ON THE SYNTAX AND SEMANTICS OF SENTENCE CONNECTIVES

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1.   Introduction

In this paper, I will give an overview of some aspects of the syntax and semantics of sentence connectives, the examples being taken from Modern German. My presentation is based to a considerable degree on the results of research work which has been done during the last two decades in the projects on sentence connectives at the *Institut für Deutsche Sprache* (IDS) at Mannheim.

At present, the research nucleus on connectives in the Grammar Department of the IDS consists of three thematically inter-related projects:

- the project *Handbook of German Connectives: Semantics*, coordinated by Eva Breindl [http://www.ids-mannheim.de/gra/konnektoren/],
- the project *German-Portuguese Comparative Grammar: Connectives*, coordinated by Hardarik Blühdorn [http://www.ids-mannheim.de/gra/sprachvergleich.html], and
- the project *Causality Markers as cohesive devices and their formalization for Automatic Text Analysis*, coordinated by Eva Breindl from the IDS and by Manfred Stede from the Institute of Computer Linguistics at the University of Potsdam [http://www.ids-mannheim.de/gra/kausal.html].

In 2003, the project team *Handbook of German Connectives* published the first volume of their *Handbook*, on the syntax of German connectives (Pasch et al. 2003). At present, Breindl and her colleagues are preparing the second volume, on the semantics of these elements.

During the last years, several articles on the system of semantic relations, on semantic classes of connectives, on a couple of individual connectives of present day German, and on specific problems of the syntax of connectives have been published by the members of the research nucleus. Part of this work, by Pasch, Breindl, Waßner and Blühdorn, is included in the bibliographic references below.

In many languages, connectives ("linkers"; see Quirk et al. 1985: 921) are among the most important means used to establish syntactic and semantic relations between clauses. Most theories of discourse structure pay particular attention to the role played by connectives in establishing coherence relations (see, e.g., Halliday & Hasan 1976: 226ff; Polanyi 1988: 605; Knott & Dale 1994: 45ff; Knott et al. (eds.) 2001).

The syntactic relations I will be looking at are coordination and adjunct relations (i.e., adverbial adjuncts and adverbial subordinate clauses). I will not be interested in complement relations (e.g., subject or object clauses), nor in attributive relations (e.g., relative clauses), which are not connective relations in the sense in which the term is being used here (see Pasch et al. 2003: 1ff, 38f; on complements and adjuncts see Bierwisch 2003).

The semantic relations I will deal with are ordered in a two-dimensional system. One dimension is the relational level, defined by the category of the relata (spatial, temporal, epistemic or deontic-illocutionary) (see Sweetser 1990; Blühdorn 2003); the other is the class of relations, characterized by a set of three semantic features (relational symmetry, dynamics, and effect value).

In terms of traditional grammar, the elements I call connectives belong to four syntactic classes: coordinating and subordinating conjunctions, adpositions, and adverbs (see Pasch et al. 2003: 38ff; Blühdorn 2008a). This is tantamount to saying that connectives do not form a homogeneous morphosyntactic category. Rather, they form a semantic category defined by a common discourse-semantic function. Nevertheless it is linguistically relevant to study their syntactic behaviour, since syntactic structure contributes strongly to their cohesive properties in discourse.

2.   The syntax of connectives

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, e.g., 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 what follows, I will focus on the prototypical poles, but I will also briefly mention two of the intermediate types which occur in German (see Pasch 2000).

2.1 Coordinators

Syntactically coordinative connections are realized by coordinating conjunctions (coordinators). The prototype of such a conjunction in German is *und* [and], as in the following example from the poem *Rätselhaftes Bielefeld* [Mysterious Bielefeld] by the German rock singer Udo Lindenberg:

(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!

        [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 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*, as Haspelmath 2004 calls them) are V(erb)2-sentences.

Opinions differ about what may be the most adequate representation of the syntactic structure of coordination. Some of the suggestions made along the last decades can be found in Dik (1972), Wiese (1980), Wesche (1995), Johannessen (1998), Camacho (2003), Osborne (2003, 2006), and Eisenberg (2004: 205ff, 377ff). Most but not all approaches assume structures in which both coordinands have similar or 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 assign specific morphosyntactic features. German has some connectives that behave similarly to coordinators, but nevertheless select expressions of a certain morphosyntactic format: *denn* [for], e.g., can only connect V1- oder V2-clauses (see Duden 2005: 628), whereas *sowie* [as well as] can only connect V-final-clauses and constituents less complex than a clause (i.e., words or phrases) (see Breindl

2007). 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 their coordinands. In German, they must be positioned in the middle between the connected expressions, with a slightly stronger affinity to the right one. Thus, (2a) is grammatical, whereas (2b) is not:

(2a)   Ihr kauft ein **und** wir warten hier an der Ecke.
         [you can go shopping **and** we'll wait here at the corner]
(2b)   ***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, as we can see in (2c/d):

(2c)   Ihr kauft ein, **und** wir warten hier an der Ecke.
         [you can go shopping, **and** we'll wait here at the corner]
(2d)   *Ihr kauft ein **und**, Wir warten hier an der Ecke.
         [you can go shopping **and**, we'll wait here at the corner]

Given these data, we may assume that coordinative connections have a constituent structure like the one shown in (3) (see Zifonun et al. 1997: 2361). The dotted lines in the diagram are only relevant for coordinations of expressions less complex than a sentence. In coordinations of complete sentences, the coordinator is clearly part of the syntactic structure of the second coordinand, but the first coordinand cannot be part of the same constituent structure, as long as we consider the sentence the maximal level of syntactic complexity:

(3)

coordinand   **coor-**   **coordinand**
                  dinator
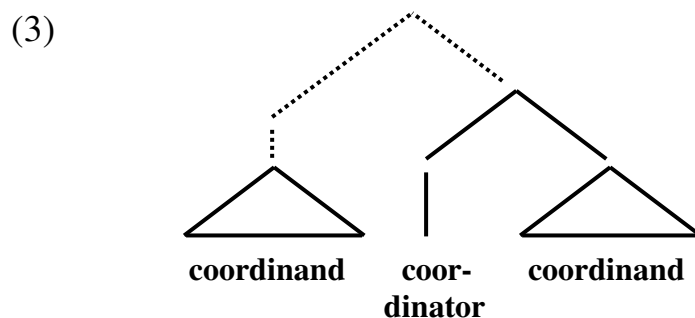
In other languages, coordinators may take linear positions which differ from the coordinator position in German (e.g., Latin *-que*, which is a suffix added to the second coordinand). In general the linear positions of coordinators are much

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   Subordinators

One of several means to establish syntactically subordinative connections between clauses are subordinating conjunctions (i.e., adverbial subordinators; see Kortmann 1996). An example is German *während* [while]:

(4)   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 connected expressions, namely, the subordinate clause. The authors of the *Handbook of German Connectives* (Pasch et al. 2003: 8ff, 106ff) call this clause the internal argument of the connective. 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 connected expressions of coordinators are typically of the same morphosyntactic category, the connected expressions 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., in German V2 and V-final order. But categorical differences between the connected expressions are by no means obligatory in subordinative connections. Both can be of the same category, if, for independent reasons, the external argument is a subordinate clause as well:

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

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In such cases, however, 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. But this limitation is largely compensated for by adpositions, which are formally and functionally very similar to subordinating conjunctions. The only difference between the two classes is that adpositions take noun phrases instead of clauses as at least one of their connected expressions (see Kortmann 1996: 25, 58ff, 66ff):

(6)   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 generally 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 format of their external argument.

Subordinating conjunctions and adpositions (or subordinators, as we may call them with a general term) have a fixed serial position in relation to their internal, but not 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 along with their internal argument. In particular, they can be postposed (as in (7/8a)), preposed (as in (7/8b)) and interposed to the external argument (as in (7/8c)).

