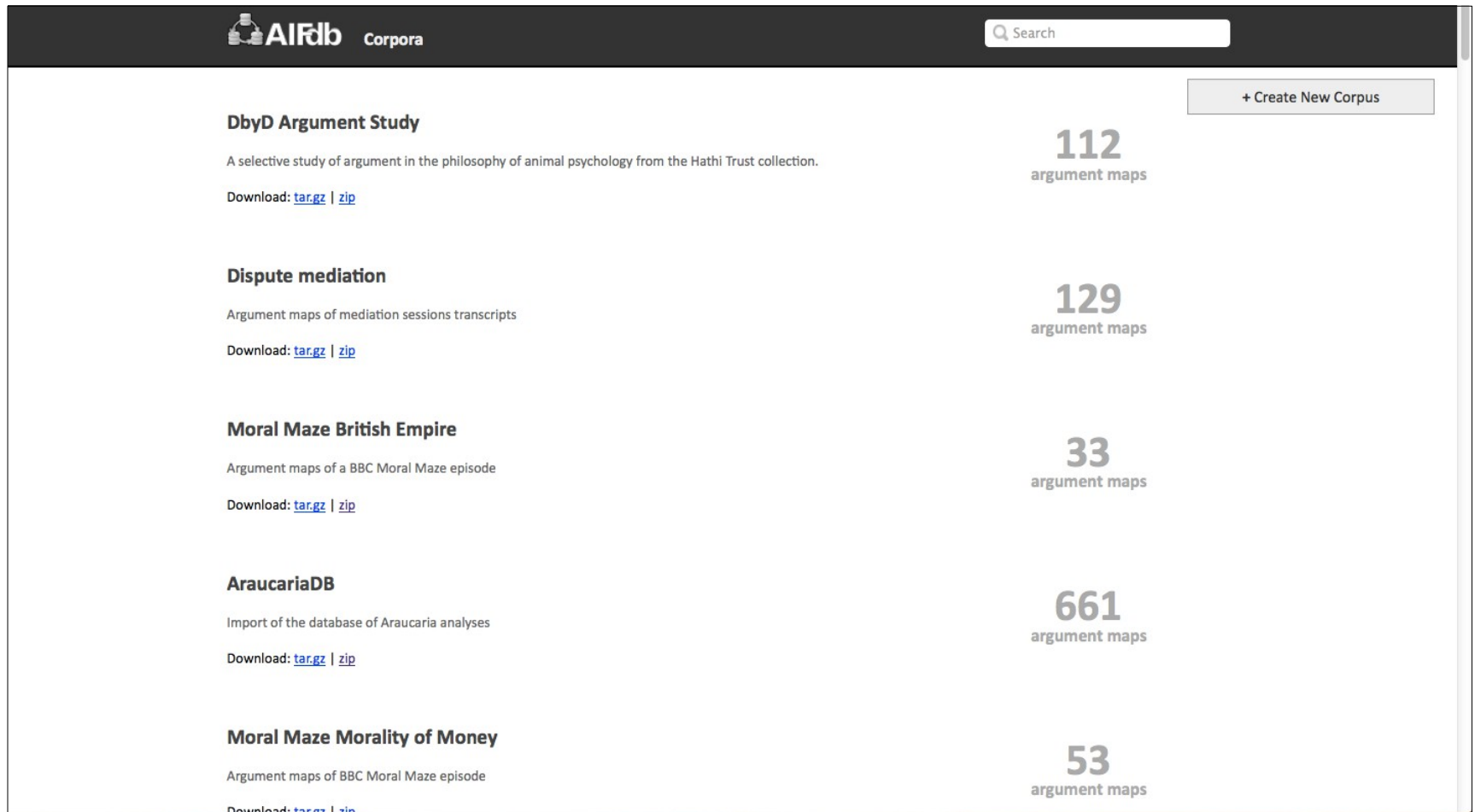
<u>Annotate</u> data, train classifier or build rules, tweak & repeat.

Moens, Boiy, Palau & Reed, 2007

Solving the **brute** problem

aifdb.org

Solving the **brute** problem

corpora.aifdb.org

Solving the **brute** problem

ova.arg.tech

Solving the **brute** problem

argublogging.com

ArguBlo,,ing

from ARG:dundee

ArguBlogging allows you to agree and disagree with opinions expressed anywhere online. Your arguments are presented not just as text, but also as elements of the Argument Web: a richly structured interconnected web of debates and disputes, arguments and counterarguments. The arguments you contribute via argublogging can be used by other Argument Web tools to automatically express opinions, to teach students how to think better, to help the public navigate complex issues, and to conduct academic research into the way argument works.

Try ArguBlogging as a guest

Drag the guest bookmarklet to your bookmark toolbar:

ArguBlog This

OR

Select some text on a web page, and click the ArguBlogging button to start argublogging and see the result on the guest blog.

Register for ArguBlogging

Give your email and a password so that we can store OAuth keys that allow argublogging to post to your blog

Email: chris@computing.dundee.ac

Password: •••••••••

Register >>

Already registered?

