Subordinators with Elaborative Meanings in Czech and English

Pavlína Jínová, Lucie Poláková, Jiří Mírovský
Charles University in Prague, Faculty of Mathematics and Physics
Institute of Formal and Applied Linguistics
Czech Republic
`{jinova|polakova|mirovsky}@ufal.mff.cuni.cz`

Abstract

This paper is focused on description of hypotactic constructions (constructions with subordinating conjunctions) with "elaborative" meanings. In dependency-based linguistic literature, they are referred to as *hypotactic coordinations* or also (a subset of) *false dependent clauses*. The analysis makes use of syntax- and discourse-annotated corpora of Czech and English and thus offers an empirically grounded contrastive study of the phenomena.

1 Motivation and Background

One of the basic means of expressing syntactic dependency are subordinating conjunctions (henceforth subordinators). They also signal the semantic type of the dependency relation, i.e. the semantic relation holding between the dependent and the governing clause. Some of them have several semantic interpretations. In this paper, we describe those uses of subordinators that operate between two syntactically dependent but semantically independent contents. In other words, the clause they introduce is formally dependent, but semantically it expresses an elaborative (coordinating, restating, etc.) meaning. For the purposes of this paper, we call them *hypotactic coordinations* (see Panevová 2012).[1]

The analysis is anchored in the theoretical framework of Prague School of structuralism and its extension – functional generative description (FGD, Sgall et al. 1986). It was carried out on 50 thousand Czech sentences from the Prague Discourse Treebank, and on a similar amount of English data from the Wall Street Journal – Penn Discourse Treebank.

In linguistic theories of dependency, there are several ways of understanding the relation between formal and semantic principles of a sentence composition. Czech linguistic tradition usually distinguishes hypotaxis and parataxis as two basic formal principles of combining clauses to create a compound sentence. In majority, the linguistic community agrees that **hypotaxis** corresponds mostly to the semantic relation of **determination** (one clause semantically complements or enriches the other, building together one content), and **parataxis** corresponds to the semantic principle of **coordination** (connecting two semantically autonomous contents – the second clause adds some new information to the first clause) (Hrbáček 2000). There are, however, discrepancies between these forms and their functions.

Such a phenomenon (correspondence between hypotaxis–determination, parataxis–coordination and also their discrepancies) was described earlier in structuralist works (Karcevskij 1929) and later in FGD for morphological and also syntactical level of linguistic analysis as asymmetric dualism of forms and functions (Panevová 1980, 2012). The phenomenon is depicted in Figure 1. The solid arrows symbolize the most common relations between the form and the meaning, the dashed arrows stand for other relations, i.e. coordination realized in the hypotactic form and determination realized in the paratactic form.
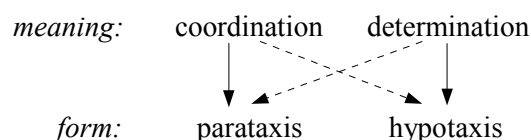

Figure 1: A schema of the asymmetric dualism between formal and semantic relations (Panevová 2012)

In the annotation of discourse structure, the account of semantic types[2] of relations between discourse units deliberately disregards the notion

