

Scaling causal relations in terms of Speaker Involvement

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1 Introduction

It has often been noted that causal connectives come in (at least) two kinds. On the one hand we have connectives like French *de ce fait*, English *as a result* and Dutch *daardoor*, which seem to specialize in relations between states of affairs:

- (1a) Le soleil se leva. *De ce fait* la température grimpa.
- (1b) The sun came up. *As a result*, the temperature went up.
- (1c) De zon kwam op. *Daardoor* steeg de temperatuur.

On the other hand, connectives like French *donc*, English *so* and Dutch *dus*, may occur in so-called non-assertive speech acts (see 2a-c) and speaker conclusions (see 3a-c), while *de ce fait*, *as a result* and *daardoor* are inappropriate in such environments.

- (2a) Tu as été très impoli. *Donc* /* *de ce fait* sors immédiatement de cette pièce!
- (2b) You have been very impolite. *So* /* *as a result* leave the room immediately!
- (2c) Je bent erg onbeleefd geweest. *Dus* /* *daardoor* verlaat de kamer onmiddellijk!

- (3a) La neige fond, *donc* /* *de ce fait* la température est au-dessus de zéro.
- (3b) The snow is melting, *so* /* *as a result* the temperature is above zero.
- (3c) De sneeuw smelt, *dus* /* *daardoor* de temperatuur ligt boven nul.

The difference between the two sets of connectives has mainly been accounted for in terms of dichotomies (cf. external/internal (Halliday & Hasan, 1976; Martin, 1992), semantic/pragmatic (Van Dijk, 1977; Moeschler, 1989)). A very influential account is also Sweetser (1990), who has proposed to distinguish not two, but three domains of use for connectives: the content domain, relevant for (1), the speech act domain, exemplified in (2), and the epistemic domain, illustrated in (3).

In this paper our objective is to propose an alternative account of the distribution of connectives. Going beyond dichotomous and trichotomous classifications, we want to propose a scale of *speaker involvement*, on which the inherent expressive power of connectives can be represented. Two observations lie on the basis of this proposal.

First, most connectives, which allow epistemic and speech act uses, may also express so-called 'volitional' causal relations, while *as a result* and *daardoor* may not and *de ce fait* is at least marked here:

- (4a) J'étais fatigué, *donc* / *de ce fait* je suis parti.
- (4b) I felt tired, *so* /* *as a result* I left.
- (4c) Ik was moe, *dus* /* *daardoor* ik ging weg.

However, volitional causality falls in the content domain, since it is clearly concerned with states of affairs in the real world, external to the discourse. But, note that *dus*, *donc*, and *so* can *not* express non-volitional real world relations (see examples 4').

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- (4'a) Il y a eu beaucoup de vent, #*donc* trois tuiles sont tombées du toit.
- (4'b) There was a strong wind, #*so* three tiles fell off the roof.
- (4'c) Er stond een harde wind, #*dus* er zijn drie pannen van het dak gevallen.

In these examples, the connectives do *not* express a non-volitional content relation but rather they suggest that the consequence is entirely predictable from the cause. This is what makes these examples decidedly odd. In other words, these epistemic and speech act connectives encroach upon the content domain, but only on the volitional part of it.

The second observation concerns the behavior of some connectives that seem to specifically express volitional causality, like *c'est pourquoi*, *that's why* and *daarom*. While these connectives are not acceptable in epistemic and speech-act contexts (examples 5abc and 6abc), they *are* as soon as speech act or modal operators are inserted (see 5'abc and 6'abc). At the same time, non-volitional connectives are excluded in all cases:

- (5a) La neige fond. **C'est pourquoi* /**De ce fait*, la température est au-dessus de zéro.
- (5b) The snow is melting. **That's why* /**As a result*, the temperature is above zero.
- (5c) De sneeuw smelt. **Daarom* /**Daardoor* ligt de temperatuur boven nul.