The application currently supports two popular blogging platforms: tumblr and Blogger. Publishing permissions are handled using OAuth, so there is never any need for you to provide us with your passwords – just grant the argublogging application access to your blog when prompted.

When you encounter text online with which you want to agree or disagree, highlight it, and click the ArguBlogging button. After posting your opinion to your blog, you can also view it as a part of a conversation in the ever growing debate that is the Argument Web.

Solving the **brute** problem

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`arvina.arg.tech`

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arg-tech.org

Solving the **brute** problem
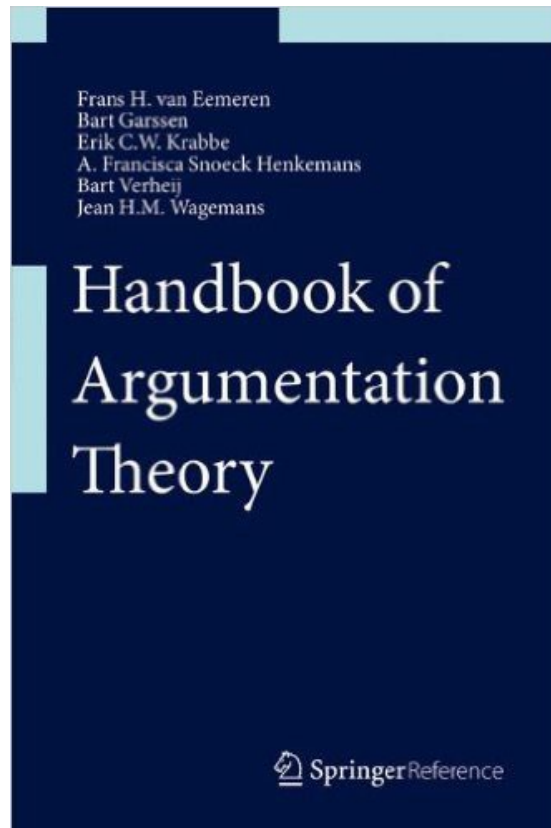
Interoperably share & re-use:

- Language of Opposition – Rutgers/Columbia
- Microtext corpus – Potsdam
- Internet Argument Corpus (IAC) – Santa Cruz
- Erulemaking corpus – Cornell
- Araucaria Corpus – Dundee
- Araucaria-PL Corpus – Warsaw
- MM2012 Corpus – Dundee
- *plus over 30 other corpora*

Solving the **brute** proble

On the AIFdb servers at Dundee:

- 1.5m words

- 14 languages, 4 scripts

- 50k annotated arguments

- 300-500 unique users per month

Solving the **subtle** problem

Frans H. van Eemeren
Bart Garssen
Erik C.W. Krabbe
A. Francisca Snoeck Henkemans
Bart Verheij
Jean H.M. Wagemans