---

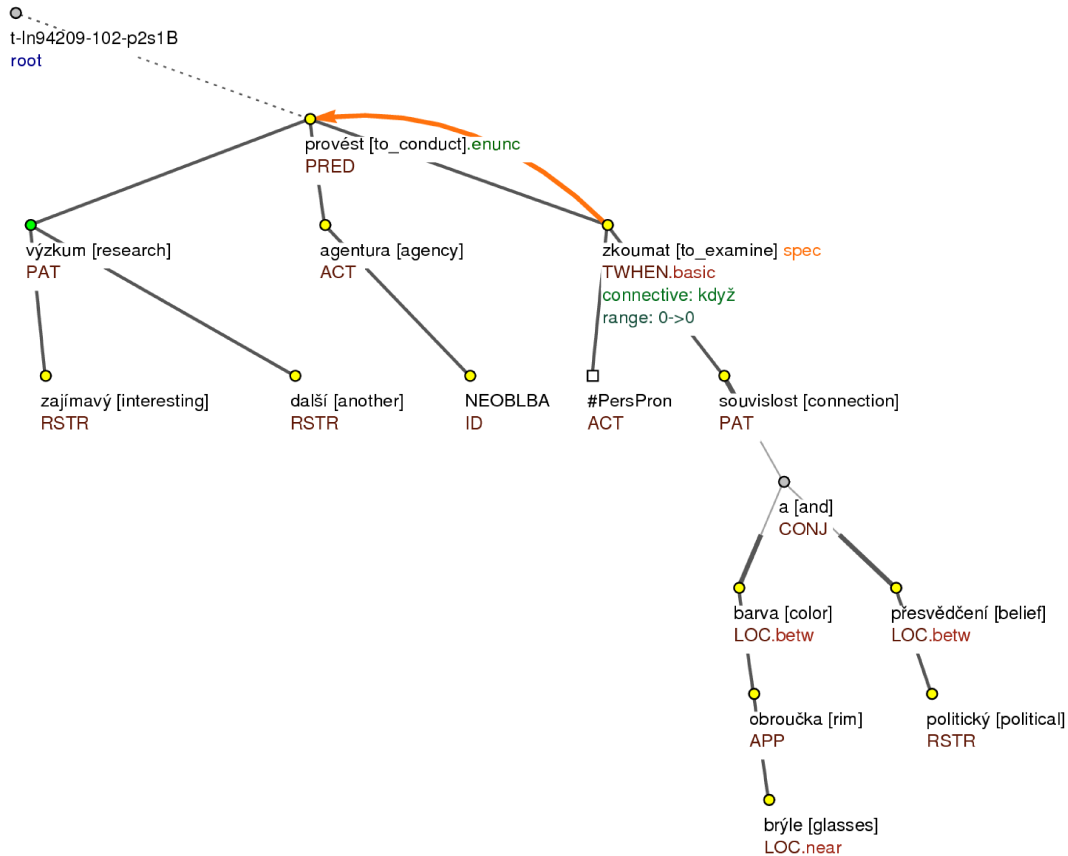[2] e.g. temporality, causality, contrast

Figure 2: The dependency tree of the example sentence (1) with a thick arrow representing a discourse relation between two verbal nodes.

of syntactic parataxis/hypotaxis, in order to liberate the perception of discourse structure from the sentential syntax.

In this paper, we look back from the discourse structure to the sentential syntax. From this point of view, for one discourse-semantic (or cognitive) type (e.g. causality), there are several language means (forms) of expression (e.g. hypotactic and paratactic constructions on the inter-clausal level).

On the general level, we are interested in the question how discourse semantics is realized formally in the sentence, our specific question is to what degree the correspondence hypotaxis–determination and parataxis–coordination on the sentence level analysis holds also for the discourse level analysis. In other words, we want to see if e.g. causality, a basic semantic concept of connecting propositions in discourse, is a matter of hypotactic constructions or if it is rather a matter of parataxis. Jínová et al. (2011) offered an overview of intra- and inter-sentential distributions of discourse relations in the Prague Discourse Treebank. Here, we are interested in hypotactic/parat-

actic distributions of discourse relations[3] in order to either confirm or disprove that tendencies holding for the principles of sentence composition hold also for discourse composition.

In the study presented in this paper we focus on one part of the problem stated above – subordinators with elaborative meaning. The annotation of explicit[4] discourse connectives (with subordinators being a subset of them) and their discourse functions revealed some discrepancies in the perception of the sentence and discourse meanings. Subordinating connectives in constructions which we call *hypotactic coordinations* became one of the most visible differences between the sentence and discourse analysis in the Prague approach.

Only thanks to the more cognitive-based[5] discourse annotation against the background of the dependency-based syntactical tagging of the same data, we were first able to identify these constructions and study them empirically. As constructions with subordinating conjunctions,

[3]   those realized within a compound sentence
[4]   present on the surface
[5]   or content-based, according to Panevová (2010)

they are tagged – accordingly to their form on the level of language meaning – as constructions with dependent clauses[6]. As discourse connectives, these subordinators are tagged in accordance with the elaborative meaning they express (the level of cognitive content), see Example (1) and Figure 2. The tree diagram shows the syntactic dependency of the clause introduced by *když* (*when*), and at the same time, the discourse tag "spec" for *specification*, which is a typical elaborative category (the prototypical temporal reading is considered inappropriate or marginal in this case).

