Cognitive Linguistics Research
44

Mouton de Gruyter
Berlin · New York

Causal Categories in Discourse and Cognition

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Mouton de Gruyter
Berlin · New York

Mouton de Gruyter (formerly Mouton, The Hague)
is a Division of Walter de Gruyter GmbH & Co. KG, Berlin

⊗ Printed on acid-free paper
which falls within
the guidelines of the ANSI
to ensure permanence and durability.

Library of Congress Cataloging-in-Publication Data

Causal categories in discourse and cognition / edited by Ted Sanders, Eve Sweetser.
p. cm. – (Cognitive linguistics research ; 44)
Includes bibliographical references and index.
ISBN 978-3-11-022441-2 (hardcover : alk. paper) 1. Psycholinguistics. 2. Causation. 3. Causative (Linguistics) I. Sanders, Ted, 1963– II. Sweetser, Eve.
P37.C38 2009
401'.9–dc22

2009045533

Bibliographic information published by the Deutsche Nationalbibliothek

The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available in the Internet at http://dnb.d-nb.de.

ISBN 978-3-11-022441-2
ISSN 1861-4132

Typesetting: ptp, Berlin
Printed in Germany

Acknowledgements

This book volume results from an inspiring international workshop on *Causal connectives in Discourse and Cognition*, which we co-organized at the Department of Linguistics of the University of California at Berkeley in April 2007. Speakers included Barbara Dancygier, Gilles Fauconnier, José Sanders and the organizers, while Dan Slobin and Len Talmy, who were invited as respondents, joined us in a lively discussion, together with many colleagues from several countries and backgrounds.

Some chapters in this book volume are directly based on these papers and discussions. Others were invited later. We took care to come up with a coherent volume of contributions, all of which were reviewed anonymously by two referees and the editors. We believe this procedure has lead to a high quality book volume.

We would like to thank all authors, as well as speakers and respondents at the original workshop, for contributing to the ideas presented in this book volume, and for acting as reviewers. We are especially grateful to Bonnie Howe (UC Berkeley) for additional reviewing.

We gratefully acknowledge the financial support of the Netherlands Organization for Scientific research NWO, through NWO-Vici-grant 277-70-003, awarded to Ted Sanders, enabling his 6 month's stay at Berkeley during the Spring of 2007. Our joint work was further supported by the Utrecht institute of Linguistics OTS and the University of California – Universiteit Utrecht program for collaborative research, while the April workshop was supported by the Department of Linguistics at UC Berkeley and by the University of California's Intercampus Travel Fund.

We are grateful to Dirk Geeraerts for his initiative to publish the book volume in this Mouton de Gruyter series, and to him and Birgit Sievert (Mouton) for managing a speedy and thorough printing process. Finally, we would like to thank Fang Li (Utrecht) for her editorial assistance.

Ted Sanders, Eve Sweetser
Utrecht/Berkeley, October 2009

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Introduction: Causality in language and cognition – what causal connectives and causal verbs reveal about the way we think

Ted Sanders and Eve Sweetser

1. What language use tells us about causal categories

All languages of the world provide their speakers with connectives to express causal relations in discourse – indeed, although no physicist has found "causation" out in the world, all humans in all cultures seem to interpret and describe the world in terms of causal relations. As in other semantic domains, the cognitive scientist and the linguist are therefore interested in how much of this causal modeling is specific to a given culture and language, and how much is characteristic of general human cognition. Causal connectives and causative auxiliaries are among the salient markers of causal construals. Speakers of English, for example, can choose between *because* and *since* or between *therefore* and *so*. How different are these from the choices made by Dutch speakers, who speak a closely related language, but (unlike English speakers) have a dedicated marker for non-volitional causality (*daardoor*)? On another grammatical level, speakers may use causal auxiliary verbs, such as *make* and *let* to mark causal relations expressed within one clause – but how different are these from *laten* (related to "let" both etymologically and semantically) and *doen* 'do, make' in Dutch?

It is also well known that at a young age, children learn to have very different models of human/animate volitional causation (a person throwing an object) as opposed to inanimate object causation (a branch falling from a tree) (Boyer 1996; Sperber, Premack, and Premack 1996). This could lead us to expect that cross-culturally, there will be some important contrasts between causal categories, which are part of a universal repertory potentially named by any language. Such a view would be similar to many analyses of color terms – it is not the case that every language must name every human visual color distinction, but rather that color vision provides a universal perceptual basis for the range of possible linguistic categories.

Language users often systematically prefer one lexical item rather than another (even highly similar) one to express a certain type of causal relationship. Such choices could provide a window on speakers' cognitive categorizations of causality. Studies of the linguistic categories apparent in people's everyday lan-

guage use have already produced many interesting insights into the working of the mind in other domains (see, for instance, Lakoff 1987; Lakoff and Johnson 1999). The linguistic study of the meaning and use of causal connectives and auxiliaries may reveal insights into human categorization of causality.

Sweetser (1990) introduced the categories of CONTENT, EPISTEMIC and SPEECH ACT use of causal conjunctions like *because* and *since* are illustrated in (1)–(3).

(1) *John came back because he loved her.*
(i.e. the loving caused the return)

(2) *The neighbors are not at home because the lights are out.*
(i.e. the observation that the lights are out causes the conclusion that the neighbors are away)

(3) *Since you're so smart, when was George Washington born?*
(i.e. the question is presumed to be motivated or enabled by the addressee's claim to superior intelligence)

Similar distinctions have been dominant in many existing classifications of COHERENCE RELATIONS – meaning relations that exist between discourse segments, e.g. *Cause-Consequence* relations between events as opposed to the relationship between premises or arguments in a *Claim-Argument* or *Conclusion (Argument-Claim)* relation (Sanders, Spooren, and Noordman 1992, 1993). Like Sweetser, these studies are sensitive to a contrast 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. Epistemic relations relate speaker's reasoning and conclusions (see [2]), and (3) illustrates speech act use.

Over the last 20 years or so, the field of discourse studies has witnessed important progress in the linguistic study of connectives (see the contributions to Couper-Kuhlen and Kortmann 2000; Risselada and Spooren 1998; Spooren and Risselada 1997; Knott, Sanders, and Oberlander 2001; Sanders, Schilperoord, and Spooren 2001). By focusing on the way in which one, crucial, conceptual relation – that of Causality – is instantiated linguistically, this book volume seeks to bring this discussion one step further.

2. Cross-linguistic comparison of causal categories

To what extent does causal connective use show causal categorization? The study of the meaning and use of connectives like these, in several languages, is a central topic in this book volume. Over the last 15 years, a number of publications have dealt with the question whether connectives specialize in expressing certain types relations. In English, backward causal relations (first *Consequence*, then *Cause*) can be expressed by *because*, which may be used to express all interpretations, while *since* seems to specialize in epistemic and speech act use. Similar observations have been made for German, French and Dutch connectives, (see Pit 2003; Sanders 2005; see also contributions to special issues like Risselada and Spooren 1998; Spooren and Risselada 1997; Knott, Oberlander, and Sanders 2001), with the difference that these languages have a more differentiated repertoire of connectives than English seems to have. The same kind of differences have been observed for forward causal connectives such as English *that's why* and *so*, Dutch *daarom* and *daardoor* and French *de ce fait* and *c'est pourquoi* on the one hand and *alors* and *donc* on the other (Pander Maat and Degand 2001; Degand and Pander Maat, 2003; Jayez and Rossari 2001; Sanders 2005). The general picture emerging from these studies is that connectives do specialize, although their semantic interrelations are more subtle than a simple one-to-one assignment from connectives to classes of coherence relations would suggest (Knott and Dale 1994; Knott and Sanders 1998; Pander Maat and Sanders 2006).

Closer comparison of such related languages as English, Dutch, French and German can show clear differences in the way these languages "cut up" the domain of causality by choosing different markers for different relations. The contrast between these languages enables us to examine the constraints on conceptualization and labelling of causal relations.

Therefore, the first leading question in this book volume is: What parameters of categorization shape the use of causal connectives and auxiliary verbs across languages? This question is taken up in all contributions. English and Dutch are studied in each chapter, in more or less detail, whereas Polish connectives are studied by Barbara Dancygier in chapter 3, in comparison with the other two languages.

3. Characterizing the categories: subjectivity, perspective and mental spaces

In recent years, we have also seen proposals to replace distinctions like content, epistemic and speech act domains 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's why', and *dus* 'so' (Pander Maat and Sanders 2000, 2001). In the case of the non-volitional *daardoor* (see [4]), 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 (6) and the volitional use of *daarom* in (5), a subject-of-consciousness *can* be identified, either the current speaker or the actor.

(4) *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.'

(5) *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.'

(6) *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 (in the French tradition the seminal work by Anscombre and Ducrot 1983, and the Groupe Lambda-l should also be mentioned). 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 J. 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, 2005), Verhagen (2000, 2005), and Sanders and Spooren (2007).

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. Dancygier and Sweetser (2005) have shown in detail how conditional constructions can be analyzed in an MST framework (see also Fauconnier 1994: chapters 3 – 4; and Sweetser 1996).

Does such an approach work for causals? In chapters 2, 3 and 4 of this book volume, Mental Spaces Theory (from now on MST) figures prominently. It is used to further clarify the causal categories expressed in connective use across languages. In chapter 2, Sanders, Sanders and Sweetser discuss three Dutch causal connectives expressing forward causality *daardoor*, *daarom* and *dus*. As we have just shown, this part of the lexicon of Dutch language users clearly illustrates the categorical distinctions. The meaning and use of *dus, daarom* and *daardoor* were investigated in several studies over the last 15 years (see especially Degand 2001; Pander Maat and Sanders 2000, 2001; Pander Maat and Degand 2001; Stukker 2005). In most studies, text fragments were selected to form a newspaper corpus, consisting of different text types: argumentative / persuasive as well as descriptive / informative texts. The methodology usually involved three steps. First, the possible relational interpretations of fragments was determined *without* connectives, by examining possible and impossible paraphrases using explicit connectives (*John wanted to leave. He was tired.* might be paraphrased as *John wanted to leave because he was tired*). Then, it was investigated how often a given connective expressed a certain relation in corpus data. In the final step, it was checked whether the original connective could be substituted by another. This substitution method is a way of testing semantic intuitions (Knott and Dale 1994; Knott and Sanders 1998). The questions are:

Does substitution lead to a sequence that is still acceptable? And, if acceptable, does the relational interpretation change as a result of this substitution?

The findings, formulated in terms of the relations the three connectives can and actually do express, can be summarized as follows:

- *Daardoor* can only express relations of the *content non-volitional* type;
- *Dus* can express *content volitional*, *epistemic*, but not *content non-volitional* relations. It most often expresses epistemic relations;
- *Daarom* can express *content* and *epistemic* relations. It most often expresses *content volitional* relations.

Note that speech act and meta-linguistic relations are absent from this overview, because they did not appear in the corpora of written text.

In addition to corpus studies, Pander Maat and Sanders (2001) presented experimental data. They found that Dutch speakers show clear patterns of preferences when asked to choose the best-fitting forward causal connective in natural discourse fragments. *Dus* is considered more appropriate when the distance between the speaker and actor / concluder is small, or when they are even identical, as in the first-person (I) example (7). *Daarom* fits better when the distance between speaker and the textual protagonist increases, as in the third-person example (8). In the case of implicit Speaker/Concluders, the distance between SOC and Speaker is smallest and the preference for *dus* at a maximum.

Pander Maat and Sanders also concluded that a Subjectivity account rather than a Domain of use account explains the choice for *dus* versus *daarom*. *Dus* is not more appropriate in epistemic relations in general; it only fits better in the case of first-person SOC's. In other words: SOC-Speaker distance seems to overrule domain differences. Moreover, the fact that *dus* is more appropriate in epistemic relations with implicit first-person concluders (9) than in those with explicit first-person concluders (10) can not be explained in term of domain differences.

(7) *The weather-forecaster predicted that there will be 10 degrees of frost.*
I will dus *not come for a walk.*

(8) *Willem heard that there will be 10 degrees of frost.*
Willem will daarom *not come for a walk.*

(9) *Yesterday evening I did not see the lights burning in our neighbors' house.*
Dus *I think that they haven't returned yet from their holiday.*

(10) *Yesterday evening Alex did not see the lights burning in our neighbors' house.*
Daarom *he thinks that they haven't returned yet from their holiday.*

All in all, data suggest the following organization of the Dutch causal connective lexicon.

Table 1. How Dutch speakers cut up forward causality; a summary from corpus and experimental studies.

no SoC	non-volitional content		DAARDOOR
SoC	volitional content	large SoC-S distance (*3rd person*)	DAAROM (dus)
SoC	Epistemic	small / no SoC-S distance (*I*)	DUS (daarom)

The challenging categorization picture of Table 1 is further investigated in this book. Overall, a major question is the extent to which a "cline" of subjectivity is equivalent to a spectrum of different possible mental space configurations – perhaps more equivalent than is immediately obvious, since more than one space configuration may be accessible simultaneously. For example, in (8), *I will not come for a walk* can be taken as both a description of a future event, and as an epistemic conclusion or decision – so (8) may not be uniquely classifiable as either only a content causal or only an epistemic causal.

