

**Cause-effect, premise-conclusion and clauses of cause/reason**  
(1999, unpublished)  
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**0. Overview**

In this paper I claim that there is a correspondence between, on the one hand, distinctions in the conceptual field vaguely circumscribed by the catchword 'causality' and, on the other hand, certain linguistic characteristics that differentiate cause/reason clauses with *because* from those with *since/as*. Section 1 introduces the conceptual distinction between the relation 'cause-effect' and the relation 'premise-consequence' and discusses their disparate yet cognitively connected character. In section 2 the syntactic, speech-act theoretical and semantic characteristics on which the proposed correspondence is based will be specified. Section 3 explains in which way precisely the distinctions worked out in the two previous sections are thought to correspond. Section 4 provides some ideas on how the theory presented may be related to certain features of texts and text genres in which 'cause-effect' and 'reason-consequence' relations are expressed. The final section 5 briefly discusses how the approach taken here differs from (and intersects with) other approaches in the literature on the linguistic realisation of 'causality'.

**1. Cause-effect and premise-conclusion relations**

Cause-effect and premise-conclusion are conceptual relations which can be thought of as absolutely disparate on the one hand and intricately connected on the other. They are absolutely disparate in that cause-effect belongs to the domain of what we perceive as the physical world (the world of physical objects or physical states-of-affairs, including events), i.e. the World 1 as conceived of by K.R. Popper, whereas premise-conclusion belongs to the domain of logic, of theoretical systems, of objective concepts of thought, i.e. the Popperian World 3.<sup>1</sup> According to J. Lyons (1977), who distinguishes between 'cause' and 'reason' and whose understanding of 'reason' is very similar to 'premise' (if explicated differently), this disparity is one of order:

Causes [...] are second-order entities. Reasons, however, being propositional in nature are third-order entities. (Ib.: 493.)

By second-order entities we shall mean events, processes, states-of-affairs, etc., which are located in time and which, in English, are said to occur or take place, rather than to exist; and by third-order entities we shall mean such abstract entities as propositions, which are outside space and time. (Ib.: 443.)

Whereas second-order entities are observable and, unless they are instantaneous

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<sup>1</sup> See Popper 1972/1979. Whereas Popper uses the terms 'first/second/third world' in the English version of *Objective Knowledge* (from which I quote), he has changed to using the terms 'World 1/2/3' in the more recent, revised German version. I will follow this more recent usage.

events, have a temporal duration, third-order entities are unobservable and cannot be said to occur or to be located either in space or time. (Ib.: 445.)

At the same time, there is an intricate connection between cause-effect and premise-conclusion, which manifests itself at least in two respects:

First, approaches to an explication of what 'causality' or 'causation' or 'cause-effect relation' mean in terms of the philosophy of science, i.e. World 3 approaches of a certain kind (which we consider to be more objective and sophisticated than 'folk-theory') to World 1 entities, have resulted in a transformation of 'cause' and 'effect' into concepts which emphasise a logical link. At the beginning of the 20th century, E. Mach, for example, maintains that the notion of 'cause and effect' has almost been (and ought to be) replaced by the notion of 'function' in the natural sciences (see Mach 1905/1917: 278). Later on in this century, R. Carnap (1966: 192f.) sums up his analysis of what 'causal relation' means by saying:

*Causal relation means predictability.* This does not mean actual predictability, because no one could have known all the relevant facts and laws. It means predictability in the sense that, *if* the total previous situation had been known, the event could have been predicted. [...] This prediction is a logical consequence of the facts and laws. In other words, there is a logical relation between the full description of the previous condition, the relevant laws, and the prediction of the event.

