



# *IMPLICIT DISCOURSE RELATIONS AND TEXT STRUCTURE*

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# RESEARCH ON TEXT STRUCTURE IN THE PRAGUE DEPENDENCY TREEBANK

- History of the research: multi-layer annotation
  - Within a sentence: morphology, syntax, syntactic semantics
  - Within a broader context: information structure, coreference and bridging anaphora, discourse relations



## DISCOURSE RELATIONS

- Explicit discourse relations (discourse connectives)

Primary discourse connectives:

*He did not go to the cinema **because** he was too tired.*

Secondary discourse connectives:

*He did not go to the cinema. **The reason was that** he was too tired.*

- Implicit discourse relations

*He did not go to the cinema. He was too tired.*



# DISCOURSE RELATIONS SEMANTICS (PRAGUE DEPENDENCY TREEBANK)

## TEMPORAL

Synchrony

Asynchrony

## CONTINGENCY

Reason–result

Pragmatic reason–result

Explication

Condition

Pragmatic condition

Purpose

## CONTRAST

Confrontation

Opposition

Restrictive opposition

Pragmatic contrast

Concession

Correction

Gradation

## EXPANSION

Conjunction

Conjunctive alternative

Disjunctive alternative

Instantiation

Specification

Equivalence

Generalization



## COMPARISON OF SEMANTIC TYPES OF IMPLICIT AND EXPLICIT DISCOURSE RELATIONS: QUESTIONS AND ASSUMPTIONS

- Are there any semantic types of discourse relations which **MUST** be expressed explicitly? (Assumption: some types with very specific and precise semantics)
- Implicit discourse relations are limited to a narrow set of semantic types
- Relations with a semantic feature of negation are more often expressed with explicit discourse connectives (opposite senses – opposition *but*, confrontation *whilst*, correction *not – but rather*, concession – *although*)



## DATA

- The Prague Dependency Treebank (large scale corpus, ca. 1 million words, 50.000 sentences)
- Czech journalistic texts from 1990s
- Annotated on tectogrammatic dependency trees containing annotation of morphology, shallow syntax, syntactic semantics (tectogrammatrics), information structure, coreference and bridging anaphora



# DATA: ANNOTATION OF IMPLICIT DISCOURSE RELATIONS

	Sentences	Documents
<b>Total</b>	2592	100

Text genre	Sent	Doc	Text genre	Sent	Doc
advice column	200	10	overview	171	6
collection	163	4	personality-focused interview	104	2
comment	171	6	readers' survey	163	8
critical review	167	7	reflective essay	170	4
description	170	4	sports news	196	8
invitation	170	7	topical interview	291	7
letters from readers	176	6	weather forecast	91	5
news report	189	15			



# CHOICE OF TEXT GENRES

- Stylistic factors:
  - Monologic vs. dialogic: news report, critical review vs. topical interview or personality-focused interview
  - Descriptive vs. argumentative: overview vs. reflective essay
  - Persuasive: invitation, advice column
  - Continuous vs. segmented: description, comment vs. collection, readers' survey





## DATA: ANNOTATION SCENARIO

- Insertion of a discourse connective; clear equivalent of an explicit discourse relation
- Adjacent and distant relations
- Complex formal interconnection of sentences in texts, annotation of interruptions
  - explicit discourse relations
  - implicit discourse relations
  - previous text – question
  - question – answer
  - metatext, caption
  - no relation
  - ...



# RESULTS: SEMANTIC TYPES OF IMPLICIT DISCOURSE RELATIONS

Conjunction	446
Specification	236
Continuation	196
Reason	125
Explication	104
Opposition	67
Confrontation	66
Precedence	55
Generalization	25
Instantiation	23
Equivalence	19

Gradation	12
Conjunctive alternative	12
Concession	11
Correction	10
Restrictive opposition	6
Synchrony	5
Condition	4
Purpose	3
Pragmatic reason	1
Disjunctive alternative	1



# SEMANTIC TYPES NOT COVERED BY IMPLICIT DISCOURSE RELATIONS

pragmatic condition, pragmatic contrast  
(implicit discourse **argument**)

*If you want to hear my attitude towards the jury's decision, it is an outrageous sign of disrespect for the work of others.* (pragmatic condition – explicit)