(1) Další zajímavý výzkum provedla agentura NEOBLBA, **když** zkoumala souvislost mezi barvou obrouček u brýlí a politickým přesvědčením.

Another interesting research was conducted by the NEOBLBA agency **when** it examined a connection between the color of glasses rims and political beliefs.

Apart from the analysis of Czech subordinators, we were also interested in another theoretical issue, where the empirical data of the kind we had at our disposal could lead to other findings: Do other languages demonstrate the same or similar examples of the described asymmetric dualism? We were able to look into this issue on discourse- and syntax-annotated English data of the Penn Discourse Treebank.

The paper is structured as follows: in Section 2, the two corpora used for the analysis (Prague Discourse Treebank 1.0 and Penn Discourse Treebank 2.0) are briefly introduced. Section 3 presents the distribution of types of intra-sentential discourse relations (in total and in hypotactic constructions) in the Prague Discourse Treebank. Sections 4 and 5 are devoted to the analyses of Czech and English subordinators in *hypotactic coordinations*, respectively, and we summarize our findings in the concluding Section 6.

2 Resources used (PDiT and PDTB)

Prague Discourse Treebank 1.0[7] (PDiT, Poláková et al. 2012) is an annotation extension of the Prague Dependency Treebank 2.5[8] (PDT, Bejček

et al. 2012). PDiT consists of approx. 50 thousand sentences of Czech newspaper texts manually annotated with discourse relations anchored by explicit (i.e. surface present) connectives. The annotation was carried out directly on the dependency trees (of the tectogrammatical (or syntactico-semantic) layer of PDT, see Sgall et al. 1986).

Penn Discourse Treebank 2.0[9] (PDTB, Prasad et al. 2008) is a manually annotated treebank of English texts from the Wall Street Journal, its size is comparable to the PDiT (again, approx. 50 thousand sentences). The annotation comprises both explicit and implicit discourse relations. In comparison with the Prague approach, the annotation was carried out on raw texts and only then mapped onto the syntactic trees.

Let us emphasize that all numbers and examples from PDiT that we present in this paper have been measured on and taken from the *training* and *development test* parts of the data (9/10 of the treebank, approx. 44 thousand sentences). The *evaluation test* part of the data thus remains unobserved.

3 Discourse relations and hypotactic structures in PDiT

In order to examine how discourse level analysis is related to the principles of sentence composition, all realizations of discourse relations within one (compound) sentence were measured over the data of PDiT. Then, as our interest here lies in subordinators, the percentage of subordinate structures among all intra-sentential realizations was measured.

Distribution of individual types of discourse relations[10] for subordinate structures is given in Table 1. It displays the total number of intra-sentential realizations for each semantic type of discourse relation and the percentage of subordinate structures for each type of relation. The remaining fraction consists of predominantly paratactic forms and a small number of parenthetical and other marginal structures. On the basis of these data, the following observations can be made.

First, all discourse intra-sentential relations whose syntactic parallels are treated by in Czech linguistic tradition as cases of **determination** (or content-dependency) – i.e. *purpose, condition – result of the condition, synchrony, conces-*

---

6 For details on the annotation principles of the Prague Dependency Treebank, see Mikulová et al. (2005).
7 http://ufal.mff.cuni.cz/discourse/
8 http://ufal.mff.cuni.cz/pdt2.5/

9 http://www.seas.upenn.edu/~pdtb/
10 Because of their nature, we exclude pragmatic relations from the analysis. They represent other types of discourse meanings.

sion, precedence – succession and *reason – result* (Hrbáček 2000, Daneš et al. 1987) are realized in PDiT as subordinate structures in 50% of cases or more. The least distinctive is this result for the relation of *reason – result*, the most distinctive for the relation of *purpose* (*purpose* was only realized in the hypotactic structure).

