From connectives to discourse relations

An analysis of CONTRAST

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Overview

- Motivation: connective-lex.info
- Flashback: Some contrastive German connectives
- Towards a map
- Enhancing the connective lexicon
- Application: Argumentation mining
- Conclusions

Lexicon Selection

- ☐ Arabic Arabic — about
- ☐ DiMLex-Bangla Bangla — about
- ☐ CzeDLex Czech — about
- ☐ DiMLex German — about
- ☐ DisCoDict Dutch — about
- ☑ Eng-DiMLex English — about
- ☐ LDM-PT Portuguese — about
- ☐ LexConn French — about
- ☐ LICO Italian — about

Search Options

Filter | Word ⇕ | 🔍

Syntactic Category

☐ cco ☐ csu ☐ adv ☐ prep ☐ other

Discourse Relation (PDTB3)

- ☐ COMPARISON
- ☐ Contrast
- ☐ Similarity
- ☑ Concession (☑ Arg1-/ ☑ Arg2-as-denier)
- ☐ CONTINGENCY
- ☐ Cause (☐ Reason/ ☐ Result)
- ☐ Condition (☐ Arg1-/ ☐ Arg2-as-cond)
- ☐ Negative condition (☐ Arg1-/ Arg2-as-negcond)
- ☐ Purpose (☐ Arg1-/ ☐ Arg2-as-goal)
- ☐ EXPANSION
- ☐ Conjunction
- ☐ Disjunction
- ☐ Equivalence
- ☐ Instantiation
- ☐ Level-of-detail (☐ Arg1-/ ☐ Arg2-as-detail)
- ☐ Substitution (☐ Arg1-/ ☐ Arg2-as-subst)
- ☐ Exception (☐ Arg1-/ ☐ Arg2-as-excpt)
- ☐ Manner (☐ Arg1-/ ☐ Arg2-as-manner)
- ☐ TEMPORAL
- ☐ Synchronous
- ☐ Asynchronous (☐ Precedence/ ☐ Succession)
- ☐ +Belief ☐ +SpeechAct ☐ Other

COMPARISON:Concession:Arg2-as-denier
Ms. Levine had never been fired, although she had stopped working at the restaurant

COMPARISON:Concession:Arg1-as-denier
Although started in 1965, Wedtech didn't really get rolling until 1975

prep

COMPARISON
Mr. Morishita's main business certainly appears to be thriving, although he won't disclose numbers

EXPANSION:Exception
Although the Treasury will announce details of the November refunding tomorrow, it could be delayed if Congress and President Bush fail to increase the Treasury's borrowing capacity

COMPARISON:Concession
Worth watching, although the music has lasted better than the plot or the humor

COMPARISON:Contrast
And Beauregard was mentioned twice -- although very briefly and in passing
Although viewership soars when big news breaks, it ebbs during periods of calm
He doesn't fully succeed, although Mr. Straszheim lists an array of interest-rate scenarios

COMPARISON:Concession:Arg2-as-denier
Ms. Levine had never been fired, although she had stopped working at the restaurant

COMPARISON:Concession:Arg1-as-denier
Although started in 1965, Wedtech didn't really get rolling until 1975

though | Variants | Synonyms | English – Eng-DiMLex 3

other

COMPARISON
But even though companies are paying more taxes, many are still paying less than the statutory rate

COMPARISON:Concession
teachers for the most part teach in English, even though it is a foreign language for most Philippine children

COMPARISON:Contrast
Giuliani has always been pro-choice, even though he has personal reservations
resulting in a two-year plan to reduce the deficit by more than $76 billion -- even though the deficit actually rose by nearly $12 billion during that period
and nuclear power (even though it would counteract the greenhouse effect

COMPARISON:Concession:Arg2-as-denier
I'm more favorably impressed by "no-load life," even though it turns out to be low-load life

COMPARISON:Concession:Arg1-as-denier
that hung over parts of the factory, even though exhaust fans ventilated the area

Connective: Definition

x is a connective if

1. x cannot be inflected,
2. the meaning of x is a two-place relation,
3. the arguments of this relation are abstract objects (propositions, events, states, or processes),
4. the arguments can be expressed as clauses,
5. x is a fixed expression and cannot be freely modified by inserting other expressions,
6. x is not semantically compositional w.r.t. to its components (~~particularly when~~, etc.).

1-5 from: R. Pasch et al.: Handbuch der deutschen Konnektoren. Berlin: De Gruyter, 2003

DiMLex-Ger

- First development in the late 1990s
- Inspiration and inventarization:
  Pasch et al.: *Handbuch der deutschen Konnektoren*. De Gruyter 2003 (Vol. 2: 2016)
- Major extension with addition of PDTB senses in 2015
- Current size: 275 entries

T. Scheffler, M. Stede: Adding semantic senses to a lexicon of German connectives. Proc. of LREC conference, 2016

DiMLex-Eng

- Starting point: 100 connectives from the Penn Discourse Treebank corpus

D. Das, T. Scheffler, P. Bourgonje, M. Stede: Constructing a lexicon of English discourse connectives.
Proc. of the SIGDIAL conference, Melbourne, 2018

DiMLex-Eng

- Starting point: 100 connectives from the Penn Discourse Treebank corpus

- 2nd source: RST signalling corpus
  - Extends the RST Discourse Treebank with signal annotations
  - Decide which signal types correspond to our definition of *connective*
  - 71/100 PDTB connectives also appear in RST-SC
  - 46 RST-SC connectives do not appear in PDTB