This definition is closely associated with - in fact, it seems to echo - the deductive-nomological model of explanation, which is, according to Popper (1972/1979: 351), "a deduction of the following kind:

<i>U</i> (Universal Law	}	Premises
<i>I</i> (Specific Initial Conditions)		(constituting the <i>Explicans</i> )
—		
<i>E</i> ( <i>Explicandum</i> )	}	Conclusion"

Popper (ib: 352) explains:

The state of affairs described by the singular *initial conditions* can be called the '*cause*', and the one described by the *explicandum* the '*effect*'. I feel, however, that these terms, encumbered as they are with associations from their history, are better avoided. [...] It is the theory or the law which constitutes the *logical link* between cause and effect, and the statement '*A* is the cause of *B*' should be analysed thus: 'There is a theory *T* which can be, and has been, independently tested, and from which, in conjunction with an independently tested description *A*, of a specific situation, we can logically deduce a description, *B*, of another specific situation.'

D. Lewis (1973/1975) has initiated an approach that focusses on the logical link (see quotation above) in a way which seems to leave behind *nothing but the logical link* of the concept of 'causation' by taking Hume's so called second definition of 'cause' as his point of departure: "Hume's 'other words' - that if the cause had not been, the effect never had existed - are no mere restatement of his first definition. They propose something altogether different: a counterfactual analysis of causation."

(Ib.: 181.) In this counterfactual analysis - "If *c* and *e* are two actual events such that *e* would not have occurred without *c*, then *c* is a cause of *e*" (ib.) - there is nothing left of any idea of interacting physical objects, of the exertion of force and of mechanical dynamics, which are associated with 'causation' from a 'subjective'<sup>2</sup> point of view.

Second, we sometimes speak of premise-conclusion relations as if they were cause-effect relations. The following passage from D.R. Hofstadter (1979/1980: 398) is a nice illustration:

*Tortoise:* [...] If, as you suggested, the number 1 trillion has the Achilles property, then no matter what prime you add to it, you do not get another prime. Such a state of affairs would be caused by an infinite number of separate mathematical "events". Now do all these "events" necessarily spring from the same source? Do they have to have a common cause?

In other words, there is the following premise-conclusion relation: On the assumption that  $10^{12}$  has the 'Achilles property', the premise that *s* is the sum of  $10^{12}$  and any prime number leads to the conclusion that *s* itself is not a prime number. And this logical/mathematical premise-conclusion relation is likened to a cause-effect relation involving events. Surely, there is nothing event-like, in a narrow, literal sense, in the mathematical states-of-affairs mentioned here (as, for that matter, in all logico-mathematical states-of-affairs): in a number having the 'Achilles property', in *s* being a sum of a certain kind, in a number being a prime number, and in whatever logico-mathematical expression may be built of them. And, of course, these states-of-affairs lack time and space dimensions as is characteristic of third-order relations in contrast to second-order relations in the sense of Lyons (see above). However, we also speak of addition, subtraction, multiplication etc. as mathematical 'operations', and this expression seems very close to events and second-order relations. But it is not the logico-mathematical objects that perform such operations but humans, who symbolically operate *with* such objects. Mr. Tortoise (or Hofstadter) is, of course, aware of this order disparity, and of the fact that we may speak of 'mathematical events and causes' only figuratively. This figurative manner of expression is indicated by the use of quotation marks in the passage just quoted.

In fact, premise-conclusion does not have a single property of those ten properties mentioned by G. Lakoff (1987: 54f.) as constituting "prototypical causation". Thus we may ask what kind of "imaginative aspects of reason - metaphor, metonymy, and mental imagery" (ib.: xi) underlies the conceptual connection between cause-effect and premise-conclusion. This connection is present already in the writings of Aristotle, for example in the *Metaphysica*, where he mentions premises as an example of that type of *aitía* which commentators have interpreted as 'material cause' (see Ross (ed.) 1924/1958: 292, 293). Aristotle says: "The

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<sup>2</sup> In R. Spaemann's (1989/1992: 161f.) sense, according to whom this 'dynamic' concept of causation is fundamental and is the paradigm of all common sense ideas of 'causation'.