type of discourse re-lation	number of occurrences within one sentence in PDiT[11]	hypotactic structures (in %)
purpose	372	100
condition – result of the condition	1,171	99
synchrony	140	84
concession	561	82
precedence – suc-cession	495	68
confrontation	312	55
reason – result	1,428	51
explication	89	26
restrictive opposi-tion	87	15
specification	453	13
exemplification	22	5
correction	300	4
opposition	1,235	4
conjunction	5,389	1
gradation	196	0.5
conjunctive alterna-tive	62	0
disjunctive alterna-tive	234	0
equivalence	38	0
generalization	8	0

Table 1: Intra-sentential discourse relations in PDiT

Second, with the exception of *confrontation* (see below in this section), all relations whose syntactic parallels are treated as cases of **coordination** (or content parallelism) are realized as hypotactic structures much less often than the first group. For four types of relations (*disjunctive* and *conjunctive alternative, equivalence* and *generaliza-*

tion), no hypotactic realization was found in PDiT.

These findings corroborate the hypothesis about a symmetrical relation between hypotaxis and determination on one side, and parataxis and coordination on the other. Of course, with the exception of *purpose*, all discourse types whose syntactic parallel is treated as determination have also paratactic realizations documented in PDiT (for *reason – result*, they represent almost a half of the occurrences) and the majority of discourse types whose syntactic parallel is treated as content parallelism (coordination) was documented also as a hypotactic form. These hypotactic forms are, however, in sum much less frequent than paratactic forms of relations in the first group, and thus they represent a linguistically interesting phenomenon that has not been described yet on the basis of a larger corpus material. Therefore, in Section 4, we introduce a detailed analysis of types of these structures according to their formal characteristics. We call them *hypotactic coordinations* further on.

Before we proceed further, two types of the PDiT discourse relations, namely *confrontation* and *explication*, require a special comment. The syntactic parallel of *confrontation* is treated as a type of semantic coordination (Daneš et al. 1987, p. 462) – two pieces of content are put side by side and compared (see Example (8)). On the other hand, comprehensive description of Czech syntax distinguishes paratactic and hypotactic means of its realization (ibid.) and thus reflect its special status among coordinations. Our data confirms this status – the relation of *confrontation* is in 55 % of cases realized in hypotactic structures.

The second PDiT relation that deserves a special comment is *explication* – it is not a basic relation in grammatical descriptions of the Czech syntax, it was newly introduced for the discourse level analysis of PDiT. From the semantic point of view, it has a mixed nature between determination (an explanation of the content of one text unit is given in the second text unit) and content parallelism (these contents are somehow similar).[12] Because of this mixed nature, we ex-

---

[11] Please note again that all numbers related to PDiT refer to the training and development test parts of the data (9/10 of the treebank, 43,955 sentences).

[12] Cf. for example the context (A), where the dependent clause expresses an explanation of the fact of a late interest by saying what "late" means.

```
(A) O studium svého syna jste se
začal zajímat pozdě, protože ofi-
ciální termín přihlášek na střední
školy a učňovská zařízení vypršel
s koncem února.
```

clude *explication* from further analysis. Typical connectives for this relation in Czech are paratactic. Hypotactic realizations of this relation employ the same connectives as *reason – result* (26 % of intra-sentential realizations in PDiT).

4 Subordinators with elaborative meanings in PDiT

According to their formal structure, we can distinguish four main types of dependent clauses expressing elaborative meanings.

4.1 Clauses with a specific unambiguous structure

First, there are certain hypotactic formal means in Czech that only express one particular coordination relation and no others. We call them specific structures. These hypotactic structures are not very frequent in our data and they were only documented for *correction* (11 occurrences, connective *místo (toho,) aby* (*instead of*, lit. *instead of that, that*)) and *conjunction* (2 occurrences, connective *kromě toho, že* (*besides*, lit. *besides that, that*)). These structures are exemplified in (2) and (3).

(2) **Kromě toho, že** je kompatibilní s MS-DOS, podporuje řadu programů pro postižené osoby.

Besides being compatible with MS-DOS, it supports a variety of programs for disabled people.

