

## Chapter 35

### Discourse and Text Structure

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#### 1. Discourse, Text Structure, and Cognitive Linguistics

The alliance between Cognitive Linguistics and the study of discourse has become stronger in the recent past. This is a natural development. On the one hand, Cognitive Linguistics focuses on language as an instrument for organizing, processing, and conveying information; on the other, language users communicate through discourse rather than through isolated sentences. Nevertheless, at the moment, the cognitive linguistic study of discourse is still more of a promising challenge to linguists and students of discourse, rather than a well established part of everyday cognitive linguistic practice. We start this chapter from the assumption that the grounding of language in discourse is central to any functional account of language (Langacker 2001). **Discourse is often considered a crucial notion for understanding human communication.** Or, as Graesser, Millis, and Zwaan (1997) put it, “Discourse is what makes us human”.

Consider the following example from a Dutch electronic newspaper, which we have segmented into (a) and (b).

- (1) a. *Greenpeace heeft in het Zuid-Duitse Beieren een nucleair transport verstoord.*  
b. *Demonstranten ketenden zich vast aan de rails. (Telegraaf, April 10, 2001)*
- a. ‘Greenpeace has obstructed a nuclear transport in the South German state of Bavaria.’  
b. ‘Demonstrators chained themselves to the rails.’

This short electronic news item does not create any interpretation difficulties. Nevertheless, in order to understand the fragment correctly, a massive amount of inferencing has to take place. For instance, we have to infer that the nuclear transport was not disturbed by the *organization* Greenpeace, but by members of that organization; that the protesters are members of the organization; that the nuclear transport took place by train; that the place where the protesters chained themselves to the rails is on the route that the train took; that the time at which the protesters chained themselves to the rails coincided with the time of the transport; and that the obstruction of the transport was *caused* by the protesters chaining themselves to the rails.

Some of these inferences are based on world knowledge, for instance that organizations consist of people and that people, but not organizations, can carry out physical actions. Others are based on discourse structural characteristics. Here are two examples: (i) The phrase *the rails* is a definite noun phrase that functions as an anaphor with a presupposed antecedent. Since there is no explicit candidate to fulfill the role of antecedent, the noun phrase necessarily invites the inference of a referential link with *transport*, the most plausible interpretation being that the transport took place by a vehicle on rails, i.e., a train. (ii) People reading news texts expect to get explanations for the phenomena described. When one event in the text can be interpreted as an explanation for another, readers will infer a causal link between them.<sup>1</sup>

In this chapter, we will focus on discourse-structural characteristics like these, which, we believe, can account for the connectedness that discourse shows when compared to a random set of sentences. Given the limited space of a chapter like this, there are many specific issues that we cannot discuss, despite the fact that they are of great interest.

Thus, we will not discuss the structure of spoken discourse. Obviously, there are

fundamental differences between written and spoken discourse. For instance, many connectives in written language function to express the meaning relationships—*coherence relations*—between segments, such as *but* in example (2), which expresses a relation of *denial of expectation*. Connectives fulfill the same function in conversation, but often they simultaneously function as *sequential markers*: for instance, they signal the move from a digression back to the main line of the conversation. This type of marker is commonly referred to by the term discourse marker (cf. Schiffrin 2001, who is the source of example (3)).

(2) The murder suspect—described by Hampshire police as “very dangerous”—had been spotted by a British tourist on Saturday, but she only informed New York police on Tuesday afternoon after returning home and seeing his photo in the British media. (*The Guardian*, June 6, 2002)

(3) Jack: [ The rabbis preach, [ “Don’t intermarry”  
Freda: [ But I did- [ But I *did* say those intermarriages that we have in this country are healthy.

According to Schiffrin, *but* in (3) performs multiple functions, including the function of displaying non-alignment with Jack, realizing an action of rebuttal during an argument, and attempting to establish Freda as the current speaker.

Clearly, connectives have multiple functions, and, clearly, these functions are related. It is an interesting research question under which conditions a connective that expresses a coherence relation can also be used as sequential marker. This type of question is under investigation in the grammaticalization literature (cf. Hopper and Traugott 1993: chapter 7;

Traugott 1995). In this chapter we confine ourselves to the coherence relation function of connectives.

Other aspects of discourse structure that are specific to spoken language include prosody and the occurrence of so-called *adjacency pairs*, i.e., minimal pairs such as *Question-Answer* and *Summons-Response* (Sacks, Schegloff, and Jefferson 1974). These topics, too, are subject to ongoing research (see the overview in Ford, Fox, and Thompson 2001), and can be considered especially important, as they cut across linguistic subdisciplines such as grammar and the study of conversation. Still, however important and promising this research may be, we will for reasons of space not go further into it.

Instead, we want to focus on the crucial characteristics spoken and written discourse have in common. After all, these characteristics are central to the linguistic study of the level at stake here, namely, that of discourse. We will use the term ‘discourse’ as the more general term to refer to both spoken and written language, and we will only use ‘text’ to refer to phenomena restricted to written language.

Over the years, the notion of ‘discourse’ has become increasingly important in linguistics—a remarkable development, considering that linguistics used to deal almost exclusively with sentences in isolation. Nowadays, the discipline includes the study of form and meaning of utterances in context, and there exist formal, functional, and cognitive approaches that consider the discourse level as the core object of study. There seems to be a consensus that what makes a set of utterances into genuine discourse is (primarily) their meaning rather than their form. More specifically, there is a shared belief that ‘discoursehood’ is based on the possibility to relate discourse segments to form a coherent message. As a result, the dividing line between cognitive linguistic approaches and more formal approaches seems to be less clear-cut than at the sentence level (Knott, Sanders, and Oberlander 2001). Still, there are large differences between formal and cognitive or functional accounts of

discourse. In formal linguistics, discourse-oriented work centers on the semantic theories of Kamp (e.g., Kamp and Reyle 1993) and Heim (1982). Here, issues like anaphora and presupposition are studied in short stretches of discourses usually consisting of constructed sets of sentences. In formal computational linguistics, however, attention is increasingly turning to the interpretation and production of extended pieces of text (Lascarides and Asher 1993). This type of approach is gradually moving in the direction of cognitively and functionally inspired work, which focuses on the discourse structure of naturally occurring language (Mann and Thompson 1986; Polanyi 1988) and on the cognitive representation of discourse in the mind of the language user (Sanders, Spooren, and Noordman 1992, 1993).