In chapter 2, Sanders, Sanders and Sweetser draw on Mental Spaces Theory to offer new insights into central problems of Subjectivity and Perspective, including an explanation of the dotted line between *daarom* and *dus* in the right column. More specifically, they introduce the concept of a Basic Communicative Spaces Network (from now on BCSN). The BCSN is the network of space structures which are automatically accessible to participants in any communicative event. As Sweetser (1990) proposed, there is no need to do extra cognitive work in order for communicative participants to be aware of the fact that some Content is being mentioned, by a speaker in a particular Speech Act context, and resulting from some Epistemic states of the speaker. The BCSN therefore starts with the deictic anchoring of the speech event (I-here-now – Bühler [1934] 1990), relates this to the content and epistemic spaces, and accounts for the relationship between Subjectivity and Domains of use in terms of blending of Mental Spaces. We seem to need at least this much analytic structure, to explain the contrasts between English or Dutch causal connectives.

4. Cross-linguistic categories?

Looking for causal categories in less-related languages than English and Dutch, Barbara Dancygier discusses the Polish causal connectives *bo* and *to* in chapter 3.

To would be used in cases like (11), whereas many cases of *bo* suggest speech act causality as in (12).

(11) *Because he tried hard, (to) he passed the exam.*

(12) *What are you doing tonight, because (bo) there's a good movie on?*

Again, Mental Spaces Theory appears useful in modelling differences and similarities in meaning and use of connectives. Dancygier shows how the two connectives invoke constructions that both signal causal links in the discourse, but in a different order: *To* marks the construed result, while *bo* marks the construed cause.

She relates her findings to the BCSN in chapter 2 and includes Verhagen's (2005) *Intersubjectivity* in the discussion. She concludes that argumentative causal links play a significant role in the use of *bo* and *to*, unlike some other Polish causal connectives which are more content-based. In terms of Verhagen (2005), *bo* and *to* are both used in the intersubjective domain, with a very broad range of uses. They do not show too many restrictions on their use, although *to* cannot mark inferential (epistemic) conclusions when no conjunction explicitly marks its cause / antecedens-segment (p).

5. Categories in diachronic development?

As Traugott pointed out (1989 and elsewhere), causal markers in English have changed over time, from double marking (*Because P, therefore Q*) as the Old English norm, to single backwards or forwards marking as the Modern English norm. In chapter 4 of this volume, José Sanders uses MST prominently in her approach to the diachronic development of Dutch causal connectives in successive Dutch translations of biblical narratives. She shows how the changing preferences of Dutch translators lead them not just to different grammatical and semantic choices but thereby to different rhetorical strategies with respect to causal structure.

The categories of causal connectives have repeatedly been shown to be relevant in research on diachronic development. 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

argued 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), Traugott (1995) and Traugott and Dasher (2005). 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 [13]); 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".

(13) *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. Are subjectivity and subjectification also valid at the discourse level? Sanders' analysis of Bible translations suggests that this is so – that rhetorical conventions can be more or less subjective.

6. Cross-level categories? Causal connectives and causative verbs

In chapter 5, Stukker, Sanders and Verhagen return to the discussion of Subjectivity in the three Dutch causal connectives discussed earlier. They start from the "categorization hypothesis": the idea that each one of the connectives is related to a specific conceptual model of causality. They build on earlier corpus studies, which revealed that, indeed, the majority of connectives' natural usage contexts reflect these conceptual categories of causality more or less directly, as was shown in table 1. However, in a minority of cases, the relation of a connective to its presumed typical category of causality seems less straightforward. Should these findings be interpreted as evidence against the categorization hypothesis?

Stukker *et al.* re-interpret the findings from previous connective studies within a usage-based framework. The "usage-based" approach to language assumes that variation is an inherent characteristic of language use, and seeks to explain occurring patterns of variation with reference to more general cog-

nitive mechanisms (cf. Langacker 1987; Bybee 1985, 2006, 2007; contributions to Barlow and Kemmer 2000). In line with this framework, they propose that an interplay of conceptual and usage factors can explain why the usage of Dutch causal connectives does not always conform to abstract definitions that seem to be quite straightforward otherwise. The hypothesis is that the apparent counter-examples are actually non-typical, peripheral members of the very same conceptual category the connectives refer to in their more typical usage contexts: "prototypical usages". The chapter focuses on one specific factor *causing* variation in connective use: the idea that language users categorize causal relations not on the basis of "objective reality", but on the basis of their subjective construal of the situation (Langacker 1990 and elsewhere) and on one specific factor *constraining* variation: the prototypicality structure of semantic categories discussed above.

Stukker *et al.* also mention the issue of the similarities between causal categories in connectives and in auxiliary verbs like Dutch *doen* 'make' and *laten* 'let', see Stukker, Sanders and Verhagen (2008), for a more elaborate discussion. Prototypical uses of *doen* and *laten* are illustrated in (14) and (15), taken from Stukker (2005:1).

(14) *De extreme koude deed de rivieren bevriezen.*
'The extreme cold caused the rivers to freeze.'

(15) *Hij liet de soep afkoelen.*
'He let the soup cool.'

Supposed similarities in cross-level categories are explicitly challenged by Speelman and Geeraerts in Chapter 6. On the basis of Verhagen and Kemmer (1997) and Stukker (2005), they formulate the (in)direct causation hypothesis: the choice for either *doen* or *laten* is influenced by the degree of involvement of the causee. Speelman and Geeraerts derive a series of concrete predictions from this hypothesis and argue that it is crucial for the further development of the "scientific method" in linguistics, that such hypotheses are tested against a sample of "observable behavior". In their chapter they test the predictions against a corpus of spontaneous spoken Dutch, making using of the innovative statistical method producing collocation patterns. In a stepwise logistic regression analysis, they incorporate factors that were predicted to affect the choice of *doen* versus *laten*. The choice of these factors was based on the indirect causation hypothesis. Interestingly, Speelman and Geeraerts conclude that their data falsify several predictions based on the (in)direct causation hypothesis. In stead, it seems like *doen* is a marked form in comparison with laten: it appears to have a more restricted and more specific range of application than *laten* does. The

authors argue that it will be necessary to pursue a new hypothesis for determining the choice between *doen* and *laten*, which in turn requires further empirical testing.

7. Research methods: Converging evidence in causal categories?

In chapter 7, Sanders and Spooren join Speelman and Geeraerts in their argumentation in favor of a stronger empirical bias for studies of language use. Sanders and Spooren acknowledge that several chapters in this book volume focus on the system behind meaning and use of these causal connectives in various languages, and by doing so, provide interesting insights in the organization of the lexicon of causal connectives. However, Sanders and Spooren see these studies as providing *one* window on conceptual categorization, but not the only one. Other windows are provided by the study of implicit and explicit causal relations in discourse, in such diverse areas as relation categorization, discourse processing and language acquisition. The authors summarize results from all these fields and conclude that Causality and Subjectivity are two cognitive principles that organize human knowledge of both cognitive construal of coherence relations and linguistic use of connectives. Notions like Causality and Subjectivity indeed help explain the system and use of causal relations and their linguistic expressions in everyday language use, in language acquisition and in discourse processing.

As has probably become clear by now, this book volume provides specific attention to the adequate research methods that may be used to investigate research questions, an important discussion that is also taken up in contributions by, among others, Geeraerts, Gibbs, Sweetser and Talmy to a recent book volume *Methods in Cognitive Linguistics* (Gonzalez-Marquez et al. 2007). Some chapters in the current volume stick to classical linguistic "introspection", while others report extensive corpus analyses and even psychologically oriented experimental studies. The basic notion of causality appears to be an ideal linguistic phenomenon to provide an overview of methods and, perhaps more importantly, invoke a discussion on the most adequate methodological approaches to study fundamental issues in language and cognition. Speelman and Geeraerts even present their chapter as a case study to illustrate how the scientific method can be used in linguistics. Needless to say that empirical testing of hypotheses is paramount in this approach.

All kinds of data have their strengths and weaknesses. Constructed examples, for instance, only tell us what judgments are consciously available to speakers;

corpus data may tell a very different story about speakers' behavior. However, an analyst's intuitions play an indispensible role in the formulation of hypotheses for testing – and only constructed examples may make us aware of what *cannot* be done with connectives (Pander Maat and Sanders 2006). The in-depth analysis of naturally occurring discourse may provide insights into the intricate interaction between semantic features and interactional conditions, but do not enable us to systematically tease out the contributions of these two factors. Corpus research may compare larger numbers of connective uses on both linguistic and contextual factors, but every corpus analyst in the field may testify to the fact that the interpretation of discourse relations may differ between several analysts. Finally, experimental research into connective effects is a superior way of supporting causal models, but the often very short texts used in these experiments have sometimes rightly been criticized for their lack of external validity (Graesser, Millis, and Zwaan 1997).

From a methodological point of view, it can be concluded that the integration of cognitively plausible theories with empirical testing is the ultimate aim rather than a situation that has already been realized (Sanders and Spooren 2007). One way to realize this goal is to proceed with the thorough investigation of corpora of actual language use. Digital corpora enable researchers to do this on a larger scale than ever, and recent studies show how fruitful statistic and (partly) automatic analyses of corpora can be for the area of causal verbs and connectives, too. Speelman and Geeraerts' chapter is an outstanding example for causative verbs and for connectives Bestgen, Degand, and Spooren (2006) have shown the way.

Furthermore, it is especially important to extend corpus research in the direction of spoken discourse. This challenge is clearly taken up in this book volume in the chapter by Speelman and Geeraerts and by Sanders and Spooren, but on the whole, the field of corpus-linguistic studies is still largely based on the study of written discourse. There are at least two important questions to consider: to what extent can results be generalized to spoken discourse? And what do the specific insights from the linguistic analysis of spoken discourse add to the picture we have so far? At present, we have only limited results on non-written connective use (Couper-Kuhlen 1996; Ford 1993; Gohl 2000). Analysis of multi-modal discourse data would presumably also allow workers to examine the role of visual cues (gaze, gesture, stance) in guiding the interpretation of causal relations; there is good evidence that gesture itself is interpretable at the different levels of content, epistemic and speech-act structure (Sweetser 1998, 2007).

Integration of text-linguistic and psycholinguistic insights is a second way to realize the goal of interaction between theory and empirical testing. The

sometimes subtle semantic-pragmatic distinctions proposed by linguists on the one hand, and the processing effects revealed by psycholinguistic research on the other hand, still need to be linked. For instance, the general processing effects of *because* and *and* have been investigated (e.g. Millis, Golding, and Barker 1995), but there is very little experimental research into the processing instructions encoded by connectives that differ in specificity (e.g. *but* versus *although*, or *dus* versus *daardoor*, see De Leeuw, Mak, and Sanders 2008). Similarly, there are a few processing studies based on linguistically sophisticated analysis of the causal categories discussed earlier in this chapter – such as the differences between content and epistemic causals. Studying on-line text processing, Traxler, Bybee and Pickering (1997) focused on the difference between content and epistemic causal relations and conclude that content relations are processed quicker than epistemic ones. Noordman and De Blijzer (2000) arrive at similar conclusions. Still, many questions remain unanswered. We believe a closer integration of theoretical and corpus-linguistic work with this type of processing studies would lead to significant further progress in the research field as a whole.

In conclusion, we believe that crucial contributions of this volume are (1) demonstrating convergence of linguistic, corpus-linguistic and psycholinguistic methodologies in determining cognitive categories of causality, (2) showing how differences between even quite closely related languages (English, Dutch, Polish) can help us to elaborate the typology of levels and categories of causation represented in language, and (3) using mental spaces theory to represent a general theory of linguistic construal of causation.

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Causality, cognition and communication: A mental space analysis of subjectivity in causal connectives

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1. Causal connectives, domains, subjectivity and Mental Spaces Theory

1.1. Causal connectives: similarities and differences

For speakers of English, it is possible to express all three of the coherence relations manifested in examples (1)–(3) with the connective *so*.

Consider these three examples.

(1) *There is coffee and tea.* ***So****, what do you want to drink?*

(2) *The neighbors' lights are out.* ***So*** *they are not at home.*

(3) *The sun was shining.* ***So*** *the temperature rose.*

This observation suggests that these relations have something in common – indeed, we agree with many other analysts that they share a conceptual relation of *causality*. English speakers also have other discourse connectives at their disposal, which seem more specifically suited to express these specific relations, and no other (Halliday and Hasan 1976; Knott and Dale 1994; Knott and Sanders 1998; Sweetser 1990). Similarly, Dutch divides up the domain of causal connection more precisely, with no overall marker such as *so* which can cover all of (1)–(3). The prototypical connectives used to express the very same relations are shown in (1')–(3') for both English and Dutch.

(1') *Er is koffie en thee. Dus wat wil je drinken?*
'There is coffee and tea. **So**, what do you want to drink?'

(2') *Het licht bij de buren is uit. Dus ze zijn niet thuis.*
'The neighbors' lights are out. **Therefore**, they are not at home.'

(3') *De zon scheen. Daardoor steeg de temperatuur.*
'The sun was shining. **As a result**, the temperature rose.'

In particular, *daardoor* could not possibly express the connections in (1') and (2'); and if *dus* were used in example (3'), it would sound as if the speaker

was focusing not on the causal relation between sunshine and temperature, but on causal relations at a higher epistemic or argumentative level. This observation suggests that the examples may have causality in common, but also show differences. These differences have often been characterized in terms of different domains (Sweetser 1990), semantic or pragmatic types (Sanders, Spooren and Noordman 1992; Sanders 1997) or levels of causality (for an overview see Knott, Sanders and Oberlander 2001; Sanders and Spooren 2001). In this chapter we describe both the similarities and the differences between these types of causality, starting from the causal connectives used to express them, mainly in Dutch.

1.2. Domains of use

Sweetser (1990) has argued that a conjunction like *because* is used in the content-domain when one event causes another in the described world (4), while epistemic use (5) concerns the speaker's reasoning and (6) illustrates the speech act use.

