

Subordination and coordination in syntax, semantics and discourse

Evidence from the study of connectives¹

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This article discusses the question whether the distinction between subordination and coordination is parallel in syntax and discourse. Its main thesis is that subordination and coordination, as they are commonly understood in the linguistic literature, are genuinely syntactic concepts. The distinction between hierarchical and non-hierarchical connection in discourse structure, as far as it is defined clearly in the literature, is of a quite different nature. The syntax and semantics of connectives (as the most prominent morphosyntactic means by which subordination and coordination are encoded) offers little evidence to support the assumption of a structural parallelism between syntax and discourse. As a methodological consequence, sentence and discourse structure should not be mixed up in linguistic analysis.

Keywords: Coherence, relation, conjunction, adposition, adverbial connective.

1. Introduction

The distinction between linguistic subordination and coordination, i.e., between hierarchical and non-hierarchical connection in language, has been investigated during the last decades by many authors within various research paradigms. Both types of connection have been examined on sentence level as well as on the level of text and discourse (for syntax-oriented approaches see e.g., Foley & Van Valin 1984: 238ff; Shopen 1985; Wesche 1995; Kortmann 1996; Haumann 1997; Van Valin & LaPolla 1997: 441ff; Johannessen 1998; Cristofaro 2003; Haspelmath (ed.) 2004; for discourse-oriented approaches see e.g., Thompson & Longacre 1985; Mann & Thompson 1988; Polanyi 1988; Günthner 1996; Lefèvre 2000; Asher & Vieu 2005).

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One of the questions addressed in the literature concerns the relation between syntactic connection and discourse connection. Should it be assumed that hierarchical connections of clauses reflect hierarchical connections of discourse units and that non-hierarchical connections of clauses reflect non-hierarchical connections of discourse units (see Hopper & Thompson 1984: 736f; Quirk et al. 1985: 919f; Matthiesen & Thompson 1988; O'Dowd 1992; Schecker 2000; Wegener 2000; Cristofaro 2003: 45ff)? Or should it be assumed that the two domains of connection are structurally independent of each other?

The present article contributes to the theoretical discussion of this question from the point of view of the study of connectives, the examples being taken from Modern German. In many languages, connectives ("linkers"; see Quirk et al. 1985: 921) are among the most important means used to establish subordinative and coordinative relations in syntax. Most theories of discourse structure pay particular attention to their role in establishing coherence relations (see e.g., Halliday & Hasan 1976: 226ff; Polanyi 1988: 605; Knott & Dale 1994: 45ff; Knott et al. 2001). In terms of traditional grammar, they belong to the following word classes: subordinating and coordinating conjunctions, adpositions, and adverbs (see Pasch et al. 2003: 38ff; Blühndorn 2007a).

There are several other means that serve to encode syntactic subordination in the languages of the world: complementizers, relative pronouns and relative particles, specialized converbs, non-finite verb forms like infinitives, gerunds and participles, as well as inflectional case forms like locatives, instrumentals or ablatives; coordinative relations may also be encoded by asyndetic juxtaposition, plurals or collectives (see O'Dowd 1992; Muller 1996; Kortmann 1996: 5, 73; Zifonun 2001; Cristofaro 2003: 51ff; Heath 2004; Breindl & Waßner 2006; Breindl 2007a, b). These other means will not be looked at in this article, the focus being on prototypical coordination and on adjunct relations (adverbial adjuncts and adverbial subordinate clauses). In particular, I will not be interested in complement relations (subject or object clauses), nor in attributive relations (relative clauses), which are not connective relations in the sense in which the term is used here (see Pasch et al. 2003: 1ff, 38f; on complements and adjuncts see Bierwisch 2003).

The research project team *Handbuch der deutschen Konnektoren* (HdK) at the *Institut für Deutsche Sprache* in Mannheim has been investigating the syntax and semantics of German connectives for several years (see Pasch et al. 2003; Blühndorn et al. 2004; Pasch 2004). One of the recurring issues discussed in that work has been the syntactic and semantic nature of subordination and coordination (see Pasch et al. 2003: 230ff, 267ff).

Based on experience from the HdK project, the thesis to be presented in this paper is:

The study of connectives offers little evidence in favour of a general structural parallelism between hierarchical and non-hierarchical connections in syntax and

discourse. Rather, it should be assumed that hierarchical as well as non-hierarchical discourse relations may, in principle, be encoded by both coordination and subordination in syntax. Whatever the relevant factors that control the choice between syntactic subordination and coordination, they should not be identified with the distinction between hierarchical and non-hierarchical connection in discourse.

In support of this thesis, I will present three main arguments:

- i. The syntactic distinction between coordination and subordination is neutralized at levels higher than the sentence. On the levels of text and discourse it does not play any relevant role (section 2).
- ii. In semantics, similarly as in syntax, we can distinguish between hierarchical and non-hierarchical connections. Both types of semantic connection can be encoded by both types of syntactic connection (section 3).
- iii. Syntax and semantics provide similar models for non-hierarchical connection, but contrasting models for hierarchical connection. There is no reason to believe that the structure of hierarchical relations in discourse should be generally more similar to hierarchical relations in syntax than to hierarchical relations in semantics (section 4).

In syntax, hierarchical connection of clauses is traditionally called subordination, and non-hierarchical connection of clauses is called coordination. In line with this tradition, I will use the terms *subordination* and *coordination* for the two main types of connection in syntax. In semantics, I will distinguish between *symmetrical* (non-hierarchical) and *asymmetric* (hierarchical) connection of conceptual entities (spatial objects, events, propositions, or acts). The terms *hierarchical* and *non-hierarchical* themselves will be reserved for the connection of rhetorical units (utterances and speech acts) in discourse.

The main question of this article can therefore be reformulated as follows:

Is there a parallelism between coordinative vs. subordinative connection of clauses in syntax, symmetrical vs. asymmetric connection of concepts in semantics and non-hierarchical vs. hierarchical connection of rhetorical units in discourse? Or are these three levels of connection independent of each other?

In section 2, this question is approached from a syntactic point of view, in section 3 from a semantic point of view, and in section 4 from the point of view of discourse. Section 5 summarizes the conclusions to be drawn from the arguments presented.

2. Syntactic connections

Recent studies on syntactic coordination and subordination in the languages of the world suggest that there is no sharp dichotomic distinction between these two types of

connection (see Cristofaro 2003: 15ff). Rather, they should be viewed as prototypical poles on some sort of gradient (see Quirk et al. 1985: 927f; O'Dowd 1992: 68f; Kortmann 1996: 56ff; Johannessen 1998: 237ff). In this section the focus is on the prototypical poles rather than the various intermediate types which occur in German (see Pasch 2000), as well as in many other languages (see Haspelmath 2004: 33ff).