D. Das, M. Taboada: RST Signalling Corpus: a corpus of signals of coherence relations.
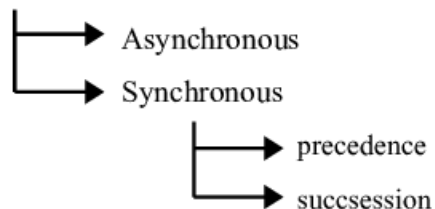*Language Resources and Evaluation* 52(1), 2018

DiMLex-Eng

- Starting point: 100 connectives from the Penn Discourse Treebank corpus

- 2nd source: RST signalling corpus

- 3rd source: List of relational indicators
  - Induce the most frequent word n-grams per coherence relation in the RST-DT
  - Decide which signal types correspond to our definition of *connective*
  - => 5 additional entries

Or Biran, Owen Rambow: Identifying justifications in written dialogs by classifying text as argumentative.
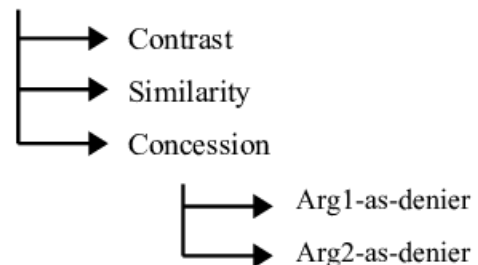*International Journal of Semantic Computing* 5(4), 2011

connective-lex

- Features in the public version
  - syntactic category
    cco, csu, adv, prep, other
  - PDTB relation(s)
  - argument order
  - orthographic variants
  - non-connective readings

- Example: although
  - syntax: csu / prep
  - PDTB relations:
    - comparison
    - comparison:concession
    - comparison:contrast
    - expansion:exception
  - order: a1-a2 / a2-a1
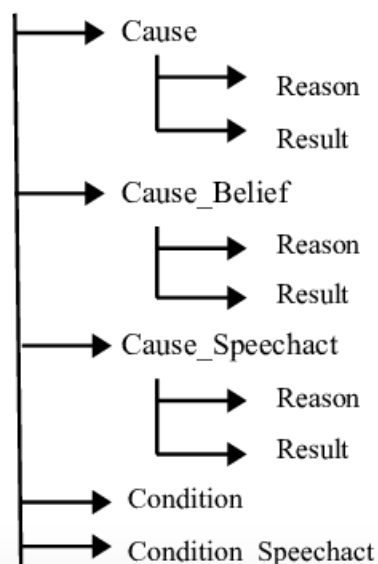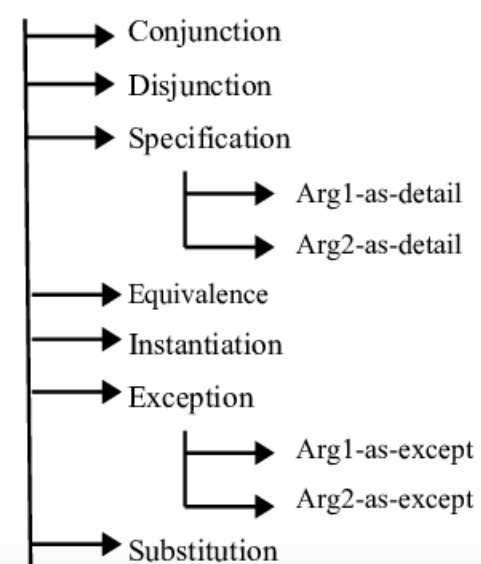 - orth. variants: though
  - non-conn readings: %

TEMPORAL
Asynchronous
Synchronous
precedence
succsession

COMPARISON
Contrast
Similarity
Concession
Arg1-as-denier
Arg2-as-denier

CONTINGENCY
Cause
Reason
Result
Cause_Belief
Reason
Result
Cause_Speechact
Reason
Result
Condition
Condition_Speechact

EXPANSION
Conjunction
Disjunction
Specification
Arg1-as-detail
Arg2-as-detail
Equivalence
Instantiation
Exception
Arg1-as-except
Arg2-as-except
Substitution

Coherence relations: CONTRAST

- PDTB:
  - Expansion:Substitution
  - Expansion:Exception
  - Comparison:Contrast
  - Comparison:Concession
- RST:
Contrast (multinuclear), Antithesis, Concession
- SDRT/Lexconn:
Contrast (coord), Concession (subord), Opposition
- SDRT/STAC:
Contrast, Correction

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A but B

- In Romania you don't pay with the Euro but with the Leu.
- My daughter attends university, but my son is still in high school.
- We tried hard to arrive on time, but the bus was terribly slow!
- His grades are OK, but we really shouldn't hire him.

Whereas A, B

- * Whereas in Romania you don't pay with the Euro, you pay with the Leu.
- Whereas my daughter attends university, my son is still in high school.
- * Whereas we tried hard to arrive on time, the bus was terribly slow!
- * Whereas his grades are OK, we really shouldn't hire him.

Although A, B

- * Although in Romania you don't pay with the Euro, you pay with the Leu.
- ?? Although my daughter attends university, my son is still in high school.
- * Although we tried hard to arrive on time, the bus was terribly slow!
- Although his grades are OK, we really shouldn't hire him.

A; instead B

- In Romania you don't pay with the Euro; instead you pay with the Leu.
- * My daughter attends university; instead my son is still in high school.
- * We tried hard to arrive on time, instead the bus was terribly slow!
- * His grades are OK; instead we really shouldn't hire him.