(4) *John came back* ***because*** *he loved her.*

(5) *John loved her,* ***because*** *he came back.*

(6) *What are you doing tonight,* ***because*** *there's a good movie on.*

Although *because* can be used across the three domains, Sweetser (1990) also suggested that some connectives specialize in one domain: English *since* and French *puisque* would be specifically used in the epistemic and speech act domains. Similarly, German *denn* can only be used to express epistemic relations (Günthner 1993; Keller 1995). Dancygier (1998) and Dancygier and Sweetser (2005) also discuss a *metalinguistic* domain – an example of a metalinguistic causal connection might be *OK, since we're being politically correct, her* ***partner*** *is coming to dinner with her* (where the speaker has been reproved for using the term *boyfriend*). We will not be discussing these cases in detail here, since we do not yet have enough Dutch examples to develop a solid approach.

The multi-domain analysis was tested empirically for Dutch. In a number of corpus studies, Dutch connectives expressing forward causality – that is, in the order "S1, CONNECTIVE S2" – were investigated, where S stands for discourse segment, which is minimally a clause. The prototypical use of these forward connectives is illustrated in (3) *daardoor* 'as a result', (2) *dus* 'so' and (7) *daarom* 'that's why'.

(3) *De zon scheen.* ***Daardoor*** *steeg de temperatuur.*
'The sun was shining. **As a result** the temperature rose.'

(2) *Het licht bij de buren is uit.* ***Dus*** *ze zijn niet thuis.*
'The neighbors' lights are out. **So** they are not at home.'

(7) *Het was een warme dag.* ***Daarom*** *ging Jan zwemmen.*
'It was a hot day. **That's why** Jan went swimming.'

Daardoor 'as a result' in (3) expresses a simple *cause-consequence* relation in the content domain, (2) can only be interpreted as an epistemic conclusion that is expressed by *dus* 'so/therefore' and *daarom* 'that's why' in (7) expresses the reason for an intentional action in S2. Several studies have shown that these connective-characteristics are robust, and vary from strong preferences to clear restrictions on the relations they can express (Pander Maat and Sanders 2000, 2001; Stukker 2005). *Daardoor* can only express non-volitional content relations, but these relations cannot be expressed by *daarom* and *dus*. *Dus* and *daarom* show rather gradual preferences. *Dus* most often expresses epistemic relations and can be used to express *content volitional* relations. *Daarom* most often expresses volitional relations, but can express *epistemic* relations. Taken together, these observations show how the Dutch language "cuts up" forward causality.

Roughly the same mechanism accounts for backward causals, where *doordat* can only express *non-volitional content* relations, *epistemic* relations are often expressed by *want* 'since / because' and *omdat* 'because' has a slight preference for *volitional content* relations (Degand 2001; Degand and Pander Maat 2003; Pit 2003).

The clearest case of this "cutting up" concerns *daardoor* and the corresponding backwards connector *doordat*. There are clear restrictions on their use. They can only express non-volitional content relations. Interestingly enough, *daarom* and *dus* can both express volitional and epistemic relations. In fact, these relations are regularly lexicalized by the same connectives: *daarom* and *dus*. The conceptual meaning these two connectives share is that they both crucially involve an animate subject, a person, whose intentionality is conceptualized as the ultimate source of the causal event, be it an act of reasoning or some "real-world" activity (Pander Maat and Sanders 2000, 2001). In terms of conceptual categories, this is a very fundamental distinction: the one between events ultimately originating from some intentional *mind*, versus events that originate from non-intentional causes; between causes that are crucially located in a *Subject of Consciousness* (from now on SoC), and those that are located in the inanimate, outside world (cf. Verhagen 1995, 2005; Stein and Wright 1995).

1.3. Subjectivity and Mental Spaces

The notion of *Subjectivity* (developed from Langacker 1990) helps us to express these contrasts more precisely: The degree of subjectivity is the distance between the current speaker and the *SoC* involved in the construction of the causal relation; the smaller this distance, the more subjective the relation. Under this approach, *daardoor* (see [3]) and *doordat* express objectivity: the speaker is not involved in the construction of the causal relations between the events. In fact, it seems like there is no SoC at all. The speaker merely reports events in the world that are causally related. In epistemic *dus/want*-relations (see [2]), the *SOC* is heavily involved and is often identical to the speaker: the speaker construes the relation, even though she is usually not mentioned explicitly in the discourse. That is, epistemic relations come in the form of (2): *The neighbors' lights are out. So they are not at home* rather than in the form *The neighbors' lights are out. So I am sure they are not at home.* Finally, in volitional causal relations (see [7]), there is an explicitly verbalized *SOC* who acts and is responsible for the causal relation, but the speaker is not involved in the construal. This characterization in terms of Subjectivity is corroborated by corpus analyses and experimental studies on language users' preferences (Pander Maat and Sanders 2000, 2001; Pander Maat and Degand 2001; Pit 2003; Stukker 2005; Stukker, Sanders and Verhagen 2008).

Hence, in terms of Langacker's (1990) notion of Subjectivity, we could argue that, when there is no SoC present, in the case of a non-volitional causal relation, the *ground* (speech event, its participants, and its immediate circumstances) may be entirely external to the semantics of the utterance. The ground can also be included in the scope of predication as an off-stage, unprofiled reference point: *yesterday, tomorrow* etc. In volitional and epistemic cases, there is a SoC present and this will be more or less clear by (implicit) evaluation by the speaker: *probably, is likely to, must be*: SoC present. Finally, the ground may be on stage: *So I think they are not at home*. In the latter case, the ground is in a sense objectified: that is, made part of the situation referred to in the utterance. The latter cases are of another category; then the speaker is made explicit and foregrounded so that it is comparable to looking at another actor.

In this chapter, we use *Mental Spaces Theory* (Fauconnier 1985, 1994; Sweetser and Fauconnier 1996) to model the similarities and differences in the meaning and use of the Dutch causal connectives. Why *Mental Spaces Theory* (from now on MST)? A first reason is that we strive for a cognitively plausible account. Both in linguistic and psycholinguistic approaches to discourse, connectives are considered as linguistic signals of coherence, or as operating instructions for interpretation: They instruct the interlocutor to relate the content of

the connected segments in a specific type of relationship (Sanders and Spooren 2001, 2007). This view on connectives is cognitively plausible and in fact fits in with what is known about the role of causal coherence markers during discourse processing (Millis and Just 1994; Noordman and Vonk 1997; Cozijn 2000; Kamalski 2007; Mulder 2008). MST seems to be particularly compatible to this conceptualization of connectives. In MST, connectives are often treated either as elements that block certain inferences (such as *but*) or as space-builders, i.e. linguistic expressions that typically establish new mental spaces, such as *if-then* conditionals. As a theoretical framework, MST seems compatible to findings in research on discourse processing.

A second reason for using MST is that this model has proven to be descriptively adequate for linguistic items that are related to causal connectives. In recent years, cognitive linguists have shown how MST can be used fruitfully to clarify the meaning and use of conditionals (Sweetser 1996; Dancygier 1998; Dancygier and Sweetser 1997, 2000, 2005) and other connectives (Verhagen 2005). Interestingly enough, these approaches seem compatible with Sweetser's original multi-domain theory. Different *if*-conditionals, for instance, have been shown to correspond to content, speech act and epistemic domains and the MST framework is used to describe these differences. Therefore, we will set out to develop a similar integrative approach for causal connectives: are Subjectivity accounts compatible to domain theory?

What is the difference between referring to mental spaces, as opposed to domains (as Sweetser 1990 did)? First, a mental spaces analysis allows for an integrated approach: both explicitly built mental spaces (*She said...*, *He thought...*) and implicit domains such as the speaker's reasoning processes can be treated as mental spaces. The difference, as we shall argue below, lies in how the spaces relate to the communicative situation, and whether they are explicitly mentioned.

Finally, there are some unresolved issues in current Subjectivity accounts, which may be clarified in an MST-approach. A crucial one is related to perspective. For instance, while describing the difference between the causality in (2) and (7) – repeated here for sake of clarity – , it is tempting to say that the speaker is responsible for the causality in (2), whereas *Jan* is responsible for the causality in (7). But what happens when these examples are changed slightly, as in (2a) – where the verb tense is changed from present to past – and (7a) – where changed the perspective from Third Person *Jan* to First Person *I*?

(2) *Het licht bij de buren is uit.* ***Dus*** *ze zijn niet thuis.*
'The neighbors' lights are out. **So** they are not at home.'

(7) *Het was een warme dag.* ***Daarom*** *ging Jan zwemmen.*
'It was a hot day. **That's why** Jan went swimming.'

(2a) *Het licht bij de buren was uit. Dus ze waren niet thuis.*
'The neighbors' lights were out. So they were not at home.'

(7a) *Het was een warme dag. Daarom ging ik zwemmen.*
'It was a hot day. That's why I went swimming.'

About (2a), we can now ask again: Who is responsible for the causality? Who is the SoC construing the causal relation here? Is it still the speaker (as in [2])? And has (7a) suddenly become an epistemic relation, simply as a result of a change in perspective from third to first person (compare [7a] with the epistemic example [2])? This type of questions are hardly addressed in the literature, where usually clear-cut cases like (1) – (3) are discussed.

In order to answer these questions, integration is needed between multi-domains theory and models of subjectivity and discourse perspective. MST has already been fruitfully used to describe issues of perspective in narrative discourse, such as the free indirect speech that we are witnessing in (2a), see J. Sanders and Redeker (1996). In the following, we investigate the relationship between domains of use, subjectivity and perspective, making use of Mental Space Theory (MST). We will argue that it is useful to think of subjectivity within this framework in terms of distance from the speaker's internal mental spaces (or the speaker as SoC), in the mental space network. We will develop a Basic Communicative Space Network to account for the representation of causal coherence between clauses. We will show how these insights from MST indeed allow us to develop an integrative theory of causal connectives, which illuminates the relationships between connective domains, subjectivity and perspective.

Hence, this chapter investigates to what extent MST can help uncovering the system behind the meaning and use of causal connectives. The meaning and use of these connectives is studied from the point of view of linguistic categorization. We focus on Dutch speakers who categorize causally related events in the order cause-consequence, by expressing them with the connectives like *daardoor*, *daarom* and *dus*. We propose an analysis of these connectives, clarifying their similarities and differences. In reverse, this analysis is likely to have implications for theories of connective categorization.

2. Towards a Basic Communicative Spaces Network

2.1. Developing an integrative account: Principles of the *Basic Communicative Spaces Network*

Mental Spaces Theory offers us a theoretical and descriptive apparatus which readily permits an analyst of causal markers to do justice to the complex data. One important initial distinction is that between *setting up* a mental space, *evoking* an accessible mental space, and *elaborating* an active mental space. There is a recognized tendency for conditional protases (*if*-clauses) to precede their main clauses, while the reverse order is more common (though not required) for clauses marking cause. (These "unmarked" orders are exemplified by the contrast between *If it rains, they'll cancel the game* and *They cancelled the game because it rained.*) Ford (1993) documents this, and notes that the two clause orders make sense because functionally, a causal clause is an added "explanation" of the main clause, while a conditional clause actually changes the assertion status of the main clause. As Dancygier and Sweetser (2000, 2005) have pointed out, Mental Spaces Theory allows us to capture this difference simply: most causal clauses are *elaborating* the previously established mental spaces wherein the main clause content holds, while conditional clauses are *setting up* mental spaces as contexts for the content of the main clause.

One possible concern which a reader of Mental Spaces Theory could raise would be how to limit the proliferation of posited mental spaces: the real issue here is how to motivate the spaces brought up in an analysis. And one important sub-issue is how certain spaces seem to be implicitly present, ready for reference without overt marking. Sweetser and colleagues have made strong claims about the inherent accessibility of certain mental spaces, even when not overtly set up or evoked (Sweetser 1990, 1996; Dancygier 1998; Dancygier and Sweetser 2000, 2005): in particular, any communicative use of language necessarily involves the presumption that the speaker has mental states, and that she is expressing some content of her mental states, in some speech act setting, using some set of linguistic forms. This being the case, any communicative speech act rests on the presumed presence of Content, Epistemic, Speech Act, and Metalinguistic spaces. This configuration is a conceptual network of Mental Spaces that represent the basic communicative situation in which a causal connective is uttered. For short, we call this grouping of spaces a *Basic Communicative Spaces Network*, and we assume that, unlike most other mental spaces, these are evoked "for free" – along with a presumed Base Space of the Speaker's reality. And since the Basic Communicative Spaces Network comes "for free", these spaces (but not generally others) are automatically accessible as potential

"domains of interpretation" for conditionals, modals, and other linguistic forms – though language-specific semantics will determine whether a given form is ambiguous between these spaces.

A *Basic Communicative Spaces Network*, then, is in essence a specification in mental space terms of the minimum basic structures involved in a speech-interaction ground – not just a speaker and a hearer interacting in an immediate context, but including some Base Space assumed by the speaker as reality, plus the content of the speaker's epistemic states and the content of the communication. The relation to Langacker's *ground* will be obvious here (Langacker 1987, 1991a, 1991b; Coulson and Oakley 2005), as is the relation to terms such as *common ground* (Clark 1992, 1996) which is in turn related to Goodwin and Harness Goodwin's (1992) *construction of context*. We shy from regular use of the term *ground*, however, for two reasons. First, we believe that the internal multi-space structure of the Basic Communicative Spaces Network is important, as compared to a less differentiated concept of the speech setting which is evoked by Langacker's *ground*. Further, we feel it is important to avoid confusion with the broader concept of *common ground*. The common ground in any discourse setting does necessarily involve the kind of space network just proposed – but it may also involve added, far more complex structures. For example, if we've been discussing Jane Austen, then the spaces built up concerning Jane Austen and her work may be part of our common ground; or if we've been planning the physical setup of a room for a workshop by laying out objects on a desk in another room, then the common ground could include a shared interpretation of the objects as an envisioned furniture arrangement in another room. A stranger entering the discourse at this point would not share the full common ground of the ongoing participants, but could not avoid constructing a Basic Communicative Spaces Network as the first stratum of shared structure.