Handbook of Argumentation Theory

Springer Reference

Solving the **subtle** problem
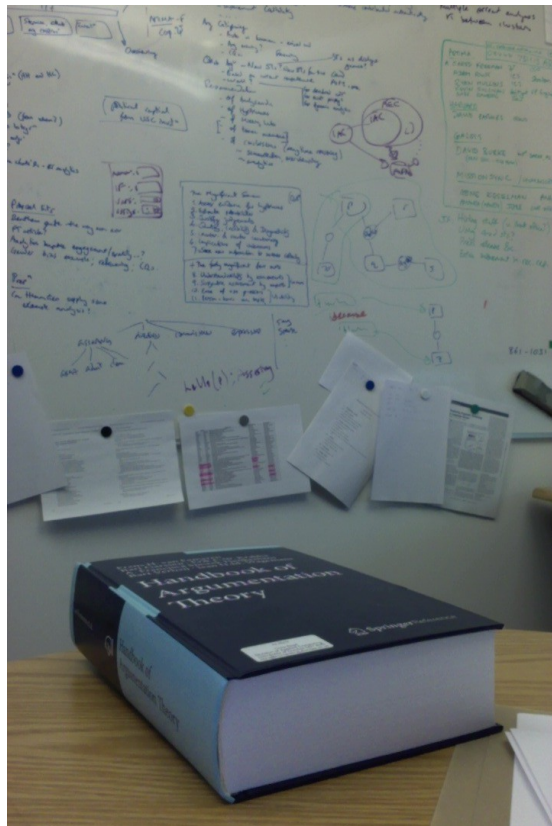
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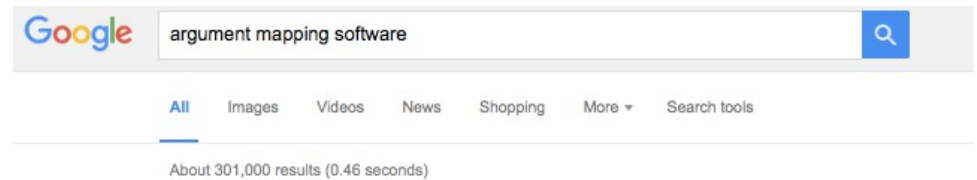