Some German contrastive connectives

- aber *(but)*
  „the prototypical adversative connective"
- doch, jedoch *(but)*
  equivalent to ‚aber'?
- hingegen *(however, on the other hand)*
- allerdings *(though)*
- dennoch *(still)*

English translations from Collins dictionary

M. Stede: Kontrast im Diskurs. In: H. Blühdorn et al.: Brücken schlagen. Grundlagen der Konnektorensemantik. De Gruyter 2004

Buscha: Lexikon deutscher Konjunktionen

- **aber** (adversativ)
  ... Sie gibt einen Gegensatz an, der sich auf die Bedeutung der von den satzwertigen Teilen bezeichneten Sachverhalte bezieht und eine semantische Opposition zum Ausdruck bringt. Sie kann aber auch einen Ggs. angeben, der sich aus der Bewertung der Sach-verhalte ergibt, in der Negation einer Erwartung besteht und eine Einschränkung darstellt.

- **doch** (adversativ)
  ... ist bedeutungsgleich mit *aber*, gehört aber ... nur der gehobenen Stilebene an. Sie ist in literarischen und wissenschaftlichen Texten als stilistische Variante von *aber* üblich, in einer mündlichen Alltagskommunikation wirkt sie allzu gewählt (vor allem in der bedeutungsmäßig stärkeren Form ***jedoch***).

Test for substitutability
(Knott/Dale 1994)

1. Remove cue A; insert cue B into the clause, at any appropriate position.
2. If necessary, alter the punctuation.
3. If necessary, other cues in the text are changed (if dependent)

- A and B are substitutable if
  - **new discourse describes the same events**
  - **new discourse achieves the same goals**
- It does not matter if
  - **stylistic change is introduced**
  - **cues are appropriate for text portions of different sizes**
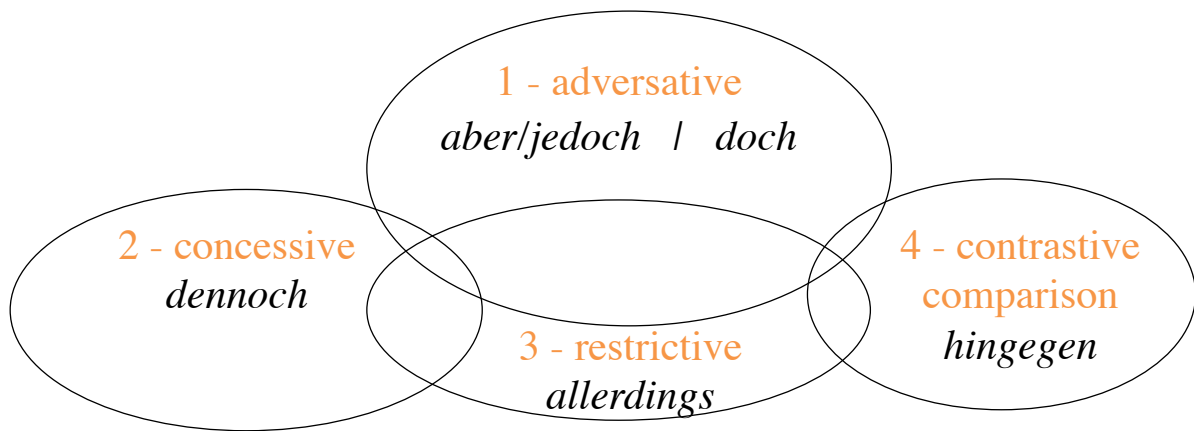 - **different amounts of background knowledge are assumed**

Probing the Similarities

- Replacement test: In context X, which connective can replace the one that was originally used in X?
- Data: Newspaper text in COSMAS (IDS Mannheim)
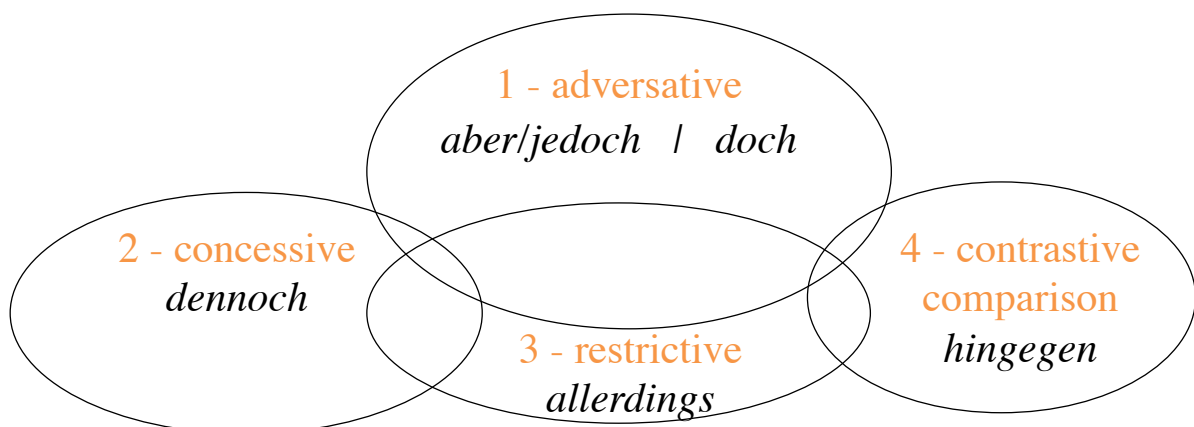- 50 instances per connective studied

vierzehn Tage vorher, als die Lok 4029t am Zughaken hatte, lag das Übergewicht noch deutlich bei den Pessimisten. DOCH Leistung überzeugt.