By acknowledging separate mental spaces for content, speech interaction, speaker's epistemic processes, and metalinguistic form choice, Dancygier and Sweetser (2005) have been able to show that there are causal and conditional markers which are general across different kinds of spaces (like English *because*) and ones which are more specific about which kinds of spaces they can mark (English causal *since* cannot mark content-space relations). These results are of interest because they make it clear that cognitively, humans can conceptualize and label both extremely general causal relations and quite specific ones – one kind of specificity being a restriction as to the level of construal of the causation. Dutch shows another important contrast in its causal markers of result, not (as we shall see) entirely orthogonal to the content-epistemic-speech act contrast set, but independently based. Specifically, Dutch makes a crucial distinction between volitional causal relations, where there is a Subject of Consciousness volitionally causing an event or situation, and non-volitional ones. *Daardoor* 'As a result' is restricted to non-volitional causation situations such as a sunny day causing a rise in temperature. *Daarom* 'that's why' is a marker of volitional causal relations. And *dus* 'so' marks causal relations wherein the speaker is directly involved as subject of consciousness (as an initial approximation, non-content-domain causation). Dutch causal conjunction choice thus crucially involves distinguishing between (i) presence and absence of a SoC as a causer and (ii) involvement of the Speaker's own epistemic and speech-act spaces, and of the Speaker as SoC. We will show how the Basic Communicative Spaces Network allows us to formalize this distinction between a SoC-less non-volitional relation in which the Speaker is "just reporting", and the volitional, epistemic and speech act cases in which a SoC *is* responsible for constructing the causal relation.

There is inevitably a special prominence to the Basic Communicative Spaces Network, as opposed to other spaces which are built up as part of a network – in a broad sense, it's the deictic center of the mental spaces network. What makes this complex is that any SoC has her own Base Space; and any SoC who communicates builds such a sub-network, and constitutes a potential deictic nexus in the mental spaces network. Authors, narrators, speakers – each has a communicative space network. For most Dutch examples from chat-room and newspaper texts we will not need to build as many layers of space networks as would be needed for some narrative works of fiction. However, we include one or two such complex cases from journalistic text.

Since the speaker *is* of course a volitional SoC, there are (as we shall see) complex similarities and differences between the uses of *dus* and *daarom*. The concept of blending in Mental Spaces Theory (Fauconnier and Turner 1996, 1998, 2002; Turner and Fauconnier 1995) helps us explain this. Third-person "non-speaker" viewpoints are often blended with speaker viewpoint, setting up a blended space which is formally third person in reference but has other formal characteristics which are very non-standard for a third-person description. The phenomena referred to as Free Indirect Style by narratologists (J. Sanders and Redeker, 1996; Fludernik 1993; Banfield 1982) are one category of such blends. For example, a sentence like *She closed the door in Mommy's face* could refer to the speaker's or narrator's mother – but it could also refer to the third-person agent's mother, whom the narrator would more normally refer to as *her mother* rather than *Mommy*. The viewpoint of the narrator is represented by the third-person *she* and probably by the past tense, while the agent's viewpoint is represented in the choice of the word *Mommy*. Blended spaces of this kind can therefore be understood as involving two inputs, the content (described) space and the speaker/narrator's here-and-now – which raises the question of how vo-

litional causation is to be marked, with *dus* or *daarom*. If subjectivity is defined as closeness to the communicative "here and now" (*cf.* Traugott 1989, 1995), then one way to bring a third-person content space "closer" to the Speaker's epistemic space is to blend the two spaces.

2.2. Further details of a *Basic Communicative Spaces Network*

We will use these ideas on the *Basic Communicative Spaces Network* to analyze examples of causal connectives from Dutch language use. Figure 1 represents the *Basic Communicative Spaces Network*. It is this diagram that will be used in all analyses. At the absolute top level, it specifies the literal example in a scattered box, followed by an identification of the segments P and Q that are causally related in the fragment.

Below that, the actual *Basic Communicative Spaces Network* (from now on BCSN) is displayed. It consists of a 2 × 2 grid. Horizontally, it distinguishes between the top level, which is the linguistic level of the explicity realized language, and the bottom level representing the conceptual level of knowledge representation. At the linguistic level, the cause-clause P and the consequence-clause Q are represented: There is coffee and tea (P), SO what do you want? (Q).

At the conceptual level, we find the Knowledge Base containing propositions p and q, which correspond to P and Q in the linguistic realization. It is this Knowledge Base that licences the P → Q relationships that are uttered (*cf.* Sanders et al.'s [1992] *Basic operation*): Can the fact that there is coffee and tea be a reason to ask what somebody wants? Can *falling rain* (P) indeed lead to (→) *the streets getting wet* (Q)? Does the observation that *the lights are out* (P) count as a valid reason for the conclusion that *the neighbors are not at home* (Q)? In short, the Knowledge Base contains the adult language user's representation of encyclopedic knowledge, pragmatic knowledge and human reasoning, as well as the lexicon of the language that is used to express the causal relations (cf. the declarative knowledge in Levelt 1989). This Knowledge Base includes the Base Space (Fauconnier 1985, 1997; Fauconnier and Sweetser 1996), the speaker's general conceptualization of the world around her.

Given a discourse containing a causal relation that is marked linguistically by a causal connective, four interpretations are readily available: It can be interpreted in speech act, epistemic, content or meta-linguistic spaces. Recall that the metalinguistic space is only absent from further discussion in this chapter for non-principled reasons; in fact, we assume it to be part of the network (Dancygier and Sweetser 2005). The three remaining spaces have a fixed position in the diagram, which vertically distinguishes between cases with an explicitly

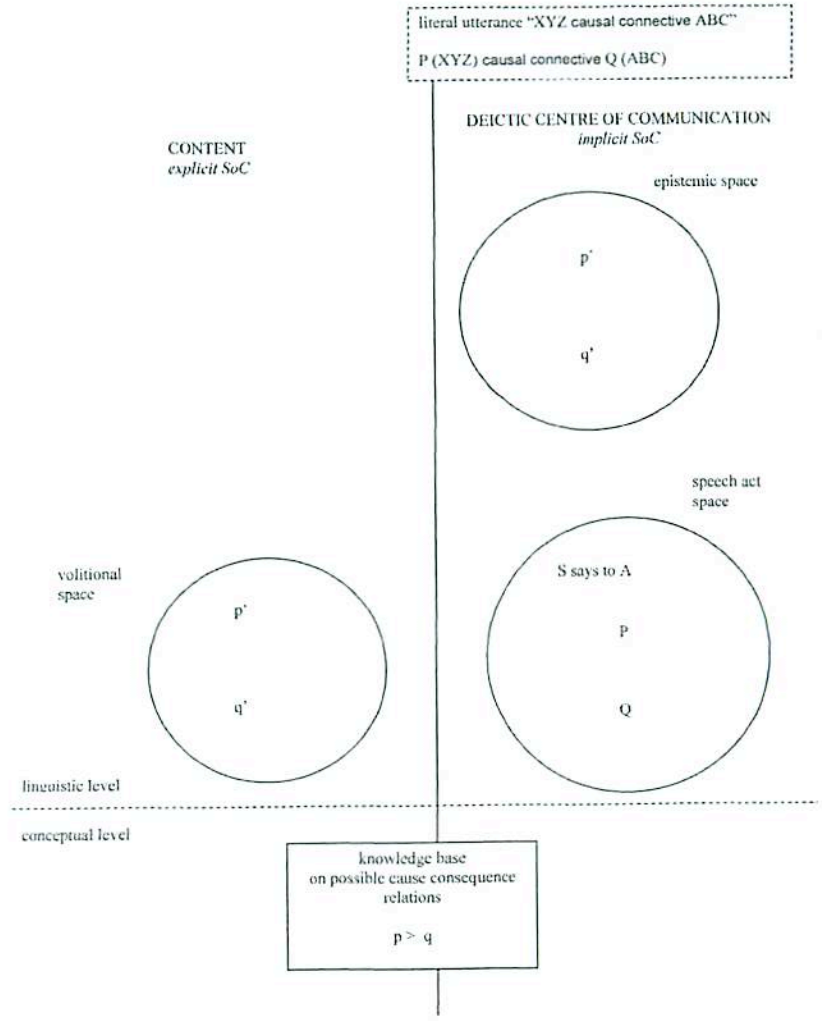

Figure 1. Basic Communicative Spaces Network

realized SoC (*Jan, she, they*) – content space – and implicit SoC's – epistemic and speech act spaces. The reason why SoC's are implicit in the latter case is that the Speaker is present in the Deictic Center of Communication.

Following a basic insight in pragmatics (Bühler [1934] 1990) we start our analysis from the Deictic Center of Communication, where Speaker and Addressee are actually present and communicate with each other. The literal utterance under analysis is always represented in the speech act space, because this is what S has literally said to A. Therefore, P and Q are also represented in the speech act space. As for interpretation, P', Q' are the corresponding representations in other spaces. When the relation is to be interpreted in other domains than the speech act one only, the diagram shows this, starting from the speech act space.

An SoC is either represented by S = SoC (when the speaker is the SoC) or by a variable x = SoC, which is then in turn specified: x = Jan. The lines in the diagrams denote identity correspondencies. We will use dotted lines for the relations P, Q and their counterparts, and separated lines for the relations between Speaker or X, Y and their counterparts. Space building is indicated by plain lines with an arrow.

3. Analysis and representation of stylized and attested examples

The attested examples used in this section were taken from corpus studies presented or published elsewhere: one on newspaper and business texts (Pander Maat and Sanders 1995, 2000), one on chat-texts (Spooren and Sanders 2005) and one on journalistic texts (J. Sanders 2007); also, a number of individual examples were taken from Dutch quality newspapers, an internet exchange, and a children's book.

3.1. BCSN at work: four prototypical usage profiles

We start our analyses from the Deictic Center of Communication. Example (1) shows a communicative situation with both Speaker and Addressee present here and now. In this context, S says something to A. This utterance contains two propositions, realized in clauses, and these two clauses are related causally, as indicated by the causal connective *dus*.

(1) *Er is koffie en thee. Dus wat wil je?*
P (There is coffee and tea.) DUS Q (what do you want?)

Figure 2 represents the mental space configuration of this unattested but unremarkable example. The utterance refers to the here and now in the deictic

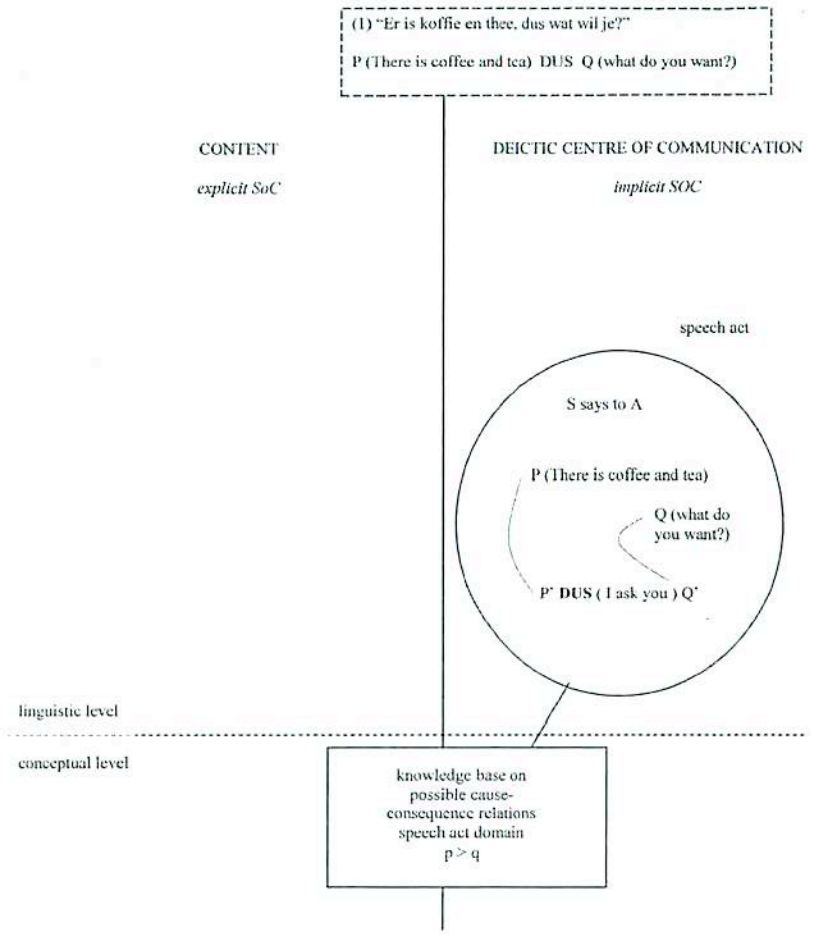

Figure 2. speech act implicit DUS

center of communication, with S and A present. Linguistically, S remains implicit; A is referred to by *je* 'you' in the second part (Q). The causal connection is construed within the speech act space; therefore, the connection between cause (P') and consequence (Q'), signalled by DUS, is represented in the same space as the utterance parts (P) and (Q).