2.1 Coordinative connections

Coordinative connections are realized by coordinating conjunctions. The prototype of a coordinating conjunction is *und* ('and'):

- (1) *Es gab da überhaupt keine Action-Abteilung,
und ich war von Tag zu Tag mieser gelaunt.
Und dann erwog ich auch bald meine Abseilung
in den ewigen Underground.
Und sehn wir uns nicht in dieser Welt,
dann sehn wir uns in Bielefeld!*
(Udo Lindenberg, *Rätselhaftes Bielefeld*)
they didn't even have an action department / *and* my mood got worse by the
day / *and* soon I began to think about abseiling / to the eternal underground /
and if we won't meet in this world / then we'll catch up in Bielefeld

The expressions linked by a coordinating conjunction (coordinator) are typically of the same formal and/or functional category (for exceptions see Johannessen 1998; Osborne 2003: 114ff). In example (1), all conjuncts (or *coordinands*; see Haspelmath 2004) are V(erb)2-sentences.

Opinions differ about what may be the most adequate representation of the syntactic structure of coordination (see e.g., Dik 1972; Wiese 1980; Wesche 1995; Johannessen 1998; Camacho 2003; Osborne 2003, 2006; Eisenberg 2004: 205ff, 377ff). Most but not all approaches assume structures in which both coordinands have equal status in relation to the coordinator or some other category. One of the exceptions is Johannessen (1998: 108ff), who proposes a structure in which one coordinand is the complement of the coordinator, the other being its specifier. Her main interest, however, is in so-called unbalanced, i.e., non-prototypical, coordination.

In prototypical coordination, the morphosyntactic format of the coordinands is defined independently of the coordinator. Coordinators neither select coordinands of a specific category nor do they require or attribute specific morphosyntactic features. German has some connectives that behave similarly to coordinators, but nevertheless select relata of a certain morphosyntactic format: *denn* ('for'), e.g., can only connect V2-clauses (see Duden 2005: 628), whereas *sowie* ('as well as') can only connect V-final-clauses and constituents less complex than a clause (words or phrases) (see Breindl 2007b). Connectives with a similar non-prototypical behaviour can be found in several languages: *for* and *as well as* in English, *car* and *ainsi que* in French, *gdyż* and *oraz* in Polish, etc.

Prototypical coordinators and similar elements are strongly constrained as to their linear position in relation to the coordinands. In German, they must be positioned in the middle between the coordinands, with a slightly stronger affinity to the right one:

- (2) a. *Ihr kauft ein und wir warten hier an der Ecke.*
you can go shopping *and* we'll wait here at the corner
b. **Und wir warten hier an der Ecke ihr kauft ein.*
and we'll wait here at the corner you can go shopping

If two coordinate clauses are separated by a comma or period, then it is invariably put to the left of the coordinator and not to its right:

- c. *Ihr kauft ein. Und wir warten hier an der Ecke.*
you can go shopping. *and* we'll wait here at the corner
d. **Ihr kauft ein und. Wir warten hier an der Ecke.*
you can go shopping *and*. we'll wait here at the corner

In other languages, coordinators may take other linear positions (e.g., Latin *-que*, which is a suffix added to the second coordinand). In general their positions are much more constrained than the positions of any other class of connectives (see Haspelmath 2004: 6ff; also Osborne 2006). We can therefore say that coordinators connect their coordinands basically by linear sequence.

2.2 Subordinative connections

One of several means to establish subordinative connections between clauses are subordinating conjunctions (adverbial subordinators; see Kortmann 1996), like *während* ('while'):

- (3) *Die Pinguine waren braun-gelb, während die Giraffen schwarz-weiß waren.*
the penguins were yellow-brown, *while* the giraffes were black and white

Subordinating conjunctions influence the morphosyntactic format of one of their relata (the subordinate clause). The authors of the *Handbuch der deutschen Konnektoren* (Pasch et al. 2003: 8ff, 106ff) call this relatum the internal argument. The relation between the subordinating conjunction and its internal argument is described as a type of government: in German, subordinating conjunctions select V-final order of their internal argument; in many languages they require certain tense and/or mood forms of the subordinate verb. On the other hand, subordinating conjunctions do not have any influence on the morphosyntactic format of their external argument (the main clause) (see Pasch et al. 2003: 361, 416f). Subordinative connections are therefore structurally asymmetric.

While the relata of coordinators are typically of the same morphosyntactic category, the relata of subordinating conjunctions typically belong to different

morphosyntactic categories. They can be distinguished in functional terms as main and subordinate clauses, or formally as clauses with certain morphosyntactic properties, e.g., V2 and V-final. But categorical differences between the relata are by no means obligatory in subordinative connections. Both relata can be of the same category, if, for independent reasons, the external argument is a subordinate clause as well:

- (4) *Maria erzählte, dass [die Pinguine braun-gelb waren, während [die Giraffen schwarz-weiß waren]]_{V-final} V-final*
 Mary told us that [the penguins were yellow-brown, while [the giraffes were black and white]]

In such cases the morphosyntactic form of the external argument is never determined by the connective.

Prototypical coordinators can connect expressions of any morphosyntactic category. Subordinating conjunctions, in contrast, can only connect clauses. This limitation is largely compensated for by adpositions, which are formally and functionally very similar to subordinating conjunctions, but which take noun phrases instead of clauses as at least one of their relata (see Kortmann 1996: 25, 58ff, 66ff):

- (5) *die Vorkommnisse während der Abschlussfeier*
 the occurrences *during* the leaving party

It is a well-known fact that in German, as in many other languages, clauses can be transformed into noun phrases (see Hopper & Thompson 1984: 737f, 744ff; O'Dowd 1992; Eisenberg 2004: 252ff). The expressions resulting from nominalization must then be connected by adpositions instead of subordinating conjunctions. Adpositions require their internal argument to adopt a specific case form, but they have no influence on the morphosyntactic form of their external argument.

Subordinating conjunctions and adpositions have a fixed serial position in relation to their internal, but not in relation to their external argument. In German, they typically take a position at the left margin of their internal argument. They structurally embed their internal argument into the external argument. In the linear structure of the external argument they can be moved rather freely together with their internal argument. In particular, they can be postposed (as in (6/7a)), preposed (as in (6/7b)) and – at least for subordinating conjunctions – even be interposed to the external argument (as in (6c)).

Subordinating conjunction:

- (6) a. *Wir warten hier an der Ecke, solange ihr einkauft.*
 we'll wait here at the corner, while you go shopping
 b. *Solange ihr einkauft, warten wir hier an der Ecke.*
 while you go shopping, we'll wait here at the corner
 c. *Wir warten, solange ihr einkauft, hier an der Ecke.*
 we'll wait, while you go shopping, here at the corner

Adposition:

- (7) a. *die Aufräumarbeiten nach der Abschlussfeier (waren ermüdend)*
 the cleaning work after the leaving party (was exhausting)
 b. *nach der Abschlussfeier die Aufräumarbeiten (waren ermüdend)*
 after the leaving party the cleaning work (was exhausting)

Thus, subordinating conjunctions and adpositions (subordinators) do not link their relata by linear sequence, but by government and embedding.