+aber, -allerdings, -dennoch, +DOCH, -hingegen, +jedoch

Result

1 - adversative
aber/jedoch | doch

2 - concessive
dennoch

3 - restrictive
allerdings

4 - contrastive
comparison
hingegen

Result

1 - adversative
aber/jedoch | doch

2 - concessive
dennoch

3 - restrictive
allerdings

4 - contrastive
comparison
hingegen

1 – Dieser Computer ist nicht toll, aber recht preiswert.
1 – *This computer is not fabulous, but it is affordable.*
2 – Dieser Computer ist eher langsam. Dennoch werde ich ihn kaufen.
2 – *This computer is a bit slow. Still, I'm gonna buy it.*
3 – Dieser Computer ist ein Bestseller. Allerdings hat er etwas wenig Hauptspeicher.
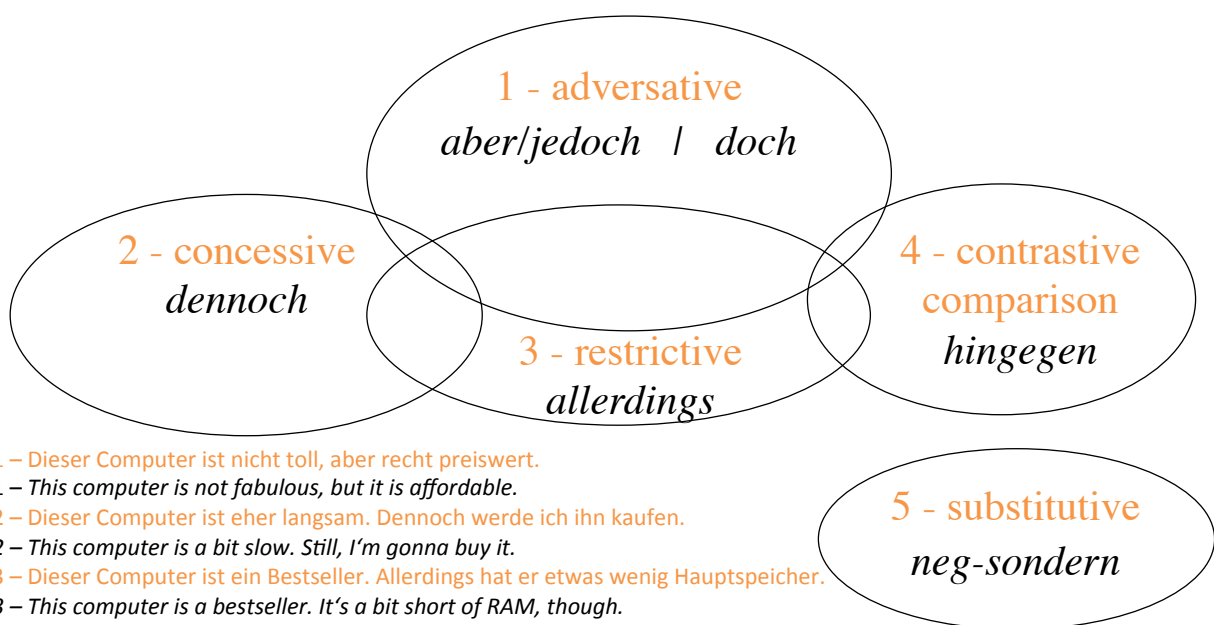3 – *This computer is a bestseller. It's a bit short of RAM, though.*
4 – Dieser Computer hat eine NVIDIA Grafikkarte. Hingegen hat der dort drüben eine GeForce.
4 – *This computer has an NVIDIA graphics card. While that one over there has a GeForce.*

Overview

Add ,substitution'

1 - adversative
aber/jedoch | doch

2 - concessive
dennoch

3 - restrictive
allerdings

4 - contrastive comparison
hingegen

5 - substitutive
neg-sondern

1 – Dieser Computer ist nicht toll, aber recht preiswert.
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2 – This computer is a bit slow. Still, I'm gonna buy it.
3 – Dieser Computer ist ein Bestseller. Allerdings hat er etwas wenig Hauptspeicher.
3 – This computer is a bestseller. It's a bit short of RAM, though.
4 – Dieser Computer hat eine NVIDIA Grafikkarte. Hingegen hat der dort drüben eine GeForce.
4 – This computer has an NVIDIA graphics card. While that one over there has a GeForce.
5 – Dieser Computer hat keine Grafikkarte, sondern einen on-board Chip.
5 – This computer doesn't have a graphics card but an on-board chip.

Concession (*dennoch*, *obwohl*, ...)

- Protoypical connective: *obwohl* (although)
  ‚Obwohl der Vortrag interessant war, bin ich dauernd eingeschlafen.'
  (Although the talk was interesting, I fell asleep all the time.)

- König 94: clauses describe „instances of situations that normally don't go together"
- if p, then normally not-q
  here, both p and q

obwohl$_{V2}$

- Standard *obwohl*:
  subordinating conjunction, requires verb-last clause
- In colloquial spoken language also:
  discourse marker joining to V2 main clauses
- *Ich kaufe mir eine Bratwurst; obwohl, ein Salat wäre noch besser.*
  ‚I'm gonna buy a sausage - actually, a salad would be even better.'
- Function: restrict or cancel the previous illocution

(Günthner 1999, 2005; Freiwald 2010; Moraldo 2012, 2018)

Corpus evidence

- In speech, *obwohl*$_{V2}$ joins two separate intonation units and is surrounded by pauses (likewise: *wobei*$_{V2}$)
- Problem: Corpora of colloquial German are small ☹
- Proxy: One-month German Twitter snapshot (Scheffler 2014)
  - 24 mio tweets, capturing around 90% of all German tweets sent in March 2013
- Use pause markers from Moraldo (2012): , / . / : / - / …
- To estimate the unmarked V2 instances, manually inspect 200 *Obwohl* and 200 *obwohl* samples