The central claim of this chapter is that the connectedness of discourse is a mental phenomenon. When confronted with a stretch of discourse, language users make a coherent representation of it. At the same time, discourse itself contains (more or less) overt signals that direct this interpretation process, which is in line with views of grammar as a processing instructor (Givón 1995; Kintsch 1995). Thus, our view of discourse revolves around two central notions: ‘mental representation’ and ‘overt linguistic signals’. The latter goes back to the Hallidayan work on cohesion (Halliday and Hasan 1976), which describes text connectedness in terms of cohesive ties such as conjunction and ellipsis. The problem with this approach is that sequences like *John was happy. It was a Saturday* can be coherent, even though they do not have any cohesive ties. The notion of ‘mental representation’ relates to approaches like Hobbs’s (1979), who coined the phrase *coherence relation* for interclausal relationships. What we inherit from this work is what we consider the best of both worlds: the attention for linguistic detail in the cohesion approach is combined with the basic insight that coherence is a cognitive phenomenon.

Considering coherence as a *mental* phenomenon implies that it is not an inherent property of a *text* under consideration. Language users establish coherence by relating the

different information units in the text. The notion of coherence has a prominent place in both (text-)linguistic and psycholinguistic theories of text and discourse. Although this is not a particularly new view of coherence (see, among many others, Van Dijk and Kintsch 1983; Hobbs 1990; Garnham and Oakhill 1992; Sanders, Spooren, and Noordman 1992; Gernsbacher and Givón 1995; Noordman and Vonk 1997)—it *is* a crucial starting point for theories that aim at describing the link between the structure of a text as a linguistic object, its cognitive representations, and the processes of text production and understanding. In our view, it is this type of theory, located at the intersection of linguistics and psycholinguistics, that could lead to significant progress in the field of discourse studies (Sanders and Spooren 2001a). Cognitive linguists have already made substantial contributions to the study of discourse. At the same time, Cognitive Linguistics can benefit from insights in discourse to further develop itself as the study of language in use (Barlow and Kemmer 2000).

In the remainder of this chapter, we will discuss two types of coherence and their textual signals: (i) Referential coherence: how does reference to individuals create continuity and (as a result) coherence? The signals that we will be considering involve reference to objects and concepts; more specifically, we will consider the ways in which reference is realized: through full NPs, pronouns, zero anaphora, etc. (ii) Relational coherence: how do coherence relations like causals and contrastives constitute connectedness? The signals that we will be considering are connectives and lexical cue phrases. At the end of this chapter, we will reach some conclusions about the relationship between discourse/text structure and Cognitive Linguistics, and on the basis of our analysis of the state of the art, we will suggest some challenging issues for future research.

## 2. Referential Coherence

Text (4) illustrates how referential coherence structures discourse.

- (4) The heaviest human in medical history was Jon Brower Minnoch (b. 29 Sep 1941) of Bainbridge Island, WA, who had suffered from obesity since childhood. The 6-ft-1-in-tall former taxi driver was 392 lb in 1963, 700 lb in 1966, and 975 lb in September 1976. In March 1978, Minnoch was rushed to University Hospital, Seattle,  $\emptyset$  saturated with fluid and  $\emptyset$  suffering from heart and respiratory failure. It took a dozen firemen and an improvised stretcher to move him from his home to a ferryboat. When he arrived at the hospital he was put in two beds lashed together. It took 13 people just to roll him over. (*The Guinness book of records 1994*: 151)

The discourse topic Jon Brower Minnoch is identified in the first sentence and is referred to throughout this fragment in each sentence. Here are the referential forms used in the text:

Jon Brower Minnoch (b. 29 Sep 1941) of Bainbridge Island, WA

The 6-ft-1-in-tall former taxi driver

Minnoch

$\emptyset$

$\emptyset$

him

he

he

him

First of all, this list shows that the linguistic indicators for referential coherence can be lexical NPs, pronouns, and other devices for anaphoric reference. Second, it appears that the longest referential forms are used in the beginning of the fragment, and once the referent has been identified, the pronominal forms suffice. This is not a coincidence. Many linguists have noted this regularity and have related it to the cognitive status of the referents. Ariel (1990, 2001), for instance, has argued that this type of pattern in grammatical coding should be understood to guide processing. She has developed an *Accessibility Theory* in which high accessibility markers consist of less linguistic material, and signal the default choice of continued activation. By contrast, low accessibility markers consist of much linguistic material, and signal termination of activation of the current (topical) referent, and the (re)introduction of a different referent. Ariel has also developed an Accessibility Marking Scale (Ariel 1990), from low to high accessibility markers:

- (5) Full name > long definite description > short definite description > last name > first name > distal demonstrative > proximate demonstrative > NP > stressed pronoun > unstressed pronoun > cliticized pronoun > zero.

For examples such as our text (4), Ariel has convincingly shown that zero anaphora and unstressed pronouns co-occur with high accessibility of referents, whereas stressed pronouns and full lexical nouns signal low accessibility. This co-occurrence can easily be understood in terms of cognitive processes of activation: High accessibility markers signal the *default* choice of continued activation of the current topical referent. Low accessibility anaphoric devices such as full NPs or indefinite articles signal termination of activation of the current topical referent, and the activation of another topic. Ariel (1990) has even argued that the framework has consequences for the binding conditions of Chomsky's Government and

Binding Theory on the distribution and interpretation of pronominal and anaphoric expressions: these conditions are actually the ‘grammaticalized versions’ of cognitive states of attention and of the accessibility of concepts that are referred to linguistically. This Accessibility Theory is based on earlier work by Chafe and Givón: “Chafe (1976, 1994) was the first to argue for a direct connection between referential forms and cognitive statuses. Accessibility Theory can be seen as an extension of his (and later Givón’s 1983) basic insight” (Ariel 2001: 60).