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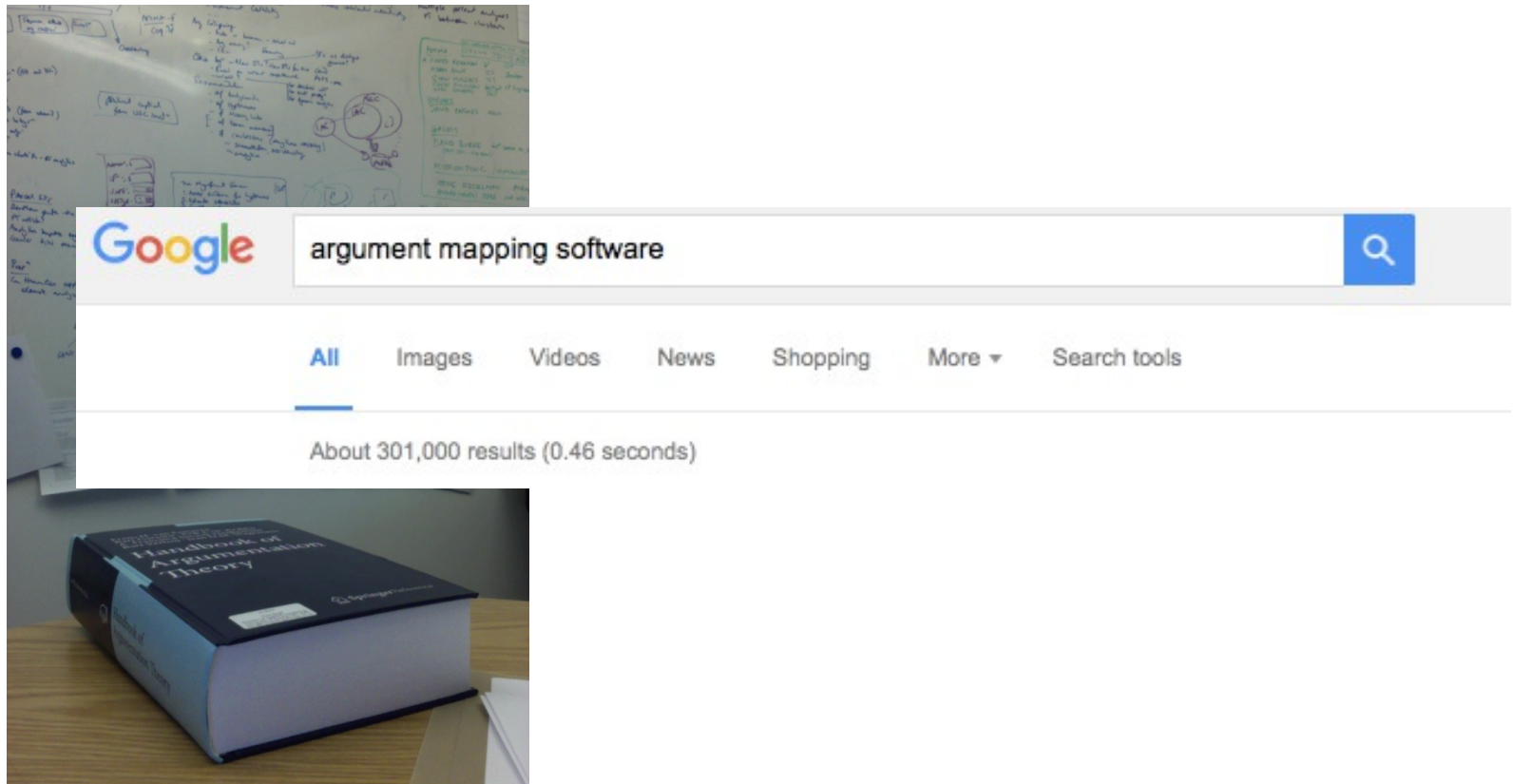
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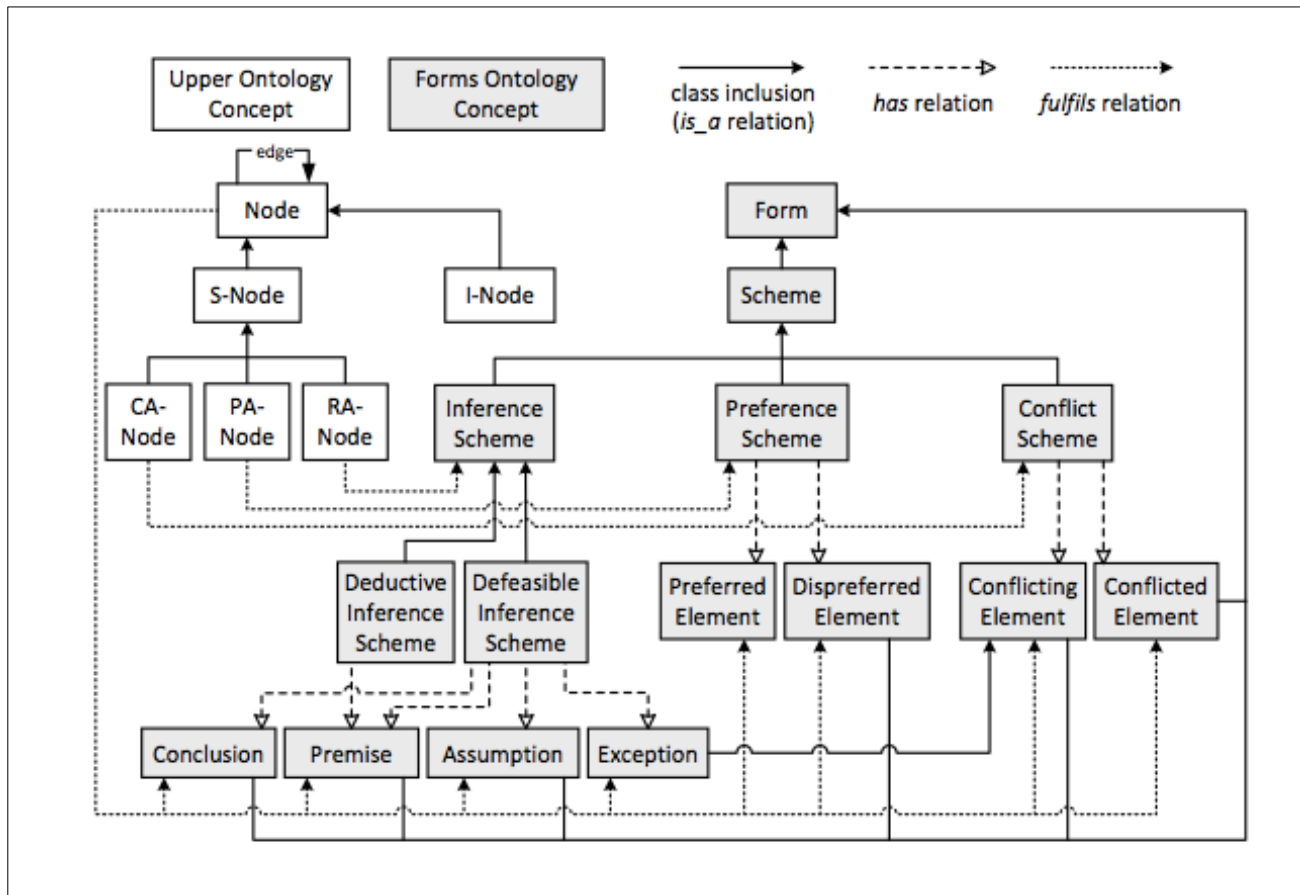
AIF: Argument Interchange Format
Artificial Intelligence 2007