Frequencies

Twitter

	Total	V2	+ .	+ … (2-5)	+ ,	+ :	+ -	no pause
obwohl	19.198		3%	27%	18%	3%	1%	47%
Obwohl	7.505		8%	24%	28%	6%	2%	33%
o|Obw.	26.703	12.9%	6%	25%	24%	5%	2%	38%
Mor12	1.032	16.7%	6%	26%	25%	5%	4%	34%

Frequencies

Twitter

	Total	V2	+ .	+ ... (2-5)	+ ,	+ :	+ -	no pause
obwohl	19.198	7.2%	3%	27%	18%	3%	1%	47%
Obwohl	7.505	27.4%	8%	24%	28%	6%	2%	33%
o|Obw.	26.703	12.9%	6%	25%	24%	5%	2%	38%
Mor12	1.032	16.7%	6%	26%	25%	5%	4%	34%

„Standard" language: DWDS.de

- DWDS *Kernkorpus* (1900-1999)
- Fiction, Newspaper, Science, Gebrauchstexte
- Total: 121 million tokens
- Hits are filtered for parentheticals etc.

Frequencies

Twitter

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DWDS Kernkorpus

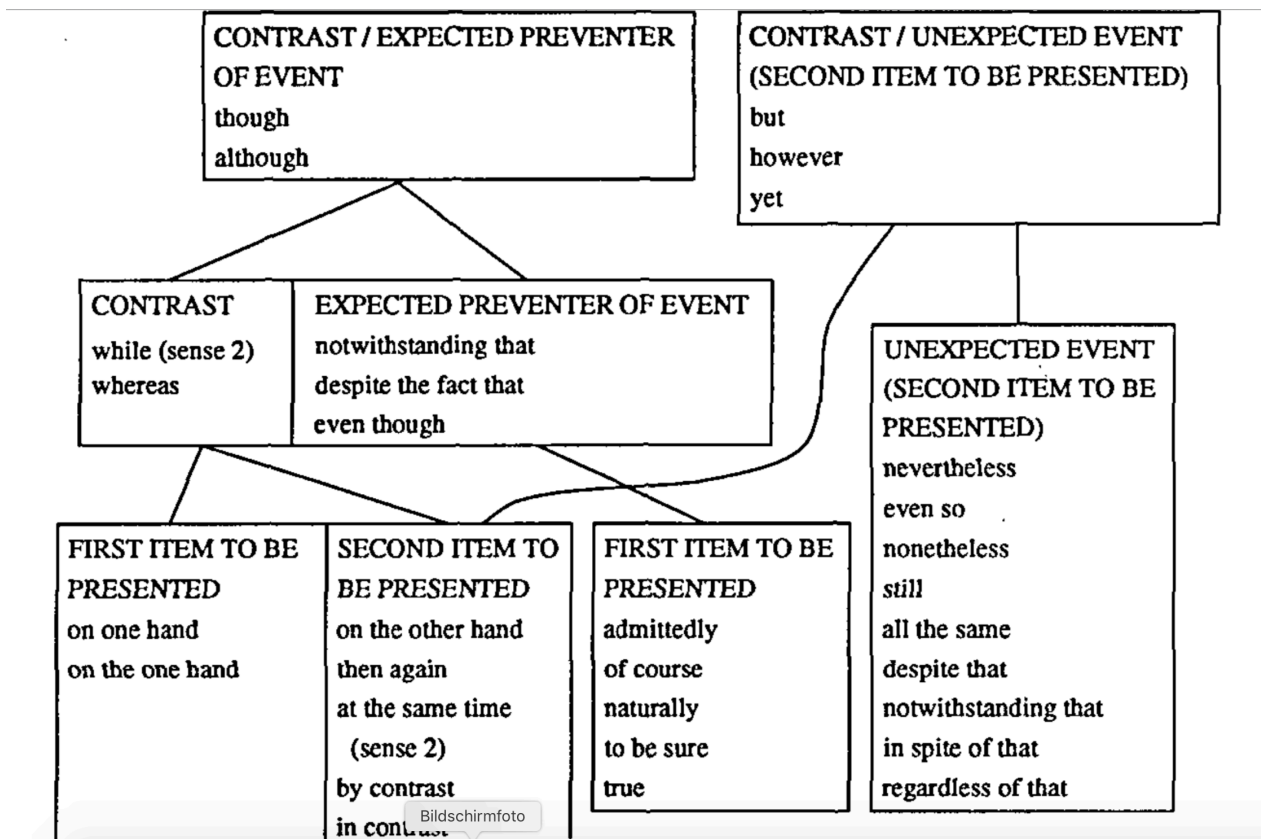|	Total		+ .	+ … (2-5)	+ ,	+ :	+ -	other
o|Obwohl	14.819		0 / 0%	0 / 0%	19 / 0.1%	3 / 0%	4 / 0%	99.8%
w|Wobei	15.336		0 / 0%	0 / 0%	0 / 0%	0 / 0%	0 / 0%	100%

Summary: obwohl$_{V2}$

- A subordinating conjunction diachronically spun off a discourse marker

- Change in meaning: From concession to correction/restriction

- Same story, but less frequent: *wobei*

- Apparently (still) restricted to colloquial language

- In Twitter: 13-16% of *obwohl* are V2

- [!] Our definition of connective covers obwohl$_{V2}$

Add ‚obwohl$_{V2}$'