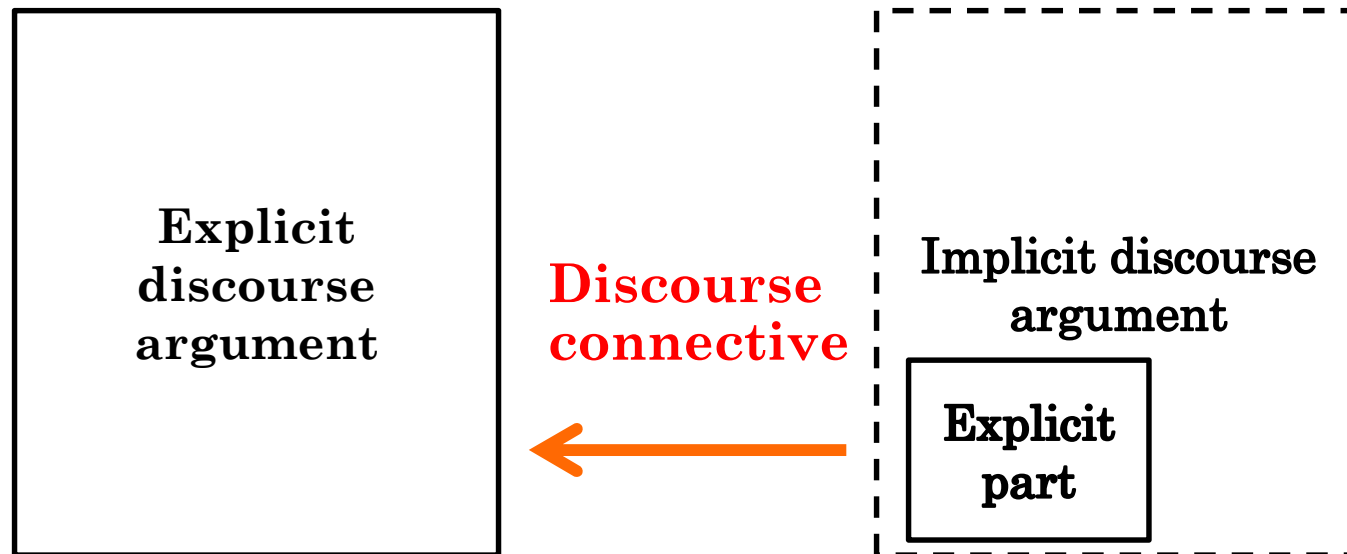
2 occurrences – explicit

*According to the production manager Miloš Přiklopil, the Seba company has a range of factory orders in process. The customers, **however**, exert great pressure on lowering of the prices of fabrics.* (pragmatic contrast – explicit)