- (5'a) La neige fond. *C'est pourquoi* /**De ce fait*, je pense que la température est au-dessus de zéro.
- (5'b) The snow is melting. *That's why* /**As a result*, I think the temperature is above zero.
- (5'c) De sneeuw smelt. *Daarom* /**Daardoor* denk ik dat de temperatuur boven nul ligt.

- (6a) Tu as été très impoli. **C'est pourquoi* /**De ce fait*, sors de cette pièce immédiatement!
- (6b) You have been very impolite. **That's why* /**As a result*, leave the room immediately!
- (6c) Je bent erg onbeleefd geweest. **Daarom* /**Daardoor* verlaat de kamer onmiddellijk!

- (6'a) Tu as été très impoli. *C'est pourquoi* /**De ce fait*, je te demande de sortir de cette pièce immédiatement!
- (6'b) You have been very impolite. *That's why* /**As a result*, I demand that you leave the room immediately!
- (6'c) Je bent erg onbeleefd geweest. *Daarom* /**Daardoor* vraag ik je de kamer onmiddellijk te verlaten!

Hence, these volitional connectives seem to take an intermediate position between the content and epistemic relations. On the one hand, they may express a certain type of relation in the content domain, on the other hand they lend themselves for use in epistemic and speech act contents as long as the speech acts and conclusions are an explicit part of the proposition.

According to us, this situation is an indication for the need of a scalar perspective on the spectrum reaching from non-volitional causality in the content domain to epistemic and speech act causality. Our hypothesis is that the different relational interpretations can be ordered along a scale from minimal to maximal *speaker involvement*. Speaker involvement refers roughly to the degree to which the present speaker plays an active role in the construal of the causal relation. Speaker involvement increases, first, with the extent to which the relation concerns the evolving structure of the present discourse, that is the extent to which the relation is located in the here-and-now of the speech situation. Second, it increases with the number and strength of the assumptions the speaker is committed to in using a particular relation.

The paper consists of two parts. First we will sketch five prototypical relational configurations exemplifying different degrees of speaker involvement. Then we will report on corpus

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studies of Dutch and French connectives empirically supporting a number of assumptions concerning the speaker involvement scale.

2 From non-volitional to speech-act relations

a. Non-volitional causal relations

- (7) There was an avalanche in the French Alps last week. 12 persons died.
- (8) Monday his train to Amsterdam arrived on another platform. He got on the train to The Hague.

Non-volitional causality appears as an entirely objective phenomenon, that is, as a phenomenon in which no observer has any part. Of course, the speaker is presumed to be aware of the situations he is talking about. But this awareness plays no role in either these situations by themselves or in their causal relationship. Assuming a (defeasible) implication, as underlying the non-volitional causal relation is too strong: in interpreting (7) we do not assume that an avalanche *normally* causes the death of 12 people. In order to understand this relation the only assumption needed is that causes like the one presented *may* have effects like the one presented, that is, natural disasters may kill or hurt people.

In example (8), a potentially conscious participant is involved in the segments but not in the relation, since the cause-effect relation falls outside the domain of his intentions. The situation referred to in the first segment need not to be known by the protagonist; indeed, this ignorance may be the prime cause for the event to take place.

b. Volitional causal relations

- (9) The guests were boring. She left the party early.
- (10) It was 12 p.m. She went home.

In contrast to non-volitional causality, volitional causality involves decision making by the protagonist; decision making implies reasoning. Reasoning implies awareness of premises: what is causally effective is not the state of affairs *p* but its representation by the protagonist. This is the first difference between volitional and non-volitional relations. The fact that *p* falls within the mental domain of the protagonist can (see example (9)), but need not be made explicit in the proposition of the first segment (see example (10)). If not, it is part of the assumptions inherent to the volitional interpretation. This assumption can only be conveyed by a speaker who temporally adopts the viewpoint of the actor. In other words, volitional relations presuppose a certain degree of speaker involvement in the construal of the causal relation.