(Lit: **Besides that, that** it is compatible with MS-DOS...)

(3) **Místo aby** clo od poslanců vymáhali, říkali jim "jen jeďte, jen jeďte".

Instead of exacting the customs from the members of parliament, they told them "just go, just go".

(Lit: **Instead that** the customs from the-members-of-parliament they-exacted, they-told them "just go, just go".)

These examples suggest that the specific status of these *hypotactic coordinations* is connected

with the form of the subordinators – they are not regular conjunctions, they are composed of several elements: a preposition, (optionally of) a relative pronoun, and a conjunction.

4.2 Relative clauses

Second, some relative clauses are known to have other functions than only to determine the noun phrase. Rather, they provide additional information which can be expressed easily in a separate sentence (often they also express temporal succession of events). There is a possibility to consider these cases relevant for discourse analysis in our sense. In the Czech description of syntax, they are mostly called *false relative clauses* (Daneš et al. 1987, p. 533)[13], in English they are viewed as non-restrictive relative clauses (Quirk et al. 1992). As far as we know, however, there are no clear criteria for distinguishing semantically autonomous contents from determined contents in relative clauses, or, in our view, discourse-relevant cases from the other ones. Often it is impossible to say whether the relative clause only determines the noun phrase or continues the discourse. For the PDiT annotation, it was decided that only those cases are marked where there is (apart from the relative pronoun/adverb) an explicit connective present in the relative clause.

In PDiT data, we were able to document 45 cases of *opposition*, 24 cases of *conjunction*, 6 cases of *restrictive opposition*, 2 cases of *confrontation* and 1 case of *correction* expressed between a relative clause and its governing clause. Examples of such a realization of *opposition* and *conjunction* are given in (4) and (5).

(4) Chtěli jsme hrát nátlakový fotbal, **který však** ztroskotal na kvalitní obraně Benešova.

Lit: We wanted to play an aggressive football, **which however** failed on a high-quality defence of Benešov.

(5) Kuvajťan byl rychlou záchrannou službou převezen do pražské Thomayerovy nemocnice, **kde** byl **také** operován.

The Kuwaiti was transported by the ambulance to the Prague Thomayer hospital, **where** he **also** underwent a surgery.

You became interested in the studies of your son too late, **because** the official deadline for applications for high schools and secondary vocational schools has expired at the end of February.

---

[13] or *improper relative clauses*, in Czech *nepravé věty vedlejší*

4.3 Clauses formally equal to regular hypotactic structures

The third group of *hypotactic coordinations* is represented by structures formally indistinguishable from regular dependency structures. In Czech linguistic tradition, these types of dependent clauses are also often called "false" (or "improper"), as they formally signal dependency but semantically express an elaborative relation between two independent propositions. Table 2 lists all types and number of occurrences of these structures that we were able to document in the PDiT data.

Example (1) from the introductory section shows such a case of *specification,* which is formally expressed as a construction with a dependent temporal clause and the subordinator *když* (*when*), Example (6) below shows the same situation for *confrontation,* which is formally expressed as a construction with a dependent conditional clause and the subordinator *jestliže* (*if*).

(6) **Jestliže** v roce 1993 jich bylo 8650, což je vytížení kapacity lázní asi na 65 až 70 procent, **tak** v letošním roce by jich mělo být již 9745.

If there were 8,650 of them in 1993, which represents the capacity utilization of the spa to about 65 to 70 percent, **then** this year there should be already 9,745 of them.

relation	number of occurrences in PDiT	connectives
confrontation	9	2 *-li* (*if*), 2 *jestliže* (*if*), 3 *když* (*when*), 1 *i když* (*although*), 1 *přestože* (*although*)
conjunction	14	2 *aby* (*(as) to*), 11 *když* (*when*), 1 *jestliže* (*if*), 1 *zatímco* (*while*)
correction	1	1 *kdyby* (*if*)
exemplification	1	1 *například když* (*for example when*)
opposition	3	1 *zatímco* (*while*), 2 *i když* (*although*)
restrictive opposition	5	4 *i když* (*although*), 1 *když* (*when*)
specification	57	57 *když* (*when*)