1 - adversative
aber/jedoch | doch

2 - concessive
dennoch

obwohl

3 - restrictive
allerdings

4 - contrastive comparison
hingegen

6 - corrective
obwohl$_{V2}$

5 - substitutive
neg-sondern
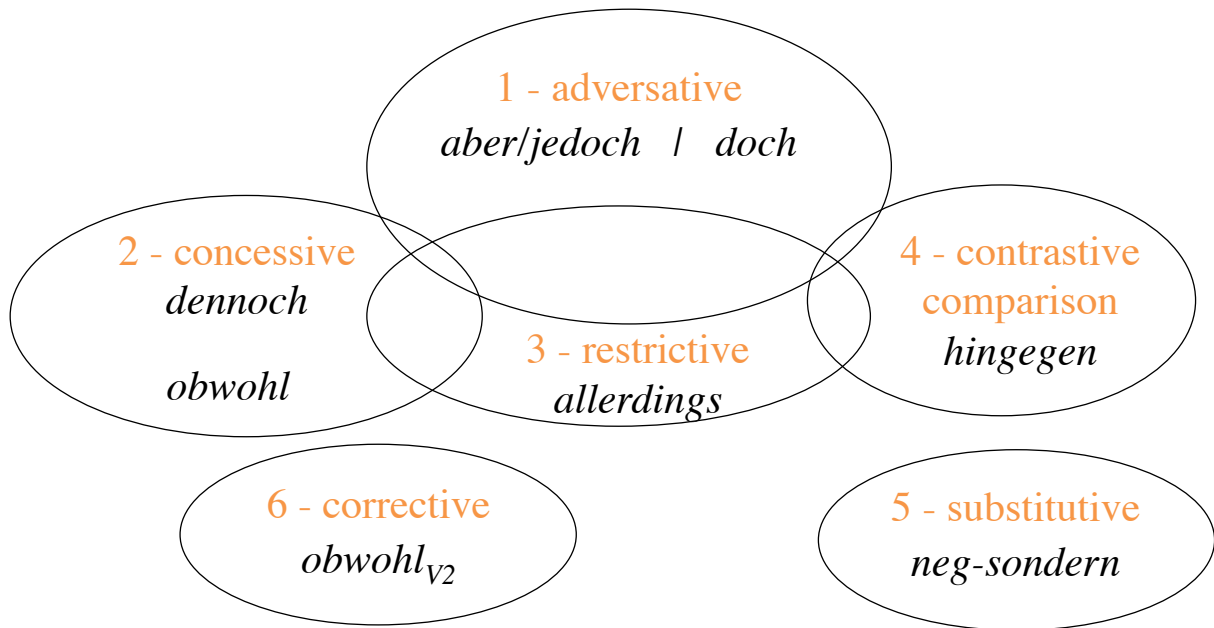
6 – OK, ich werde diesen Computer kaufen. Obwohl - lass nochmal die von Dell angucken.
6 – OK, I'm gonny buy this computer. Though - let's first take another look at the Dell machines.

CONTRAST / EXPECTED PREVENTER OF EVENT	CONTRAST / UNEXPECTED EVENT (SECOND ITEM TO BE PRESENTED)
though	but
although	however
	yet

CONTRAST	EXPECTED PREVENTER OF EVENT
while (sense 2)	notwithstanding that
whereas	despite the fact that
	even though

UNEXPECTED EVENT (SECOND ITEM TO BE PRESENTED)
nevertheless
even so
nonetheless
still
all the same
despite that
notwithstanding that
in spite of that
regardless of that

FIRST ITEM TO BE PRESENTED	SECOND ITEM TO BE PRESENTED	FIRST ITEM TO BE PRESENTED
on one hand	on the other hand	admittedly
on the one hand	then again	of course
	at the same time	naturally
	(sense 2)	to be sure
	by contrast	true
	in contrast	

Bildschirmfoto

A. Knott, R. Dale: Using linguistic phenomena to motivate a set of coherence relations. Discourse Processes 18(1), 1994

Compatibility

- General: *but, however, yet / though, although*
- Strict separation between
  - contrastive comparison (contrast: *while, whereas*)
  - concessive (exp. preventer of event: *even though, despite the fact that*)
- English *although* is more flexible than German *obwohl*; it also covers restriction
  - *Our university covers all the important areas of study, although there's no medicine*
  - *??Unsere Universität bietet alle wichtigen Fächer an, obwohl es keine Medizin gibt.*
  - *Unsere Universität bietet alle wichtigen Fächer an, allerdings gibt es keine Medizin.*

Compatibility

- Some Differences:
  - Substitution is not covered in this part of the Knott/Dale taxonomy
  - Knott/Dale emphasize hierarchy (directed substitutability)
  - Knott/Dale distinguish *even though, despite the fact that* from *nevertheless, despite that* (partly on the grounds of linear order)

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connective-lex

- Features in the public version
  - syntactic category
    cco, csu, adv, prep, other
  - PDTB relation(s)
  - argument order
  - orthographic variants
  - non-connective readings

- Potential new features
  - more fine-grained syntax
  - modifiability
  - argument linking
    (semantic roles:
    causing / caused, etc.)
  - sem/prag function

DiMLex-Ger: Substitution

anstatt (dass)

anstelle dessen

sondern

statt

stattdessen

vielmehr

DiMLex-Ger: Contrast

aber	doch	unterdessen
alldieweil	einerseits	wiederum
allein	freilich	wogegen
allerdings	gleichzeitig	wohingegen
andererseits	hingegen	während
bloß dass	immerhin	währenddessen
dafür	indessen	zugleich
dafür dass	jedoch	zum anderen
dagegen	nur	zum einen
dahingegen	nur dass	
dementgegen	sosehr	
demgegenüber	und	