hypotheses [read 'premises'<sup>3</sup>] are causes of the conclusion, in the sense that they are that out of which these respectively are made" (*Metaphysica*: 1013b). For Aristotle, it seems, (material) causes and premises are alike in that both are the 'material' from which something else is made. From that point of view, causes and premises are metaphorically linked in that they share the idea of 'material from which something else is made' as *tertium comparationis*. However, the idea that conclusions are somehow 'made of premises' appears to be a metaphor itself. Furthermore, in what for Lakoff (1987: 54f.) characterises prototypical causation - which is itself derived from the prototypical concept of "DIRECT MANIPULATION" by metaphorical extension (see Lakoff & Johnson 1980: 73ff.) - material causes in Aristotle's sense play no role (except that agents and patients are involved, which are, of course, material). Material or substance does play a crucial role in the metaphorical extension of 'direct manipulation' to 'causation'. According to Lakoff & Johnson (*ib.*: 75), the metaphors that underly and combine in this extension are: "THE OBJECT COMES OUT OF THE SUBSTANCE, THE SUBSTANCE GOES INTO THE OBJECT, CREATION IS BIRTH, and CAUSATION (of event by state) IS EMERGENCE (of the event/object from the state/container)". I would propose, as a first approximation to the problem of how cause-effect and premise-conclusion are conceptually related, that 'direct manipulation' itself is the *tertium comparationis* of a metaphorical extension from cause-effect to premise-conclusion: Our knowledge of premises 'manipulates', i.e. *causes us* to decide in one way or another, what statements (the potential conclusions) we consider true or false.<sup>4</sup>

## 2. Clauses of cause/reason<sup>5</sup>

It is well known to linguists that clauses of cause or reason with *because* on the one hand and with *since* and *as*<sup>6</sup> on the other hand differ in certain aspects of syntax (see e.g. Quirk et al. 1985: 1070ff.) and in frequency in spoken compared to written English (see e.g. Altenberg 1984).<sup>7</sup> And a number of studies are devoted to (or at least partly so) examining the difference in meaning between *because* and *since* and/or *as* (sometimes also comprising causal/reason *for*) (see e.g. Aijmer 1979, Colson 1980, Deléchelle 1980, 1984a, 1984b, Frey 1980, Heinämäki 1975, Newsome 1959, Vandepitte 1993, Wood 1956). At the same time, the conjunctions

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<sup>3</sup> Ross (1908/1928) translates 'hypotheses', but in his commentary (1924/1958: 292, 293), he speaks of 'premises' instead of 'hypotheses'.

<sup>4</sup> This is an example of World 3 influence on World 2 (see Popper 1972/1979: *passim*), for knowledge of World 3 phenomena (premises) cause states-of-affairs in World 2, "the world of states of consciousness, or of mental states, or perhaps of behavioural dispositions to act" (*ib.*: 106).

<sup>5</sup> The usage among authors varies between these two terms.

<sup>6</sup> Instead of 'causal/reason *since/as*', I will simply speak of '*since/as*'.

<sup>7</sup> For a more comprehensive treatment of these and related aspects see Breul 1997a. I treat causal/reason *since* and *as* clauses on a par here because they do not differ in ways that are relevant for my aims in this paper; some aspects of difference between *since* and *as* are mentioned in Breul 1997a: ch. 7.3.

are reported to be interchangeable in most cases without obvious change of meaning (see e.g. Lütjen 1981). However, there is no attempt to be found in these studies to relate the syntactic properties of the respective clauses with the semantic properties of the concepts of cause-effect and premise-conclusion as discussed in the previous section.<sup>8</sup>

Before I turn to summarising the syntactic differences between *because* and *since* /*as* clauses, it has to be expressly noted that I am *not* talking about those types of clauses that are "style disjuncts" representing "INDIRECT REASON" in terms of the *Comprehensive Grammar of the English Language (CGEL)* (= Quirk et al. 1985: 1072ff., 1104). The following examples of style disjunct causal/reason clauses (i.e. 'indirect reason' clauses) are given in the *CGEL* (ib.):

- (1) I have nothing in my bank account, because I checked this morning.
- (2) What does the word mean, since you're so clever?
- (3) Since you don't seem to know, all further negotiations have been suspended.
- (4) As you're in charge, where are the files on the new project?