Subordinating conjunction:

(7a)   Wir warten hier an der Ecke, **solange** ihr einkauft.
        [we'll wait here at the corner, **while** you go shopping]
(7b)   **Solange** ihr einkauft, warten wir hier an der Ecke.
        [**while** you go shopping, we'll wait here at the corner]
(7c)   Wir warten, **solange** ihr einkauft, hier an der Ecke.
        [we'll wait, **while** you go shopping, here at the corner]

Adposition:

(8a)   Die Gäste mussten alles alleine aufräumen **nach** der Abschlussfeier.
        [the guests had to clean up everything by themselves **after** the leaving party]

(8b)   **Nach** der Abschlussfeier mussten die Gäste alles alleine aufräumen.
        [**after** the leaving party the guests had to clean up everything by themselves]

(8c)   Die Gäste mussten **nach** der Abschlussfeier alles alleine aufräumen.
        [the guests had to clean up **after** the leaving party everything by themselves]

Subordinators are functional heads that take their internal argument as a syntactic complement. Together with their internal argument, they are attached to their external argument as adverbial adjuncts. Blühdorn (2008a) argues that a subordinator and its internal argument can occupy, alternatively, a high or a low structural position within the external argument. In figure (9), these alternative positions are represented in a simplified manner as positions above and below the subject of the main clause, respectively. Being more precise, the critical difference is not in relation to the subject, but in relation to sentence operators like negation and modal adverbials. But these details can be neglected here:

(9)
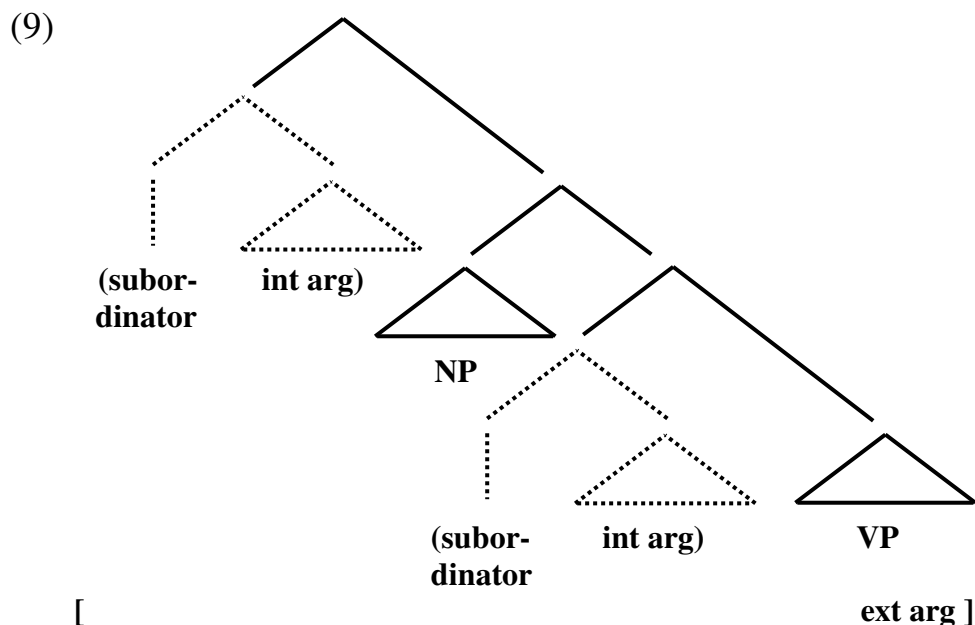
The difference between a high and a low position in constituent structure has important consequences for the semantic interpretation of the connection. Subordinate clauses in a low structural position only permit content readings, as Sweetser (1990) calls them, or temporal readings, in my terminology (Blühdorn

2008a; see section 3.1 beow). Subordinate clauses in a high structural position permit temporal and modal (epistemic or deontic-illocutionary) readings.

Unlike coordinators, subordinators do not link their connected expressions by linear sequence, but by government and embedding.

2.3   "Hitch-up" subordinators and V2-embedding conjunctions

The typology of sentence connectives in German can be made more complete, according to Pasch et al. (2003: 241), if we distinguish between two syntactic relations: subordination and embedding.

According to Pasch et al., a clause is subordinate, if its finite verb must be in final position in order to satisfy formal requirements of a subordinator. Thus, the clause introduced by *weil* [because] in example (10) is subordinate, whereas the V2-clause introduced by *denn* in example (11) is not:

(10)   Ich halte mich nicht an diese Vorschläge, **weil** ich die Lösung nicht innovativ finde.
        [I won't follow these suggestions, **because** I don't consider the solution innovative]
(11)   Heute bleibe ich zu Hause, **denn** ich habe seit drei Monaten kein Geld bekommen.
        [today I'll stay at home, **for** I haven't received any payment for three months]

A clause is embedded, if it can occupy the first linear position of the matrix clause, the so-called *Vorfeld* [pre-field]. In this case it is considered a syntactic constituent of the matrix clause. The clause introduced by *da* in example (12) is embedded in this sense, while the clause introduced by *sodass* in (13a) is not. *Sodass*-clauses cannot be fronted, as is shown by (13b):

(12)   **Da** ich mutig und neugierig bin, reizt es mich ins Ausland zu gehen.
        [**since** I am daring and curious, I find it attractive to go abroad]
(13a)   Der studierte Zeitraum konnte auf 11.400 Jahre ausgedehnt werden, **sodass** die ganze Zeitspanne seit dem Ende der letzten Eiszeit jetzt von der Untersuchung abgedeckt ist.
        [the period studied could be extended to 11,400 years, **so that** the whole time since the end of the last ice age is now covered by the investigation]

(13b)   ***Sodass** die ganze Zeitspanne seit dem Ende der letzten Eiszeit jetzt von
        der Untersuchung abgedeckt ist, konnte der studierte Zeitraum auf
        11.400 Jahre ausgedehnt werden.
        [**so that** the whole time since the end of the last ice age is now covered
        by the investigation, the period studied could be extended to 11,400
        years]

Pasch et al. (2003: 351f.) distinguish between four classes of conjunctional
connectives in present day German:

- **subordinating conjunctions** [*Subjunktoren*], like *weil* [because] and *da*
  [since], subordinate and embed their internal argument;
- **V2-embedding conjunctions** [*V2-Einbetter*], like *angenommen* [supposed]
  in (14), embed, but do not subordinate their internal argument (they can be
  fronted along with their internal argument, but their internal argument
  cannot have V-final order);
- **"hitch-up" subordinators** [*Postponierer*], like *sodass* [so that] subordinate,
  but do not embed their internal argument (their internal argument must have
  V-final order, but the subordinate clause cannot be fronted);
- **coordinators** [*Konjunktoren*], like *und* [and] in (15), neither subordinate nor
  embed an argument.

(14)   **Angenommen** er schließt einen Vertrag für einen Opel ab, muss er
       diesen Monat keine Zahlung leisten.
       [**supposed** he signs a contract for an Opel, he needn't effect any payment
       this month]
(15)   Drucken Sie jedes Schriftstück aus. Sie gewinnen dadurch eine andere
       Perspektive, **und** Sie sehen dadurch eventuelle Fehler.
       [print every document. doing this, you'll gain a different perspective **and**
       you'll find possible mistakes]

"Hitch-up" subordinators and V2-embedding conjunctions are two intermediate
classes between prototypical subordinators and coordinators. To a certain
degree, they owe their existence to a peculiarity of German syntax, the V2-
constraint on the finite verb in normal declarative sentences. But typological
research has shown that many languages have intermediate types of syntactic
connection as well as intermediate classes of connectives between subordinating
and coordinating conjunctions (see Haspelmath 2004: 33ff).