Many functional and cognitive linguists have argued that the grammar of referential coherence plays an important role in the mental operations of connecting incoming information to existing mental representations. This cognitive interpretation of referential phenomena is supported by a growing body of empirical data from corpus studies along the lines set out by functional linguists like DuBois (1980). In a distributional study, Givón (1995), for instance, shows that in English the indefinite article *a(n)* is typically used to introduce nontopical referents, whereas topical referents are introduced by *this*. In addition, there is a clear interaction between grammatical subjecthood and the demonstrative *this*: most *this*-marked NPs also appear as grammatical subjects in a sentence, while a majority of *a(n)*-marked NPs occur as non-subjects. Across languages, there appears to be a topic persistence of referents: in active-transitive clauses the topic persistence of subject NPs is systematically higher than that of object NPs.

In experimental research on text processing, quite some work has been done which can be taken to demonstrate the ‘psychological reality’ of linguistic indicators of referential coherence. For instance, it is easier to resolve a pronoun with only one possible referent than one with ambiguous reference, and it is easier to resolve a pronoun with a proximal referent than one with a distant referent. As for the time course, eye fixation studies have repeatedly shown that anaphoric expressions are resolved immediately (e.g., Carpenter and Just 1977;

Ehrlich and Rayner 1983).

- (6) a. The guard mocked one of the prisoners in the machine shop.  
b. He had been at the prison for only one week.

When readers came upon ambiguous pronouns such as *he* in (6b), the data showed many regressions; that is, readers frequently looked back in the text. More than 50% of these regressive fixations were to one of the two nouns in the text preceding the pronoun, suggesting that readers attempted to resolve the pronoun immediately. As for meaning representation, it has been shown that readers have difficulty understanding the text correctly when the antecedent and referent are too far apart and reference takes the form of a pronoun.

On a more global text level, rather less research has been done into the exact working of accessibility markers as processing instructions. Well researched, however, is the influence of typical discourse phenomena such as prominence of a referent in the discourse context. Garrod and Sanford (1985) used a spelling error detection procedure, and on the basis of that earlier experiment, Garrod, Freudenthal, and Boyle (1993) did an eye-tracking study with texts such as the one rendered (in a simplified version) below.

(7) *A dangerous incident at the pool*

Elizabeth was an inexperienced swimmer and wouldn't have gone in if the male lifeguard hadn't been standing by the pool. But as soon as she got out of her depth she started to panic and wave her hands about in a frenzy.

Target:

Within seconds she sank into the pool. (**Thematic, Consistent**)

Within seconds she jumped into the pool. (**Thematic, Inconsistent**)

(A simplified version of experimental texts used by Garrod, Freudenthal, and Boyle 1993)

The eye-tracking data show strong evidence for very early detection of inconsistency, as is apparent from longer fixations (in this case on the verb), but only when the pronoun maintains reference to the focused thematic subject of the passage, i.e., in the thematic conditions. In non-thematic conditions, i.e., when the pronoun does not refer to the subject in focus, there is no evidence for early detection of inconsistency.

In recent approaches to discourse anaphora, the modeling of this type of discourse focusing is pivotal. This is especially true for *Centering Theory* (Walker, Joshi, and Prince 1998), which aims at modeling the center of attention in discourse in terms of the relationship of attentional state, inferential complexity, and the form of referring expressions in a given discourse segment. Centering Theory makes explicit predictions about the referent that is ‘in focus’ at a certain moment in a discourse. It is even predicted that the degree of coherence exhibited by a textual sequence is determined by the extent to which that sequence conforms to the ‘centering constraints’. These constraints suggest that topic continuity is the default discourse situation, because frequent topic-shifting results in less local coherence. Without going into much detail, we discuss two examples of ‘centering rules’ (based on Grosz, Weinstein, and Joshi 1995; Walker, Joshi, and Prince 1998). These rules concern the transition from one discourse segment to another and are illustrated by the following short text, adapted from Grosz, Weinstein, and Joshi (1995).

- (8) a. Susan gave Betsy a pet hamster.  
b. She reminded Betsy that such hamsters were quite shy.  
c. Betsy told her that she really liked the gift.

d. She said she loved these little animals.

There are two referents present in this discourse, both referred to with proper names in (8a) and with pronouns later on. Centering Theory predicts that, given its grammatical role of subject, Susan is the center<sup>2</sup> of (8a). Centering Theory further predicts that the most likely continuation in (8b) is a zero anaphor or a third person pronoun (*she*) referring back to the center, Susan. This, then, is a case of *center continuation*. In (8c), Betsy is pronominalized (*she*) as well. In (8d), then, there is a *smooth shift* to Betsy as the center. Sequence (9) is an example of a *rough shift* from Susan to Betsy from (9b) to (9c).

- (9) a. Susan gave Betsy a pet hamster.  
b. She reminded her that such hamsters were quite shy.  
c. She told her that she really liked the gift.

The shift in (9) is rough because of the grammatical role and the expression types used to encode both Betsy and Susan in (9b) and (9c): Betsy has been pronominalized in (9b), and in (9c) Betsy is referred to with a pronoun in subject position, whereas Susan is referred to with a pronoun in object position. This shift is so rough that the sequence could even be judged incoherent (as Cornish 1999: 171 does)—or at least hard to process. Indeed, several processing studies have shown the cognitive relevance of the referential factors identified in Centering Theory (see especially Gordon, Grosz, and Gilliom 1993). The precise predictions of Centering Theory not only show how linguistic expressions of referential coherence can function as processing instructions, they also suggest that there is a referential linguistic system at the discourse level, which is a challenging topic for further investigation (see Cornish 1999).