Solving the **subtle** problem

Node Type	Description
I	propositional information contained in an argument, such as a conclusion, premise, data etc.
L	subset of I-nodes referring to propositional reports specifically about discourse events
RA	application of a scheme of reasoning or inference
CA	application of a scheme of conflict
MA	application of a scheme of rephrasing
YA	application of a scheme of illocution describing communicative intentions which speakers use to introduce propositional contents
TA	application of a scheme of interaction or protocol describing relations between locutions

AIF and IAT

Solving the **subtle** problem
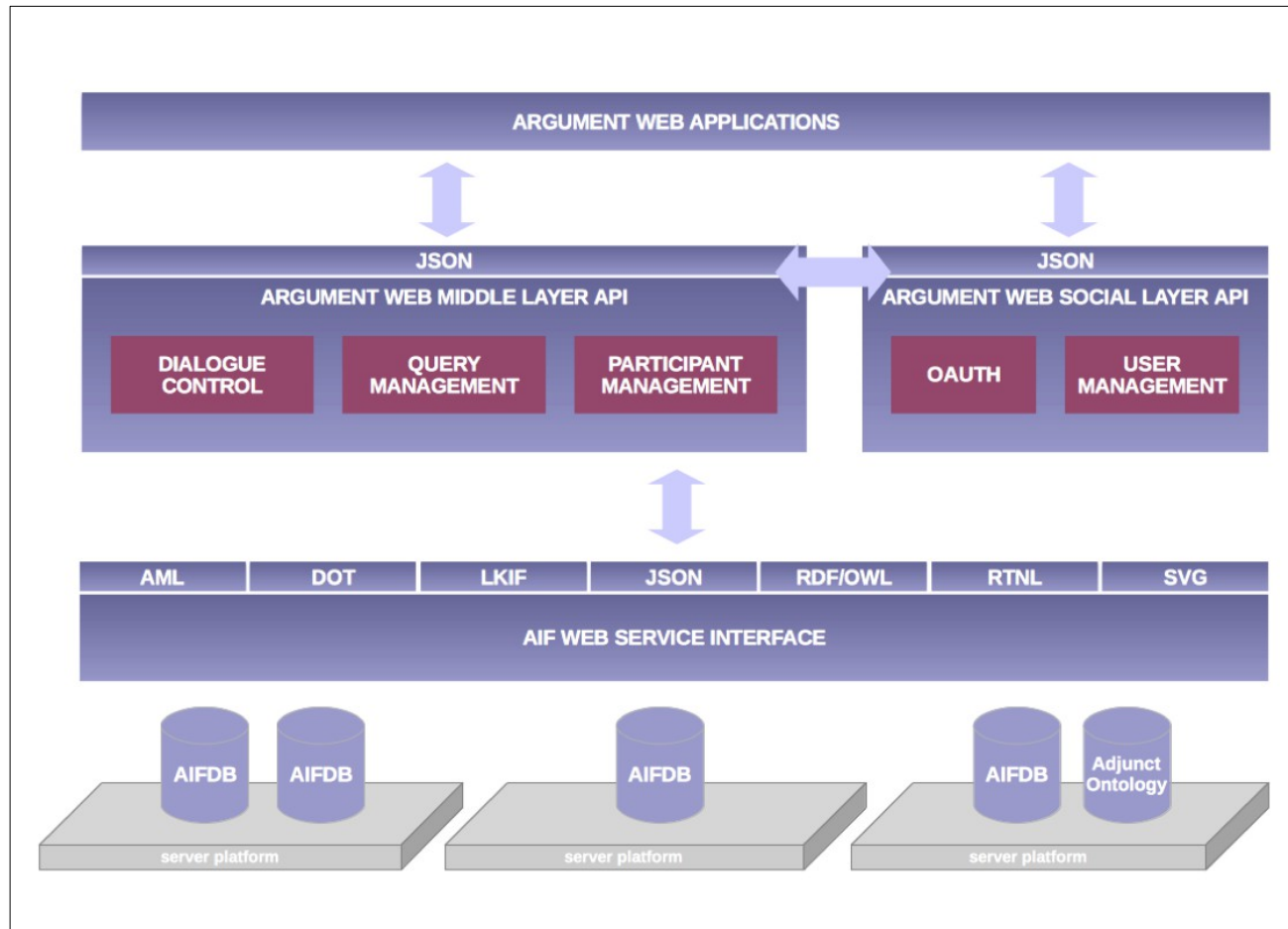
Argument Web
CACM 2013