2.4   Adverbial connectives

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. (16a/b) show synonymous connections made up by a subordinating conjunction and an adverbial connective:

(16a)   Die Pinguine waren braun-gelb, **während** die Giraffen schwarz-weiß waren.
[the penguins were yellow-brown, **while** the giraffes were black and white]

(16b)   Die Pinguine waren braun-gelb. Die Giraffen **dagegen** waren schwarz-weiß.
[the penguins were yellow-brown. the giraffes, **in contrast**, were black and white]

(17a/b) show synonymous connections made up by an adposition and an adverbial connective:

(17a)   Die Aufräumarbeiten **nach** der Abschlussfeier waren sehr anstrengend.
[the cleaning work **after** the leaving party was very exhausting]

(17b)   Die Abschlussfeier war ein großer Erfolg. Die Aufräumarbeiten **danach** waren sehr anstrengend.
[the leaving party was a great success. the cleaning work **afterwards** was very exhausting]

(18a/b) show semantically equivalent connections made up by a coordinating conjunction and an adverbial connective:

(18a)   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]

(18b)   Es gab da überhaupt keine Action-Abteilung. **Zudem** war ich von Tag zu Tag mieser gelaunt.
[they didn't even have an action department. **in addition**, my mood got worse by the day]

Adverbial connectives are syntactic constituents of one of their connected clauses. They are attached to that clause as adverbial adjuncts. They may

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

In relation to both connected clauses, adverbial connectives do not have a fixed linear position. Like most adverbials, they can be moved relatively freely within the clause of which they are a constituent, and though they typically occur in the right (subsequent) clause, they can also occur in the left (antecedent) clause, as is shown by (19), where the connective *so lange* in the antecedent clause refers to an event described in the subsequent clause:

(19)   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 the connected clauses 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 clause of which the connective 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 (16b), (17b) and (18b) respectively, connect two clauses anaphorically, whereas *so lange* [for the time being] in (19) connects the clauses 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 (16b) 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 (18b), the pronominal component *-dem* of the adverb *zudem* contained in the second sentence refers anaphorically

to the proposition encoded by the first sentence. In (17b), the pronominal component *da-* of the adverb *danach* refers to an event (the leaving party) described in the preceding sentence. In (19), the pronominal component *so* refers to an event (namely, finishing shopping) described in the subsequent sentence (on the referential function of *da* and *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. I 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 manner (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*** [in addition; lit.: to-**that**-DAT], *außer-**dem*** [moreover; lit.: outside-**that**-DAT], *in-**dessen*** [however; lit.: in-**that**-GEN] or *während-**dessen*** [in the meantime; 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 morphological 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 (making use of a term coined for a somewhat different purpose by Lyons 1977: 262), 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, adverbial connectives are closer in syntax to their external argument (the clause of which they are a constituent) than to the referent of their internal argument (the clause to which they establish a link by reference):

(20)
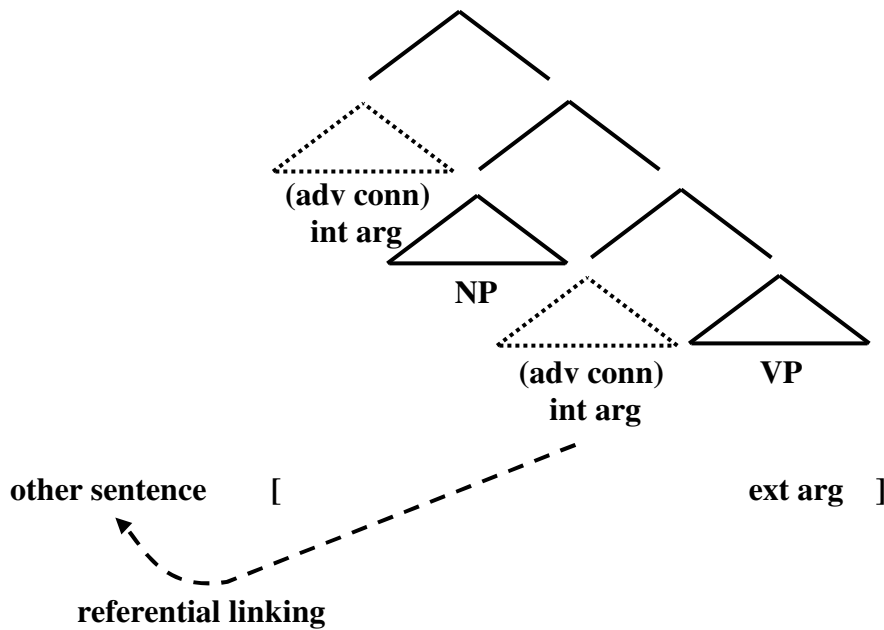
The tree diagram in (20) represents the sentence of which the adverbial connective is a constituent. Like adverbial subordinate clauses, adverbial connectives can be attached to this sentence in a high or in a low hierarchical position, with the same consequences for semantic interpretation (see section 2.2 above). But the referent of their internal argument cannot be found in the same sentence. It must be looked for in another sentence in the preceding or following context.

The table in (21) gives an overview of the linking properties of the classes of connectives which have been discussed so far:

(21)

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

Subordinating conjunctions and adpositions (i.e., subordinators) link their connected expressions 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) connected expression (see Quirk et al. 1985: 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.

2.5 Relational roles

In all syntactic classes of connections we have found at least a minimal structural asymmetry. This is less obvious in coordinative connections, but very apparent in connections of all other classes. With the possible exception of coordinands, it seems to be a valid generalization that morphosyntactic expressions connected by a connective have different relational roles, which we have called internal and external argument. This distinction is relevant even for adverbial connectives, which encapsulate a pronominal internal argument and establish a referential connection between sentences.

In the following sections, I will use the abbreviations E for the **E**xternal argument and R for the internal argument (or **R**eference point). These abbreviations were originally borrowed from Reichenbach's (1947=1999: 273ff) tense logic, but are used here in a much broader sense (for more details see Blühdorn 2004: 186). E and R are relational roles assigned by a connective to its connected expressions. Connectives of the different syntactic classes assign E and R according to characteristic patterns:

(22) adpositions: [[adp R] E]
   subordinating conjunctions: [[subcj R] E]
   V2-embedding conjunctions: [[V2emb R] E]
   "hitch-up" subordinators: E [husub R]
   adverbial connectives: R [adv E]
   coordinators: R/E coord E/R

Adpositions, subordinating conjunctions and V2-embedding conjunctions assign the relational role R to their syntactic complement and E to the matrix clause to which their are syntactically attached as adjuncts, together with their complement. "Hitch-up" subordinators assign R to their syntactic complement and E to the clause to which they are postposed. Adverbial connectives assign R to the sentence linked up by reference and E to the sentence of which they are a syntactic constituent. Coordinators are the only class without a fixed assigment pattern. Some of them, such as German *aber* [but] and *denn* [for], can be analyzed as assigning E to the first and R to the second connected expression (or vice versa, depending on the criteria used; see Blühdorn 2008c). Others, such as German *und* [and] and *oder* [or], most probably do not assign relational roles to their coordinands.

The assignment of E and R is part of the syntax-semantics interface. E and R are assigned to the connected morphosyntactic expressions and thereby also to the semantic relata the expressions refer to. One of the relata is connected (like a ship that drops its anchor), the other is what it is connected to (like the sea ground in which the anchor is fixed). In Ronald Langacker's (1987: 231ff) cognitive grammar, the former (E) is called *trajector* and the latter (R) *landmark*. Langacker's account is in terms of Gestalt psychology. For him, the trajector is cognitively a figure and the landmark a ground against which the figure is construed. We will return to this point later (see section 3.2 below).

3.   The semantics of connectives

As I already mentioned, the term *connective* does not refer to a syntactic, but to a semantic category. Connectives are lexical elements of several syntactic classes that share the function of encoding semantically characterized relations between conceptual entities. We will now have a closer look at the nature of those relations and at the entities they connect.

3.1   Categories of semantic relata

John Lyons (1977: 442ff) was the first to make the suggestive distinction between first order, second order and third order entities, which has since then been taken up and modified by several authors (see, e.g., Kortmann 1996: 28ff; Dik 1997: 136f; Blühdorn 2002: 266ff; 2003: 13ff). We can use a variant of this ontology as the starting point for a theory of the semantics of connectives.

Let us assume that conceptual entities can be divided into four major categories:

- physical (spatial) objects,
- states of affairs (temporal entities: events and states),
- propositions (epistemic entities to which truth values may be assigned),
- (speech) acts (deontic entities to which values of desirability may be assigned).

Physical objects have spatial properties. They are spatially extended and are linked to each other by spatial relations (insideness, aboveness, behindness etc.). They occur or fail to occur in the context of other physical objects. For a given spatial context, any physical object can be assigned an occurence-value (be-present, not-be-present, or something in between):

(23)   die Katze **auf** dem Sofa
        [the cat **on** the sofa]
(24)   Kinder **außerhalb** des Klassenzimmers
        [kids **out of** the classroom]

(23) refers to a cat which is present in the spatial context defined by a sofa. (24) refers to kids who are absent from the spatial context defined by the classroom. The adpositions *auf* [on] and *außerhalb* [out of] encode spatial relations between two physical objects.