Vonk, Hustinx, and Simons (1992) also showed the relevance of discourse context for the interpretation of referential expressions. Sometimes anaphors are more specific than is necessary for their identificational function (for instance, full NPs are used rather than pronominal expressions). The authors convincingly argue that this phenomenon can be explained in terms of the thematic development of discourse: if a discourse participant is referred to by a proper name after a series of pronominal referential expressions, this serves to indicate that a shift in topic is occurring. As is apparent from reading times, readers process the referential expressions differently.

Where anaphoric reference modulates the availability of previously mentioned concepts, cataphoric devices change the availability of concepts for the text that follows. Gernsbacher (1990) and her colleagues have demonstrated readers' sensitivity to this type of linguistic indicator of reference. They contrasted cataphoric reference by means of indefinite *a(n)* as opposed to definite *this*, both used to introduce a new referent in a story. For example, the new referent *egg* was introduced either as *an egg* or as *this egg*. It was hypothesized that the cataphor *this* would signal that a concept is likely to be mentioned again in the following story, and that *this*-cataphor therefore results in higher activation. Subjects listened to texts and were then asked to continue the text after the critical concept. They appeared to refer sooner and more often to a concept introduced by *this* than to a concept introduced by *an*. These and other results show that concepts that were marked as a potential discourse topic by *this* are more strongly activated, more resistant to being suppressed in activation, as well as more effective in suppressing the activation of other concepts (Gernsbacher 1990). It is this type of findings that provide the psycholinguistic underpinning for the idea of 'grammar as a processing instructor'.

By now, the results of on-line studies of pronominal reference make it possible to formulate cognitive parsing principles for anaphoric reference (cf. Garrod and Sanford 1994

for an overview; also Sanford and Garrod 1994; Gernsbacher 1990; Sanders and Gernsbacher 2003). Person, number, and gender obviously guide pronominal resolution. More interestingly, data from reading time, eye-tracking, and priming studies show that it takes less processing time to

- a. resolve pronouns with only one possible referent than several;
- b. resolve pronouns with proximal referents than distant ones;
- c. resolve reference to topical concepts than to less topical ones.

One obvious explanation for these findings lies in the notion of accessibility: anaphoric expressions are instructions to connect incoming information with referents mentioned earlier, and the referent nodes can be more accessible or less accessible. As a result, it takes less or more processing time, respectively, to understand anaphoric expressions (Gernsbacher 1990).

### 3. Relational Coherence

So far, we have discussed examples of the way in which linguistic signals of *referential coherence* affect text processing. We now move to signals of *relational coherence*. In many approaches to discourse connectedness, coherence relations are taken to account for the coherence in readers' cognitive text representation (cf. Hobbs 1979; Mann and Thompson 1986; Sanders, Spooren, and Noordman 1992). Coherence relations are meaning relations that connect two text segments (minimally consisting of clauses). Examples are relations such as CAUSE-CONSEQUENCE, LIST, and PROBLEM-SOLUTION. These relations are conceptual and they can, but need not, be made explicit by linguistic markers: so-called connectives (*because, so, however, although*) and lexical cue phrases (*for that reason, as a result, on the other*

*hand*).

Ever since Ducrot (1980) and Lang (1984), there have been linguistic accounts of connectives as operating instructions. The basic idea is that a connective serves to relate the content of connected segments in a specific type of relationship. Anscombe and Ducrot (1977), for instance, analyze *but* as setting up an argumentative scale (for instance, the desirability of John as a marriage candidate), with one segment tending towards the negative side of the scale and the other towards the positive side:

(10) John is rich, but dumb.

In his influential work on *Mental Spaces*, Fauconnier (1994) treats connectives as one of the so-called *space-builders*, that is, linguistic expressions that typically establish new *Mental Spaces*. Mental Spaces are mental constructs set up to interpret utterances, “structured, incremental sets ... and relations holding between them ..., such that new elements can be added to them and new relations established between their elements” (Fauconnier 1994: 16). An example of a connective acting as a space-builder is the *if-then* conditional, as in *If I were a millionaire, my VW would be a Rolls*. An expression like *if p then q* sets up a new mental space *H* in which *q* holds. In other words, *if I were a millionaire* is the space builder and in this new space my VW from the initial space is identified with the Rolls in the new space (for the detailed analyses see Fauconnier 1994, chapters 3–4; and Sweetser 1996).

Is there any psycholinguistic work showing the relevance of these ideas of connectives as processing instructions? Various on-line processing studies have examined the function of linguistic markers. These studies have primarily aimed at the investigation of the processing role of the signals *per se*, rather than on more sophisticated issues such as the exact working of ‘space building’. The experimental work typically involves the comparison of reading

times of identical textual fragments with different linguistic signals preceding them. Recent studies on the role of connectives and signaling phrases show that these linguistic signals affect the construction of the text representation (cf. Millis and Just 1994; Noordman and Vonk 1998; Cozijn 2000; Sanders and Noordman 2000).

Millis and Just (1994), for instance, investigated the influence of connectives such as *because* immediately after reading a sentence. After participants had read two clauses that were either linked or not linked by a connective, they had to judge whether a probe word had been mentioned in one of the clauses. The recognition time to probes from the first clause was consistently faster when the clauses were linked by a connective. The presence of the connective also led to faster and more accurate responses to comprehension questions. These results suggest that the connective *does* influence the representation immediately after reading.

Using eye-movement techniques, Cozijn (2000) studied the exact location of the various effects of using *because*. Using *because* implies making a causal link between the related segments. Comparing reading times in segments linked by a connective to segments not linked by a connective, Cozijn found that in clauses with a connective words immediately following the connective were read faster, but reading slowed down towards the end of the clause. This suggests that connectives help to integrate linguistic material (thus leading to faster reading when the connective is present), whereas at the same time they instruct the reader to draw a causal inference (thus slowing down clause-final reading).

In sum, several studies show the influence of linguistic markers on text *processing*. However, studies of the influence on text *representation* show a much less consistent pattern (see Degand, Lefèvre, and Bestgen 1999; Sanders and Noordman 2000; and Degand and Sanders 2002 for an overview). On the one hand, some results show that linguistic marking of coherence relations improves mental text representation. This becomes apparent from better

recall performance, faster and more accurate responses to prompted recall tasks, faster responses to verification tasks, and better answers on comprehension questions. On the other hand, there are a number of studies indicating that linguistic markers do *not* have this facilitating role, as shown by a lack of effect on the amount of information recalled or a lack of better answers on multiple-choice comprehension questions. Some authors even claim a negative impact of connectives on text comprehension.