A similar attested example from the VU-chat-corpus is provided in (8). The context is a chat-session between middle school students (source: Spooren and Sanders 2005).

(8) *Je krijgt er geen egt cijfer voor, dus late we over iets leuks prate.*
P (We are not actually being graded on this) DUS Q (lets talk about something fun.)

As in (1), S remains implicit in the first part (P), but S and A are referred to by *we* in the second part (Q). Again, both causal connection and speech act utterance are construed in one and the same space. This speech act use is one of the ways in which *dus* is used. A second case is the epistemic use.

(2) *Het licht bij de buren is uit. Dus ze zijn niet thuis.*
P (The neighbors' lights are out.) DUS Q (they are not at home.)

Here, the speaker observes something and we see her mental processes of inference at work: She concludes here and now that knowing that P (the lights being out) implies Q (the neighbors are gone). Therefore, as Figure 3 shows, the causal relation between P and Q, signalled by DUS, is represented not in the speech act domain, but in the epistemic domain, denoting S's internal mental processes. S and A are present here and now; SoC is implicit, which is the reason why the representation remains on the implicit side of the diagram; the whole structure is construed without an explicit Subject of Consciousness present.

An attested corpus example is provided by (9), which was taken from a corpus of newspaper texts; this particular text was a letter to the editor, in other words, an example of the persuasive genre (Source: Pander Maat and Sanders 1995, 2000).

(9) *Drugs verwoesten mensenlevens, dus moeten drugs strafrechtelijk bestreden worden.*
P (Drugs destroy human lives) DUS Q (drugs must be fought by criminal law).

As in (2), on the basis of knowledge of an ongoing state of affairs (P), the speaker here and now draws a conclusion (Q), signalled by DUS, indicating an epistemic relation, construed in the epistemic space.

The prototypical context for the connective *daarom* is that of volitional action, such as (7).

(7) *Het was een warme dag. Daarom ging Jan zwemmen.*
P (It was a hot day.) DAAROM Q (Jan went swimming.)

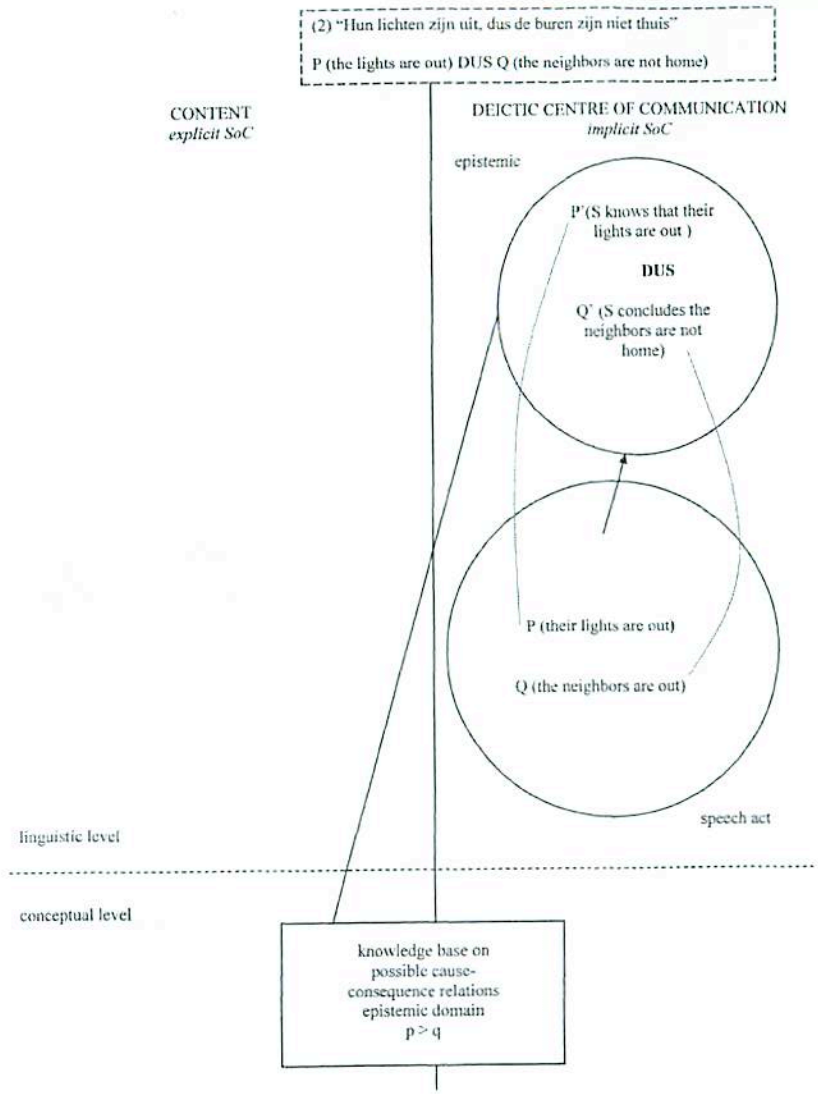

Figure 3. epistemic implicit DUS

Figure 4 shows that an explicited Subject (x) in the speech act space, Jan, undertakes a volitional action (Q) for a particular reason (P): In order to prevent getting too hot, or at least to have a nice day, he goes swimming. By using DAAROM, the Speaker expresses that (x) is the Subject of Consciousness responsible for this causal connection. Therefore, the causal connection is not construed in the epistemic domain connected to the Speaker, but rather construed by the SoC in a volitional domain that is connected to Subject (x) in the speech act; this volitional domain is represented on the content-side of the diagram. Note that this analysis does not change in the case of a first person subject with DAAROM.

(7a) *Het was een warme dag. Daarom ging ik zwemmen.*
P (It was a hot day.) DAAROM Q (I went swimming.)

Although it is the Speaker's perspective that is represented rather than a narrative third person's, the causal relation is construed in the volitional domain, much in the same way as in Figure 3 of example (7). Even if the "I" is being objectified, this does not automatically mean that the causal relation is construed in the epistemic or speech act space. In other words, the analysis does not change because of the grammatical person. It is the volitional causal relation that distinguishes volitional relations (7) and (7a) from epistemic and speech act relations, regardless of the grammatical person: crucial is the explicitness of the SoC.

An example from an expository newspaper text is given in (10) (Source: NRC-Handelsblad 6-6-06).

(10) *Elise van de Putte, kinderarts in het Wilhelmina Kinderziekenhuis in Utrecht, wilde weten hoe dat zat. Daarom deed ze onderzoek naar de relatie tussen chronische vermoeidheid bij pubers en vergelijkbare symptomen bij hun ouders.*
P (Elise van de Putte, pediatrician in the Wilhelmina Children's Hospital in Utrecht, wanted to know what was going on.) DAAROM Q (she studied the relation between chronic fatigue in puberty and similar symptoms in parents.)

As in (7), the Speaker (author) makes explicit that subject (x) Elise van de Putte is the SoC responsible for the causal connection between reason (P) given in the first part, and action (Q) undertaken in the second part. This prototypical configuration of DAAROM can be used "rhetorically" (Stukker 2005) by the author/Speaker: It can be used to "objectify" causal relations that are in fact connected to the Speaker, as in example (11) which was taken from a business

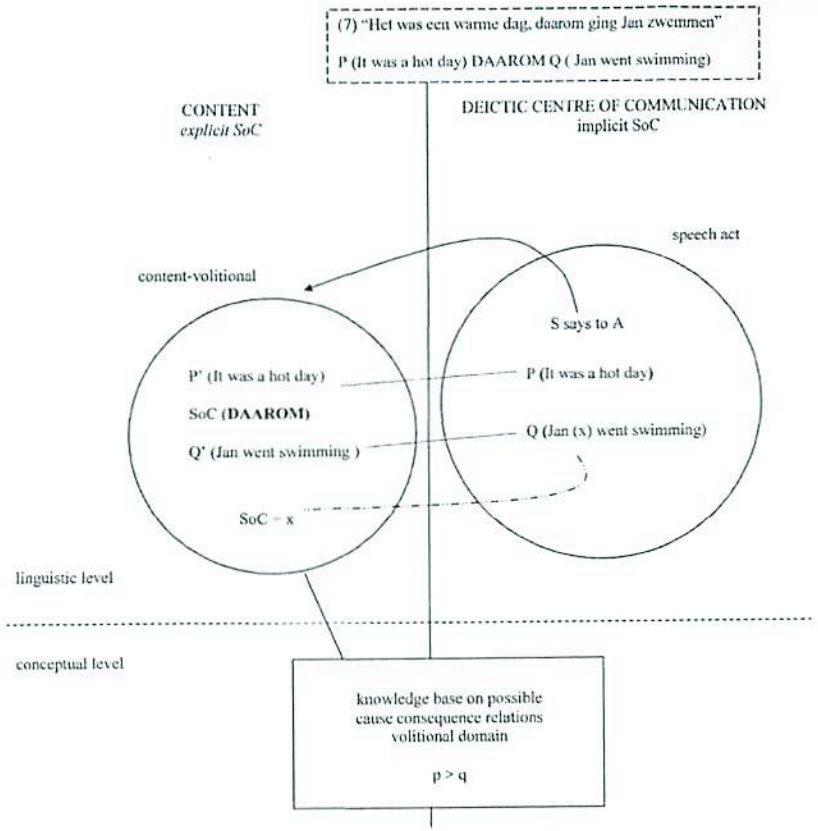

Figure 4. content volitional DAAROM

report (Source: Pander Maat and Sanders 1995; context: De Bijenkorf annual report).

(11) *Vaste klanten besteden per jaar twee maal zoveel in de Bijenkorfwinkels als andere klanten. Daarom heeft de Bijenkorf aan de Vaste Klantkaart een aantal voordelen verbonden*
P (In a year, regular customers spend twice as much as other customers do.) DAAROM Q (The Bijenkorf has added a number of advantages to the Regular Customer Card)

The Mental Space representation of (15) is similar to that of examples (7) and (14), with one exception: SoC is not a discourse subject (x) – an actor presented in the discourse – but the Speaker (S'). Note that De "Bijenkorf", a major Dutch department store, writes this text in a annual business report about the company *itself*. Therefore, the causal relation is construed in the volitional domain connected to the Speaker. In fact, this example can be interpreted as the S acting as if she is an actor in the text, but in fact it is the speaker who is responsible for this causal relation. The use of DAAROM in such cases can be viewed as a discourse strategy, since awareness of the Speaker's responsibility for the causality can only be inferred by the reader from the context and is presumably made at an implicit or unconscious level.

3.2. *Dus* and *daarom* in speech act and epistemic relations

Apart from these prototypical usage profiles – *dus* in epistemic and *daarom* in volitional relations – we also know from earlier work (section 2), that *dus* and *daarom* can often be substituted. Is that true for these cases too? In fact, earlier work hardly addressed the speech act use. Closer study of example (1) shows how forward causality in the speech act domain can only be expressed with *dus*. Even with a long pause and a ":" reading, *daarom* is odd, see (1b).

(1b) *Er is koffie en thee. # Daarom wat wil je drinken?*
P (There is coffee and tea.) #DAAROM Q (what do you want to drink?)

However, *daarom* can be used if we make the speech act explicit, as in (1c).

(1c) *Er is koffie en thee. Daarom vraag ik je wat je wilt drinken.*
P (There is coffee and tea.) DAAROM Q (I ask you what you want to drink.)

Figure 5 represents the difference in causal configuration between (1) and (1c): In the case of (1c), there is a linguistically explicit SoC, i.e. the speaker, who is foregrounded as "I" and as such performs an explicit speech act: To ask somebody what he wants to drink. This configuration is very similar to the volitional causal connection in (7) and it is represented likewise: As a causal relation in the volitional domain, in which the SoC – in this case, not x, but explicit S' – intentionally performs an act (Q') in order to achieve a goal (P').

Example (12) is a real-life instantiation of this explicit speech act relation signalled by DAAROM (Source http://mail.python.org/pipermail/python-nl/2005-May.txt, found May 11, 2007).