2.3 Adverbial connections

Coordinative and subordinative connections of the kinds discussed so far are established by syntactic means such as linear ordering, government and embedding. They clearly fall within the scope of syntax.

Semantically equivalent connections can also be encoded by means of adverbial connectives. In the following pairs of examples, the (a)-variants encode the connection by means of a subordinator or coordinator, whereas the (b)-variants encode a semantically equivalent connection by means of an adverbial connective:

- (8) a. *Die Pinguine waren braun-gelb, während die Giraffen schwarz-weiß waren.*
 (subordinating conjunction)
 the penguins were yellow-brown, while the giraffes were black and white
 b. *Die Pinguine waren braun-gelb. Die Giraffen dagegen waren schwarz-weiß.*
 (adverbial connective)
 the penguins were yellow-brown. the giraffes, in contrast, were black and white
- (9) a. *Die Aufräumarbeiten nach der Abschlussfeier waren sehr anstrengend.*
 (adposition)
 the cleaning work after the leaving party was very exhausting
 b. *Die Abschlussfeier war ein großer Erfolg. die Aufräumarbeiten danach waren sehr anstrengend.* (adverbial connective)
 the leaving party was a great success. The cleaning work afterwards was very exhausting
- (10) a. *Es gab da überhaupt keine Action-Abteilung, und ich war von Tag zu Tag mieser gelaunt.* (coordinating conjunction)
 they didn't even have an action department, and my mood got worse by the day
 b. *Es gab da überhaupt keine Action-Abteilung. Zudem war ich von Tag zu Tag mieser gelaunt.* (adverbial connective)
 they didn't even have an action department. in addition, my mood got worse by the day

Adverbial connectives are syntactic constituent of one of their semantic relata. They are attached to that relatum as adverbial adjuncts. They may influence the tense and/

or mood of the verb of that relatum, but they do not influence the morphosyntactic format of their other relatum. To their other relatum, they do not bear any syntactic relation (see Pasch et al. 2003: 485).

In relation to both connected expressions, adverbial connectives do not have a fixed linear position. Like most adverbials, they can be moved relatively freely within the relatum of which they are a constituent, and though they typically occur in the right (subsequent) relatum they can also occur in the left (antecedent) relatum:

- (11) *Wir warten hier so lange. Ich meine, bis ihr mit dem Einkaufen fertig seid.*
we'll wait here *for the time being*. I mean until you have finished shopping

Adverbial connectives link their relata neither by government and embedding nor by linear sequence. Instead, they connect them semantically or, more precisely, by reference. The semantic representation of an adverbial connective contains a slot for a referent that cannot be identified on grounds of the information provided by the sentence in which the adverbial is a constituent. In order to identify that referent, the interpreter must look for the necessary information in the preceding or following context. Depending on where the required information is placed, we can distinguish between anaphoric (backward oriented) and cataphoric (forward oriented) adverbial connections. Thus, the adverbial connectives *dagegen* ('in contrast'), *danach* ('afterwards'), and *zudem* ('in addition'), in (8b), (9b) and (10b) respectively, connect their relata anaphorically, whereas *so lange* ('for the time being') in (11) connects its relata cataphorically.

In many adverbial connectives of German, the referential element is morphologically visible. Such connectives are results of word formation processes in which an adpositional and a pronominal component have been contracted into one word form. In the following examples, the pronominal component is boldfaced, the other one being the adpositional component: *da-gegen* ('in contrast', lit. 'there-against'), *da-nach* ('afterwards', lit. 'there-after'), *hier-bei* ('on this occasion', lit. 'here-at'), *hier-für* ('for this', lit. 'here-fore'), *zu-dem* ('in addition', lit. 'to-that'), *außer-dem* ('moreover', lit. 'outside-that'), *in-dessen* ('however', lit. 'in-that'), *während-dessen* ('in the meantime', lit. 'during-that') etc. Thus, in (8b) the pronominal component *da-* of the adverbial connective *dagegen* contained in the second sentence refers anaphorically to the proposition encoded by the first sentence. Similarly in (10b), the pronominal component *-dem* of the adverb *zudem* contained in the second sentence refers anaphorically to the proposition encoded by the first sentence. In (9b), the pronominal component *da-* of the adverb *danach* refers to an event (the leaving party) described in the preceding sentence. In (11), the pronominal component *so* refers to an event (finishing shopping) described in the subsequent sentence (on the referential function of *da* 'there' and *so* 'so' see Blühdorn 2003).

Some adverbial connectives of German, such as *bestenfalls* ('at best'), *wenigstens* ('at least') or *anschließend* ('afterwards') do not contain morphologically explicit pronominal components. We cannot go into the details here, but probably all adverbial connectives can be traced back historically to expressions that involve some sort of

referential element, and all of them are used in exactly the same referential way (see Webber et al. 2003: 548ff). We are therefore justified in assuming that the semantic representation of all adverbial connectives contains a referential slot, even if their morphological form has not preserved a corresponding pronominal element.

It is interesting to observe that the pronominal element, where it is visible, quite often maintains case morphology within the contracted form, as in *zu-dem* (lit.: to-that-DAT), *außer-dem* (lit.: outside-that-DAT), *in-dessen* (lit.: in-that-GEN) or *während-dessen* (lit.: during-that-GEN). The complex morphology of these connectives reveals that their referential linking does not simply substitute syntactic subordination. Rather, the linking force of adverbial connectives builds on a subordinative relation which has become incorporated in their structure. The pronominal component was originally case-governed by the adpositional component: it is, in fact, its internal argument. Consequently, the clause to which the adverbial connective is attached as an adjunct must be its external argument. In the contracted form of the connective, the subordinative force of the adposition has become encapsulated, so that it is no longer able to contribute actively to syntactic structure. But at the same time, the semantic scope of the connective is extended beyond the limits of the sentence by the referential force of the pronominal component. Structurally, the internal argument is incorporated within the connective, but its referent must be found in the context. Thus, in a sense, adverbial connectives are closer in syntax to their external argument (the clause of which they are a constituent) than to their internal argument (the clause to which they establish a link by reference).

Table 1 provides an overview of the linking properties of the connectives that have been discussed so far:

Table 1. Overview of the linking properties of connectives

	Subordinators	Coordinators	Adverbial connectives
Linking by government and embedding	+		±
Linking by linear sequence		+	±
Linking by reference			+

Subordinating conjunctions and adpositions (subordinators) link their relata hierarchically, by government and embedding, whereas coordinators link them non-hierarchically, by linear sequence. Adverbial connectives neutralize this difference (see Quirk et al. 1985: 927f). With subordinators, they share government and embedding, but they encapsulate these relations in their morphology, so that they cannot take effect within sentence structure. With coordinators, they share a positional affinity to the right (subsequent) relatum (see *ibid.*: 921f). But in coordinators this affinity amounts to a strict syntactic rule, while in adverbial connectives it is only a pragmatic preference. The particular linking force of

adverbial connectives is based neither on government and embedding nor on serial position, but on reference, i.e., on a principle that does not play a crucial role in syntactic coordination or subordination.