There are several plausible explanations for the reported contradictions (Degand and Sanders 2002). One is that the category of linguistic markers under investigation is not well defined. For instance, in the signaling literature different types of *signals* seem to be conflated. A second explanation is that some experimental methods, such as the recall task, are simply too global to measure the effect of relational markers. Other methods such as recognition, question answering, or sorting (Kintsch 1998) might be more sensitive in this respect. Indeed, Degand, Lefèvre, and Bestgen (1999), and Degand and Sanders (2002) provide evidence for the claim that under average conditions (i.e., in natural texts of normal text length and with a moderate number of connectives) causal connectives do contribute significantly to the comprehension of the text. In sum, connectives and cue phrases seem to affect both the construction process and the representation once the text has been processed, but the effects are rather subtle and specific measurement techniques are needed to actually assess them.

Thus far, we have discussed the role of connectives and signaling phrases in discourse processing. A preliminary conclusion might be that they can be treated as linguistic markers that instruct readers how to connect a new discourse segment with a previous one (Britton 1994). In the absence of such instructions, readers have to determine for themselves what coherence relation connects the incoming segment to the previous discourse. Such an inference process requires additional cognitive energy and results in longer processing times.

If this idea has any validity, it implies that the coherence relations themselves should have a major influence on discourse processing as well. One might expect that the type of relation that connects two discourse segments, be it causal, additive, contrastive, etc., affects discourse representation.

Here we move into another area where the combination of text linguistic and discourse psychological insights has led to significant progress: the discussion about the types or categorization of coherence relations. In the last decade, a significant part of the research on coherence relations has focused on the question how the many different sets of relations should be organized (Hovy 1990; Redeker 1990; Knott and Dale 1994; Sanders 1997; Pander Maat 1998;). Sanders, Spooren, and Noordman (1992) have started from the properties common to all relations, in order to define the ‘relations among the relations’, relying on the intuition that some coherence relations are more alike than others. For instance, the relations in (11), (12), and (13) all express (a certain type of) causality, whereas the ones in (14) and (15) do not. Furthermore, a negative relation is expressed in (14), as opposed to all other examples. Finally, (15) expresses a relation of enumeration or addition.

(11) The buzzard was looking for prey. The bird was soaring in the air for hours.

(12) The bird has been soaring in the air for hours now. It must be a buzzard.

(13) The buzzard has been soaring in the air for hours now. Let's finally go home!

(14) The buzzard was soaring in the air for hours. Yesterday we did not see it all day.

(15) The buzzard was soaring in the air for hours. There was a peregrine falcon in the area, too.

Sweetser (1990) introduced a distinction dominant in many existing classification proposals, namely that between content relations (sometimes also called ideational, external,

or semantic relations), epistemic relations, and speech-act relations. In the first type of relation, segments are related because of their propositional content, i.e., the locutionary meaning of the segments. They describe events that cohere in the world. The relation in (16) can be interpreted as a content relation because it connects two events in the world; our knowledge allows us to relate the segments as coherent in the world. Similarly, the relation in (16) could be paraphrased as “the neighbors suddenly having left for Paris last Friday leads to the fact that they are not at home” (Sanders 1997).

(16) The neighbors suddenly left for Paris last Friday. As a consequence they are not at home.

(17) The lights in their living room are out. So the neighbors are not at home.

(18) Why don't you turn up the radio? The neighbors are not at home.

In (17), however, the two discourse segments are related not because there is a causal relation between two states of affairs in the world, but because we understand the second part as a conclusion from evidence in the first: it is *not* the case that the neighbors are not at home because the lights are out. The causal relation in (17) could be paraphrased as ‘I observe that the lights in their living room are out. I conclude from that that the neighbors are not at home’. This is an example of an epistemic relation. Example (18) is a speech-act relation: its paraphrase is ‘I invite you to turn up the radio’. The basis for that invitation is that the neighbors are not at home.

If this distinction is applied to the set of examples above, the causal relation (11) is a content relation, whereas (12) is an epistemic relation and (13) a **speech-act** relation. This systematic difference between types of relation has been noted by many students of discourse coherence. Still, there is quite a lot of discussion about the exact definition of a distinction

like this (see; e.g., Hovy 1990; Martin 1992; Moore and Pollack 1992; Knott and Dale 1994; Knott 1996; Bateman and Rondhuis 1997; Oversteegen 1997; Sanders 1997; Knott and Sanders 1998; Pander Maat 1998; Sanders and Spooren 1999; Degand 2001). At the same time, several researchers have come up with highly similar distinctions, and there seems to be basic agreement on the characteristics of the prototypical relations (Sanders 1997).

If categorizations of coherence relations have real cognitive significance, they should prove relevant in areas such as discourse processing and language development, both synchronically (language acquisition) and diachronically (language change). In all three areas, much suggestive evidence already exists in the literature and additional, substantial studies are under way.

Experimental studies on the processing of coherence relations have especially dealt with causal relations. For instance, causally related events are recalled better (Black and Bern 1981; Trabasso and Van den Broek 1985), and at the same time they are processed faster (Haberlandt and Bingham 1978; Sanders and Noordman 2000). These results possibly imply that causality has a special status. In Zwaan's Event Indexing Model, readers construct coherent representations of a narrative text by integrating the events in the text on five different dimensions: time, space, causation, motivation, and protagonist. By default, readers assume inertia: discontinuities on any of these dimensions (leaps in time, space etc.) lead to processing problems. That explains why temporal inversion increases processing time (Zwaan 1996), that non-causally related events are more difficult to process than causally related events (Singer et al. 1992), and that causally related sentences which follow the order *Cause–Consequence* take less processing time than sentences presented in the reversed order *Consequence–Cause* (Noordman 2001).