States of affairs have temporal properties. They are temporally extended and are linked to each other by temporal relations (anteriority, posteriority, simultaneity etc.). They happen or fail to happen in the context of other states of affairs. For a given temporal context, any state of affairs can be assigned a factivity-value (be-the-case, not-be-the-case, or something in between):

(25)   Sie rauchten eine Pfeife **nach** der Mahlzeit.
        [they smoked a pipe **after** the meal]
(26)   Er vergaß, den Brief abzuschicken, **nachdem** er ihn verschlossen hatte.
        [he forgot to post the letter **after** sealing it]

(25) tells us that the smoking of a pipe happened in the temporal context defined by the event of having the meal. (26) says that posting the letter failed to happen in the temporal context defined by the sealing. The adposition *nach* [after] and the subordinating conjunction *nachdem* [after] encode temporal relations between two states of affairs.

Propositions have epistemic (logical) properties. They are epistemically extended (i.e., they have domains and degrees of logical validity), and they are

linked to each other by epistemic (logical) relations (implication, equivalence, complementarity etc.). Propositions are true or false in the context of other propositions. For a given epistemic context, any proposition can be assigned a truth-value (be-true, not-be-true, or something in between):

(27)   **Da** eine gründliche Lektüre mehrere Stunden gedauert hätte, kann dies nur eine sehr oberflächliche Revision gewesen sein.
[**since** a thorough reading would have taken several hours, this can only have been a very cursory revision]

(28)   Die Tabelle zeigt die Verfügbarkeit von Bauland seit 1995. **Angesichts** dieser Zahlen ist es schwierig zu glauben, dass Mangel an Bauland der Grund dafür gewesen sein kann, dass weniger Häuser gebaut wurden.
[the table shows the land supply position since 1995. **in view of** these figures, it is hard to believe that shortage of building land can have been the reason why fewer houses were built]

(27) tells us that, in the epistemic context defined by the knowledge that a thorough reading would have taken several hours, it is probably true that the revision was very cursory. (28) says that, in the epistemic context defined by the knowledge of the figures presented in the table, it is probably not true that the reduction of house building was due to a shortage of building land. The subordinating conjunction *da* [since] and the adposition *angesichts* [in view of] encode epistemic relations between two (sets of) propositions.

Acts, including speech acts as the linguistically most interesting subclass of this category, have deontic (ethical) properties. They are deontically extended (i.e., they have domains and degrees of permittedness, forbiddenness etc.), and they are linked to each other by deontic relations (compatibility, conflict, means, purpose etc.). Acts are desirable or undesirable in the context of other acts. For a given deontic context, any act can be assigned a desirability-value (be-desirable, not-be-desirable, or something in between):

(29)   **Als** Psychologe meine ich, dass Lehrer während ihrer Ausbildung in Psychologie des Lesens unterrichtet werden sollten.
[**as** a psychologist, I believe that teachers in training ought to be taught the psychology of reading]

(30)   **Um** ein Erasmus-Stipendium beantragen zu können, dürfen Sie nicht mehr im ersten Studienjahr sein.
[**in order to** be eligible for an Erasmus Student Mobility Grant, you must not be in your first year of study]

(29) tells us that, in the deontic context defined by his convictions and aims as a psychologist, the speaker considers it desirable that teachers in training are

taught the psychology of reading. (30) says that, in the deontic context defined by the desire to receive an Erasmus Grant, it is undesirable to be in the first year of study. The particles *als* [as] and *um* [in order to] encode relations between two (sets of) deontic objects, including (speech) acts, social norms and pragmatic objectives and options.

States of affairs, propositions and speech acts have in common that they may be encoded by sentences/clauses and also by noun phrases. Physical objects can only be encoded by noun phrases.

The table in (31) gives a schematic overview of the four categories of conceptual entities:

	Order of entity (Lyons 1977)	Class of object	Conceptual domain	Context-value	Encoding expression
(31)	1st order	physical object	space	occurrence	NP
	2nd order	state of affairs	time	factivity	NP or clause
	3rd order	proposition	epistemics	truth	NP or clause
	4th order	(speech) act	deontics	desirability	NP or clause

The four categories of entities define four levels of semantic relations, as they have been distinguished by Blühdorn (2003: 16ff; 2004: 191f), based on Sweetser (1990). From spatial over temporal and epistemic to deontic-illocutionary relations, there is a constant increase of conceptual complexity:

- Physical objects constitute space. Relations between physical objects are spatial relations.
- States of affairs constitute time. Relations between states of affairs are temporal relations. Physical objects occur as participants of states of affairs.
- Propositions constitute epistemic space. Relations between propositions are epistemic relations. What is stated in a proposition is the factivity of a state of affairs.
- Acts constitute deontic space. Relations between (speech) acts are deontic-illocutionary relations. Speech acts consist in uttering propositions pursuing pragmatic goals.

Connectives are linguistic means to encode relations of these four levels. The physical objects, states of affairs, propositions and (speech) acts referred to or encoded by the connected morphosyntactic expressions are the semantic relata linked by the relations.

We have already seen that the semantic level on which a given connection is interpreted cannot be selected on purely semantic grounds. The interpretation of

connectives is strongly influenced by syntax. Spatial relations, e.g., can only be encoded by adpositions and adverbs, since only connectives of these two classes can interact in a suitable way with noun phrases. Adpositions take noun phrases as their syntactic complements, whereas adverbs can take them as referential antecedents. Temporal, epistemic and deontic relations can be encoded by connectives of all syntactic classes, but connectives syntactically attached in a low position in constituent structure exclude epistemic and deontic-illocutionary (modal) interpretations. Only connectives attached in high structural positions permit modal readings of the connection.

3.2   Semantic symmetry and asymmetry

There has been a good deal of discussion around the question of whether the syntactic distinction between coordination and subordination has a parallel in semantics. 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 (32), we can construe something like "colours of zoo animals" as the common integrator:

(32)   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":

(33)   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]

As these examples show, 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.

Lang's (1984) account suggests that the requirement of a common integrator should be considered a characteristic of a certain class of connections, namely of syntactically coordinative and/or semantically symmetrical connections. But on a closer look it seems rather that this requirement is a general characteristic of all syntactic and semantic classes of connections discussed in this paper. In order to be linkable by a semantic relation encoded by a connective, two

semantic objects must belong to the same conceptual domain and, consequently, be of the same general category. In order to enter into a spatial relation, both must be (sets of) spatial objects; in order to enter into a temporal relation, both must be (sets of) states of affairs; in order to enter into an epistemic relation, both must be (sets of) propositions; and in order to enter into a deontic-illocutionary relation, both must be (sets of) deontic objects (speech acts, social norms, pragmatic goals or options) (for more details see Blühdorn 2006, 2008a). Two semantic objects which are not of the same category in this sense cannot be linked up by a semantic relation encoded by a connective.

It can be concluded, then, that the requirement of a common integrator is not an appropriate criterion for distinguishing between different classes of semantic relations. A better criterion seems to be relational symmetry. Some but not all semantic relations are symmetrical. Their relata have equal semantic functions and equal semantic weight (see Breindl 2007: 144). One of the syntactic consequences of semantic symmetry is the possibility of reversing the positions of the connected expressions around the connective without a significant change of meaning. The clauses in the following example are symmetrically connected. Their positions can be reversed without semantic consequences:

(34a) Die Pinguine waren braun-gelb **und** die Giraffen waren schwarz-weiß.
       [the penguins were yellow-brown, **and** the giraffes were black and white]
(34b) Die Giraffen waren schwarz-weiß **und** die Pinguine waren braun-gelb.
       [the giraffes were black and white, **and** the penguins were yellow-brown]

Other semantic relations, in contrast, are asymmetric. Reversing the positions of the connected expressions will significantly change the meaning. Where a reversal of positions gives rise to such a change of meaning, it can be concluded that the relation is not understood as symmetrical, even if it is syntactically encoded by a coordinator:

(35a) Maria ging in die Bibliothek **und** sie bekam Hunger.
       [Mary went to the library, **and** she began to feel hungry]
(35b) Maria bekam Hunger **und** sie ging in die Bibliothek.
       [Mary began to feel hungry, **and** she went to the library]

In the most plausible readings of (35a/b), the connected events are ordered in a temporal sequence, which is inverted from (35a) to (35b). 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 2008). The examples show that syntactic coordination and semantic symmetry must be carefully distinguished. By no means can they be identified with each other.