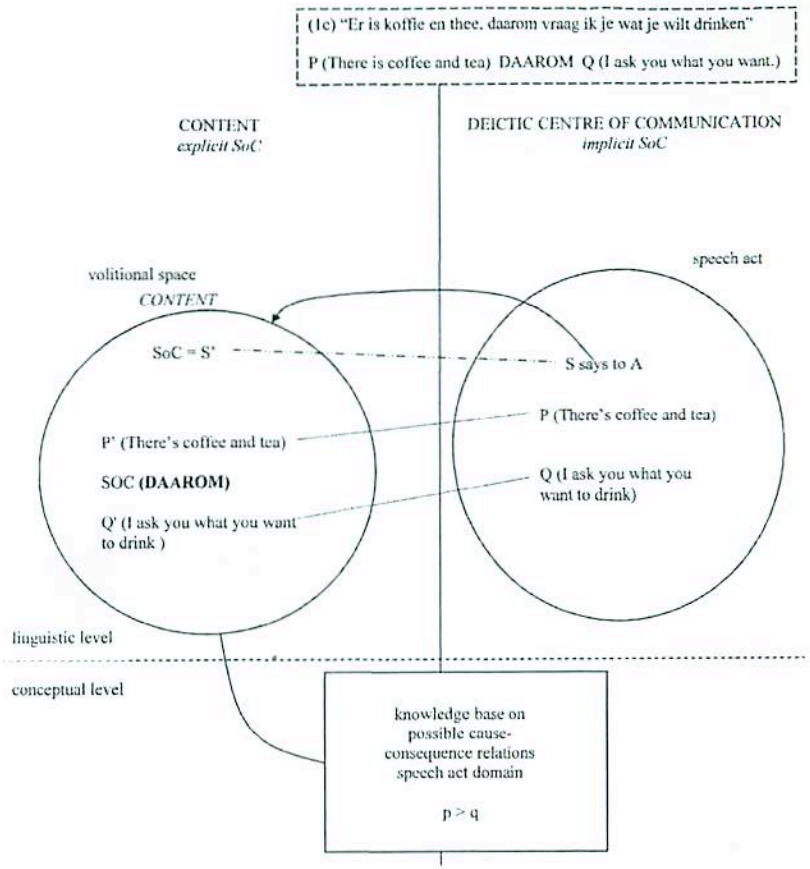

Figure 5. speech act explicit DAAROM

(12) *Komende woensdag zal de eerst volgende Python meeting zijn. We willen graag weten wie er allemaal zullen komen. Daarom vraag ik jullie het a.u.b. te laten weten als je van plan bent te komen.*
P (This Wednesday we will have the next Python meeting. We would like to know who will attend.) DAAROM Q (I ask you to please make known if you are planning to attend)

As was the case in Figures 4 and 5, the causal connection is construed in the volitional domain of an explicit subject (S).

The next question is of course whether *daarom* can be used to express epistemic relations, too? It is clear that *daarom* does not fit in epistemic contexts such as (2), even if we use the syntactically right word order, as is demonstrated in (2b).

(2b) *Het licht bij de buren is uit. # Daarom zijn ze niet thuis.*
P (The neighbors' lights are out.) #DAAROM Q (they are not at home.)

The use of *daarom* would express that their lights being out is the reason for their not being at home. Since the causal relation is not established between two events in the content domain, but between something that S has observed and her conclusion based on that observation, *daarom* cannot express the causality.

As in the speech act-case, this act of concluding here and now that Q is the case can be made explicit. In that case, it **is** possible to use *daarom*.

(2c) *Het licht bij de buren is uit. Daarom concludeer ik dat ze niet thuis zijn.*
P (The neighbors' lights are out.) DAAROM Q (I conclude they are not at home.)

Figure 6 represents the construal of a volitional causal connection similar to that in (7): The Speaker is made *explicit* as a Subject (S), and is, as SoC, responsible for undertaking action Q because of P, which is represented in the volitional domain on the content-side of the diagram.

It is important to note (this is also stressed by Dancygier and Sweetser 2005) that once a first-person conclusion or speech-act is made *explicit*, it is treated as a content space, with no special status such as the speaker's implicit speech-act or epistemic space.

3.3. How BCSN explains for the relation between Domains, Subjectivity and Perspective

A second matter is the question whether the difference between the speech act and epistemic causal spaces on the one hand, and the content spaces on the other hand, coincides with a difference in perspective. Note that the content relations discussed above show an explicit SoC in the third person, whereas in speech act and epistemic cases, the Speaker is either present and linguistically implicit, or present in first person (*I*).

In our view, it is not the difference in perspective that determines the relation interpretations. Rather, our claim is that the explicit presence of an SoC opens the way for an epistemic space connected to the SoC in addition to the Speaker's

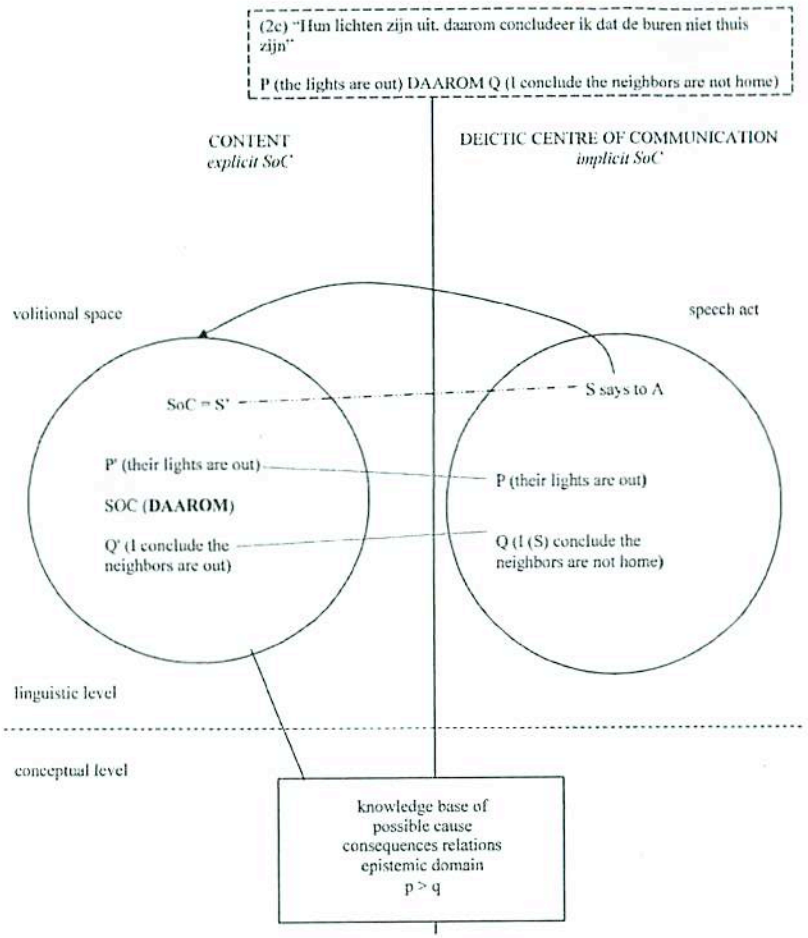

Figure 6. epistemic explicit DAAROM

epistemic space that is always, if often implicitly, present. And in such cases, conceptual blending of the speaker's epistemic space and the SoC's epistemic space can take place.

Let us systematically explore how the perspective of the Speaker vs. SoC relates to the interpretations in terms of the spaces we distinguish. How do epistemic relations behave in this respect? Epistemic *dus*-relations like (2) can

very well be expressed in narrative contexts, where the perspective is taken not from the Speaker/Implicit SoC/1st person here and now, but from a third person-SoC or first person-SoC in the past. The essential characteristic configuration of the causal connection remains, as is shown in example (2d), which is identical to the first person example (11).

(2d) *Jan zag dat het licht bij de buren uit was. Dus ze waren niet thuis.*
P (Jan saw the lights at the neighbors' house were out.) DUS Q (they were not at home.)

Figure 7 represents the causal construal of this sequence. As is typical for each (fragment of) narrative, subjects such as Jan (x) and objects in the speech act domain are immediately projected in the narrative situation. The narrative situation is construed in a narrative content domain in which the narrative character – Jan (x) is represented. From the narrative content domain, an epistemic space connected to Jan (SoC) is elaborated in which Jan is here and now concluding something (Q) on the basis of some observation (P). This relation could not possibly be expressed with *daarom:* it is an epistemic relation, in which SoC is responsible for the causal relation, at which he arrives at the conclusion in his own epistemic space.

However, the configuration is more complicated than that. The fragment does not say: "so they are not at home, he thought". In that case, the representation of the causal relation would only concern Jan's epistemic space (cf. J. Sanders and Redeker 1996). In example (2d), however, the Speaker (author) identifies with the SOC and sees through Jan's eyes; it is a case of free indirect discourse (thought). The DUS fits in with the SoC-perspective: The reader gets insight into Jan's space, sees Jan's internal mental processes. Mental Spaces Theory provides us with an excellent tool to represent this insight: The BCSN-representation shows there is a blend of the epistemic space of the Speaker/narrator (implicit SoC) with the space of the narrative subject (x), who is SoC. In other words, the distance between S and SoC is not only small – it is absent because their epistemic spaces are blended. This becomes even more clear, when the scene is placed in the narrative here and now (2e). Here, the suggestion of free indirect speech by Jan becomes even stronger because of the blending with the deictic here and now of the Speaker/narrator.

(2e) *Jan ziet dat het licht bij de buren uit is. Dus ze zijn niet thuis.*
P (Jan sees that the neighbors' lights are out.) DUS Q (they are not at home.)
Daarom

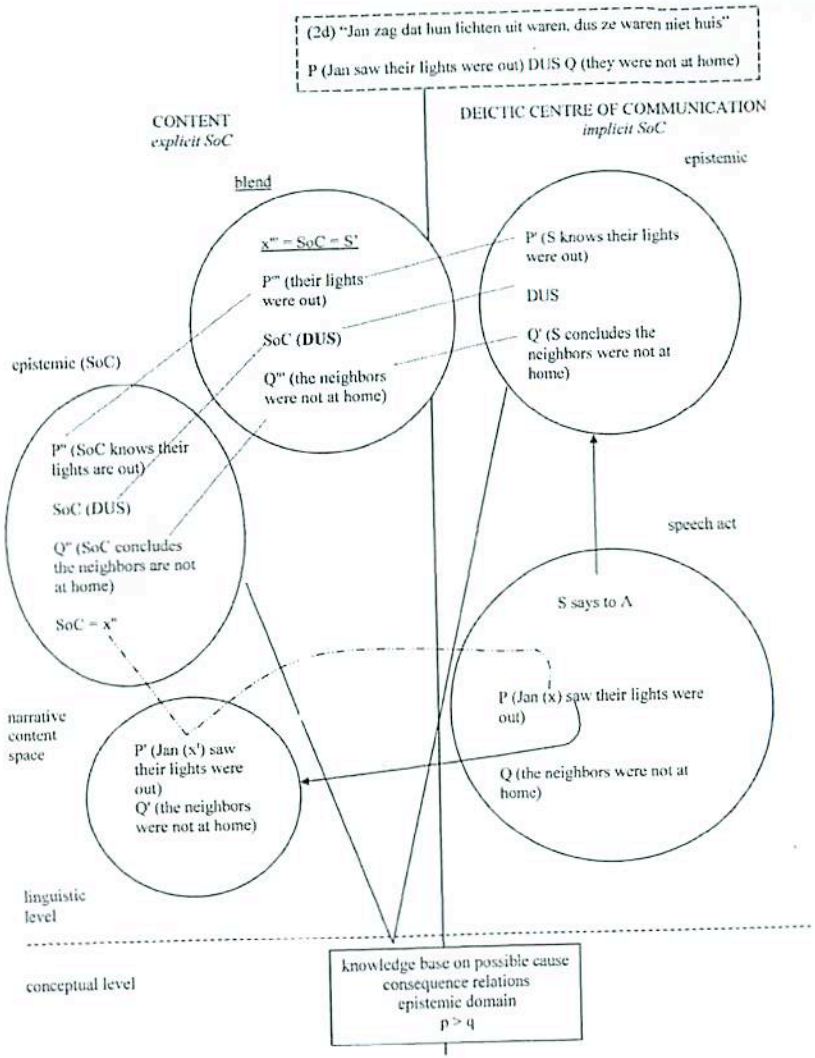

Figure 7. epistemic 3rd person DUS

An attested example from a children's book is given in (13) (Source: C. Slee [1999]. Houten: Van Holkema en Warendorf.)

(13) *Tigo fietst weg. Als hij de straat inkomt, ziet hij zijn moeders auto staan. Ze zijn dus al weer thuis.*
P (Tigo cycles away. When he enters the street, he sees his mother's car.) DUS Q (they are already at home).

In (13) the conclusion is a clear case of free indirect thought by narrative character Tigo; he is the Subject of Consciousness who concludes Q on the basis of observation P. Note that direct quotation marks are absent, and that S and A are implicit in Q; therefore, no clear boundary can be drawn between the epistemic domain of the narrative character and of the Speaker/narrator; the two are blended. Blending of spaces is possible even without the immediate presence of an observing narrative subject, as is shown by example (2f).

(2f) *Het licht bij de buren was uit. Dus ze waren niet thuis.*
P (The lights at the neighbors' house were out.) DUS Q (they were not at home.)

In the BCSN-representation (Figure 8) it becomes clear that the only difference between (2d) and (2f) is the presence of a concrete narrative subject (x) making observation (P) and causally connecting conclusion (Q); in (2f), it remains unclear who (x) is. The narrative context will provide plausible candidates for (x).

In conclusion, when the distance between S and SOC is small, the causal relation is construed more subjectively, which makes it more difficult, if not impossible, to use DAAROM. Hence: DUS is suited to express implicit SoC cases, which fits in with corpus and experimental results (see section 2).

Similar parallels between DUS and DAAROM come to light when we have another look at volitional causal DAAROM-cases with third person (SoC), as the one discussed in (7). Again, such relations are prototypically expressed with a DAAROM, but here DUS is not impossible, see (7b).

(7b) *Het was een warme dag, dus Jan ging zwemmen.*
P (It was a hot day), DUS Q (Jan went swimming).