However, it would be too simple to say that knowing *p* is what led to the action in S2. Intentional participants are endowed with a minimum of consistency. Hence, it is natural to infer a general pattern of cause and effect underlying the specific sequence that is reported. That is, the protagonist of (10) is presented as a person who will normally leave a party at 12 p.m. or leave earlier when it is boring. Moreover, in volitional relations the protagonist is always aware of this regularity.

Finally, the protagonist is not only responsible for the action, but also accepts the principle underlying it, namely that the awareness of *p should* lead to this action. The essential feature of volitional causation is that the acceptance itself by the protagonist of the normative principle is part of the reason for acting like she does: she does not go home merely because it is 12 p.m., but because it is 12 p.m. *and* she accepts this to be a good reason for leaving a party. The principle needs not always to be accepted by the speaker. One may describe actions following a 'logic' one does not approve of; the speaker himself may regard it bizarre to leave a party at 12 o'clock.

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In sum, volitional relations can only be understood by constructing a number of assumptions concerning the knowledge and attitudes of the protagonist; assumptions that are usually left unstated.

c. Causality-based epistemic relations

- (11) We have many German texts in the course this year. Many students will probably have trouble to complete it.

In causally based epistemic relations a segment, describing a real-world cause, constitutes a reason to draw a certain conclusion regarding its (real-world) consequence. Like reasons for actions, premises in argumentations are known or accepted by the speaker. It is the propositional attitude that is causally effective, not its content. Unlike what is the case for volitional relations, however, in epistemic relations the consequence is not some state of affairs q in the world, but a mental state of the protagonist.

Like the protagonists in volitional relations, epistemic protagonists are also seen as consistent. As a result, epistemic relations are understood against the background of assumptions relating premises and conclusions. In contrast with volitional relations, these assumptions apply to persons in general, not solely to the speaker. Any reasonable person observing that texts are written in a language not well known to the reader will conclude that the readers will have trouble understanding it. This assumption in turn is based on the assumption that the first situation will normally lead to the other. Like in volitional relations, the general assumption is not only part of the knowledge of the protagonist, but it is also normatively endorsed by him.

In sum, epistemic causality needs no longer be tied to the protagonist specified in the propositions themselves; typically it relates to a 'contextually salient' protagonist: the speaker and the group of language users he belongs to: all language users.

d. Non-causal epistemic relations

- (12) The snow is melting. The temperature must be above zero.
(13) It's 10 o'clock. Everyone has probably left for work.
(14) His twin brother is very tall. He probably will be tall too.

In causally based epistemic relations, the real world cause is taken as the argument supporting a conclusion concerning the real world effect. That is, the causal relations in the real world and the epistemic domain have the same direction. In non-causal reasoning, either the real world causality has a different direction from the epistemic one, or real-world causality is not relevant at all.

The first case concerns abductive reasoning: the real world effect is taken as an argument supporting a conclusion concerning the real world cause. In (12), the observation of melting snow is used to infer its cause, namely a temperature above zero degrees. These kinds of examples have become prototypical of epistemic coherence relations (Sweetser, 1990). This is unfortunate for two reasons. First, the majority of epistemic relations encountered in discourse is causality based; second, besides abduction there are other kinds of reasoning not modeled on real-world causality. What is underlying the argumentations in (13) and (14) is no causal relation between the situations referred to in the relational segments of any kind, but other kinds of assumptions: most people leave for work well before 10 a.m. (the fact that it is 10 a.m. does not cause them to have left); and twin brothers are usually the same height (one of them being tall does not cause the other to be tall).

In our view, non-causal inferences exhibit a larger degree of speaker involvement than causally based epistemic relations. The difference here lies not in the number of intervening assumptions, but in their nature. Causally based inferences simply transpose a real-world link into the inferential domain. By contrast, the assumption behind abductive and other types of non-causal

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inferences is not modeled on real-world links anymore; it is entirely situated in the mental domain of the speaker.

e. Speech-act relations

(15) I want to pay you for your work. How long have you been cleaning?

(16) To win the elections an absolute majority (more than half of the votes) is required.