(2/4) Argument Structures for Corpus Analysis

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(2a/4) Basic
Argument Structures

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Two types

• **Support** (argumentation, Default Inference, RA) - holds between two propositions when one proposition provides a reason to accept another proposition. In other words, for a given claim p, a supporting claim q can be used to reply to the question "Why p?" ("Because q").

• **Conflict** (Attack, Default Conflict, CA) - holds between two propositions which cannot be both true at the same time. Speakers use conflicting propositions to attack another speaker's claims by means of providing counter-claims.

Two types of arguments
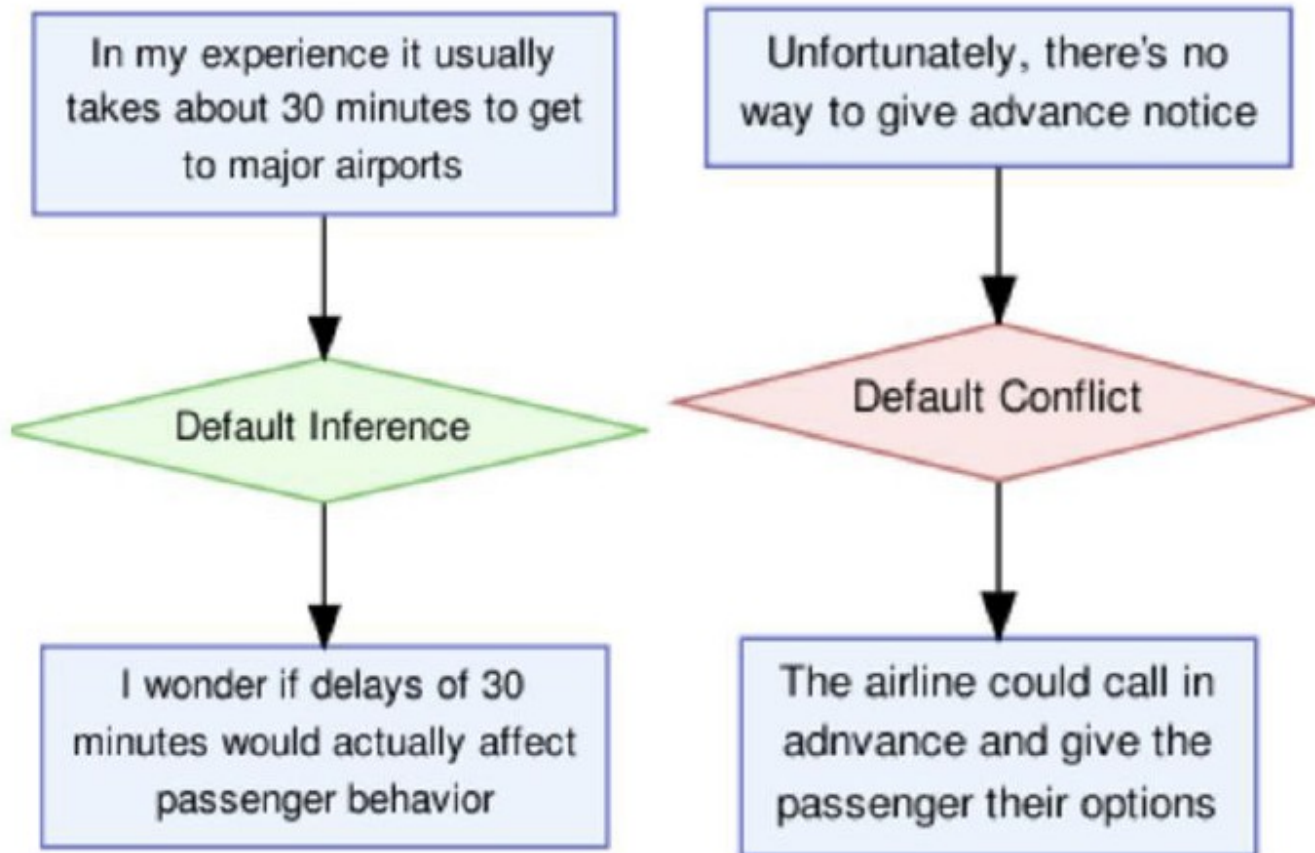
Example 1

•Discussion Board in BB: **Is technology destroying imagination?**

I think it is entirely dependant on how people use the internet which shapes the way they think. The internet can be used to inspire people. Things can be seen, read about, watched, listened to at the user's convenience. The internet can also be used to learn an entire spectrum of new information. There is a valid point though that some websites do not offer many positive outcomes.

Argument map in OVA+ (ova.argtech.org)
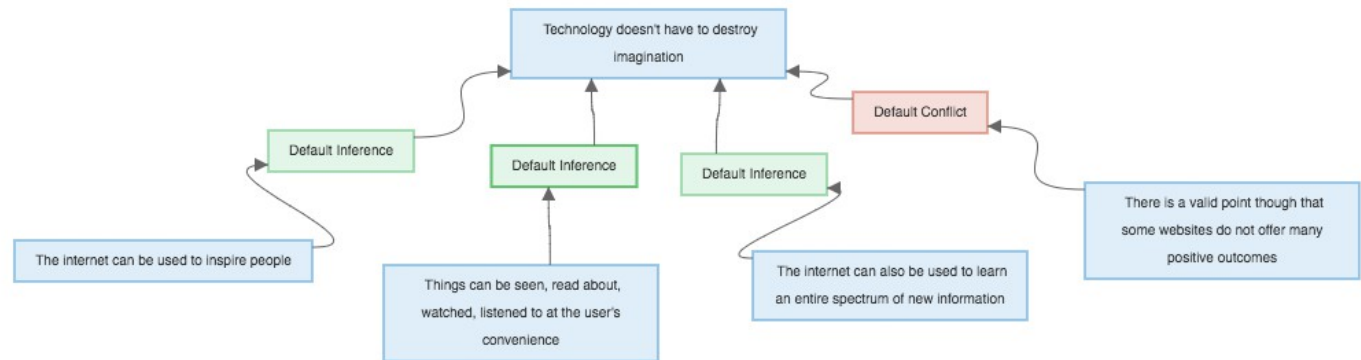
How are arguments signalled linguistically?

Is technology destroying imagination?

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(1) Discourse indicators?

Is technology destroying imagination?

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(2) Topic similarity?

Is **technology** destroying imagination?

I think it is entirely dependant on how people use the **internet** which shapes the way they think. The internet can be used to inspire people. Things can be seen, read about, watched, listened to at the user's convenience. The internet can also be used to learn an entire spectrum of new information. There is a valid point though that some websites do not offer many positive outcomes.

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(1+2) Discourse indicators + topic similarity?

Is **technology** destroying imagination?

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(3) Sentiment?

Is technology destroying imagination?

I think it is entirely dependant on how people use the internet which shapes the way they think. The internet can be used to <u>inspire</u> people. Things can be seen, read about, watched, listened to at the user's <u>convenience</u>. The internet can also be used to <u>learn</u> an <u>entire spectrum</u> of new information. There is a valid point though that some websites <u>do not</u> offer many <u>positive outcomes</u>.

(3) Sentiment?

Is technology destroying imagination?

I think it is entirely dependant on how people use the internet which shapes the way they think. The internet can be used to inspire people. Things can be seen, read about, watched, listened to at the user's convenience. The internet can also be used to learn an entire spectrum of new information. There is a valid point though that some websites do not offer many positive outcomes.

(3) Sentiment (positive = support, and vice versa)?

Where should we go for holidays?

Warsaw has many great bars which are cheap.

(3) Sentiment (positive = support, and vice versa)?

Where should we go for holidays?

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(3) Sentiment (positive = support, and vice versa)?

Where should we go for holidays?

• "We should go to Warsaw." "Warsaw has many great bars which are cheap." Support

•"We should go to Copenhagen." "Warsaw has many great bars which are cheap."

(3) Sentiment (positive = support, and vice versa)?

Where should we go for holidays?

• "We should go to Warsaw." "Warsaw has many great bars which are cheap." Support

•"We should go to Copenhagen." "Warsaw has many great bars which are cheap." Attack

(4) Txt span or relation?

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(4) Txt span or relation? (Specific domains)

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(4) Txt span or relation? (Specific domains)

Where should we go for holidays?