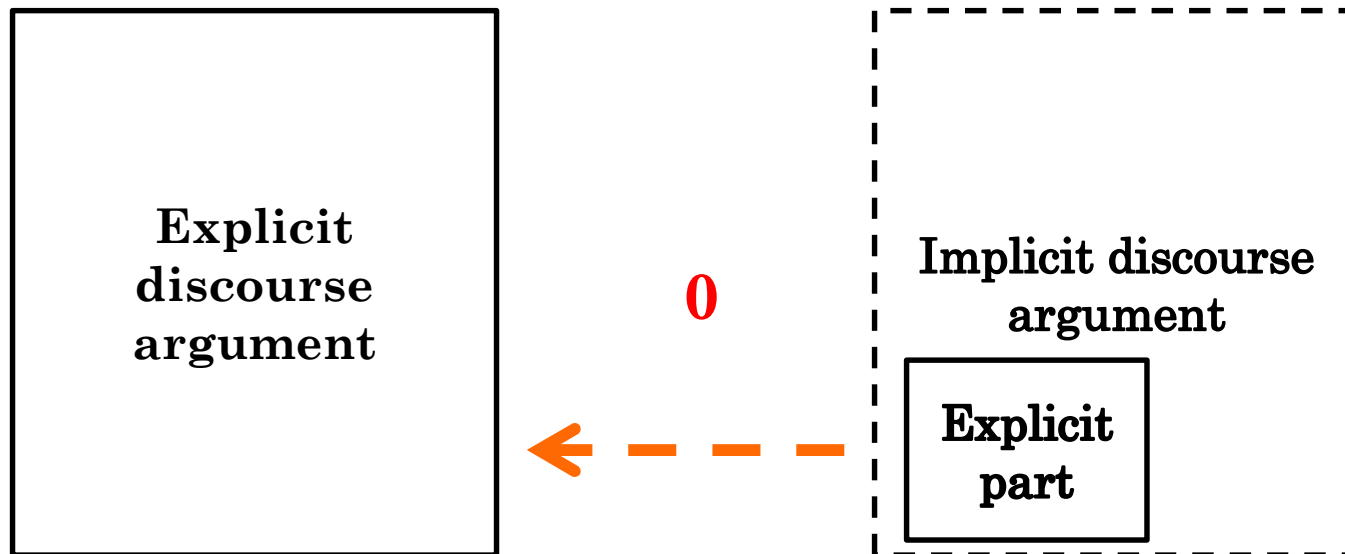
4 occurrences – explicit



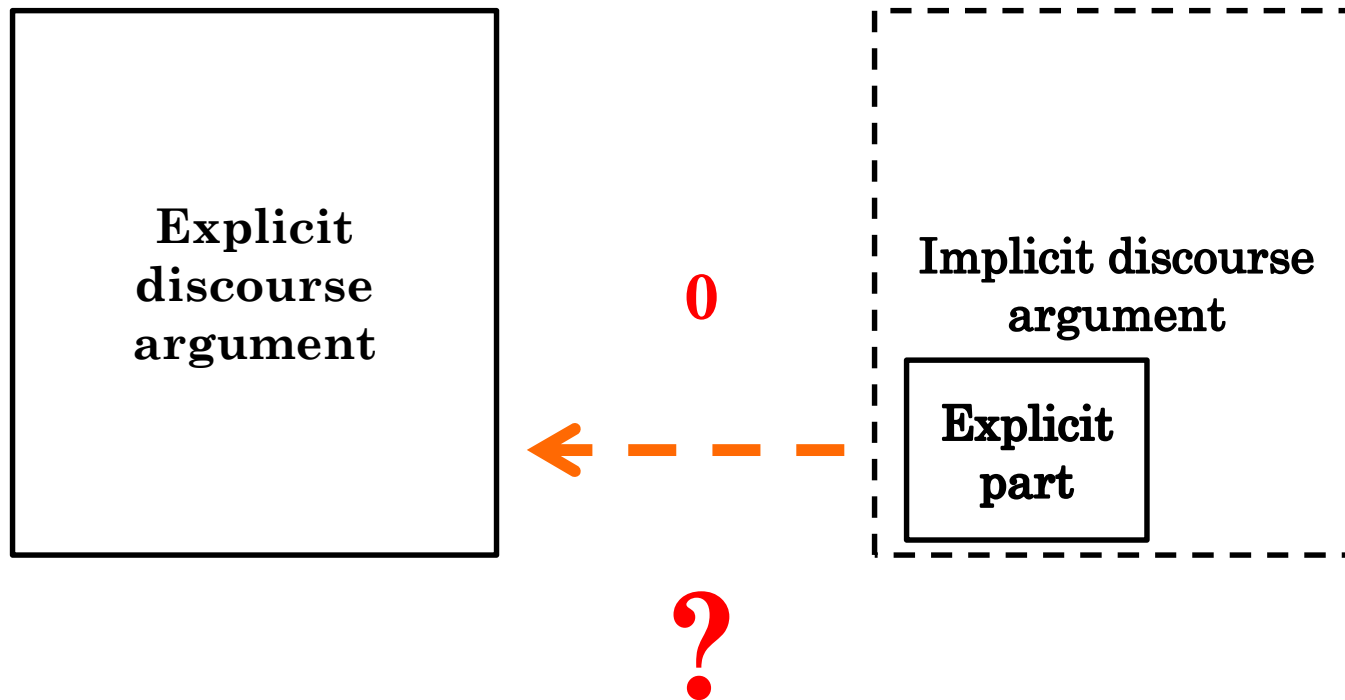
# STRUCTURE OF PRAGMATIC RELATIONS: EXPLICIT DISCOURSE RELATION



# STRUCTURE OF PRAGMATIC RELATIONS: IMPLICIT DISCOURSE RELATION



# STRUCTURE OF PRAGMATIC RELATIONS: IMPLICIT DISCOURSE RELATION



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4 occurrences – explicit

**Almost all the semantic types of discourse relations can be expressed implicitly.**



# SEMANTIC TYPES OF IMPLICIT AND EXPLICIT DISCOURSE CONNECTIVES

## Implicit discourse relations

<b>Total</b>	<b>1427</b>
Conjunction	446
Specification	236
Continuation	196
Reason	125
Explication	104
Opposition	67
Confrontation	66
Precedence	55
Generalization	25
Instantiation	23
...	...

## Explicit discourse relations

<b>Total</b>	<b>1280</b>
Conjunction	460
Opposition	178
Reason	169
Condition	109
Specification	58
Precedence	47
Concession	43
Confrontation	31
Explication	29
Purpose	26
...	...