So far we discussed relations which concern the way a speaker conceptualizes a reality that is external to the speech situation. This includes causal and non-causal reasoning, since reasoning patterns exist independently from their expression in discourse (thinking is not saying).

By contrast, speech-act relations concern the structure of the present discourse - and nothing else. They appear in discourse in response to the interactional needs of a specific/potential interlocutor, not to present or draw conclusions regarding the real world. Above, two types of speech-act relations are illustrated: speech-act causals in which one of the segments prepares the ground for an upcoming speech act (see 15), and paraphrases (see 16). In these kinds of relations, the speaker is not involved as a thinking being, but solely in his role as speaker.

Like epistemic relations, speech-act relations are based on assumptions that need to be shared between speaker and hearer: since in example (15), the speaker wants the hearer to consider his question to be an appropriate speech act, he appeals to an assumption that is acceptable to the hearer: when you want to pay somebody for (simple) work, you need to know the time spent on it. In example (16), in which a certain discourse segment X is re-expressed in segment Y, the assumption is that in this context segment X is interpretable as Y, and that Y will present less comprehension problems for the hearer than X does.

3 The Speaker Involvement Scale

Speaker Involvement (SI) is a characteristic of relational interpretations. Hence it can be used for analyzing both:

- the interpretational options in a stretch of discourse;
- the expressive potential of connectives;
- and the interaction between these two.

Up till now, we have been concentrating on the first topic; the rest of the paper will be devoted to the other two issues. A first insight in the interaction between connectives and their discourse environments can be gained by considering inappropriate combinations of connective and discourse contexts; i.e. 'starred' fragments. In our proposal, these are due to discrepancies in SI-profiles. That is, the connective encodes a higher or lower degree of SI than is allowed for by the discourse context. The first case was illustrated by fragment (4'), in which the connective 'dus' /'so' introduces rather strong assumptions that are implausible in view of the discourse segments. The second case was illustrated by the fragments (5) and (6) in which the relations suggested by the segments carry a degree of SI which cannot be expressed by the connectives 'daarom', 'c'est pourquoi' and 'that's why'. When some of the assumptions inherent to these relations are made explicit in the second segment however, the SI-level of the discourse segments decreases, i.e. less assumptions need to be invoked in their interpretation (5'-6').

More generally, we want to make the following claims concerning the relation between connectives and SI:

1. The expressive potential of causal connectives can be represented as an area on the SI scale. Our expectation is that every connective occupies a contiguous area on the scale. That is, we do not

expect to find a single connective that may express, e.g., the interpretations corresponding with C and E on the scale but not the one corresponding with D.

2. The (causal) connectives in a given language should differ significantly from each other on the scale.
3. A connective encodes a certain SI level, which it contributes to the interpretation of its discourse environment.
4. These claims are cross-linguistically valid (starting with Dutch and French).

In our view, analyses of the SI potential inherent to connectives cannot do without systematic corpus analyses. Hence, we have tested these hypotheses by corpus analyses of forward causal connectives in (written) Dutch and French.

4 Empirical support for the SI scale

We selected the three, cq. four most frequent connectives: *dus*, *daarom*, and *daardoor* for Dutch, *donc*, *dès lors*, *c'est pourquoi*, and *de ce fait* for French. For each of these connectives, we assembled 50 occurrences from a newspaper corpus.

First, we identified the coherence relation of each fragment by means of a paraphrase test¹. The results for Dutch and French are given in Tables 1 and 2, respectively. In both languages, the contiguity hypothesis is confirmed.

Relation	connective		
	<i>dus</i>	<i>daarom</i>	<i>daardoor</i>
non-vol. causal		1 (2%)	50 (100%)
vol. causal	5 (10%)	25 (50%)	
causal epistemic	17 (36%)	17 (34%)	
non-causal epistemic	25 (50%)	7 (14%)	
speech act	3 (6%)		
	50	50	50

Table 1: Coherence relations and forward causal connectives in a Dutch newspaper corpus.