The syntactic positions of connected expressions whose referents are in an asymmetric relation to each other cannot be reversed without significant semantic consequences. In earlier papers (Blühdorn 2003: 19f; Blühdorn 2005: 315f) I have suggested a typology of three classes of asymmetric relations:

- situating relations
- conditional relations
- causal relations

In order to define these classes of relations, I make use of the distinction between the relational roles E and R introduced in section 2.5 above.

Situating relations are stative. They assign a place in a conceptual domain to an object to be situated in that domain. The place is described with the help of a reference point:

(36) **Bevor** du nach Hause gehst (reference point – R), lösch bitte das Licht (object to be situated – E).
[**before** you go home, please switch off the light]

In (36), switching off the light is the object (here: the event) to be situated. It is situated on the time scale in relation to the event of going home, which serves as the reference point. If an asymmetric semantic relation is encoded by a connective that assigns the relational roles E and R to its connected expressions, the object to be situated is invariably encoded by the morphosyntactic expression with the relational role E (the external argument of the connective). The reference point is invariably encoded by the expression with the relational role R (the internal argument of the connective). The assignment of E and R is part of the syntax-semantics interface. On the one hand, E and R are syntactic roles, whose assignment depends on the syntactic properties of the assigning connective. On the other hand, they are semantic roles which characterize the different semantic contributions of the relata to the relation.

Situating relations are stative, but in (36) the individual relata switching off the light and going home are evidently non-stative. What is stative is their sequential relation on the time scale, encoded by the conjunction *bevor* [before]. Each of the events has its fixed position in time, and the position of E is defined on grounds of the position of R.

In situating relations there is a clear distinction between E (situated relatum) and R (situating relatum), but the relata are not assigned more specific thematic roles. Conditional and causal relations are different in that their relata bear quite specific thematic roles: CONDITION and CONSEQUENCE in conditional, CAUSE and EFFECT in causal relations.

Conditional and causal relations are dynamic: R not only situates E, but it also influences the value (factivity, truth, desirability) to be taken by E (the CONSEQUENCE). In a conditional relation it is not clear if E will in fact take the specified value (become real, come true etc.). The value to be taken by E remains open. It depends on the value to be taken by R:

(37)   Und sehn wir uns nicht in dieser Welt (CONDITION – R), **dann** sehn wir uns in Bielefeld (CONSEQUENCE – E).
        [and if we won't meet in this world, **then** we'll catch up in Bielefeld]

(37) tells us that the meeting in Bielefeld will take place on the condition that the meeting in this world does not.

Conditional connectives *stricto sensu* assign the thematic role CONDITION to the relatum with the relational role R and CONSEQUENCE to the relatum with the relational role E. But there are also connectives which assign CONSEQUENCE to the relatum with the relational role R and CONDITION to the relatum with the relational role E. They are called purpose or final connectives:

(38)   Wir empfehlen, dass Sie sich alle Ihre Aufzeichnungen noch einmal durchlesen (CONDITION – E), **damit** Sie die Prüfung bestehen (CONSEQUENCE – R).
        [we recommend you read through all your notes, **in order that** you may pass the exam]

Final relations involve CONSEQUENCES with an open value. The other relatum is a CONDITION that favours a specified consequence value.

Causal relations are dynamic as well, but in a causal relation the value of the EFFECT is already fixed, e.g., the EFFECT is real or true or desirable, and the CAUSE has influenced the fixing of this value:

(39)   Ich war von Tag zu Tag mieser gelaunt (EFFECT – E), **weil** es gab da überhaupt keine Action-Abteilung (CAUSE – R).
        [my mood got worse by the day, **for** they didn't even have an action department]

(39) presents the inexistence of an action department as the cause which led to the change of the speaker's mood. The effect is presented as factual, i.e., as a state of affairs with a fixed factivity-value.

Causal relations can be divided into a couple of subtypes. Again, one important criterion is the mapping of thematic on relational roles. Causal connectives *stricto sensu* assign the thematic role CAUSE to the relatum with the relational role R and EFFECT to the relatum with the relational role E, but most languages have also consecutive connectives, which assign CAUSE to the relatum with the relational role E and EFFECT to the relatum with the relational role R:

(40) Hypnose versetzte ihn in die Lage, sein Selbervertareun wiederzugewinnen (CAUSE – E), **sodass** er Vorfälle ignorieren konnte, die ihn früher aufgeregt hatten (EFFECT – R).
[hypnosis enabled him to regain his self-confidence, **so that** he managed to disregard incidents which had previously upset him]

Symmetrical and asymmetric relations can be ordered on a scale of complexity with the help of semantic features:

- similarity relations (no features)
- situating relations (+ asymmetric)
- conditional relations (+ asymmetric, + dynamic)
- causal relations (+ asymmetric, + dynamic, + fixed effect value)

Similarity relations are symmetrical. They have no features in the sense that their relata have equal status and weight in the relation. The connected expressions do not have a fixed syntactic position in relation to the connective. Their positions can be reversed without changing the semantic relation. Similarity relations typically involve some sort of comparison between the relata. Two prominent types of such relations are equivalence and contrast.

Situating, conditional and causal relations have the feature [+ asymmetric]. Their relata have different status and weight, and the connected expressions cannot reverse their positions. Conditional and causal relations have the additional feature [+ dynamic], which means that R influences the value to be taken by E. Causal relations, finally, have [+ fixed effect value] as a third semantic feature.

3.3   A model of the universe of semantic relations

In sections 3.1 and 3.2, I have discussed four classes of semantic relations and four relational levels, repeated here for the sake of convenience.

Classes of semantic relations:

- similarity relations
- situating relations
- conditional relations
- causal relations

Relational levels:

- spatial relations
- temporal relations
- epistemic relations
- deontic-illocutionary relations

Classes and levels of relations can be crossed with each other, yielding 16 basic categories of semantic relations:

(41)

deontic similarity	deontic situating	deontic condition	deontic causation
epistemic similarity	epistemic situating	epistemic condition	epistemic causation
temporal similarity	temporal situating	temporal condition	temporal causation
spatial similarity	spatial situating	spatial condition	spatial causation

This model is meant to describe the semantic universe of relations encodable by sentence connectives. The table in (42) gives a provisional overview of how the semantic classes of connectives most frequently mentioned in traditional grammar handbooks (see, e.g., Duden 2005: 628ff) can be inserted into the model:

(42)

	similarity	situating	condition	causation
deontic	adversative comparative disjunctive additive	(modal)	final instrumental concessive conditional	conclusive evidential instrumental concessive consecutive causal
epistemic				
temporal		temporal		
spatial		local		

In German, the most typical connectives of the classes in the first column can encode relations of all four levels. The prototypical additive connective *und* [and], e.g., can encode relations between physical objects (spatial relations) as in (43), relations between states of affairs (temporal relations) as in (44), relations between propositions (epistemic relations) as in a plausible reading of (45), and relations between acts (deontic-illocutionary relations) as in (46):

(43)   ein Mann **und** ein Hund
        [a man **and** a dog]
(44)   Die Männer rauchten **und** die Frauen tranken Tee.
        [the men were smoking **and** the women were drinking tea]
(45)   Thomas ist Deutscher **und** Max ist Holländer.
        [Thomas is German **and** Max is Dutch]
(46)   Der Chef ruft! **Und** Sie sind immer noch hier?
        [the boss is calling! **and** you are still here?]