Using both reading-time and eye-tracking data, Louwerse (2001) investigated the cognitive reality of several conceptual dimensions underlying coherence relations, and found

some suggestive evidence. For instance, the more complex relations, CAUSAL rather than ADDITIVE and NEGATIVE rather than POSITIVE, took longer to process and triggered more regressions: readers looked back more often. Longer reading times and regressions are generally considered as indicators of processing difficulty.

Research on first language acquisition suggests that the order in which children acquire connectives reflects increasing complexity, which can be accounted for in terms of the relational categories mentioned above: ADDITIVES (*and*) before CAUSALS (*because*), POSITIVES (*and, because*) before NEGATIVES (*but, although*) (Bloom 1991; Spooren 1997; Evers-Vermeul 2005; Spooren and Sanders 2003). In a corpus of naturalistic data, Kyratzis, Guo, and Ervin-Tripp (1990) found that speech-act causal relations are frequent even at a very early age, whereas epistemic causal relations are acquired very late (they hardly occur, even in the oldest age group studied by Kyratzis, Guo, and Ervin-Tripp, of 6;7–12;0 years). It remains to be seen how these issues of cognitive complexity of coherence relations relate to so-called usage-based or input-based accounts of language acquisition (Tomassello 2000; see also Evers-Vermeul, 2005).

In research on diachronic development, too, the classification categories of connectives show to be relevant. Sweetser (1990) originally introduced her three-domain distinction to cover the semantics of a number of related phenomena involving verbs of perception, modal elements, and connectives. She argues that, from their original content meanings, these linguistic elements have diachronically developed new meanings in the more subjective epistemic and **speech-act** domains. Examples of such developments in the realm of connectives have been presented by König and Traugott (1988), and Traugott (1995). Thus, *still* originally meant ‘now as formerly’ but has changed from an expression of simultaneity to one of denial of expectation. Similarly, *while* developed from a marker exclusively expressing simultaneity (‘at the time that’) to a marker used to express contrast and concession (see (19));

German *weil* had the same root meaning, but developed into a causal connective. Traugott (1995: 31) considers this a case of “subjectification: meanings become increasingly based in the speaker’s subjective belief state/attitude toward the proposition.”

(19) Mary read while Bill sang.

Mary liked oysters while Bill hated them.

(Traugott 1995: 31)

Traugott shows how subjectification plays a significant role in the grammaticalization processes. on the sentence level. However, subjectivity and subjectification are also valid at the discourse level as becomes apparent from the study of coherence relations and connectives. Some have claimed that distinctions between **content relations, epistemic relations and speech act** relations should be replaced by a subjectivity scale of *speaker involvement* (Pander Maat and Degand 2001). This scale is a continuum on which content relations such as CAUSE-CONSEQUENCE are maximally objective, whereas epistemic relations are very subjective. Volitional causal relations such as the REASON-relation in *John wanted to leave. He was tired* hold an intermediate position. Some corpus evidence may be found in the distribution of Dutch and French connectives, since the notion of subjectivity, i.e., the amount of speaker involvement—to what extent is the speaker responsible for the utterance?—seems to provide an explanation for differences in meaning and use of causal connectives like Dutch *daardoor* ‘as a result’, *daarom* ‘that is why’, and *dus* ‘so’ (Pander Maat and Sanders 2000, 2001). In the case of the nonvolitional *daardoor* (see (20)), for instance, the causality is located outside of the speaker as a subject-of-consciousness. There is a minimal amount of speaker involvement. In the epistemic use of *dus* in (22) and the volitional use of *daarom* in (21), a subject-of-consciousness *can* be identified, either the current speaker or the actor.

(20) *Er was een lawine geweest op Roger's pass. Daardoor was de weg geblokkeerd.*

'There had been an avalanche at Roger's pass. As a result, the road was blocked.'

(21) *Daan wilde op tijd thuis zijn. Daarom vertrok hij om 5 uur.*

'Daan wanted to be home in time. That is why he left at 5 o'clock.'

(22) *Het waren grote grijze vogels, die veel lawaai maakten. Dus het moeten wel kraanvogels geweest zijn.*

'They were large grey birds that made a lot of noise. So it must have been cranes.'

Proposals such as these illustrate the unmistakable tendency in recent text-linguistic work to use the notions of subjectification and perspective. This tendency goes back on Ducrot (1980), who already stressed the diaphonic nature of discourse. Even in monologic, texts traces can be found of other 'voices', information that is not presented as fact-like, but as coming from a particular point-of-view, either the current speaker's (subjectified information, in the terminology of Sanders and Spooren 1997) or another cognizer's (perspectivized information). Cognitive Linguistics has a large role to play in the development of this line of work, because of the key role it attributes to processes of subjectification in natural language, but also because it allows for a dynamic approach to connectives 'as processing instructors'. Fauconnier's Mental Space framework is very suitable to model this type of phenomena, as has been suggested by Dancygier and Sweetser (2000), Verhagen (2000, 2005), and Sanders and Spooren (2001b). As an example, consider Verhagen's (2005) use of the Mental Space framework to analyze differences between epistemic and content uses of *because* and *although*. In a content use of *because* such as (23), the only Mental Space involved is the

speaker's space, containing the facts that 'John passed his exams' and 'John worked hard', as well as the general rule 'Normally, working hard increases your chances of passing your exam'.

(23) John passed his exams because he worked hard.

(24) John must have worked hard, because he passed his exams.

In epistemic uses of *because* as in (24) the first segment functions as a claim, for which the second is an argument. This use of *because* requires the construction of a more complex Mental Space configuration. The speaker's space contains the general rule that 'Normally, working hard increases your chances of passing your exam'. It also contains the fact that John passed his exams, and it contains the (abductive) inference that John worked hard. In addition to this speaker's space, a Mental Space is created that contains a nonpositive epistemic stance, probably uttered by a conversational partner, regarding the issue of whether or not John has been working hard. Together, the configuration captures the interpretation that epistemic *because* reaffirms a possible inference from another cognizer, as may be clear from the paraphrase 'The inference is correct that John may have been working hard considering that he has passed his exams'.