For Dutch, *dus* is clearly highest on the SI-scale in terms of relations, *daardoor* clearly lowest, and *daarom* occupies an intermediate position. All connectives significantly differ from one another.

Relation	connective			
	<i>donc</i>	<i>dès lors</i>	<i>c'est pourquoi</i>	<i>de ce fait</i>
non-vol. causal		1 (2%)	2 (4%)	33 (66%)

¹ The non-volitional paraphrase was «this has/had the following consequence»; the volitional paraphrase was «this is/was the reason to perform the following act» and the epistemic paraphrase was «this leads to the following conclusion». For speech-act relations, three kinds of paraphrases were used: «this can be paraphrased/summarized as follows» and «this is the reason to carry out the following speech-act». Finally, non-causal epistemic relations were distinguished from causally-based epistemic relations by checking whether substituting a 'real-world' causal paraphrase (non volitional or volitional) results in a coherent sequence (though the meaning differs from the original fragment). If yes, the relation is causally-based, if not it is non-causal.

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vol. causal	8 (16%)	8 (16%)	33 (66%)	7 (14%)
causal epistemic	26 (52%)	32 (64%)	15 (30%)	10 (20%)
non-causal epistemic	12 (24%)	7 (14%)		
speech act	4 (8%)	2 (4%)		
	50	50	50	50

Table 2: Coherence relations and forward causal connectives in a French newspaper corpus.

For French, *donc* and *dès lors* are highest on the SI-scale in terms of relations, followed by *c'est pourquoi*, which in turn is more subjective than *de ce fait*.

As we can see in the tables 1 and 2, most connectives have one interpretation as its most frequent use, but they are not restricted to this environment. Dutch *dus* and French *donc* and *dès lors* reach from volitional relations to speech act relations with causally based epistemics as their most frequent use; Dutch *daarom* and French *c'est pourquoi* reach from non-volitional relations to causally based epistemics with volitional relations as their most frequent use; and French *de ce fait* reaches from non-volitional relations to causally-based epistemics with non-volitional causality as its most frequent use.

Now the question is what the communicative results are of using a connective in an 'atypical' environment. We will illustrate this by considering the use of *dus* and *donc* in volitional contexts. What happens to a relation of intermediate SI when it is marked by a high SI-connective? Imagine the following utterance addressed to a traffic agent:

- (17a) Ik had haast, ?*dus* /*daarom* /?*daardoor* heb ik me niet aan het inrijverbod gehouden.
 (17b) J'étais pressé, ?*donc* /*c'est pourquoi* /*de ce fait* j'ai pris le passage interdit.

Because *dus* and *donc* carry an assumption of general acceptability, they seem inappropriate when the utterance is meant as an excuse; by contrast, *daarom* and *c'est pourquoi* suggest no more than that the action seemed the best thing to do to the speaker at the time. *De ce fait* further reduces the responsibility of the speaker; *daardoor* however sounds rather silly since it suggests that the speaker did not act intentionally at all.

In other words, when used in an atypical environment, a connective may yield an increase in the degree of SI, when its position on the SI scale is higher than that of the relational interpretation allowed for by the environment (it may yield a decrease, when its position is lower). Likewise, semantic effects of substitution of one connective by another (if the substitution is acceptable at all) can be explained by the positions of the connectives on the SI scale.

In French, all connectives differ significantly from each other in terms of relations, except *donc* and *dès lors*, though *donc* appears to be slightly more subjective. This raises the question what distinguishes *donc* from *dès lors*, if it is not their relational potential. Our assumption is that these two words show more subtle differences regarding subjectivity. To check this we analyzed the related segments for the following subjectivity features: (i) the modality of the second segment (values: opinion, knowledge, perception, action, fact); (ii) the participant who is responsible for the content of the second segment (author, cited speaker, generic third person, pronominal third person, nominal third person); (iii) the explicit/implicit presence of the responsible participant in the second segment.

The most pronounced difference between *donc* and *dès lors* is the participant responsible for the second segment: *donc* shows a clear preference for speaker responsibility (74%), while this tendency is less marked for *dès lors* (42%). In addition, the participant in the second segment is significantly

more often explicit for *dès lors* than it is for *donc* (see Table 3).