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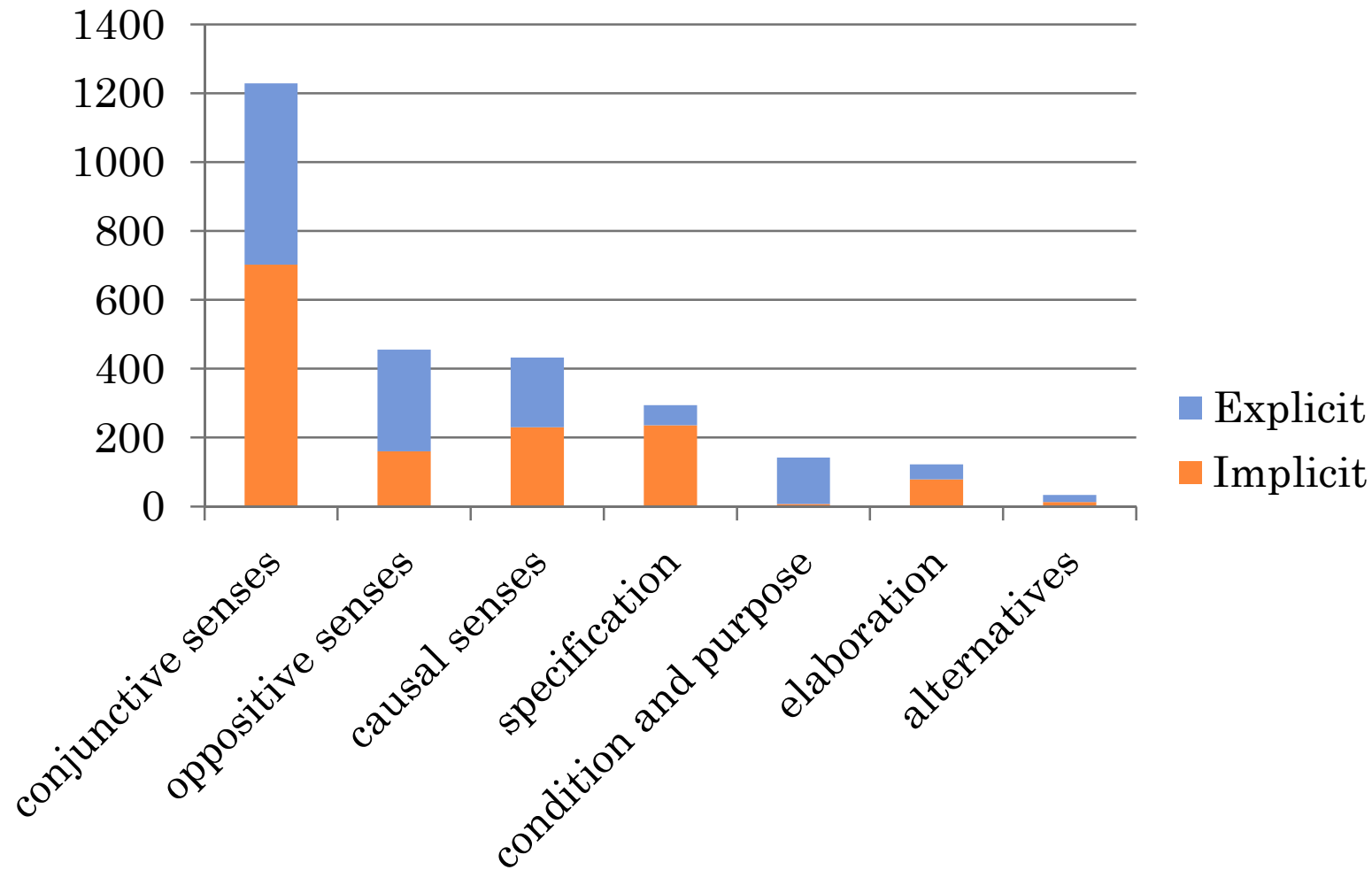