Table 2: "False" dependent clauses in PDiT

The findings in Table 2 show that these structures are rather sparse. To illustrate how frequent the *hypotactic coordinations* are for each subordinator from Table 2, we measured types of relations which were expressed by each of them in PDiT. The results are summarized in Table 3.

connective	occurrences	dominant type of relation (in %)	hypotactic coordinations (in %)
aby	390	*purpose* (94)	0.5
-li	272	*condition* (97)	1
když	499	*condition* (42), *precedence – succession* (21), *synchrony* (16)	15
i když	166	*concession* (90)	4
jestliže	85	*condition* (92)	4
přestože	87	*concession* (98)	2
kdyby	155	*condition* (89), *concession* (10)	1
zatímco (regular use)	176	*confrontation* (90), *synchrony* (8)	92

Table 3: Subordinators in hypotactic coordinations in PDiT

Despite this rare use of subordinators in *hypotactic coordinations*, there is one subordinator in Czech, namely *zatímco* (*while*), which is used in *hypotactic coordinations* regularly and frequently. *Zatímco* in Czech either expresses temporal synchronicity (7) or confrontation (8) and both these uses are perceived as regular, in the sense not "false" or "improper". The confrontational use, however, is treated as a semantic coordination, not determination, see Section 3. Therefore we claim that the connective *zatímco* in the confrontational use is the only regular form of expressing the asymmetric dualism in Czech on the syntax-discourse level of analysis. For comparison, it is added to Table 3 (the last row).

There are 160 occurrences of *confrontation* with the connective *zatímco* (*while*) documented in the PDiT data.

(7) [...] **zatímco** Sára ještě spí, zapřáhne osla.

> […] ***while*** *Sarah is still sleeping,*
> *he hithes up the donkey.*

> (8) Prezident Václav Havel se těší
> důvěře 75 procent občanů, **zatímco**
> důvěra v premiéra Václava Klause
> klesla na 54 procent.

> President Václav Havel enjoys the
> confidence of 75 percent of citi-
> zens, **while** the confidence in the
> Prime Minister Václav Klaus declined
> to 54 percent.

4.4 Connective *s tím, že* (*along with*)

One subordinator in Czech – *s tím, že* (roughly *along with* or *saying also that*, lit. *with that, that*) – is semantically vague and can serve as a connective for many relations (in PDiT data, there are eight different types of relation expressed by this connective). The type of the relation is inferable only from the context. From the point of view of *hypotactic coordination* in PDiT, it serves as a connective of *conjunction* in 14 cases and as a connective of *specification* in 3 cases. Examples of these contexts are given in (9) and (10), respectively.

> (9) Doplněný návrh by měl obsahovat
> dvě varianty řešení **s tím, že** se k
> němu správní rada Českých drah znovu
> sejde 3. března.

> The completed proposal should
> contain two variants of the solution
> **and** (lit. **with that that**) the Board
> of Czech Railways will reconvene to
> adress it again on the third of
> March.

> (10) K oběma vraždám se přiznal **s**
> **tím, že** chtěl získat skromný majetek
> důchodců a drobné peněžní částky.

> He confessed to both murders **saying**
> **that** he wanted to get the modest
> possessions of the retirees and
> small amounts of money.

5 Subordinators with elaborative meanings in PDTB

Thanks to Penn Discourse Treebank 2.0, we have at our disposal English subordinators annotated for their discourse semantics (Prasad et al. 2008). Having left their prevalent uses out of this analysis, we were able to draw (at least partial) parallels between their "non-standard" uses in Czech and in English.

We translated into English the Czech subordinators that took part in *hypotactic coordinations* (e.g. *když = when*; *jestliže = if*) and searched the PDTB for similar patterns. Even though such constructions may be language-specific, and, for English, they are scarcely documented in linguistic handbooks[14], some correspondence between Czech and English in our data is evident, compare Examples (11)–(13).

Subordinator: if, PDTB tag: Comparison:Contrast

> (11) **If** Mr. Wilbur's translation
> is a finely ground lens through
> which we see the pettiness and
> corruption of 17th-century Paris,
> Mr. Falls's production is a mirror
> in which we see ourselves.