Participant	connective	
	<i>donc</i>	<i>dès lors</i>
author (implicit)	37 (74%)	21 (42%)
author + others (explicit)		3 (6%)
cited speaker (expl/impl)	2 (4%)	6 (12%)
cited speaker + others (expl)		1 (2%)
generic third person (expl)		3 (6%)
third person pronominal (expl)	3 (6%)	
third person nominal (expl)	8 (16%)	16 (32%)
	50	50

Table 3: *Donc* and *dès lors*: Identity and explicitness of the responsible participant.

In other words, *donc* combines better with contexts in which the (implicit) speaker is responsible for the second segment, that is, with high SI-contexts. If this is correct, substituting *donc* for *dès lors* in fragments in which not the speaker, but a third person is responsible for the second segment, should introduce a sense of increased speaker involvement. As a matter of fact, in fragment (18) the substitution of *donc* leads to a more prominent role for the speaker to the expense of the explicit third person (the Antwerp authorities).

- (18) (Car) pour accéder à la mer, le port d'Anvers dépend bien évidemment du fleuve. Les autorités anversoises se réjouissent *dès lors/donc* grandement du démarrage d'importants travaux de draguage pour l'approfondissement de l'Escaut.

Another difference between *donc* and *dès lors*, though this is only significant within the non-causal epistemic category, concerns the modality of the second segment: *donc* regularly accompanies factually formulated second conclusions, which do not occur with *dès lors*. That is, a fragment like (19) was not found for *dès lors*.

- (19) L'un d'entre eux portait un anorak vert. Les bandits n'était *donc* pas, comme on l'avait cru un instant, déguisés en agents de la Stib.

In our framework, there is a natural relation between implicit segments and connectives encoding a high SI-level. Even when the segment itself has no subjectivity markers, a highly subjective connective suffices to induce a subjective reading, that is, an interpretation as a conclusion from the author. Likewise, we have found fragments in which connectives of intermediate SI-level impose an action interpretation to a second segment containing no action predicates.

Interestingly, Dutch *dus* and *daarom* show differences parallel to the ones between *donc* and *dès lors*. First, *dus* combines better with (implicit) speaker responsibility, while *daarom* more often combines with explicit third person concluders or actors². This applies to both epistemic and volitional relations

² For the purposes of this analysis, a relationally stratified corpus was used in order to guarantee a sufficient number of observations both for epistemic and volitional relations.

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(see Table 4).

Participant	epistemic		volitional	
	<i>dus</i>	<i>daarom</i>	<i>dus</i>	<i>daarom</i>
author (implicit)	17 (68%)	6 (24%)	3 (12%)	2 (8%)
cited speaker (expl/impl)	8 (32%)	10 (40%)	8 (16%)	2 (8%)
cited speaker + others (expl)			3 (12%)	1 (4%)
third person pronom. (expl)		1 (4%)	6 (24%)	2 (8%)
third person nom. (expl)		8 (32%)	5 (20%)	18 (72%)
	25	25	25	25

Table 4: *Dus* and *daarom*: Identity and explicitness of the responsible participant in epistemic and volitional relations

Another parallel between the Dutch and French connectives is that *dus* regularly co-occurs with factual conclusions in epistemic relations (28%), while *daarom* does not.

5 Final remark

As we can see in the tables above, all connectives except *daardoor* occur in different relational contexts, though they have one relational interpretation as its most frequent use. We have tried to explain this finding by assuming that the meaning of a connective goes beyond relational categories, i.e. it cannot be expressed in terms of these categories. What a connective encodes, is a certain degree of SI which it contributes to its discourse environment. This degree of SI fits naturally with a certain relational category, that is, allows for an unmarked expression of this category. The relative independence, however, between connective meanings and relational categories yields expressive possibilities for speakers who want to introduce or remove assumptions in the interpretation of a certain relation.

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