• "We should go to Warsaw." "Warsaw has many great bars which are cheap." Support

• "We should go to Copenhagen." "Warsaw has many great bars which are cheap." Attack

(4) Txt span or relation? (Specific domains)

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(4) Txt span or relation? (Specific domains)

~~Where should we go for holidays?~~

• "We should go to Warsaw." "Warsaw has many great bars which are cheap." Support

• "We should go to Copenhagen." "Warsaw has many great bars which are cheap." Attack

• "Warsaw has many great bars which are cheap." ???

(4) Txt span or relation? (argument = txt span?)

"I love bananas"

(4) Txt span or relation? (argument = txt span?)

- "What fruits do you like?" "<u>I love bananas</u>."

- "We should visit Philippines. <u>I love bananas</u> and in Philippines they grow amazing baby bananas, best in the world."

- "Chris hates bananas." "<u>He loves them</u>!"

(4) Txt span or relation? (argument = txt span?)

- "What fruits do you like?" "I love bananas." **Not Argument**

- "We should visit Philippines. I love bananas and in Philippines they grow amazing baby bananas, best in the world." **Support**

- "Chris hates bananas." "He loves them!" **Conflict**

(4) Txt span or relation?
(If argument = relation, then...)

• Not only convergent, but also linked and serial arguments, or even unrelated text

• Long-distance relations

(4) Txt span or relation?
(If argument = relation, then...)

• **Not only convergent, but also linked and serial arguments, or even unrelated text**

• Long-distance relations

(4) Example 2: Not only convergent

Is technology destroying imagination? I think that, firstly, it depends on with what aim people are using technologies. Speaking about youngsters who spend most of their time on the computer playing computer games or just charting in different chats and forums, I strongly believe that they are destroying their imagination. They do not see anything around besides their computer or game console. But if we speak about people who are using technologies with reasonable causes such as working or studying, this part of society does not destroy their imagination. On the contrary, they are evolving that.

(4) Example 2: Not only convergent

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2. They do not see anything around besides their computer or game console

3. if we speak about people who are using technologies with reasonable causes such as working or studying, this part of society does not destroy their imagination

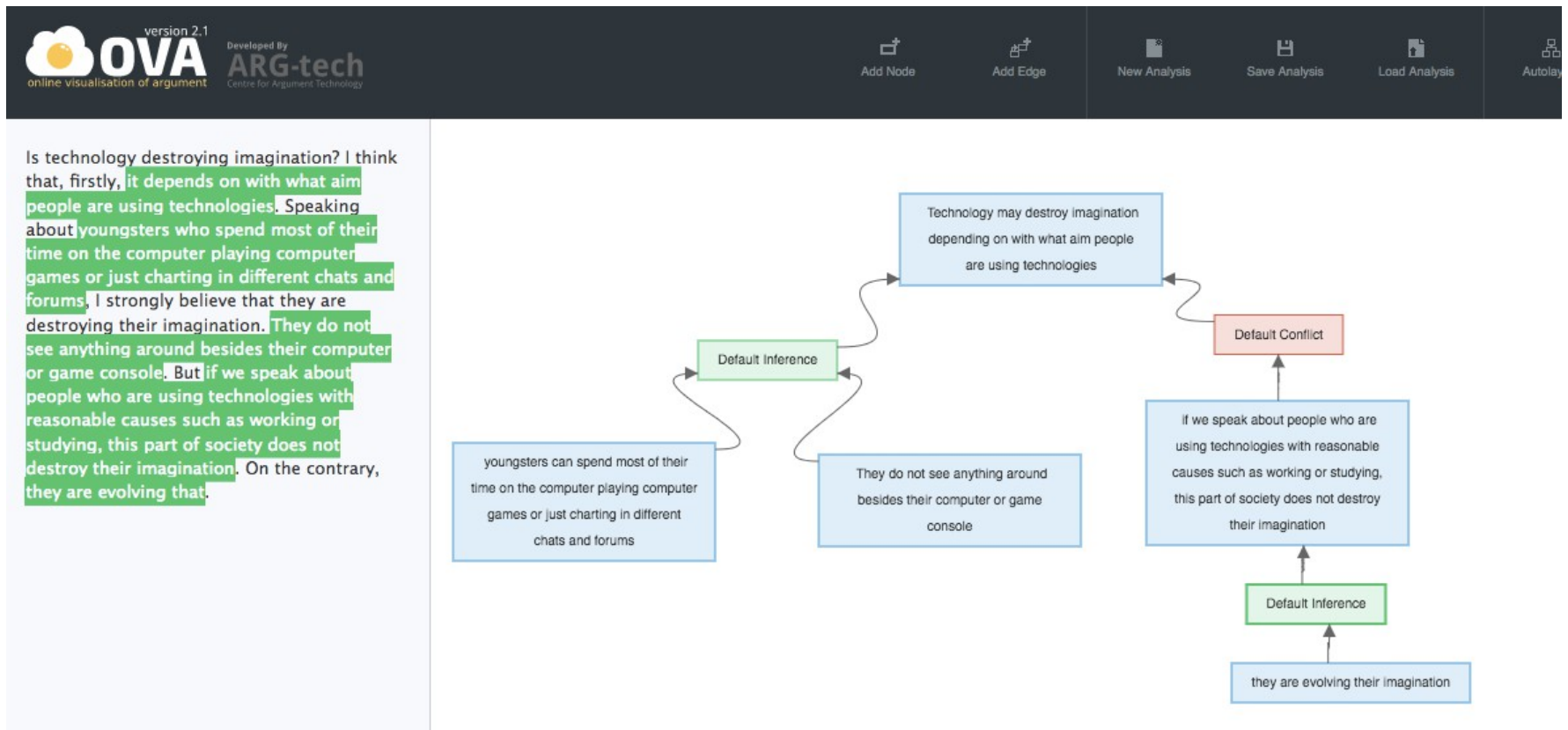4. they are evolving that

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(4) Example 2: Not only convergent