According to the *CGEL*, "style disjuncts implicitly refer to the circumstances of the speech act" (ib.: 1072), and, with indirect reason, the "reason is not related to the situation in the matrix clause but is a motivation for the implicit speech act of the utterance" (ib.: 1104). Note, however, that my account will differ from the one given in the *CGEL* in that such a motivation or justification of a speech act - especially of the representative type (e.g. statements, assertions) - is very well possible also in the case where the situation in the matrix clause *is* related to the situation in the causal/reason clause. This is the case where the causal/reason clause is epistemic in the sense of Sweetser (1990; see also section 5 below).

What I am talking about is "DIRECT REASON" clauses (ib.: 1103), i.e. adjunct<sup>9</sup> *because* clauses and content disjunct *since* /*as* clauses (see ib.: 1070ff.). For the authors of the *CGEL*, the syntactic difference between adjunct and disjunct adverbial clauses lies in the "measure of integration within the superordinate clause" (ib.). Disjuncts are said to be "peripheral to the clause to which they are attached" (ib.), in contrast to adjuncts, which are (more) integrated within their superordinate clause. Of the six features listed in the *CGEL* that serve as indicators of a structural difference between adjunct and disjunct adverbial clauses (subsuming reason clauses) (ib.: 1071), I quote four:

- (i) Only the adjunct clause can be the focus of a cleft sentence:  
It's because they are always helpful that he likes them.  
\*It's since they are always helpful that he likes them.  
[...]

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<sup>8</sup> This approach is taken in Breul 1997a, of which the present article highlights and develops some aspects (see also Breul 1997b). Frey 1980 comes closest to the ideas presented here and in Breul 1997a, b.

<sup>9</sup> I am using the term 'adjunct' in this article solely in the sense given to it in the *CGEL*.

(iii) Only the adjunct clause can be the focus of a question, as we can test with alternative interrogation:

Does he like them because they are always helpful or because they never complain?

\*Does he like them since they are always helpful or since they never complain?

(iv) Only the adjunct clause can be the focus of negation, as we can test with alternative negation:

He didn't like them because they are always helpful but because they never complain.

\*He didn't like them since they are always helpful but since they never complain.

[...]

(vi) Only the adjunct clause can be the response to a *wh*-question formed from the matrix clause:

Why does he like them? Because they are always helpful.

\*Why does he like them? Since they are always helpful.

I have discussed the *CGEL*'s theoretical explication of this distinction elsewhere (Breul 1997a: ch. 3, 1998), and I have suggested an alternative account along the following lines (see also Breul forthcoming): An adjunct adverbial clause as characterized in the *CGEL* is a constituent of the superordinate predicate, i.e. of the VP of the superordinate clause, whereas a disjunct adverbial clause is not at all a constituent (immediate or mediate) of a superordinate clause but is syntactically independent.<sup>10</sup> This amounts to saying - and this is the crucial point - that a causal/reason clause composite<sup>11</sup> containing an adjunct *because* clause represents one proposition, whereas a causal/reason clause composite containing a *since /as* clause represents two propositions. In other words, the adjunct *because* clause is part of the predicate of the superordinate clause, whereas *since /as* clauses are neither part of the superordinate clause predicate nor part of the superordinate clause as a whole.<sup>12</sup> An adjunct *because* clause manifests a proposition embedded in another proposition, whereas a *since /as* clause manifests a non-embedded proposition.

Now consider the following observation by A. Davison (1970: 198).

I do not know exactly how *because* differs semantically from *since* and *as*, but I would like to note sentences in which *since* does not mean the same thing as *because*:

[(5)] Because John is a Republican, I proved that his friends are Republicans too.