The same holds true for the prototypical disjunctive connective *oder* [or] and the most typical comparative connective *wie* [as]. Adversative connectives are probably restricted to encoding epistemic and deontic-illocutionary relations (see Sweetser 1990: 102ff; Blühdorn 2008a). Certainly they cannot encode relations between physical objects (spatial relations):

(47a)   #der Mann **während** des Hundes
        [the man **while** the dog]
(47b)   Thomas liebt Sushi, **während** Max Salat bevorzugt.
        [Thomas loves sushi, **while** Max prefers salad]

The most important groups in the second column are local adpositions and adverbs and temporal connectives. Most traditional grammars give relatively detailed accounts of these classes of connectives. Modal connectives in the sense of epistemically or deontically situating connectives are not normally treated as a separate class in grammar handbooks. In German, modally situating relations are generally encoded by connectives with an originally spatial or temporal meaning:

(48)   **Nach** allem, was ich weiß, wollen sie die neue Karte dazu nutzen, Verbraucherprofile zu erstellen.
        [**for** all I know they are going to use the new card to make up consumer profiles]
(49)   **Von** mir **aus** können sie den Gelben Sack nur einmal im Monat abholen, aber der Restmüll muss jede Woche weg.
        [recycling could be every month **for** all I care, but rubbish needs collecting weekly]

The third column contains four subclasses of connectives. Conditional connectives *stricto sensu* such as *wenn* [if] can encode temporal and modal relations. Spatial conditional relations are encoded by connectives with a spatially situating basic meaning:

(50)   Rhabarber macht sich ganz gut **im** Schatten.
        [rhubarb does rather well **in** the shade]

A plausible reading of (50) is 'rhubarb does well **if** it is (planted) in the shade'. "In the shade" is an adequate spatial condition for rhubarb to do well.

Concessive relations are typically causal, i.e., involve an E with a fixed value. But they can be conditional, too:

(51)   **Auch wenn** Sie die derzeitige Spendenhöhe nicht beibehalten können (CONDITION), würde uns einer kleiner Betrag immer noch sehr helfen (CONSEQUENCE).
        [**even if** you can't maintain your current level of giving, a small amount would still help us very much]

In cases like (51), the relatum with the thematic role CONSEQUENCE has an open factivity value.

Instrumental relations, too, can be causal or conditional. (52) is, at least in one of several possible readings, an example of an instrumental relation with an open consequence value:

(52)   Die beiden wollten ihre Familie überraschen (DESIRED CONSEQUENCE – E), **indem** sie ankamen, als alle schliefen (CONDITION – R).
        [the couple wanted to surprise their family **by** arriving while everyone was sleeping]

Final connectives are a fourth subclass of the conditional family. They, too, have an open consequence value:

(53)   Wir verknüpfen einfache Gedanken, **um** komplexere Strukturen **zu** verstehen.
        [we associate simple thoughts **so as to** comprehend more complex structures**]**

Instrumental and final connectives can encode temporal, epistemic or deontic-illocutionary, but no spatial relations, as we can see in (54) and (55):

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(54)   #der Nagel **durch** den Hammer
        [the nail **by** the hammer]
(55)   #die Garage **zwecks** des Autos
        [the garage **for purpose of** the car]

In the fourth column we find the biggest number of subclasses, including causal connectives *stricto sensu* such as *weil* [because] and *da* [since]. Both can encode temporal, epistemic and deontic-illocutionary relations (see Blühdorn 2006, 2008c). Relations of spatial cause can be encoded by adpositions such as *von* [from]:

(56)   das Loch **von** der Kugel
        [the hole **from** the bullet]

Consecutive connectives such as *sodass* [so that], instrumental connectives such as *durch* [by means of] and *indem* [by] and concessive connectives such as *trotz* [in spite of] and *obgleich* [although] can encode temporal, epistemic and deontic-illocutionary, but probably no spatial relations.

Evidential connectives like *also* [so] or *folglich* [consequently] and conclusive connectives like *schließlich* [after all] can encode epistemic and deontic-illucutionary relations:

(57)   In seiner Manteltasche wurde ein Messer gefunden. **Also** muss er der Mörder sein.
        [a knife was found in his coat pocket. **so** he must be the murderer.
(58)   Die Behörden übernahmen liebenswürdigerweise die Kosten. Es ist **schließlich** nur öffentliches Geld.
        [the authorities meekly paid up. it's only public money, **after all**]

(57) is an example of an evidential relation on the epistemic level, (58) illustrates a conclusive relation on the deontic-illocutionary level.

The arrows on the axes of the diagrams in (41) and (42) symbolize the directions in which the relations become more complex. They correspond to the directions of metaphorical transference between the relational categories as well as to the directions of grammaticalization in the historical development of connectives. This model has been used as a framework for the semantic description of some groups of connectives in Blühdorn (2003, 2004, 2005, 2006, 2008c; Blühdorn & Golubeva 2007) as well as for the discussion of theoretical questions of the semantics of connectives in Blühdorn (2008a, 2008b).

4.   Semantic relations and syntactic hierarchy

The last question to be discussed here concerns the relation between syntactic hierarchy and semantic symmetry in sentence connections.

The distinction between semantically symmetrical and asymmetric relations can be made within the boundaries of the sentence (i.e., on intra-sentence level) and also between sentences in discourse (i.e., on inter-sentence level). Both kinds of semantic relations can be encoded by coordinators as well as by subordinators and also by adverbial connectives. Let uns look at some examples to illustrate this point:

(59a)   Das ist kein Selbstbedienungsladen, **und** sonntags ist hier zu.
        [**this** is no self-service store, **and** on Sundays we are closed]
(59b)   Sonntags ist hier zu, **und** das ist kein Selbstbedienungsladen.
        [on Sundays we are closed, **and** this is no self-service store]
(59c)   Das ist kein Selbstbedienungsladen. **Außerdem** ist hier sonntags zu.
        [this is no self-service store. **besides**, we are closed on Sundays]
(59d)   Sonntags ist hier zu. **Außerdem** ist das kein Selbstbedienungsladen.
        [on Sundays we are closed. **besides**, this is no self-service store]

The relations encoded in (59a-d) are symmetrical. The positions of the relata can be reversed without a significant change of meaning. In (59a/b), the relation is encoded by a coordinator, i.e., on intra-sentence level. In (59c/d), a semantically equivalent relation is encoded by an adverbial connective, i.e., on inter-sentence level.

(60a)   **Wenn** du keine Lust hast (R), gehe ich allein (E).
        [**if** you don't feel like it, I'll go on my own]
(60b)   **Wenn** ich allein gehe (R), hast du keine Lust (E).
        [**if** I go on my own, you won't feel like it]
(60c)   Du hast keine Lust? (R) **Dann** gehe ich allein. (E)
        [you don't feel like it? **then** I'll go on my own]
(60d)   Ich gehe allein? (R) **Dann** hast du keine Lust. (E)
        [I'll go on my own? **then** you won't feel like it]

The examples in (60a-d) illustrate asymmetric relations. Reversing the positions of their relata leads to a significant change of meaning. In (60a/b), the relations are encoded by a subordinator, i.e., on intra-sentence level. In (60c/d), semantically equivalent relations are encoded by an adverbial connective, i.e., on inter-sentence level.

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

(61a)   Die Pinguine waren braun-gelb **und** die Giraffen waren schwarz-weiß.
        [the penguins were yellow-brown, **and** the giraffes were black and white]
(61b)   Die Giraffen waren schwarz-weiß **und** die Pinguine waren braun-gelb.
        [the giraffes were black and white, **and** the penguins were yellow-brown]
(61c)   Die Pinguine waren braun-gelb, **während** die Giraffen schwarz-weiß waren.
        [the penguins were yellow-brown, **while** the giraffes were black and white]
(61d)   Die Giraffen waren schwarz-weiß, **während** die Pinguine braun-gelb waren.
        [the giraffes were black and white, **while** the penguins were yellow-brown]

(62a)   Ich war von Tag zu Tag mieser gelaunt (E), **weil** es gab da überhaupt keine Action-Abteilung (R).
        [my mood got worse by the day, **for** they didn't even have an action department]
(62b)   Es gab da überhaupt keine Action-Abteilung (E), **weil** ich war von Tag zu Tag mieser gelaunt (R).
        [they didn't even have an action department, **for** my mood got worse by the day]
(62c)   Ich war von Tag zu Tag mieser gelaunt (E), **weil** es da überhaupt keine Action-Abteilung gab (R).
        [my mood got worse by the day, **because** they didn't even have an action department]
(62d)   Es gab da überhaupt keine Action-Abteilung (E), **weil** ich von Tag zu Tag mieser gelaunt war (R).
        [they didn't even have an action department, **because** my mood got worse by the day]

The examples in (61a-d) illustrate symmetrical relations. In (61a/b), the relations are encoded by a coordinator. In (61c/d), the same relata are symmetrically connected by a subordinator. The examples in (62a-d) illustrate asymmetric relations. Reversing the positions of the relata leads to a change of meaning. In (62a/b), the relations are encoded by a (non-prototypical) coordinator. Both relata are syntactically realized as main clauses. In (62c/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.