Subordinator: if, PDTB tag: Comparison:Contrast:Juxtaposition

> (12) **If** the political establish-
> ment is reluctant to forgive sex-
> ual misadventures, the private
> sector sometimes will.

Subordinator: when, PDTB tag: Temporal:Synchrony/Expansion:Restatement:Specification

> (13) In the same sentence he con-
> tradicts himself **when** he reports
> that the government still retains
> 40% of the total equity of the
> airline.

In these examples, the predominantly conditional *if* (11), (12) and the predominantly temporal *when* (13) express elaborative meanings – the same ones that we were able to document for Czech in Section 3.3, i.e. in Example (6) *confrontation*, in Example (1) *specification*.

A similar correspondence was documented for "false" relative clauses in English. Example (14) from PDTB shows a relative clause introduced by *which* that also contains a contrastive connective *nonetheless*. This co-occurrence in our view clearly signals the presence of a semantically autonomous content in the dependent clause (e.g. a coordination of the two contents rather than a determination) and so it corresponds to the Czech sentence in (4).

---

14 with the exception of some non-restrictive relative clauses with a coordinative meaning (Quirk et al. 1992, p. 648), or "false" infinitives of purpose, such as: *I awoke to find the room flooded by sunshine.* (Dušková 1992, p. 562)

```
 (14) Gemina, which owns 13.26% of
Nuovo Banco, abstained in the fi-
nal vote on Credit Agricole, which
was nonetheless approved by a ma-
jority of shareholders.
```

Similarly as in Czech, the only subordinators that regularly signal a coordinative meaning are *while* and *whereas*: in terms of PDiT relations, they express *confrontation*. Of course, Czech *zatímco* and English *while* cannot be mapped 1:1 (e.g. the English *while* regularly expresses also causality) but for both languages they represent the most frequent subordinator with a coordinative meaning.

Having found evidence for parallels in use of subordinators in *hypotactic coordinations* in English and Czech, we are aware of the fact that the direction of analysis from Czech to English may have not revealed all such relevant structures in English. The existence of other types of *hypotactic coordinations* cannot be excluded and it is a possible topic for further linguistic research.

However, in spite of the assumed language-specificity in the repertoire of connective means and their use, our findings on a relatively small amount of data and a restricted language domain (financial journal) suggest that when subordinators deviate from their usual functions, they tend to do it in the similar way in Czech and English.

6 Conclusion

In this paper, we surveyed structures where subordinators convey coordinative meaning (*hypotactic coordinations*). These structures represent an irregular relation between formal and semantic principles of sentence composition, since coordinative meanings are prototypically realized in paratactic structures. On the basis of PDiT and PDTB, we described this phenomenon for Czech and we have drawn some comparisons of their use in English.

As the first step, the distribution of discourse relations as hypotactic versus paratactic structures in PDiT was measured to see to what extent the hypothesis of correspondence determination – hypotaxis, coordination – parataxis is also applicable for discourse semantics. We found that with the exception of *confrontation*, whose syntactic (and sentence-level semantic) counterpart is treated as coordination and which appears in our data quite regularly both as paratactic and hypotactic structures, relations whose syntactic counterpart is treated as coordination are realized as hypotactic structures rather rarely.

Further, we analyzed four types of *hypotactic coordinations* in Czech according to the characteristics of their respective subordinators. Some subordinators (e.g. *kromě toho, že* (lit. *besides that that*)) are specific only for coordination, a majority of them is used regularly for other relations than coordination (e.g. *jestliže* (*if*) is a regular subordinator for *condition*, some uses of it however express *confrontation*) etc.

Finally, subordinators whose "non-standard" meaning was documented for Czech (e.g. *jestliže* (*if*)) were translated and looked for also in the English data. Despite of the assumed language-specificity in connective functions, we were able to document English examples corresponding to the Czech structures.

Our findings are of course limited by the size and type of the language resources available for such a comparative study. Nevertheless, it should be highlighted that only the existence of such manually and specifically annotated corpora that gather linguistic information from different levels of language description makes it possible for the first time to carry out such a linguistic analysis.