Reference is a discourse relation, not a syntactic relation. When using referential expressions such as adverbial connectives as cohesive devices, speakers refer to discourse entities, not to other syntactic expressions. This means that adverbial connectives establish connections on discourse level, while subordinators and coordinators establish connections on sentence level. Connections established by adverbial connectives are outside the scope of syntactic rules. The syntactic distinction between coordination and subordination makes sense only within sentence boundaries, i.e., as a means to construct complex and compound sentences (see Quirk et al. 1985: 719). It cannot be transferred to connections established by adverbial connectives. As a consequence, the distinction between hierarchical and non-hierarchical connections in discourse cannot reasonably be supposed to mirror the distinction between coordination and subordination in syntax. A very considerable part of discourse connections is established on a level higher than the sentence, i.e., beyond the scope of syntactic rules. At least for those connections, whether they count as hierarchical or non-hierarchical can only be decided on other than syntactic grounds.

An additional observation may be made here about two groups of subordinators with pronominal components. Some German subordinating conjunctions contain such components, e.g., *nachdem* ('after'), *indem* ('as') or *seitdem* ('since'). Subordinators of this kind derive historically from adverbs. Their pronominal components are residues with a very weak (if any) referential function left in present day use (on *nachdem* see Blühdorn 2004). A second group are relative adverbs like *weshalb* ('wherefore'), *wobei* ('whereby'), *worauf* ('whereupon') etc., which contain the pronominal components *wes-* and *wo-*. Adverbs of this kind can be used to introduce adverbial relative clauses. They establish a type of connection that combines referential linking with linking by government, though not by embedding (see Pasch et al. 2003: 241ff, 422ff). The existence of this type of linking does not weaken my argument. I do not claim, in fact, that reference has no role to play on sentence level, but that its role is not crucial for syntactic connections. On the other hand, I do claim that syntactic linking mechanisms such as government, embedding and syntactic serialization do not work beyond the boundaries of the sentence, i.e., are neutralized on the level of discourse.

3. Semantic connections

Strictly speaking, the term *connective* does not refer to a syntactic, but to a semantic category. Connectives are elements of several syntactic classes that share the function of encoding semantically characterized relations between conceptual entities such as events and propositions (see Pasch et al. 2003: 1ff, 38f; Blühdorn 2003; Lohnstein 2004). In semantics, as well as in syntax, we can distinguish between hierarchical and non-hierarchical connections.

According to Lang (1984: 69ff), the semantic relata of coordinative connections must be tied up by a *common integrator*. This term refers to a superordinate conceptual category, under which both relata can be subsumed, and under which they are in contrast with each other. In example (12), we can construe something like "colours of zoo animals" as the common integrator:

- (12) *Die Pinguine waren braun-gelb und die Giraffen waren schwarz-weiß.*
the penguins were yellow-brown, and the giraffes were black and white

For the verses by Udo Lindenberg, a possible common integrator seems to be "motives that suggest abseiling to the eternal underground":

- (13) *Es gab da überhaupt keine Action-Abteilung, und ich war von Tag zu Tag mieser gelaunt.*
they didn't even have an action department, and my mood got worse by the day

The examples show that the common integrator need by no means pertain to generally accessible world knowledge. On the contrary, it may be construed *ad hoc*, according to the demands of each context in discourse.

It might seem as if the requirement of a common integrator could be a good criterion to distinguish between hierarchical and non-hierarchical connections in semantics. But on a closer look we find that this requirement is not restricted to semantically symmetrical nor to syntactically coordinative connections. Rather, it is a characteristic of a much more extensive class of connections, which may be symmetrical or asymmetrical and which may be encoded by coordination, subordination or any other syntactic mechanism. Also, all kinds of adverbial connections belong to this class, i.e., require a common integrator.

According to a well-known model proposed by Lyons (1977: 442ff; 791ff), conceptual entities can be divided into four general categories: spatial (first order) entities, temporal (second order) entities, logical/epistemic (third order) entities and deontic (fourth order) entities (see also Kortmann 1996: 28ff). First order entities are spatial objects, second order entities are states of affairs (including states and events), third order entities are propositions, and fourth order entities are intentional entities, which, for lack of a better term, I will call acts (see Blühdorn 2003: 16ff). The four general categories define four conceptual domains: space, time, logic/episteme (the domain of knowledge) and ethics/deontics (the domain of intentions and acting).

It is a general semantic requirement on adverbial connections (subordinative or not), as well as on coordinative connections, that their relata must belong to the same conceptual domain and, consequently, be of the same general category. Thus, in order to connect two relata spatially, both must be spatial objects; in order to connect them temporally, both must be states of affairs; in order to connect them logically, both must be propositions; and in order to connect them deontically, both must be acts (for more details see Blühdorn 2007a, b).

It can be concluded that the requirement of a common integrator is not an appropriate criterion for distinguishing between hierarchical and non-hierarchical connections in semantics. A better criterion seems to be relational symmetry. Non-hierarchical semantic connections are symmetrical. Their relata have equal semantic functions and equal semantic weight (see Breindl 2007b: 144). One of the syntactic consequences of semantic symmetry is the possibility of inverting the sequence of the relata without a significant change of meaning. The relata in the following example are symmetrically connected. They can be inverted without semantic consequences:

- (14) a. *Die Pinguine waren braun-gelb und die Giraffen waren schwarz-weiß.*
the penguins were yellow-brown, and the giraffes were black and white
b. *Die Giraffen waren schwarz-weiß und die Pinguine waren braun-gelb.*
the giraffes were black and white, and the penguins were yellow-brown

Hierarchical semantic connections, in contrast, are asymmetric. Changing the syntactic sequence of their relata will significantly change the meaning. Where an inversion of the relata gives rise to such a change of meaning, it can be concluded that the connection is not understood as symmetrical, even if it is syntactically encoded by a coordinator:

- (15) a. *Maria ging in die Bibliothek und sie bekam Hunger.*
Mary went to the library, and she began to feel hungry
b. *Maria bekam Hunger und sie ging in die Bibliothek.*
Mary began to feel hungry, and she went to the library

In the most plausible reading of these examples, the connected events are ordered in a temporal sequence, which is inverted from (15a) to (15b). It is not uncommon for syntactically coordinative connections to be interpreted in semantically asymmetric ways – an effect that can be explained by very general cognitive and pragmatic principles (see Grice 1981: 185f; Posner 1980: 182ff; Lang 1984: 80ff; Blakemore & Carston 2005; Breindl 2007a). The examples show that syntactic coordination and semantic symmetry must be carefully distinguished. By no means can they be identified with each other.