However, there is a clear semantic difference between (7) and (7b). The DUS in (7b) seems to give the reader insight into the immediate internal mental processes of Jan (SoC) while he is deciding to go swimming: It looks like a *monologue interieure*. The reader gets involved in a here-and-now moment of decision making, represented in the past. Again, Mental Spaces Theory can be

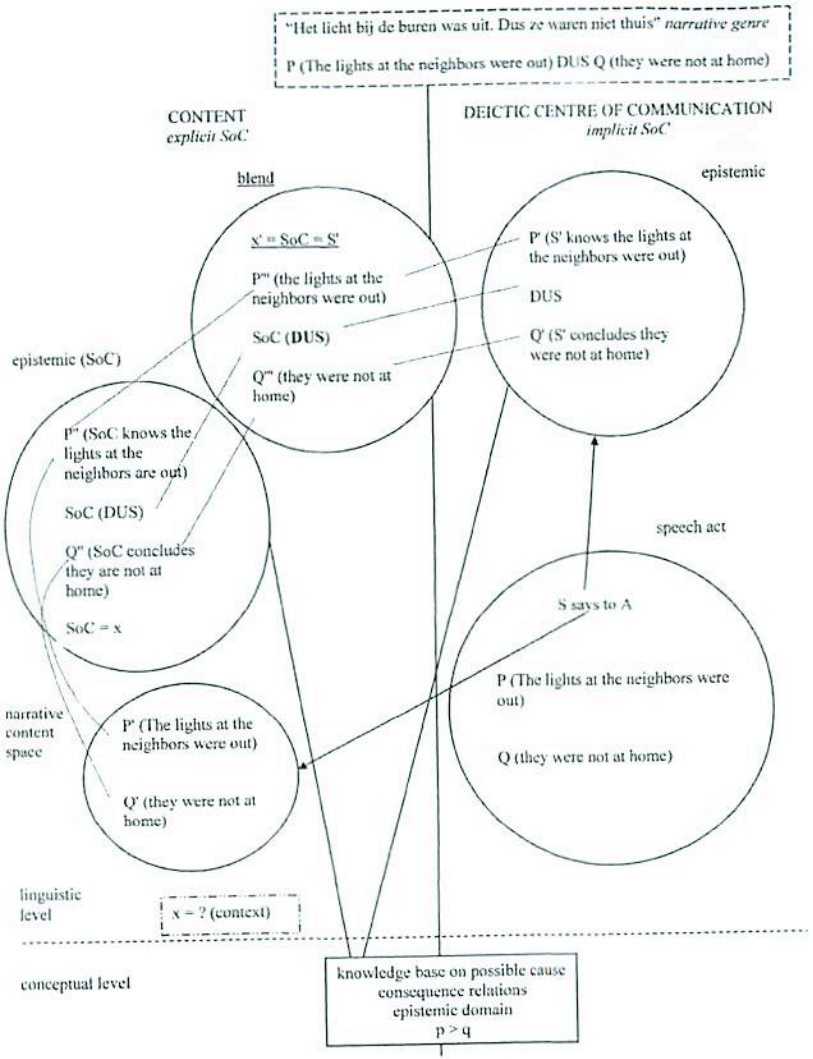

Figure 8. epistemic 3rd person Free Indirect Style DUS

used to analyze this insight. The BCSN-configuration in Figure 9 shows that DUS in (7b) enables an epistemic interpretation (after all, DUS is the prototypical marker of such relations), in which the S(SoC) concludes that Jan must have thought it was hot and that this must have been the reason to go swimming. A blending of the mental space of the two SoC's takes place: We are interpreting the epistemic domain of the SoC = X (Jan) as the epistemic domain of the Speaker. Note that this blended reading is even easier to get in the case of 1st person in the past as shown by (7c).

(7c) *Het was een warme dag. Dus ging ik zwemmen.*
P (It was a hot day). DUS Q (I went swimming).

Interestingly, this blended reading was not found in the sequence connected by DAAROM, as was discussed in case example (7a) above. In other words, the blended reading of example (7c) disappears when epistemic DUS *is* changed in volitional DAAROM.

Hence, in the DUS-case (7c), the Speaker is objectified because she is mentioned explicitly, but this objectification does not imply volitionality as in (7a). By contrast, the configuration is similar to that in Figure 8, representing example (7b): From the objectified Speaker an epistemic domain is elaborated which is blended with the epistemic space of the Speaker here and now. In other words, DUS highlights the decision making, enabling the participation of the decision, whereas DAAROM stresses the report of volitionality of SoC's subsequent action.

An attested example of the latter was taken from a chat-corpus (Source: Spooren and Sanders 2005).

(14) *(Speaker 1:) "dit gaat f*king langzam, ik had dat al een minuut ingetypt" (Utterances of other participants...) (Speaker 2:) "ja daarom dee ik het twee keer"*
context: (Speaker 1:) "this goes ** slow, I typed that already a minute ago" (...utterances of other participants...) (Speaker 2:) "P (yeah – acknowledging contextual utterance by Addressee) DAAROM Q (I did it twice)"

Note that this analysis sheds a new light on earlier corpus results that show significant differences in the usage contexts of *dus* and *daarom*; the prototypical configuration of *dus* is with first person SoC, and for *daarom* 3rd person SoC (Pander Maat and Sanders 2000). *Daarom* prototypically expresses the volitional relation, irrespective of perspective: When there is an SoC undertaking this action, it is a volitional causal relation and it is expressed with *daarom*. Thus,

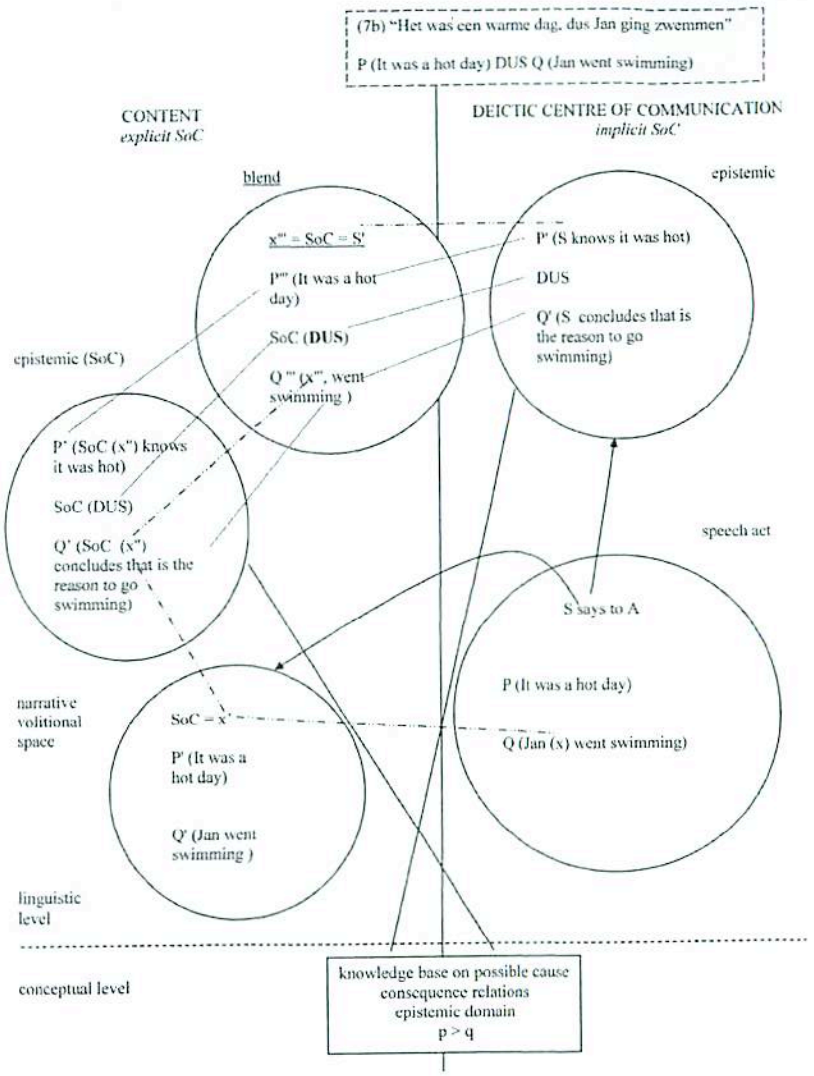

Figure 9. epistemic 3rd person volitional context DUS

the difference expressed with *daarom* versus *dus* is not so much the third versus first person, but rather the causality that is reported from outside (*daarom*) versus the inside decision making (*dus*).This difference can be illuminated with narrative examples from newspapers. Example (15), taken from a narrative newstext fragment, uses *daarom* to appoint responsibility for the action by the narrative character; by contrast, example (16), taken from a review article, uses *dus* to express shared responsibility between Speaker and SoC (Source: J. Sanders 2007; context: narrative fragment in an informative article on infanticide).

(15) *Sonja van der Z. had haar baby een mooie laatste rustplaats willen bieden, een plekje met zingende vogeltjes, maar dat was niet gelukt en daarom had ze het lijkje in haar rugzak achter in de auto laten liggen.* P (Sonja van der Z. had wanted to give her baby a nice resting place, a spot with singing birds, but that hadn't worked out and) DAAROM Q (she had left the little corpse in her backpack in the trunk of the car.)

As Figure 10 represents, there is blending in this fragment, but it does not concern the causal relation. The first part of the sequence contains content and evaluative lexical choices –"a beautiful resting place, a spot with singing birds" – that are so specific that they ask for attribution to the narrative character *Sonja van der Z.*, and not to the Speaker (journalist). However, no direct quotation marks are used to appoint responsibility to the character alone. Therefore, we cannot but interpret the construal of this part of the sequence as a shared responsibility, blended between character and Speaker. By contrast, the causal relation is solely to be attributed to the narrative character (SoC) and is construed in the volitional domain connected to the SoC. Note what effect the use of DUS would have had: Either via epistemic reasoning by the Speaker, making the character's decision the S's decision; or, via blending the epistemic spaces of Speaker (SoC) and character (SoC), involving the Speaker (and the reader) in the momentous decision of the character. Because of the inappropriate nature of this decision, this would be an unwanted effect, which is avoided by using DAAROM, which has a "distancing" effect, compare (7). In principle, DUS would have been possible only in a longer stretch of free indirect thought; a literary device that a journalistic text generally does not use.

Let us compare this case with the next attested example, also from a narrative fragment of a newspaper text, this time with *dus* (Source: Pander Maat and Sanders 1995; context: publishing history of famous poet).

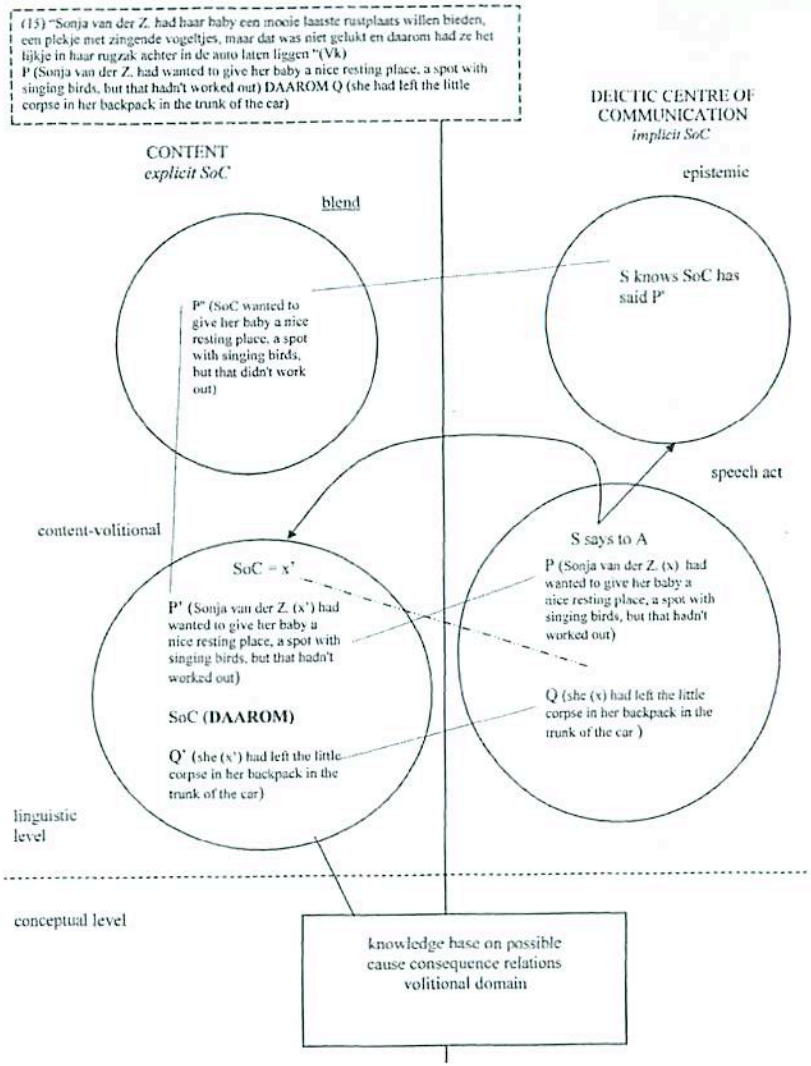

Figure 10. content volitional corpus DAAROM

(16) *Ze had eens een paar gedichten naar Maatstaf gestuurd, en daarover was hij laaiend enthousiast geweest – vond haar poëzie meteen af. Dus hij schreef haar meteen of ze nog meer had, en dat werd toen die bundel.*
P (She had sent some poems to Maatstaf, and he had loved them – found her poetry had an immediate perfection) DUS Q (he wrote her if she had any more, and this became her first collection of poems)

In the case of (16), the Speaker/journalist (SoC) will not mind to participate in the mental act by the character "he" (SoC), since it is an appropriate decision; hence DUS rather than volitional, distance creating DAAROM. The Mental Space Representation is similar to the one of example (7b) in Figure 8: P and Q are projected in a narrative content space, from which an epistemic domain is elaborated, which is connected to the narrative character (SoC) *he*. This epistemic domain is blended with the Speaker's epistemic domain; in the blend, the causal relation as signalled by DUS is construed.