Is technology destroying imagination? I think that, firstly, it depends on with what aim people are using technologies. Speaking about youngsters who spend most of their time on the computer playing computer games or just charting in different chats and forums, I strongly believe that they are destroying their imagination. They do not see anything around besides their computer or game console. But if we speak about people who are using technologies with reasonable causes such as working or studying, this part of society does not destroy their imagination. On the contrary, they are evolving that.
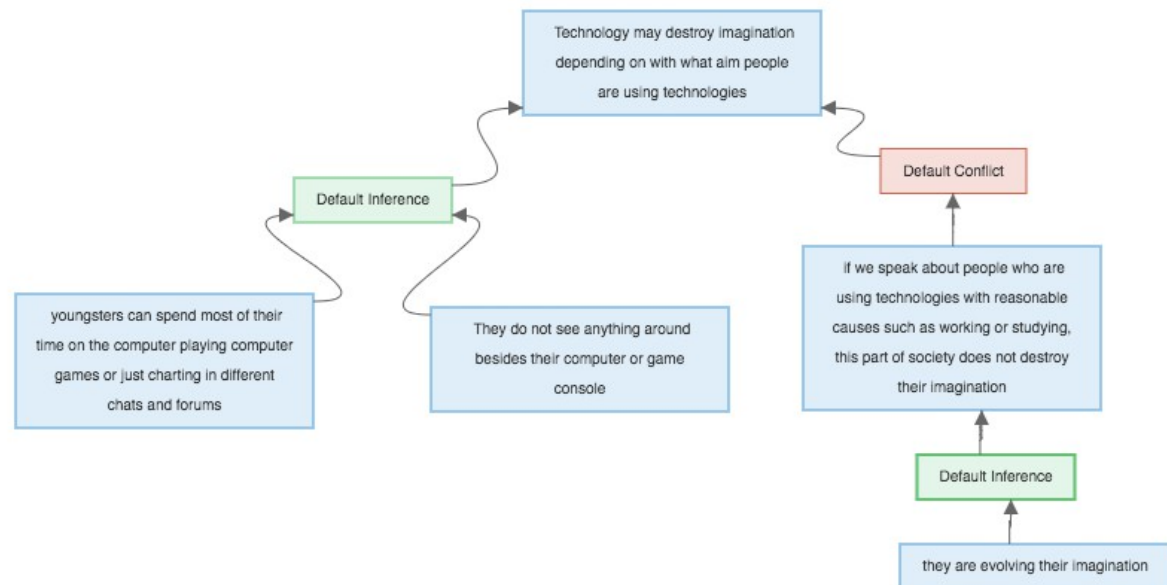
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(4) Analysis/SenseMaking/Summary: What the speaker is advocating?

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(4) Graph-based AIF argument map

(4) Analysis/SenseMaking/Summary: What the speaker is advocating?

(4) Txt span or relation? (If argument = relation, then...)

• Not only convergent, but also linked and serial arguments, or even unrelated text

• **Long-distance relations**

(4) Txt span or relation?
(If argument = relation, then...)

"Meta-talk in mediation" Corpus (Janier & Reed, 2016a; 2016b; 2017; Janier et al. 2016)
• http://corpora.aifdb.org/metatalk
• 2,862 ADUs, 446 supports, 73 conflicts

Eric: It's my team.
George: It's your team, exactly.
Mildred: Maybe.
George: There are obviously discussions that need to happen around the team. Would that be a fair statement?
Viv: Yes.
Eric: Oh, I want Viv to be a productive member, but it's not for me to actually
George: The team...
Mildred: Contribution to the team? Would that be a [Crosstalk 0:16:12].
Viv: [I would have assumed] they're my team. I mean, I thought we were equals.

(4) Txt span or relation?
(If argument = relation, then...)

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(If argument = relation, then...)

http://corpora.aifdb.org/

corpora.aifdb.org

Q Search

Meta-talk in mediation

Argument maps of meta-talk in dispute mediation

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146 argument maps

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1 argument maps

ERulemaking (Train)

Argument maps of comments from regulationroom.org

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67 argument maps

eRulemaking Controversy Corpus (Train)

Argument maps of comments from regulationroom.org with dialogical, inter-comment relation annotation

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47 argument maps

MM2012a

Argument maps of 4 transcripts from the 2012 Moral Maze corpus

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171 argument maps

(4) Txt span or relation?

(4) Txt span or relation?