The relata of asymmetric connections cannot be inverted without significant semantic consequences. They have different relational (thematic) roles. One of them is being connected (like a ship that drops its anchor), the other is what it is being connected to (like the sea ground in which the anchor is fixed). In Ronald Langacker's (1987: 231ff) terminology, the former is called *trajector* (T) and the latter *landmark* (L).

Three types of asymmetric connections can be distinguished (see Blühdorn 2003: 19f; Blühdorn 2005: 315f):

- situating connections
- conditional connections
- causal connections

Situating connections are stative. They assign to the trajector a place in a conceptual domain, which is described by a relation to the landmark:

- (16) *Bevor du nach Hause gehst (L), lösch bitte das Licht (T).*
before you go home (L), please switch off the light (T)

Switching off the light is the trajector that is situated on the time scale in relation to the event of going home (landmark). Switching off the light and going home themselves are evidently non-stative, but their sequential relation on the time scale, encoded by the conjunction *before*, is stative. Each of the events has its fixed position in time, and the position of the trajector is defined on grounds of the position of the landmark.

Conditional connections are dynamic: the landmark event not only situates the trajector event, but it also influences the value to be taken by the trajector event. It is not yet clear if the trajector event will in fact become real (or come true). This depends on the value to be taken by the landmark event:

- (17) *Und sehn wir uns nicht in dieser Welt (L), dann sehn wir uns in Bielefeld (T).*
and if we won't meet in this world (L), then we'll catch up in Bielefeld (T)

The example tells us that the meeting in Bielefeld will take place on the condition that the meeting in this world does not.

Causal connections are dynamic as well, but in a causal connection the value of the trajector event is already fixed. The trajector event is real, and the landmark event has influenced the fixing of its value:

- (18) *Ich war von Tag zu Tag mieser gelaunt (T), weil es gab da überhaupt keine Action-Abteilung (L).*
my mood got worse by the day (T), for they didn't even have an action department (L)

The inexistence of an action department is the cause which led to the change of the speaker's mood. The result is presented as factual, i.e., as a state of affairs with a fixed reality value.

The distinction between semantically symmetrical and asymmetric connections can be made within the boundaries of the sentence (on intra-sentence level) and also between sentences in discourse (on inter-sentence level). Both kinds of semantic connection can be encoded by coordinators as well as by subordinators and also by adverbial connectives. Some further examples may illustrate this point:

- (19) a. *Das ist kein Selbstbedienungsladen, und sonntags ist hier zu.*
this is no self-service store, and on Sundays we are closed
b. *Sonntags ist hier zu, und das ist kein Selbstbedienungsladen.*
on Sundays we are closed, and this is no self-service store
c. *Das ist kein Selbstbedienungsladen. Außerdem ist hier sonntags zu.*
this is no self-service store. besides, we are closed on Sundays

- d. *Sonntags ist hier zu. Außerdem ist das kein Selbstbedienungsladen.*
on Sundays we are closed. *besides*, this is no self-service store

The connections in (19a-d) are symmetrical. The sequence of their relata can be inverted without a significant change of meaning. In (19a/b), the connection is encoded by a coordinator (intra-sentence level); in (19c/d), a semantically equivalent connection is encoded by an adverbial connective (inter-sentence level). My argument for considering coordination of two main clauses an intra-sentence connection is the syntactic constraint on the position of the coordinator, discussed in section 2. In addition, we can consider punctuation and intonation. Coordinated main clauses may be separated by a comma instead of a period and may even not be separated by any punctuation mark. In spoken utterances, they can be included into the same intonational phrase.

- (20) a. *Wenn du keine Lust hast* (L), *gehe ich allein* (T).
if you don't feel like it (L), I'll go on my own (T)
b. *Wenn ich allein gehe* (L), *hast du keine Lust* (T).
if I go on my own (L), you won't feel like it (T)
c. *Du hast keine Lust?* (L) *Dann gehe ich allein.* (T)
you don't feel like it? (L) then I'll go on my own (T)
d. *Ich gehe allein?* (L) *Dann hast du keine Lust.* (T)
I'll go on my own? (L) then you won't feel like it (T)

The examples in (20a-d) illustrate asymmetric connections. Inverting the sequence of their relata leads to a significant change of meaning. The connections in (20a/b) are encoded by a subordinator (intra-sentence level). In (20c/d), semantically equivalent connections are encoded by an adverbial connective (inter-sentence level).

On intra-sentence level symmetrical and asymmetric connections can be encoded by coordinators as well as subordinators:

- (21) a. *Die Pinguine waren braun-gelb und die Giraffen waren schwarz-weiß.*
the penguins were yellow-brown, and the giraffes were black and white
b. *Die Giraffen waren schwarz-weiß und die Pinguine waren braun-gelb.*
the giraffes were black and white, and the penguins were yellow-brown
c. *Die Pinguine waren braun-gelb, während die Giraffen schwarz-weiß waren.*
the penguins were yellow-brown, while the giraffes were black and white
d. *Die Giraffen waren schwarz-weiß, während die Pinguine braun-gelb waren.*
the giraffes were black and white, while the penguins were yellow-brown
(22) a. *Ich war von Tag zu Tag mieser gelaunt* (T), *weil es gab da überhaupt keine*
Action-Abteilung (L).
my mood got worse by the day (T), for they didn't even have an action
department (L)

- b. *Es gab da überhaupt keine Action-Abteilung* (T), *weil ich war von Tag zu Tag*
mieser gelaunt (L).
they didn't even have an action department (T), for my mood got worse by
the day (L)
c. *Ich war von Tag zu Tag mieser gelaunt* (T), *weil es da überhaupt keine*
Action-Abteilung gab (L).
my mood got worse by the day (T), because they didn't even have an action
department (L)
d. *Es gab da überhaupt keine Action-Abteilung* (T), *weil ich von Tag zu Tag*
mieser gelaunt war (L).
they didn't even have an action department (T), because my mood got
worse by the day (L)

The examples in (21a-d) illustrate symmetrical connections. In (21a/b), the connections are encoded by a coordinator. In (21c/d), the same relata are symmetrically connected by a subordinator. The examples in (22a-d) illustrate asymmetric connections. Inversion of the relata leads to a change of meaning. The connections in (22a/b) are encoded by a (non-prototypical) coordinator. Both relata are syntactically realized as main clauses. In (22c/d), the same relata are asymmetrically connected by a subordinator. One of the relata is realized as a main clause, the other as a subordinate clause.

The data discussed in this section are from Modern German, but data from other languages could just as well have been used. From the observations made, it can be concluded that the distinctions between syntactic coordination and subordination and between semantic symmetry and asymmetry are independent of each other. Connections of syntactic units and the connections of the encoded conceptual entities can be either parallel or non-parallel in structure.