[INSERT FIGURE 1 ABOUT HERE]

Verhagen proceeds by analyzing content and epistemic uses of *although*, which are based on the same pattern of Mental Space configurations. Especially the allusion to other cognizers' interpretation is a clear example of how the polyphonic, perspectivizing nature of epistemic *because* and *although* can be analyzed. Fauconnier's Mental Space framework seems

adequate in capturing perspective, which remains an elusive notion for linguistics and psycholinguistics alike (Sanders 1994).

#### 4. Cognitive Linguistics at the Discourse Level

What is the place of a chapter on discourse structure in a Handbook of Cognitive Linguistics?

We have presented an overview of current research in the field of discourse and text structure, focusing on issues of referential and relational coherence. It can be concluded that the study of discourse provides us with important insights in the relationship between language on the one hand, and the cognitive representation that language users have or make of discourse, on the other. Highly attractive, in this context, is the idea that linguistic expressions are instructions for the construction of such a representation. Even if the research that we have discussed is not cognitive linguistic ‘by nature’, it can be concluded that many of its results can and should be incorporated in Cognitive Linguistics. Reasons are the following:

- a. Cognitive Linguistics is a source of inspiration for the modeling of discourse structure. Major contributions such as those by Fauconnier (Mental Spaces), Langacker (Subjectivity), and Sweetser (Domains of Use) offer the terminology and theoretical framework to consider linguistic phenomena as structure-building devices.
- b. Cognitive Linguistics provides theoretical insights that can be—and partly have been—extended to the discourse level. An example is the classical cognitive linguistic work on categorization. Human beings categorize the world around them. As Lakoff (1987) and Lakoff and Johnson (1999) have shown, the linguistic categories apparent in people’s everyday language use provide us with many interesting insights in the working of the

mind. Over the last decade, the categorization of coherence relations and the linguistic devices expressing them have played a major role in text-linguistic and cognitive linguistic approaches to discourse. For instance, the way in which speakers categorize related events by expressing them with one connective (*because*) rather than another (*since*) can be treated as an act of categorization that reveals language users' ways of thinking.

- c. Cognitive Linguistics is the study of language in use; it seeks to develop so-called usage-based models (Barlow and Kemmer 2000) and in doing so increasingly relies on corpora of naturally occurring discourse that make it possible to adduce cognitively plausible theories to empirical testing.
- d. Cognitive Linguistics typically appreciates the methodological strategy of converging evidence. In principle, linguistic analyses are to be corroborated by evidence from areas other than linguistics, such as psychological (Gibbs 1996) and neurological processing studies.

## 5. Looking into the Future: Integration of Different Approaches

At the end of this chapter, we have reached the point where we can stop and ask about the avenues that lie ahead of us. We see several interesting developments that may set the research agenda for the coming years. We focus on issues that follow from our analysis of the state of the art in the preceding sections. A first and very basic issue is the question of discourse segmentation: What are the building blocks of discourse? To what extent do they correspond to traditional units of analysis such as the clause, sentence and—in the spoken mode—the turn? Are discourse units in spoken and written language comparable? To what

extent are grammatical and discourse structure isomorphic (see Verhagen 2001 for a discussion of similar topics)?

A second important issue is the linguistics–text linguistics interface. As noted in section 1, we see a growing exchange or sharing of ideas between grammarians, (formal) semanticists, and pragmaticists on the one hand, and text linguists on the other. Questions that can be asked are: What is the relationship between information structuring at the sentence level and at the discourse level? And, how do factors such as tense and aspect influence discourse connections (Lascarides and Asher 1993; Oversteegen 1997)? For instance, discourse segments denoting events that have taken place in the past (*The duke fell of his horse. He died*) will be typically connected by coherence relations linking their content, whereas segments whose events take place in the present or future typically contain many evaluations or other subjective elements (*I am sure I saw the duke fall of his horse just now. He may die*), and are prototypically connected by epistemic relations.

Another promising topic related to the sentence–discourse interface is that of intraclausal and interclausal relationships: are the types of causality found at the intraclausal level (*John made him pay the bill* vs. *John let him pay the bill*; Verhagen and Kemmer 1997) similar to the types of causality found at the discourse level (Stukker 2005)? For instance, can *The headache caused the soprano to cancel the concert* be (insightfully) compared to *Because she had a headache the soprano cancelled the concert*?

A final topic related to the linguistics–text linguistics interface is the relationship between discourse and grammar. In the more functionally oriented literature, there is a rich tradition of corpus studies of linguistic structures in a discourse context. A good example is the work on the discourse function of subordinated clauses (Tomlin 1985), more specifically *if/when*–clauses (Haiman 1978; Ramsay 1987) and purpose clauses (Thompson 1985; Matthiessen and Thompson 1987). Thus, the discourse function of purpose clauses appears to

depend on their placement in relation to the main clause. In medial or final position, their role is one of local elaboration, but in initial position, their role becomes one of foregrounding information. They signal how to interpret the following clause, and how to relate it to the preceding text. Hopefully, such studies will inspire more (cognitive) linguists to look at linguistic structures as vehicles built by language producers to enable interpreters to understand what they have in mind. Recently, Langacker (2001) has presented a framework for the further integration of discourse and Cognitive Grammar.

A third, obvious issue is the relationship between the principles of relational and referential coherence. Clearly, both types of principles provide language users with signals during discourse interpretation. Readers and listeners interpret these signals as instructions for how to construct coherence. Therefore, the principles will operate in parallel, and they will influence each other. The question is: how do they interact? This issue can be illustrated with the simple example in (25).

- (25) John congratulated Pete on his excellent play.
- a. He had scored a goal.
  - b. He scored a goal.