DiMLex-Ger: Concession

aber	entgegen	obzwar
abgesehen davon	freilich	sosehr
allerdings	gleichwohl	trotz
als ob	immerhin	trotzdem
angesichts	jedoch	unbeschadet dessen
bloß	mangels	ungeachtet dessen,
bloß dass	mithin	wenn .. auch
dabei	nichtsdestominder	wenngleich
davon abgesehen, dass	nichtsdestoweniger	wiederum
dennoch	obgleich	wobei
dessen ungeachtet	obschon	wohingegen
doch	obwohl	zwar

Simplifications

- For present purposes of sem/prag grouping,
  - ignore prepositions
  - fuse quasi-synonyms (*obwohl, obschon, obzwar)*
    - dialect
    - register
  - fuse entries that are semantically very similar, yet they differ syntactically

DiMLex-Ger: Substitution

anstatt

anstatt dass

anstelle dessen

sondern

statt

stattdessen

vielmehr

DiMLex-Ger: Contrast

aber	doch	unterdessen
alldieweil	einerseits	wiederum
allein	freilich	wogegen
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andererseits	hingegen	während
bloß dass	immerhin	währenddessen
dafür	indessen	zugleich
dafür dass	jedoch	zum anderen
dagegen	nur	zum einen
dahingegen	nur dass	
dementgegen	sosehr	
demgegenüber	und	

DiMLex-Ger: Concession

aber	entgegen	obzwar
abgesehen davon	freilich	sosehr
allerdings	gleichwohl	trotz
als ob	immerhin	trotzdem
angesichts	jedoch	unbeschadet dessen
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bloß dass	mithin	wenn .. auch
dabei	nichtsdestominder	wenngleich
davon abgesehen, dass	nichtsdestoweniger	wiederum
dennoch	obgleich	wobei
dessen ungeachtet	obschon	wohingegen
doch	obwohl	zwar

DiMLex-Ger: subset

Substitution
statt
sondern
vielmehr

Contrast
aber
während
allein
allerdings
zum einen/anderen
nur
dafür
hingegen
zugleich
freilich
immerhin
indessen
sosehr
und
wiederum

Concession
aber
abgesehen davon
allerdings
als ob
bloß
dabei
dennoch
freilich
immerhin
mithin
obwohl
sosehr
wenn .. auch
wiederum
wobei
wohingegen
zwar

1 - adversative
aber/jedoch | doch

2 - concessive
dennoch

obwohl

3 - restrictive
allerdings

4 - contrastive
comparison
hingegen

6 - corrective
obwohl-V2

5 - substitutive
neg-sondern
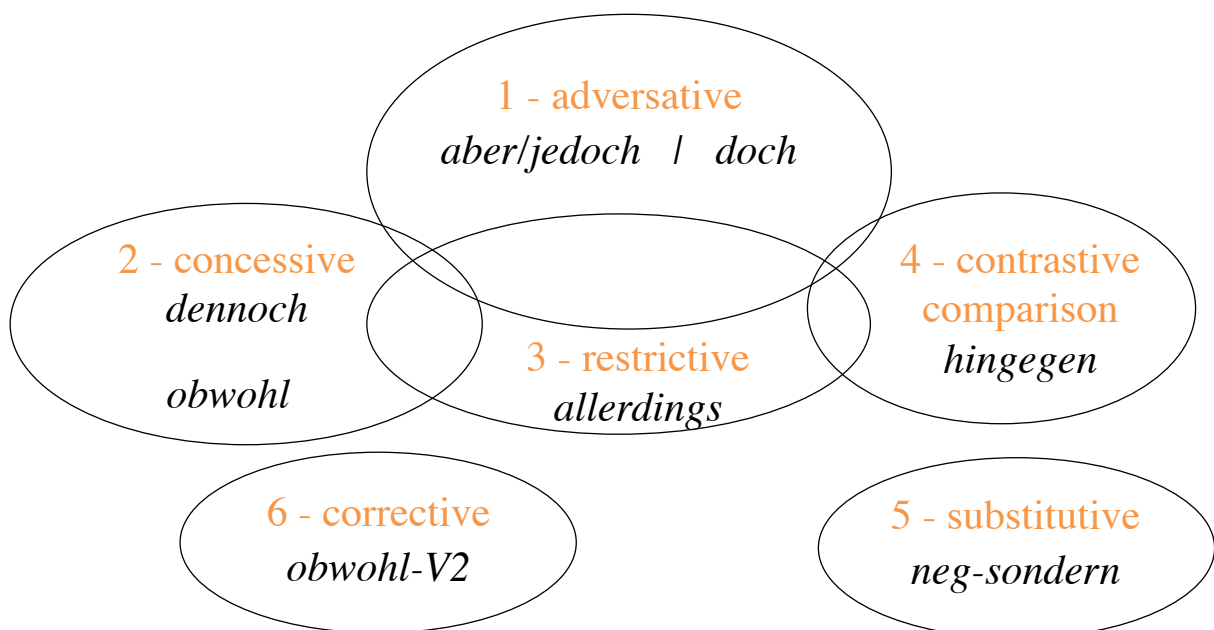
DimLex-Ger: subset

Substitution
statt - 5
sondern - 5
vielmehr - 5

1 - adversative
2 - concessive
3 - restrictive
4 - contr. comparison
5 - substitutive
6 - corrective

(n): only in specific
     contexts: evaluative, ..