4. Discourse connections

Since the 1980s, several models and theories of discourse structure have been proposed, which have tried to give an explicit account of coherence relations in written and spoken text. Most of them distinguish in some way or another between hierarchical and non-hierarchical discourse relations. But they differ considerably in how they motivate this distinction.

4.1 Syntax and semantics as models for understanding discourse structure

One obvious hypothesis is that discourse structure might be parallel to syntactic and/or semantic structure (see Hopper & Thompson 1984: 736f; O'Dowd 1992; Matthiessen & Thompson 1988; Mann & Thompson 1988: 269; Taboada & Mann 2006: 427). The *and*-variant of this hypothesis has often been assumed for coordinative relations. Coordinated syntactic units are typically of the same formal and functional category, and their


linear order can be inverted without semantic consequences. Symmetrically connected conceptual units are of the same semantic category and have a common semantic function. Non-hierarchically connected discourse units should belong to the same rhetorical category and have a common discourse function.

Many examples discussed in the literature seem to support the view that semantic symmetry and syntactic coordination are natural linguistic means to encode non-hierarchical discourse relations. Yet we have seen in section 3 above that coordinative connections in syntax are typically underspecified for semantic interpretation. Depending on the context of the utterance, they may (or even must) receive an asymmetric reading:

- (23) *Maria ging zu McDonald's, und sie bekam Hunger.*
 Mary went to McDonald's, and she began to feel hungry
 a.→ *Außerdem bekam sie Hunger.*
besides, she began to feel hungry
 b.→ *Dann bekam sie Hunger.*
then she began to feel hungry
 c.→ *Deshalb bekam sie Hunger.*
therefore she began to feel hungry


(23a) to (23c) are possible interpretations of the second part of (23). (23a) is a symmetrical reading. The two connected propositions have equal status: two predicates which are true of Mary. (23b) and (23c) are asymmetric readings of (23). (23b) is a situating interpretation: Mary's going to McDonald's is the landmark, her beginning to feel hungry is the trajector. (23c) is a causal interpretation: going to McDonald's is the causal landmark, feeling hungry the causal trajector. Most theories of discourse structure have paid little attention to the multiple interpretability of coordinative syntactic connections.

Some authors have assumed structural parallelism between syntax, semantics and discourse also for subordinative adverbial connections (e.g., Matthiessen & Thompson 1988). For most of these connections, however, for general reasons, only the *or*-variant of the hypothesis is possible, because the syntactic and semantic structures of typical subordinative adverbial connections are inverse to each other. A crucial property of their syntactic structure is embedding. Hierarchically higher relata, e.g., main clauses, embed hierarchically lower relata, e.g., subordinate clauses:

- (24)
- 
- main clause
- adverbial subordinate clause

Semantically asymmetric connections, too, can be characterized, in a sense, as embedding relations. The landmark is the embedding part: it forms the conceptual background framework into which the trajector is inserted. Using the terminology of *Gestalt* psychology, Langacker (1987: 231ff) characterizes the landmark as *ground*. The trajector,

on the other hand, is the embedded part: it takes a position in relation to the conceptual background. Langacker (ibid.) characterizes it as *figure*. In terms of embedding, then, the landmark's position in the semantic hierarchy is higher than the position of the trajector, for the trajector is embedded by the landmark:

- (25)
- 
- landmark
- trajector

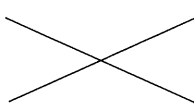
Looking at the mapping relations between hierarchical connections in syntax and semantics, we realize that the semantically embedding landmark is invariably encoded by the syntactically embedded expression (e.g., the subordinate clause) and the semantically embedded trajector by the syntactically embedding expression (e.g., the main clause):

- (26) *Solange ihr einkauft (L), warten wir hier an der Ecke (T).*
while you go shopping (L), we'll wait here at the corner (T)

Lohnstein (2004: 143) states, from the point of view of model-theoretic semantics: "Das Wahrheitsintervall des Hauptsatzes [...] wird relativ zum Wahrheitsintervall des Nebensatzes [...] bestimmt, so dass der Nebensatz die Auswertungsdomäne für den [...] Hauptsatz determiniert." (The truth interval of the main clause is fixed in relation to the truth interval of the subordinate clause, so that the subordinate clause determines the domain of interpretation for the main clause.)

Bierwisch (2003) sees the crucial difference between complements and adjuncts in the direction of the attribution of thematic roles. Both complements and adjuncts are syntactically subordinate to their heads, but whilst complements receive their thematic roles from their heads, adjuncts attribute thematic roles to their heads. If we interpret attribution of thematic roles as a manifestation of semantic superordination, we can state that complements are semantically subordinate and adjuncts semantically superordinate to their heads. Applied to adverbial subordinate clauses, this means that they are semantically superordinate to their main clauses.

The hierarchies of subordinative syntactic connections and asymmetric semantic connections are thus inverse to each other: the syntactically embedding part is the semantically embedded part and *vice versa*:

- (27)
- 
- main clause landmark
- subordinate clause trajector

This application of the landmark-trajector distinction on adverbial clauses differs from Langacker's own proposal (see Langacker 1991: 436). When explaining the subordinate

status of adverbial clauses, Langacker abandons his analysis in terms of landmark and trajector and stipulates, instead, a general iconicity between syntactic and semantic subordination in terms of profiling (see *ibid.*: 436f; also Cristofaro 2003: 29ff). This solution appears somewhat *ad hoc* to me, and Langacker himself does not explain it. As a consequence, questions may also be raised about Cristofaro's (*ibid.*) claim that semantic asymmetry provides a more reliable starting point for the analysis of subordination than traditional morphosyntactic asymmetries do.

4.2 Some formal accounts of discourse structure

4.2.1 Rhetorical Structure Theory

The hypothesis of a structural parallelism between syntax, semantics and discourse has been of some importance in *Rhetorical Structure Theory* (RST; see Mann & Thompson 1988; Taboada & Mann 2006; Stede in this volume). RST distinguishes between nuclear information and satellite information within a discourse. Nuclear information is main information, satellite information is secondary information. The difference between them becomes clearest when they are deleted. The deletion of nuclear information will make the discourse less coherent, the remaining parts becoming more difficult to comprehend. The deletion of satellite information will make the discourse less explicit, but the remaining information will still be coherent. Thus, the omission of satellite information may play an important role in summarizing (see Mann & Thompson 1988: 267f).