29

What we can learn of these examples is that syntactic coordination and subordination and semantic symmetry and asymmetry are two quite independent distinctions. Semantically symmetrical relations can be encoded either by syntactic coordination or by syntactic subordination, and the same is true of semantically asymmetric relations. Furthermore, both kinds of semantic relations can be encoded referentially, by adverbial connectives.

Although syntactic hierarchy and semantic symmetry are in principle independent of each other, it seems natural to assume a certain preference for encoding semantically symmetrical relations by syntactic coordination and semantically asymmetric relations by syntactic subordination (see Matthiessen & Thompson 1988; Langacker 1991: 436f; Cristofaro 2003: 29ff). But we must keep in mind one important observation which shows that such a tendency, if it really exists, is not necessarily a matter of iconicity.

As we saw in section 2.3 above, Pasch et al. (2003: 315f) distinguish between two structural properties of conjunctions: subordination and embedding. Subordinating conjunctions and adpositions have both properties. In a typical subordinative sentence connection the main clause embeds the subordinate clause and not vice versa:

(63)   main clause

                    |
                    |
                    |

        adverbial subordinate clause
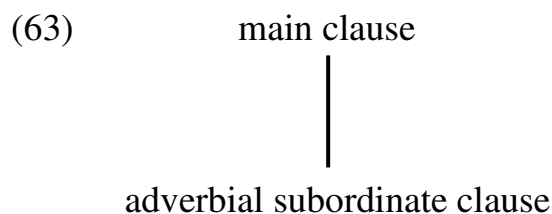
Semantically asymmetric connections, too, can be characterized, in a sense, as embedding relations. The relatum with the relational role R (the landmark, in Langacker's terminology) provides a conceptual framework into which the relatum with the relational role E (the trajector) is inserted. In this sense, R is the embedding part and E the embedded part:

(64)   R

                    |
                    |
                    |

                 E
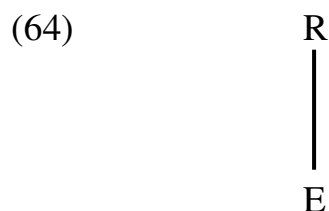
Looking at the mapping between embedding relations in syntax and semantics, we realize that R (the semantically embedding part) is invariably encoded by the syntactically embedded expression (e.g., the subordinate clause) and E (the

semantically embedded part) by the syntactically embedding expression (e.g., the main clause):

(65)   **Solange** ihr einkauft (subordinate clause – R), warten wir hier an der Ecke (main clause – E).
        [**while** you go shopping, we'll wait here at the corner]

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 assignment of thematic roles. Both complements and adjuncts are syntactically subordinate to their heads, but while complements receive their thematic roles from their heads, adjuncts assign thematic roles to their heads. If we interpret assignment 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   R

                        ╳

            subordinate clause   E
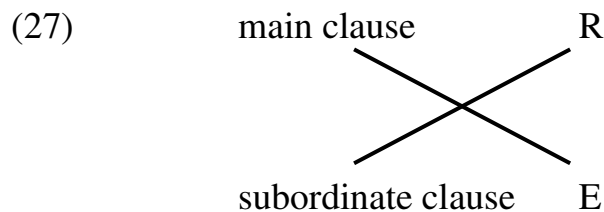
5.   Closing remarks

This paper has given an account of some aspects of the syntax and semantics of sentence connectives, a class of elements which have often been neglected in descriptive grammar handbooks of German and of other languages. The syntactic classification of connectives presented in the first part has been especially elaborated for German. It is useful for the syntactic description of

connectives in German data, but it cannot be transferred without modifications to other (non-V2-)languages. Particularly the intermediate classes between coordinators and subordinators, i.e., "hitch-up" subordinators and V2-embedding conjunctions, will not be found in languages with different typological characteristics.

The semantic model presented in the second part of the paper is potentially universal and may therefore be suitable as a *tertium comparationis* for cross-language studies. But it is much more a general conceptual framework than a tool for actual semantic description. The semantic subclasses of connectives distinguished by traditional grammar handbooks are not only structured by general semantic features such as class of relation and category of the connected entities, but also by additional features and oppositions, some of which are relevant for various semantic classes of connectives, while others are peculiar to individual subclasses. Those features and other descriptive details of the semantics of connectives have not even been mentioned in this paper.

Another very important part of the semantics of connectives about which nothing has been said is the logic of relations. It is a much disputed question to what extent the meaning of natural language connectives can or must be identified with the meanings of connectives in formal logics. It was not the objective of the present paper to make a contribution to this discussion, but it is in fact my conviction that the semantics of natural language connectives cannot be described without at least some of the tools of formal logics and that therefore a central part of my topic has not been dealt with in this paper.

References

Bierwisch, Manfred. 2003. „Heads, complements, adjuncts: Projection and saturation". In *Modifying adjuncts*, Ewald Lang, Claudia Maienborn & Cathrine Fabricius-Hansen (eds), 113-159. Berlin: Mouton de Gruyter.

Blakemore, Diane & Carston, Robyn. 2005. „The pragmatics of sentential coordination with *and*". *Lingua* 115: 569-589.

Blühdorn, Hardarik. 2003. „Zur Semantik der Konjunktion *als*. Paradigmatische und syntagmatische Aspekte". *Linguistik online* 13: 11-53 [http://www.linguistik-online.de/13_01/bluehdorn.html].

Blühdorn, Hardarik. 2004. „Die Konjunktionen *nachdem* und *bevor*". In *Brücken schlagen: Grundlagen der Konnektorensemantik*, Hardarik Blühdorn, Eva Breindl & Ulrich Hermann Waßner (eds), 185-211. Berlin: Walter de Gruyter.

Blühdorn, Hardarik. 2005. „Zur Semantik kausaler Satzverbindungen: Integration, Fokussierung, Definitheit und modale Umgebung". *Studi Linguistici e Filologici Online. Rivista Telematica del Dipartimento di Linguistica dell'Università di Pisa* (SLiFO) 3.2: 311-338 [http://www.humnet.unipi.it/slifo/2005vol2/Bluhdorn3.2.pdf].

Blühdorn, Hardarik. 2006. „Kausale Satzverknüpfungen im Deutschen". *Pandaemonium Germanicum. Revista de Estudos Germanísticos* 10: 253-282, São Paulo: Humanitas.

Blühdorn, Hardarik. 2008a. „Epistemische Lesarten von Satzkonnektoren – Wie sie zustande kommen und wie man sie erkennt". In *Semantik vs. Pragmatik oder Semantik und Pragmatik?*, Inge Pohl (ed.). Frankfurt/Main: Peter Lang (in print).

Blühdorn, Hardarik. 2008b. „Subordination and coordination in syntax, semantics and discourse. Evidence from the study of connectives". In *'Subordination' versus 'Coordination' in Sentence and Text*, Cathrine Fabricius-Hansen & Wiebke Ramm (eds), 59-85. Amsterdam: John Benjamins.

Blühdorn, Hardarik. 2008c. „Verknüpfungs-Eigenschaften deutscher Kausal-Konnektoren zwischen syntaktischer Hierarchie und Linearität". *Deutsche Sprache* (submitted).

Blühdorn, Hardarik, Breindl, Eva & Waßner, Ulrich Hermann (eds). 2004. *Brücken schlagen: Grundlagen der Konnektorensemantik*. Berlin: Walter de Gruyter.

Blühdorn, Hardarik, Breindl, Eva & Waßner, Ulrich Hermann (eds). 2006. *Text – Verstehen. Grammatik und darüber hinaus*. Berlin: Walter de Gruyter.