Another interesting case is provided by example (17), again taken from a newspaper; this time, the genre is not narrative but persuasive, i.e. a letter to the editor (Source: J. Sanders 2007. Context: the prosecution previously has been accused of simplifying the truth in a bizarre case).

(17) *(Het is nadrukkelijk niet zo dat als een verhaal maar bizar genoeg is, het 'dus' niet wordt geloofd door politie en OM.*
It is not true that P (if a story is sufficiently bizarre) "DUS" Q (the Police and the Prosecution will not believe it.)

Figure 11 represents the complicated construal of the causal relation in (17). The speech act space merely negates the causal connection; from the embedded negated space, an epistemic space of the quoted subject is elaborated. In principle, the causal relation signalled by DUS would have been construed in the blending of epistemic spaces between Speaker and SoC (x); The use of DUS draws attention to the here and now of the conclusion (p>q), as was shown in Figure 8. However, the direct quotation marks indicate that the conclusion itself (and the makers of this conclusion) are being refuted: The speaker does not want to go in the blend, at least not as far as it concerns the actual causal connection. The direct quotation marks appoint exclusive responsibility for the causal connection to the quoted SoC (x). Using DAAROM would have had a distancing effect, drawing more attention to the SoC's decision and less to the refusal of the Speaker to join in the concluding act.

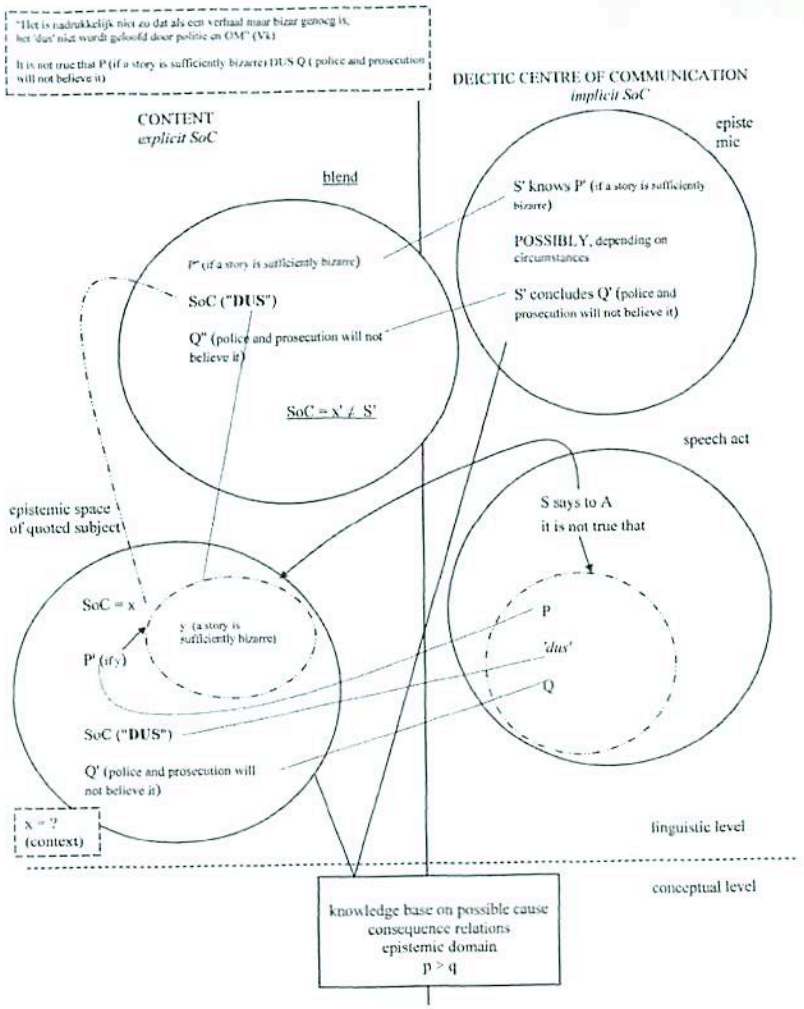

Figure 11. epistemic reading direct quote *corpus* DUS

3.4. Non-volitional content: *daardoor*

Dutch offers interesting opportunities for comparison in the specific expression of causality which involves only content relations. In example (3), a causally related sequence of events is simply reported by the Speaker: Hence, there is no SoC involved. The result is a typical non-volitional content configuration, for which Dutch speakers uniquely use the connective *daardoor*.

(3) *De zon scheen. Daardoor steeg de temperatuur.*
P (The sun was shining.) DAARDOOR Q (the temperature rose).

Figure 12 represents the BCSN for example (3). The causal relation is construed in the content domain, but there is no SoC involved. For this reason we represent it in the upper left of our diagram, with a "fence" around it: there is no SoC involved. Thus, the Basic Communicative Spaces Network allows us to represent a typical feature of the Dutch lexicon of causal connectives: The further specification of the content space in non-volitional versus volitional spaces. This can be viewed as a distinction that is "forced" by the Dutch data.

An attested example from a newstext corpus (expository genre) is provided in (18) (Source: Pander Maat and Sanders 1995).

(18) *Een kandidaat dient eerst de voorverkiezingen te winnen voordat hij officieel wordt gekandideerd. Een presidentiële campagne duurt daardoor al gauw anderhalf jaar*
P (A candidate has to win the pre-elections before he is officially nominated) 'DAARDOOR Q (a presidential campaign easily takes one and a half years)

Similarly, the causal relation as signalled by DAARDOOR is construed in the content domain without the volitional or epistemic consideration of a Subject of Consciousness.

4. Conclusions and discussion

In this chapter, we have described similarities and differences of causal relations in discourse, especially those expressed by Dutch forward causal connectives. We have formulated an integrative, new proposal: The *Basic Communicative Spaces Network* structure, which, in our view, is a helpful step in developing a Mental Space analysis of Ground. This proposal allows the commonalities and differences of relations and connectives to be described in a coherent framework.

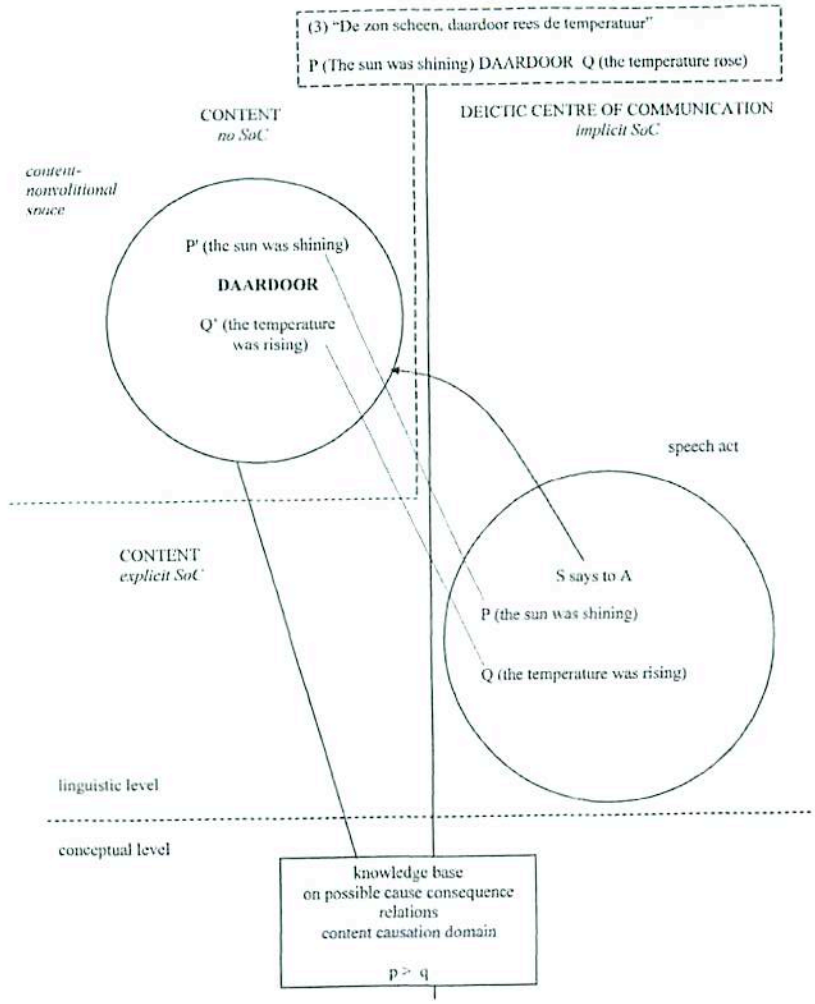

Figure 12. content non volitional DAARDOOR

We have combined insights from previous accounts (Domain theory, Subjectivity and Mental Spaces Theory) to account for the linguistic categorization in Dutch causal connectives. Domain theory and the study of English connectives gave us the original four-way classification of content, epistemic, speech act

and meta-linguistic use. Subjectivity accounts and the empirical study of Dutch pointed up the crucial factor of the Subject-of-Consciousness, who is present as an actor or concluder in many causal relations. Finally, MST provided us with two innovative insights: (i) SoC's in the discourse can, by their presence, generate their own Mental Spaces, and (ii) these spaces can be blended.

The main conclusions can be summarized as follows. The absence of a SoC accounts for the differences between non-volitional content relations and the other relations. Speech act causation invokes the current Speaker as a SoC. The Speaker can also be SoC in volitional relations, but she is explicit in the volitional cases and implicit in the speech act relations. Epistemic and speech act spaces share presence of the Speaker as a SoC, but in the epistemic space the Speaker-SoC is only a participant in reasoning processes; by contrast, in the speech-act space she is an interactive agent in a communicative exchange, which takes place in the shared setting with the addressee and links both to a Deictic Communicative Center. Finally, other actors can also be SoC's, especially in the volitional content and in the epistemic domains.

A crucial insight, which helps us really understand the system and use of *dus* and *daarom* is that (i) not only does the Speaker have her own Mental Space, but potentially so do all the SoC's in the discourse, and (ii) the Speaker's and the SoC's spaces may be blended, constituting cases of Free Indirect Speech: "seeing through another's eyes." Several interesting observations arise from our analyses at this point. For instance, there seems to be a difference between the accessibility of the Speaker's epistemic space and that of a narrative character's SoC. The epistemic space of the Speaker seems to really "come for free" – after all, she is always there – whereas that of a Third Person character requires elicitation (see the discussion of examples [2d] and [2e]). Furthermore, the blending of a Third Person SoC's and the Speaker's spaces seems to be even more complicated, given the complexity of the BCSN-configuration. We expect these relative complexities to affect on-line discourse processing. Hence, we believe we have advanced the understanding of narrative voices and genres (following in the steps of Sanders and Redeker 1996; Vandelanotte and Dancygier forthcoming).

The BCSN-approach described in this chapter seems useful to make systematic cross-linguistic comparisons, as has been done for conditionals (see Dancygier and Sweetser 2000, 2005); they point out that contrasts such as content vs. non-content domain uses recur as formally grammaticalized categories in multiple unrelated languages.) When even closely related languages like Dutch and English show such interesting similarities and differences, one wonders about other, less-studied and less-related languages. What, then, are our predictions for this cross-linguistic work? We expect the principles that causal relations share to be universal (Sanders 2005). That is, we expect the underlying grid of the

Basic Communicative Spaces Network with four interpretations that are readily available, the distinction between implicit and explicit SoC and the Mental Spaces attached to SoC's, to hold for every language studied.

The exact way in which the lexicon of connectives "cuts up" the causality will vary. One empirical question is whether Dutch is the only language distinguishing between volitional and non-volitional content relations at the level of connectives. Also, we expect the new insights of the SoC – Speaker blending of Mental Spaces to generate many new results. For one thing, it may account for ambiguities and complexities in language use, as well as for many rhetorical effects on readers, as we have already hinted at in this chapter. Empirical studies should definitely include non-planned, non-edited types of discourse, such as spontaneous conversation (Spooren, Sanders, Huiskes and Degand to appear).

Another intriguing issue concerns the cognitive interpretation of the connectives as markers of relations: What is the role of the distinctions and Mental Spaces in the *Basic Communicative Spaces Network*? We consider our proposal compatible with psycholinguistic approaches in which the connective is seen as a processing instruction: It informs hearers and readers as to how the relation should be interpreted. In the diagrams, connectives and interpreted segments select the Space where the relation is interpreted. Clearly, the interpretative choice of the domain in which the relation is interpreted, remains a question of interpretation of the relation as a whole: It should be compatible to the content of the segments. An interesting processing hypothesis might be that domain-specific connectives, that is, connectives that clearly select only one of the possible spaces for interpretation, such as Dutch *daardoor*, should be very informative processing instructors (Sanders 2005).

Similarly, the blending analysis is flexible enough to allow for the many actual cognitive interpretations. For instance, we have argued that volitional causal relations in First Person ("So I went swimming") have the same configuration as those in a corresponding Third Person example ("So Jan went swimming"). In other words, it is the nature of the volitional causal relation rather than Perspective or Grammatical Person which determines the configuration. This proposal can lead to interesting predictions to be tested in processing studies. In fact, it may lead to the right explanations for some existing neurocognitive findings. While discussing neuron activation in purposeful, goal-related (volitional!) hand actions, such as grasping a tool, Feldman (2006: 68) explains how the same neurons are activated during both the *execution* of these actions – the actual grasping – and the *observation* of similar actions performed by another individual. These are the kinds of insights into the workings of the causal mind that we hope to achieve in a study of linguistic categories present in people's everyday language use.

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