RST distinguishes between two types of relations: nucleus-satellite relations and nucleus-nucleus relations. The former are hierarchical, the latter are non-hierarchical (Mann & Thompson 1988: 246ff, 266). Nucleus-satellite relations are more frequently dealt with in RST-related studies. The examples analysed by Mann & Thompson (*ibid.*: 252, 261ff) show that they can be encoded by both coordinative and subordinative connections in syntax. Both nuclear (N) and satellite (S) information can be encoded by both main (M) and adverbial subordinate clauses (A):

- (28) *I'll post more details later (S-M), but this is a good time to reserve the place on your calendar (N-M).* (concessive relation; coordinative connection)
- (29) *As your floppy drive writes or reads (S-A), a Syncom diskette is working four ways (N-M).* (circumstance relation; subordinative connection 1)
- (30) *A carbon additive drains away static electricity (S-M), before it can attract dust or lint (N-A).* (antithesis relation; subordinative connection 2)

Nucleus-nucleus relations are not in the focus of interest in RST. The examples given by Mann and Thompson (*ibid.*: 278f) are not conclusive, but they suggest that nucleus-nucleus relations can also be encoded by both coordinative and subordinative connections:

- (31) *Peel oranges (N-M) and slice crosswise (N-M). Arrange in a bowl (N-M) and sprinkle with rum and coconut (N-M).* (sequence relation; coordinative connection)

- (32) *Chill (N-M) until ready to serve (N-A).* (sequence relation; subordinative connection)

Satellite-satellite relations (see Asher & Vieu 2005: 592, 594f), which are a second type of symmetrical relations, are not recognized in RST. But the text analysis given in Mann & Thompson (1988: 261ff) shows that they can at least be encoded by syntactic coordination:

- (33) *Strong binders hold the signal-carrying oxides tightly within the coating (S). And the non-woven jacket liner (...) provides thousands of tiny pockets to keep what it collects (S).*

One of the main practical problems in RST seems to be how to reliably recognize main information and how to distinguish it from secondary information (see Stede in this volume). As a consequence, the distinction between hierarchical and non-hierarchical discourse connections remains problematic as well.

Mann & Thompson (1988: 249f) insist that the definitions of RST relations "do not rely on morphological or syntactic signals. Recognition of the relation always rests on functional and semantic judgements alone. [...] We have found no reliable, unambiguous signals for any of the relations." Although this affirmation seems to be somewhat idealized (compare the section on explicit signalling of discourse relations in Taboada & Mann 2006: 438ff), RST thus provides at least some evidence for considering discourse structure as independent of syntactic structure. On the other hand, Mann & Thompson (1988: 269) explicitly suggest a functional link between asymmetric discourse relations and hypotaxis in syntax.

An unresolved theoretical problem in RST has to do with the concept of a discourse relation. Syntactic subordination and coordination are defined as relations between syntactically categorized units (such as phrases, clauses or sentences) with certain syntactic functions (such as head, complement or adjunct). Symmetrical and asymmetric semantic connections are defined as relations between semantically categorized entities (such as spatial objects, events or propositions) bearing semantic or thematic roles (such as agent, theme, cause, goal etc.).

Similarly, hierarchical and non-hierarchical discourse relations should be defined as relations between rhetorically categorized units (such as utterances or speech acts) with certain rhetorical functions (such as topic and focus, or intended communicative effects). But that is not how discourse relations are defined in RST. The basic units of analysis in RST are clauses, sentences or phrases, i.e., syntactic units. The relations between these units are divided into "subject matter" and "presentational" ones (Mann & Thompson 1988: 256f; also Taboada & Mann 2006: 435f). The former are clearly semantic relations such as *cause*, *condition*, *result* etc.; the latter are pragmatic relations between speech acts such as *evidence*, *motivation*, *justify* etc. Only the latter deserve to be called discourse relations in the strict sense of the term.

RST is a hybrid model that incorporates syntactic, semantic and rhetorical concepts and categorizations (see Stede in this volume). RST tree diagrams contain information

of different domains. This makes them suggestive and at the same time non-conclusive in relation to a possible parallelism between sentence and discourse structure. They are suggestive to the extent that their basic units are syntactic instead of rhetorical categories, and they are non-conclusive to the extent that these units are associated with partly semantic and partly rhetorical functions.

4.2.2 *The Linguistic Discourse Model*

A more homogeneous account of discourse structure is offered by Polanyi's (1988) *Linguistic Discourse Model* (LDM). In LDM, discourse is segmented into discourse constituent units of different levels of complexity. The units at the elementary level are clauses and so-called discourse operators (assigners, connectives and discourse markers) (Polanyi 1988: 605f). Constituents at the levels of higher complexity are genuine discourse units such as interactions, speech events, stories, plans, question-answer sequences, lists etc. (ibid.: 603). Representations of the elementary level of discourse structure in LDM are relatively close to syntax; representations of higher levels are much closer to conversational analysis.

A non-hierarchical ("coordinating") discourse relation is defined in LDM as a relation between two or more discourse constituents that are all linked by the same relation to a common higher order constituent. The linear sequence in which these constituents are uttered is viewed as motivated by cognitive or communicative principles and therefore as non-random. Thus, the possibility of inverting the sequence of the relata is not a criterion for non-hierarchical discourse connection in LDM. The decisive criterion is the common discourse function in relation to a superordinate constituent (ibid.: 606f).

A hierarchical ("subordinating") discourse relation is defined as a relation in which the information conveyed by a discourse constituent S1 further specifies information conveyed by a preceding constituent S0. More specifically, the same inferences can be drawn from S0 and S1, but some of the information which can be inferred from S1 is more detailed than the information which can be inferred from S0 (Polanyi 1988: 609). Discourse constituents which interrupt preceding constituents or which constitute thematic or interactional digressions are also treated as subordinate, even if no information related to the preceding constituent can be inferred from them (Polanyi 1988: 611, 619). Thus, the concept of discourse subordination in LDM is much broader than the concept of a nucleus-satellite relation in RST. It is striking that in LDM, for purely technical reasons, a subordinate discourse unit can never precede its superordinate unit (Polanyi 1988: 613ff). This constraint seems somewhat unrealistic, when we think of the structural possibilities of natural discourse.

Hierarchical discourse relations are also characterized as "embedding" relations in LDM (Polanyi 1988: 613). But the underlying notion of discourse embedding is not related to syntactic embedding as it was discussed in section 2 above, nor to semantic embedding as it was discussed in section 4.1. Although LDM considers clauses as

elementary units of discourse and distinguishes between coordinating and subordinating connectives as discourse operators, the relation between syntactic structure and discourse structure is not explicitly discussed. In LDM, an incoming discourse unit is processed as subordinate or coordinated in relation to a preceding discourse unit in accordance with contextual information and general world knowledge (Polanyi 1988: 616ff).

On the whole, LDM is much more concerned with genuine discourse units and functions than with syntax and semantics. Syntactic coordination and subordination are never explicitly mentioned as criteria for considering a given discourse relation as hierarchical or non-hierarchical. On the other hand, the role of contextual and general world knowledge in the selection of a hierarchical or non-hierarchical discourse relation remains somewhat fuzzy. It seems not impossible that the recognition of syntactic coordination and subordination may contribute indirectly or implicitly to the selection of discourse relations.