At least two factors are relevant in resolving the anaphoric expression *he* in (25a) and (25b): the aspectual value of the verb in the sentence and the coherence relations that can be inferred between the sentences. At sentence level, the verb in (25a) is in the perfect tense; at the discourse level, there is one straightforward interpretation of coherence relation is available, namely, the backward causal relation CONSEQUENCE-CAUSE. In (25b), the verb is in the imperfect tense, and, at the discourse level several coherence relations can exist, e.g. TEMPORAL SEQUENCE (of events), or ENUMERATION/LIST (of events in the game). The

resolution of the anaphor-antecedent relation is related to these two factors. In (25a); *he* must refer to Pete, while in (25b), several antecedents are possible: John, Pete, or even an actor mentioned earlier. Interestingly, the interrelationship of sentence and discourse levels turns up again: How does the sentence-internal property of aspect interact with the discourse property of coherence relations in the process of anaphor resolution? Is the anaphor resolved as a consequence of the interpretation of the coherence relation? Questions of this kind have already been addressed in the seminal work of Hobbs (1979) and have recently been taken up again in a challenging way by Kehler (2002).

A fourth specific issue is the refinement of the relationship between the central concepts of subjectivity, perspectivization, and the typology of coherence relations, which needs to be explored in much greater detail (Sanders and Spooren 2001b). The **starting point** for these studies consists of corpus-based accounts of connectives in terms of subjectivity and speaker involvement (Pander Maat and Degand 2001; Pander Maat and Sanders 2001), discussions of perspective and subjectivity (Sanders and Spooren 1997; Pit 2003), Mental Space analyses of perspective (Sanders and Redeker 1996) and connectives (Dancygier and Sweetser 2000; Verhagen 2005).

A fifth issue and area for further research is the interrelationship between spoken and written discourse. Results from **text-linguistic** and psycholinguistic studies presented here are largely based on the study of written discourse. To what extent can they be generalized to spoken discourse? And what will the specific insights from the linguistic analysis of spoken discourse add to the picture we have so far? These questions become especially important when claims concerning *cognitive reality* are at stake. After all, our most natural and spontaneous way to communicate is not simply in discourse, but in *spoken* discourse.

Finally, there is an important methodological issue on the road ahead. A traditional *forte* of Cognitive Linguistics is its determination to provide cognitively plausible analyses of

linguistic phenomena. A less well developed aspect of Cognitive Linguistics is the empirical study of language in use, aiming either to find regular patterns that feed the theories, or to actually test theories against language use. Plausible theoretical ideas regularly have to be revised after serious empirical testing. And even though there are more and more examples of studies combining linguistic theorizing with some kind of testing either in corpus examinations or in language processing experiments, these studies do not dominate the field.

Still, to balance the picture of the actual situation, we are happy to find that there is indeed a growing tendency towards quantitative, usage-based studies in Cognitive Linguistics in general. We will mention three fields where we see this tendency. First, there is the field of lexical studies where Geeraerts, Grondelaers, and Bakema (1994) have shown how lexical salience can be operationalized on a corpus of actual language use, and can then be employed to explain the actual choices of lexical construal that language users make. More recently, the same quantitative approach has been extended to more grammatical fields of research. Bybee (2001) epitomizes the use of the quantitative analysis of salience in the phonological (and to some extent morphological) domain; specifically, she uses type and token frequencies to explain diachronic phonological changes (see also chapter 36 of the present Handbook). Second, in the field of syntax, Grondelaers' work on Dutch *er* is an excellent illustration of how the work by Ariel can be extended and incorporated into quantitative studies of syntactic variation. Building on corpus data and experimental findings, Grondelaers (2000) extends Ariel's Accessibility Theory of definite reference to indefinite reference, to explain and predict the distribution of *er* 'there' in sentences like *Op de hoek van de straat is (er) een bakker* 'At the corner of the street (there) is a bakery'. Grondelaers' work is especially interesting in that it uses offline corpus data to generate hypotheses that are subsequently tested in a psycho-experimental design. Third, in the area of language acquisition, the work of Tomasello (2000) and his co-workers generates many new insights and further questions: Do

we want to explain the acquisition order of connectives only in terms of the input provided by the parents? How would such a usage-based account relate to theories of increasing cognitive complexity (see section 3, and Evers-Vermeul and Sanders 2001)?

In conclusion, it seems that, especially on the level of discourse, the integration of cognitively plausible theories with empirical testing is the ultimate aim, rather than a situation that has already been realized. Therefore, we consider the level of discourse a ‘new frontier’ for Cognitive Linguistics.

## Notes

1. Another, less preferred reading of this fragment is that the second sentence gives an elaboration of the first sentence. Such a reading does not disprove our central point here that the reader has to link the second sentence to the first sentence.

2. Because we only want to illustrate the transition principles of Centering Theory, we simplified things here. In fact, Centering Theory distinguishes between a forward and a backward looking center for each segment.

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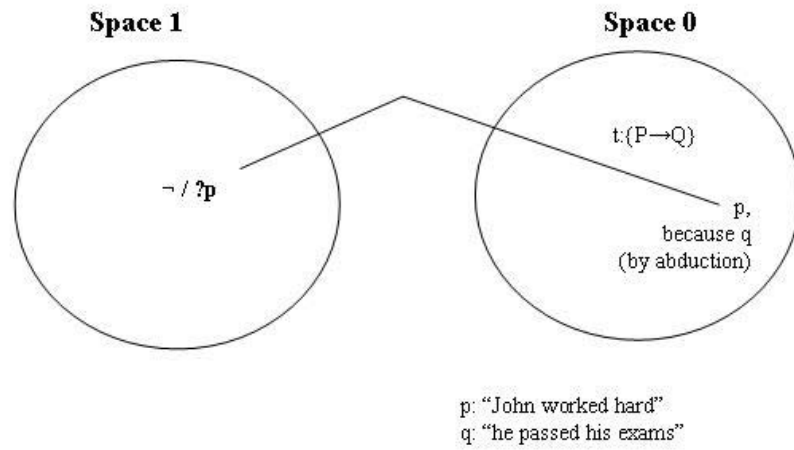


Figure 35.1: Verhagen's (2005) Mental Space analysis of epistemic *because*.