Contrast
aber - 1, 2
während - 4
allein - 3
allerdings – 2, 3
zum einen/anderen - 4
nur - 3
dafür – (5)
hingegen - 4
zugleich – (3, 4)
freilich – 1, 3
immerhin – (1)
indessen - 4
sosehr – (2, 4)
und - 4
wiederum – (4)

Concession
aber – 1, 2
abgesehen davon – (2)
allerdings – 2, 3
als ob – (2)
bloß – 2, 3
dabei - 2
dennoch - 2
freilich
immerhin – (2)
mithin
obwohl – 2, 6
sosehr – (2, 4)
wenn .. auch – (2)
wiederum
wobei – 2, 3, 6
zwar -2

(using the 30 sample instances compiled by Scheffler/Stede 16)

connective-lex

- Features in the public version
  - syntactic category
    cco, csu, adv, prep, other
  - PDTB relation(s)
  - argument order
  - orthographic variants
  - non-connective readings

- Potential new features
  - more fine-grained syntax
  - modifiability
  - argument linking
    (semantic roles: causing / caused, etc.)
  - sem/prag function
    - adversative
    - concessive
    - restrictive
    - contr. comparison
    - substitutive
    - corrective
  - register, dialect

Overview

- Motivation: connective-lex.info
- Flashback: Some contrastive German connectives
- Towards a map
- Enhancing the connective lexicon
- Application: Argumentation mining
- Conclusions

Application: Argumentation Mining

[e1] Health insurance companies should naturally cover alternative medical treatments.

[e2] Not all practices and approaches that are lumped together under this term may have been proven in clinical trials,

[e3] yet it's precisely their positive effect when accompanying conventional 'western' medical therapies that's been demonstrated as beneficial.

[e4] Besides many general practitioners offer such counselling and treatments in parallel anyway -

[e5] and who would want to question their broad expertise?

Application: Argumentation Mining

- The „argumentative microtext" corpus (Peldszus/Stede 15) has parallel annotations: discourse structure (RST, SDRT) and argumentation structure
- We measured the potential benefit of discourse structure information for argumentation structure parsing
(Peldszus/Stede 16, Hewett et al. 19)
- Error analyses indicate that the coarse granularity of additive, causal, contrastive RST relations limits the utility for understanding argumentation

Should the bachelor thesis be more important for the overall BSc grade?

The idea of the bachelor degree is to put together a cumulative grade from various individual assignments in order to generate a final grade. This is also more akin to the real working world later, where performance isn't singular, but constant and has to be delivered over longer periods. That's why it makes sense that the bachelor thesis only makes up a relatively small portion of the final grade (15 out of 120 credits). However, the effort required for the individual equally weighted modules differs strongly. It would therefore be wise to adjust the required effort for final theses accordingly.

Sollte die Abschlussarbeit in der BSc Gesamtnote höher gewichtet werden?

Die Idee des Bachelorstudiums ist, die Gesamtnote aus zahlreichen Einzelleistungen zusammenzusetzen, um die Endnote zu generieren. Dies entspricht auch eher der späteren Arbeitswelt, in der Leistung nicht singulär, sondern regelmäßig und über längere Zeit hinweg erbracht werden soll. Daher macht es Sinn, dass die Bachelorarbeit nur einen relativ kleinen Teil der Endnote ausmacht (15 von 120 SP). Allerdings differiert der unterschiedliche Aufwand für die einzelnen, teils gleichwertigen Module stark. Es wäre also sinnvoll, den Aufwand der Abschlussarbeit(en) entsprechend anzupassen.

Summary

- connective-lex.info: from breadth to depth
- There are "discourse marker connectives" that should be covered by a connective lexicon (obwohl$_{V2}$, wobei$_{V2,}$ weil$_{V2}$)
- For CONTRAST: An inventory of six bottom-up induced functions can enrich the lexicon, providing more fine-grained categories than the coherence relations

Outlook

- Intersubjectivity: Do annotators agree on assigning the 6 functions?
- Can argumentation mining benefit from such finer-grained functions/relations?
- Representation of cross-lingual mappings in connective-lex
- More granularity for other semantic groups of connectives?

- Thank you!

- aber only:
  Vierzehn Tage vorher, als die Lok 4029t am Zughaken hatte, lag das Übergewicht noch deutlich bei den Pessimisten. Doch Leistung überzeugt.

obwohl$_{V2}$ into the lexicon?

- obwohl$_{V2}$ (and wobei$_{V2}$), though limited to spontaneous, conceptually-oral language, belongs into connective-lex, as it clearly denotes a two-place relation

- (Contrary to Danlos et al. 2018, there is overlap between discourse markers and connectives)

Granularity: CONTRAST

- PDTB: Substitution, Contrast, Concession
- RST: Contrast (multinuclear), Antithesis, Concession
- SDRT/Lexconn: Contrast (coord), Concession (subord), Opposition
- SDRT/STAC: Contrast, Correction

- adversative
- concessive
- restrictive
- contr. comparison
- substitutive
- corrective

- 31 connectives

- 75 connectives

TODO - DiMLex-Eng: Substitution

but

instead (of)

rather (than)

much as

quite the contrary

TODO - DiMLex-Eng: Contrast

although	as	earlier
though	nonetheless	neither .. nor
but	meanwhile	conversely
nevertheless	yet	on the contrary
if	rather	on the one/other hand
previously	in fact	instead of
and	besides	by the way
then	nor	at the same time
while	whereas	
still	in/by comparison	
instead	in/by contrast	
on the other hand	in the end	

TODO - DiMLex-Eng: Concession

although	as	in spite of
though	nonetheless	
but	meanwhile	
nevertheless	yet	
if	as if	
when	in the end	
and	regardless	
then	much as	
while	even so	
however	despite	
after	even though	
still	even if	