References

Eduard Bejček, Jarmila Panevová, Jan Popelka, Pavel Straňák, Magda Ševčíková, Jan Štěpánek, Zdeněk Žabokrtský. 2012. Prague Dependency Treebank 2.5 – a revisited version of PDT 2.0. In: *Proceedings of the 24th International Conference on Computational Linguistics (Coling 2012)*, Mumbai, India, pp. 231-246.

Libuše Dušková. 1992. *Mluvnice současné angličtiny na pozadí češtiny*. Praha: Academia.

Josef Hrbáček. 2000. Věta a výpověď. In: Čechová, M. et al. *Čeština – řeč a jazyk*.

Pavlína Jínová, Lucie Mladová, Jiří Mírovský. 2011. Sentence Structure and Discourse Structure: Possible Parallels. In: P*roceedings of the International Conference on Dependency Linguistics (Depling*

2011), Universitat Pompeu Fabra, Barcelona, Spain, ISBN 978-84-615-1834-0, pp. 233-240.

S. Karcevskij. 1929. Du dualisme asymétrique du signe linguistique. In: *Travaux du Cercle Linguistique de Prague, 1*, pp. 88–93. Czech translation by A. Bémová in: *Principy strukturní syntaxe 1* (1974). Praha: Státní pedagogické nakladatelství, pp. 26–30.

Marie Mikulová et al. 2005. *Anotace na tektogramatické rovině Pražského závislostního korpusu. Anotátorská příručka. Praha: UFAL MFF.* Available at: http://ufal.mff.cuni.cz/pdt2.0/doc/manuals/cz/t-layer/html/index.html.

Lucie Poláková, Pavlína Jínová, Šárka Zikánová, Eva Hajičová, Jiří Mírovský, Anna Nedoluzhko, Magdaléna Rysová, Veronika Pavlíková, Jana Zdeňková, Jiří Pergler, Radek Ocelák. 2012. *Prague Discourse Treebank 1.0.* Data/software, ÚFAL MFF UK, Prague, Czech Republic, http://ufal.mff.cuni.cz/discourse/, Nov 2012.

R. Prasad, N. Dinesh, A. Lee, E. Miltsakaki, L. Robaldo, A. Joshi and B. Webber. 2008. The Penn Discourse Treebank 2.0. In *Proceedings of the 6th International Conference on Language Resources and Evaluation (LREC 2008)*, Marrakech, Morocco, pp. 2961-2968.

Jarmila Panevová. 2010. Ke vztahu kognitivního obsahu a jazykového významu. In: *Korpus – gramatika – axiologie, Vol. 1, No. 1*, Gaudeamus, Hradec Králové, Czech Republic, ISSN 1804-137X, pp. 30-40.

Jarmila Panevová. 1980. *Formy a funkce ve stavbě české věty.* Praha: Academia.

Jarmila Panevová. 2012.*Koordinace vs. determinace (Forma nebo význam?).* Contributed talk, Zasedání Komise pro gramatickou stavbu slovanských jazyků při MKS, Univerzita Konštantína Filozofa Nitra, Nitra, Slovensko, Oct 2012.

František Daneš, Zdeněk Hlavsa, and Miroslav Grepl. 1987. *Mluvnice češtiny 3, Skladba.* Praha, Academia.

Lucie Poláková, Pavlína Jínová, Šárka Zikánová, Zuzana Bedřichová, Jiří Mírovský, Magdaléna Rysová, Jana Zdeňková, Veronika Pavlíková and Eva Hajičová. 2012. *Manual for Annotation of Discourse Relations in the Prague Dependency Treebank.* Technical report, UFAL MFF UK, Prague, Czech Republic. Available at: http://ufal.mff.cuni.cz/techrep/tr47.pdf.

Randolph Quirk, Sidney Greenbaum, Geoffrey Leech, Jan Svartvik. 1992. *A Grammar of Contemporary English*. England: Longman Group.

Petr Sgall, Eva Hajičová, Jarmila Panevová. 1986. *The Meaning of the Sentence in Its Semantic and Pragmatic Aspects.* Dordrecht: D. Reidel Publishing Company.