## GROUPS OF SEMANTIC TYPES OF DISCOURSE RELATIONS

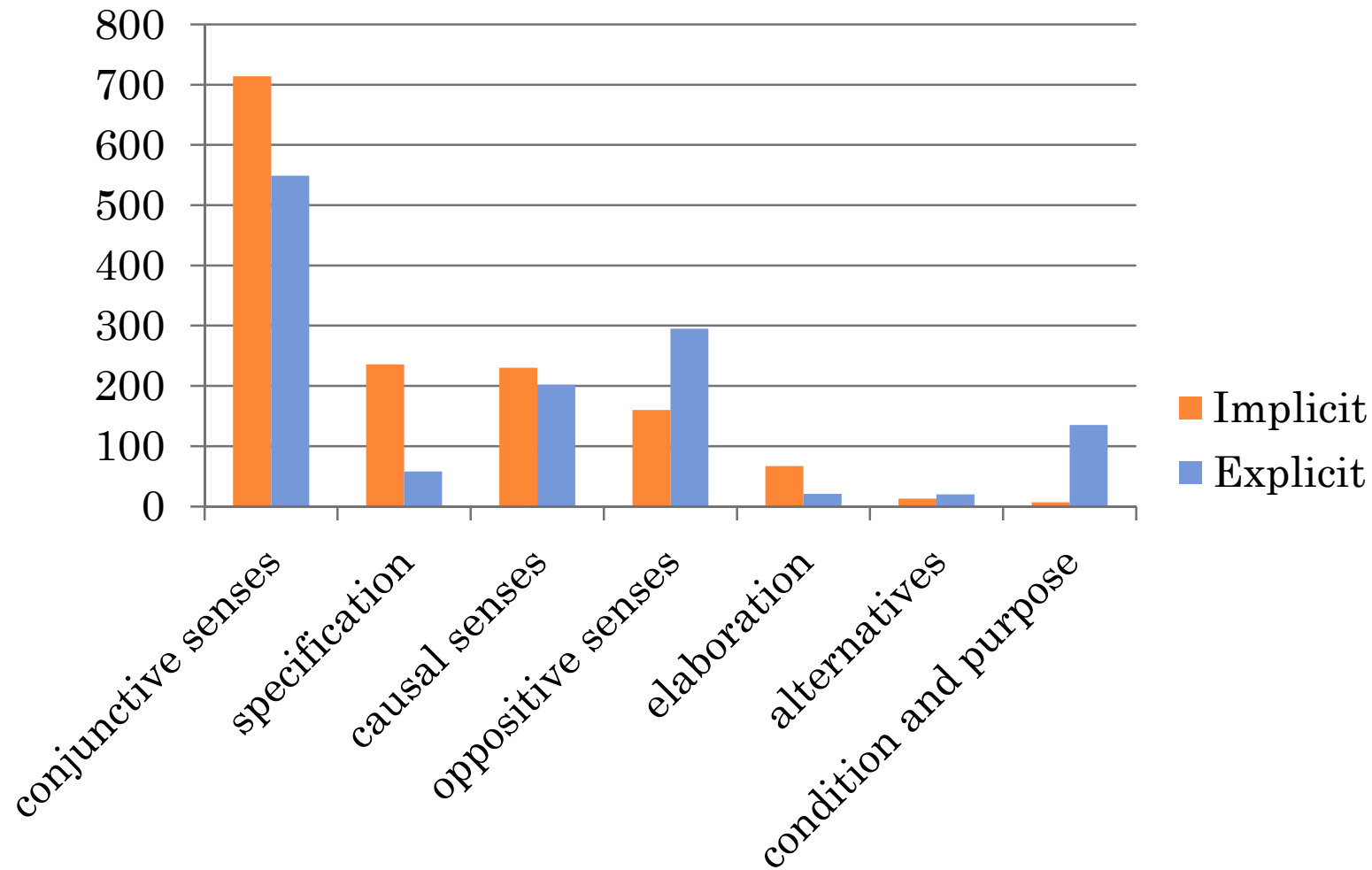
- **Conjunctive senses:** conjunction, continuation, precedence, synchrony, gradation
- **Causal senses:** reason, explication, pragmatic reason
- **Oppositive senses:** opposition, confrontation, concession, correction, restrictive opposition
- **Elaboration:** instantiation, generalization, equivalence
- **Specification**
- **Alternatives:** conjunctive alternative, disjunctive alternative



# DISTRIBUTION OF DISCOURSE RELATIONS



# SEMANTICS OF IMPLICIT AND EXPLICIT DISCOURSE RELATIONS



- Distribution of semantic types of discourse relations in general (conjunction vs. alternatives)
- Inclination to understand texts in a coherent way; relations with vague semantics (conjunctive, specification, causal)
- High occurrence of causal discourse relations (causal understanding of implicit discourse relations) - metacommunication
- Slightly lower occurrence of implicit discourse relations with oppositive senses, but still high (the understanding of implicit oppositive relations is often based on bridging relations between parts of the sentences) – influence of the analogy with explicit discourse connectives?
- Rather avoidance of very specific relations (condition, purpose)



## FURTHER QUESTIONS

- Relations between expressing discourse relations and text genres
- Discourse local relations and a higher structure of the text
- Do typical clusters of discourse relations exist?  
*A – because B – therefore A'*
- Relation between implicit discourse relations and other ways of signalling the relation than a discourse connective



Thank you for your attention.



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