4.2.3 *Segmented Discourse Representation Theory*

The approach of Asher & Vieu (2005) is more abstract than both RST and LDM. It does not aim primarily at describing discourse relations in real data, but rather at giving general characterizations of categories of discourse relations such as *Narration* and *Elaboration*. Asher & Vieu do not believe in the possibility of defining the distinction between hierarchical and non-hierarchical discourse relations in semantic terms (Asher & Vieu 2005: 598). Instead, they look for syntactic definitions of the two types of relations within the framework of *Segmented Discourse Representation Theory* (SDRT). They propose formal criteria for testing whether relations of different categories are "subordinating" or "coordinating" (Asher & Vieu: 599ff).

The first criterion exploits the so-called *right-frontier-constraint* on anaphoric linking (see Polanyi 1988: 602, 613ff). If in a sequence of discourse units α , β and γ a discourse relation R connects α and β , and γ can be anaphorically attached to α , then R is subordinating. If γ can only be attached to β , then R is coordinating.

The second criterion is based on an SDRT principle called *Continuing Discourse Patterns* (CDP). If discourse units β and γ are connected by a coordinating discourse relation R2 which requires that its relata "bear the same discourse relation to a dominant constituent" (Asher & Vieu 2005: 595) and if discourse unit α is connected to β by a discourse relation R1 which is different from R2, then it can be inferred that R1 is a subordinating relation and that α and γ are connected by a relation R3 of the same subordinating type as R1. If R2 is not a coordinating relation that requires R1 and R3 to be relations of the same type, then R1 is coordinating.

The third criterion is very similar to the first one and can therefore be left out here. The fourth criterion is based on the SDRT assumption that two discourse units α and β cannot be connected simultaneously by two discourse relations one of which is subordinating and the other coordinating. Therefore, if a relation R between α and

β is proved to be coordinating, α and β cannot be connected simultaneously by a subordinating relation.

The second and fourth tests seem to be somewhat circular, since what can be “inferred” from them is little more than a reformulation of their input conditions. The first test is more interesting, but the authors warn that it might not be conclusive in all cases.

When applying the tests to some concrete examples, Asher & Vieu recognize that there are more difficulties. An analysis of the discourse relation *Result* (ibid.: 604ff) suggests that it can be “used” either in a coordinating or in a subordinating manner. The same possibility might exist for other discourse relations as well. Asher & Vieu do not explain what exactly it means for a discourse relation to be “used”. But they draw the conclusion that “the concepts of subordinating and coordinating discourse relations” might be founded neither on semantics nor on syntax. Instead they suggest that these properties might be a matter of information packaging (ibid.: 600, 609).

4.3 Future perspectives

An important conclusion to be drawn from the discussion of different models of discourse structure is that discourse should be viewed as a system *sui generis*. Discourse structure is the arrangement of discourse units (see Polanyi 1988: 603ff), which can be ordered on different levels of constituency as well as on different levels of focality. On higher levels of constituency, the units are structurally more complex, on lower levels they are structurally more simple. On higher levels of focality, units are more central to the communicative goals of the speaker, on lower levels of focality, units have supporting or secondary functions (see Klein & von Stutterheim 1992). Non-hierarchical discourse relations connect units of the same level, either of constituency or of focality (intra-level connection); hierarchical discourse relations connect units of different levels of constituency or of focality (inter-level connection).

Discourse should not be viewed from the beginning as something derived from syntax and/or semantics. Hybrid conceptualizations make it more difficult to recognize genuine discourse properties and make discourse studies more susceptible to precipitate conclusions. The interaction between hierarchical and non-hierarchical connections in syntax, semantics and discourse can only be described in appropriate detail on the basis of independent and explicit theories of each of the three domains of language structure.

Recent research in the areas of intonational phonology and conversational analysis (see e.g., Chafe 1988; Selting 1995; Peters 2005; Büring 2006; Moroni 2006) has shown ever more clearly that (in non-tone languages) a considerable part of discourse structure is encoded by intonation, even in written discourse (“silent prosody”: Féry 2006). This suggests that the widespread convention of taking the clause as the elementary unit of discourse structure must be seriously questioned. The clause is a syntactic unit. The corresponding discourse unit is the utterance. Clauses have subjects and predicates; utterances

have an information structure which can be described in terms of focus, background and topic (see Jacobs 1988, 2001; Klein & von Stutterheim 1992; Büring 2006; Moroni 2006). Subject, predicate, adjunct etc. are categories that cannot be directly related to the communicative and interactional goals of language users. Focus, background and topic are immediately related to this kind of goals and are therefore more appropriate concepts for analysing discourse structure.

As long as we have no independent and comprehensive theory of discourse structure, we should refrain from formulating hypotheses about possible parallelisms between discourse and syntax or other subsystems of language. The examples of text analysis given within different research paradigms (e.g., Mann & Thompson 1988; Klein & von Stutterheim 1992; Asher & Vieu 2005) all indicate that both main and secondary discourse units can, in principle, be encoded by both main and secondary syntactic expressions and that both hierarchical and non-hierarchical discourse connections can be encoded by both coordinative and subordinative syntactic connections.

The relation between syntax, semantics and discourse should be viewed as a matter of rhetorical options to be taken by speakers and writers in individual acts of encoding. Languages may fix some of these options in their structure and leave only some of them open to the speakers' preference, but it seems very improbable that any language should generally identify discourse hierarchy with syntactic subordination and/or with semantic asymmetry. Most discourse connections, at any rate, could not be captured by such a deterministic system: all relations that are encoded referentially, across sentence boundaries, by adverbs and proforms. The connecting function of those elements, as we have seen in section 2, is generally independent of the syntactic distinction between coordination and subordination.

5. Conclusion

The concepts of subordination and coordination in language are ultimately terminological metaphors. The notional content of such metaphors depends very much on the nature of the domain to which they are applied. Syntax and discourse are domains of quite different nature. While discourse structure is about presenting information in order to achieve communicative goals, syntactic structure is about arranging formal expressions in order to facilitate parsing. An appropriate account of discourse structure should preferably be given in a terminology sufficiently different from the one used in syntax, in order to avoid misconceptions.

The arguments presented in this paper suggest that syntactic hierarchy should not be considered a general model for the conceptualization of discourse hierarchy, nor *vice versa*. The data from the study of connectives do not support a view that considers syntactic subordination as a generally specialized means for encoding rhetorical hierarchy. It seems slightly more plausible to expect that syntactic coordination should be a preferable means for encoding non-hierarchical discourse connections. But as we

have seen, syntactic coordination can (or must) in many cases receive an asymmetric semantic interpretation, and the literature contains numerous examples in which syntactic coordination encodes hierarchical discourse relations.

The final conclusion is therefore that we should be careful in assuming too many parallels between syntax and discourse structure. Syntax seems to be designed in such a way that the structural variants it offers can be employed very flexibly to encode the structural variants of discourse. This flexibility in the relationship between syntax and discourse seems to be one of the features of natural languages that render them suitable for infinite use in communication.

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