Blühdorn, Hardarik & Golubeva, Nadežda A. 2007. „Konzessivkonnektoren und ihre morphologischen Bestandteile im Deutschen und im Russischen". *Das Wort. Germanistisches Jahrbuch Russland* 23: 77-100, Moscow [http://www.daad.ru/wort/inhalt2007.htm].

Breindl, Eva 2007. „Additive Konjunktoren und Adverbien im Deutschen". In *Feldergrammatik in der Diskussion. Funktionaler Grammatikansatz in*

Sprachbeschreibung und Sprachvermittlung, Joachim Buscha & Renate Freudenberg-Findeisen (eds), 141-164. Frankfurt/Main: Peter Lang.

Breindl, Eva. 2008. „Die Bedeutung additiver Konnektoren (*und*, *sowohl als auch*, *sowie*)". In *Semantik vs. Pragmatik oder Semantik und Pragmatik?*, Inge Pohl (ed.). Frankfurt/Main: Peter Lang (in print).

Breindl, Eva & Waßner, Ulrich Hermann. 2006. „Syndese vs. Asyndese. Konnektoren und andere Wegweiser für die Interpretation semantischer Relationen in Texten". In *Text – Verstehen: Grammatik und darüber hinaus*, Hardarik Blühdorn, Eva Breindl & Ulrich Hermann Waßner (eds), 46-70. Berlin: Walter de Gruyter.

Camacho, José. 2003. *The structure of coordination: Conjunction and agreement phenomena in Spanish and other languages*. Dordrecht: Kluwer.

Cristofaro, Sonia. 2003. *Subordination*. Oxford: University Press.

Dik, Simon C. 1972. *Coordination: Its implications for the theory of general linguistics*. 2nd ed., Amsterdam: North-Holland.

Dik, Simon C. 1997. *The Theory of Functional Grammar. Part 1: The Structure of the Clause*. 2nd, rev. ed., Kees Hengeveld (ed.). Berlin: Mouton de Gruyter.

Duden. 2005. *Die Grammatik* (Duden Vol. 4), Dudenredaktion (ed.). 7th ed., Mannheim: Dudenverlag.

Eisenberg, Peter. 2004. *Grundriss der deutschen Grammatik*. Vol. 2: *Der Satz*. 2nd ed., Stuttgart, Metzler.

Grice, Paul. 1981. „Presupposition and conversational implicature". In *Radical pragmatics*, Peter Cole (ed.), 183-198. New York: Academic Press.

Halliday, Michael A.K. & Hasan, Ruqaiya. 1976. *Cohesion in English*. London: Longman.

Haspelmath, Martin. 2004. „Coordinating constructions: An overwiew". In *Coordinating constructions*, Martin Haspelmath (ed.), 3-39. Amsterdam: John Benjamins.

Haspelmath, Martin. (ed.). 2004. *Coordinating constructions*. Amsterdam: John Benjamins.

Hopper, Paul J. & Thompson, Sandra A. 1984. „The discourse basis of lexical categories in universal grammar". *Language* 60: 703-752.

Johannessen, Janne Bondi. 1998. *Coordination*. Oxford: Oxford University Press.

Knott, Alistair & Dale, Robert 1994. „Using linguistic phenomena to motivate a set of coherence relations". *Discourse Processes* 18: 35-62.

Knott, Alistair, Sanders, Ted & Oberlander, Jon. (eds). 2001. *Special issue: Levels of representation in discourse relations. Cognitive Linguistics* 12: 197-332.

Kortmann, Bernd. 1996. *Adverbial subordination: A typology and history of adverbial subordinators based on European languages*. Berlin: Mouton de Gruyter.

Lang, Ewald. 1984. *The semantics of coordination*. Engl. transl. by John Pheby. Amsterdam: John Benjamins.

Langacker, Ronald W. 1987. *Foundations of Cognitive Grammar*. Vol. 1: *Theoretical prerequisites*. Stanford: Stanford University Press.

Langacker, Ronald W. 1991. *Foundations of Cognitive Grammar*. Vol. 2: *Descriptive application*. Stanford: Stanford University Press.

Lohnstein, Horst. 2004. Variable und invariante Strukturmerkmale von Satzkonnektoren. In *Brücken schlagen: Grundlagen der Konnektorensemantik*, Hardarik Blühdorn, Eva Breindl & Ulrich Hermann Waßner (eds), 137–160. Berlin: Walter de Gruyter.

Lyons, John. 1977. *Semantics*. 2 vols., Cambridge: Cambridge University Press.

Matthiessen, Christian & Thompson, Sandra A. 1988. The structure of discourse and ‚subordination'. In *Clause Combining in Grammar and Discourse*, John Haiman & Sandra A. Thompson (eds), 275–329. Amsterdam: John Benjamins.

O'Dowd, Elizabeth. 1992. „The syntactic metaphor of subordination: A typological study". *Lingua* 86: 46-80.

Osborne, Timothy. 2003. *The third dimension: A Dependency Grammar theory of coordination for English and German*. PhD Dissertation, Pennsylvania State University. Ann Arbor: UMI.

Osborne, Timothy. 2006. „Shared material and grammar: Toward a dependency grammar theory of non-gapping coordination for Englisch and German". *Zeitschrift für Sprachwissenschaft* 25: 39-93.

Pasch, Renate. 1983. „Untersuchungen zu den Gebrauchsbedingungen der deutschen Kausalkonjunktionen *da*, *denn* und *weil*". *Linguistische Studien, Reihe A: Arbeitsberichte* 104: 41-243. Berlin: Zentralinstitut für Sprachwissenschaft.

Pasch, Renate. 2000. „Vorschlag für eine Neuordnung der ‚subordinierenden' Konjunktionen des Deutschen". In *Subordination in Syntax, Semantik und Textlinguistik*, Michel Lefèvre (ed.), 23-32. Tübingen: Stauffenburg.

Pasch, Renate, Brauße, Ursula, Breindl, Eva & Waßner, Ulrich Hermann. 2003. *Handbuch der deutschen Konnektoren: Linguistische Grundlagen der Beschreibung und syntaktische Merkmale der deutschen Satzverknüpfer (Konjunktionen, Satzadverbien und Partikeln)*. Berlin: Walter de Gruyter.

Pasch, Renate. 2004. „Das *Handbuch der deutschen Konnektoren*". In *Brücken schlagen: Grundlagen der Konnektorensemantik*, Hardarik Blühdorn, Eva Breindl & Ulrich Hermann Waßner (eds), 11-44. Berlin: Walter de Gruyter.

Polanyi, Livia. 1988. „A formal model of the structure of discourse". *Journal of Pragmatics* 12: 601-638.

Posner, Roland. 1980. „Semantics and pragmatics of sentence connectives in natural language". In *Speech act theory and pragmatics*, John R. Searle, Ferenc Kiefer & Manfred Bierwisch (eds), 169-203. Dordrecht: D. Reidel.

Reichenbach, Hans. 1947=1999. *Grundzüge der symbolischen Logik* (*Elements of Symbolic Logic*). Gesammelte Werke, Bd 6. Matthias Varga von Kibéd, Claudia Thomé & Stephan Bayerl (trad.). Braunschweig: Vieweg.

Quirk, Randolph, Greenbaum, Sidney, Leech, Geoffrey & Svartvik, Jan. 1985. *A comprehensive grammar of the English language*. London: Longman.

Sweetser, Eve. 1990. *From etymology to pragmatics. Metaphorical and cultural aspects of semantic structure*. Cambridge: University Press.

Webber, Bonnie, Stone, Matthew, Joshi, Aravind & Knott, Alistair. 2003. „Anaphora and Discourse Structure". *Computational Linguistics* 29: 545-587.

Wesche, Birgit. 1995. *Symmetric coordination: An alternative theory of phrase structure*. Tübingen: Max Niemeyer.

Wiese, Bernd. 1980. „Grundprobleme der Koordination". *Lingua* 51: 17-44.

Zifonun, Gisela. 2001. *Grammatik des Deutschen im europäischen Vergleich: Der Relativsatz*. Mannheim: Institut für Deutsche Sprache.