[(6)] Since John is a Republican, I proved that his friends are Republicans too.

The *because* clause in [(5)] states my motivation for constructing such a proof,

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<sup>10</sup> Disjunct adverbial clauses may be said to be 'textually' dependent on (and in that sense hypotactically related to (cf. Halliday 1985/1994: 242, note)) another clause. A disjunct reason clause, for example, is textually dependent on the clause which expresses the state-of-affairs of which the reason clause expresses the reason. Cf. also Huddleston 1994: 3854.

<sup>11</sup> The term 'causal/reason clause composite' is introduced as a generic term for these syntactically fundamentally different clausal relations.

<sup>12</sup> Essentially, this idea is very similar to the account of the Port-Royal analysis of restrictive versus non-restrictive relative clauses as described in Chomsky 1966: 35ff.

while the *since* clause states my basis for a proof, assuming the axiom of Guilt by Association to allow me to arrive at my conclusion [...].

I assume that the expression "motivation for constructing such a proof" rather refers to a cause, the driving force behind the action - note also the etymology of the word 'motivation' - while the explication of the meaning of the *since* clause refers to a reason (the axiom of Guilt by Association being a kind of 'folk-law' used to derive a conclusion by a syllogistic procedure). Furthermore I hypothesise that Davison's intuition concerning the semantic difference between *because* on the one hand and causal *as* and *since* on the other hand is shared by many (native) speakers of English - not only with respect to this example, but rather as a general tendency. This hypothesis may find support in a result I obtained by investigating the one million word Lancaster-Oslo/Bergen (LOB) corpus of Modern English texts and text-extracts distributed over 15 different text-categories (see Breul 1997a): The share of causal/reason *as*- and, especially, *since* clauses is significantly higher than the average in academic writing, i.e. in a text-category that is especially concerned with models of and theories about the world, with the (scientific) laws that are operative in the world, with arguing and explaining by putting forward reasons; *because* clauses are significantly less frequent in these texts than on average. (In fact, this tendency is even more pronounced in the mathematics/natural sciences subcategories of the LOB corpus.)

Taking Davison's observation to be accurate and generalizable, I turn now to synthesizing the ideas presented in the two preceding sections. The aim is to show in what sense the syntactic structural differences between *because* clause composites and *since* /*as* clause composites correspond to their semantic differences.

### 3. Synthesis

In order to formulate an argument as premise and conclusion, we need at least two asserted (or hypothetically asserted) propositions, namely one proposition that serves as premise and one that serves as conclusion. Logically, of course, you need two premises for the derivation of a conclusion (cf. syllogisms); in natural language utterances, however, a second premise is very seldom expressly stated but implied - or rather implicated in the sense of H.P. Grice (1975). In Davison's *since* clause composite (6), for example, the "axiom of Guilt by Association" (see quotation above) is the implied/implicated second premise. It is not possible for a premise-conclusion relation to be formulated by two propositions one of which being embedded in the other. Such a constellation results in a single asserted complex proposition - and it does not make sense to say of a single proposition that it expresses a premise-conclusion relation. An embedded proposition is not asserted, it constitutes, together with its superordinate proposition, a single complex proposition just like a restrictive relative clause "constitutes a single complex idea together with

this noun [i.e. the noun determined by the relative clause]" (Chomsky 1966: 38).<sup>13</sup>

In contrast, it is perfectly possible to say of a cause-effect relation that it is expressed by one single proposition. A cause-effect relation is a phenomenon of the World 1, which we may describe or refer to by using a single proposition. It is a phenomenon that is conceptualised as a complex concept in the sense that it *would* be possible to refer to the cause by using one proposition and to refer to the effect by another proposition. But in the representation of a cause-effect relation by a clause composite with an embedded (adjunct)<sup>14</sup> *because* clause, the cause and the effect merge conceptually so as to represent a single phenomenon.

Strictly speaking, I have so far argued only that premise-conclusion cannot be represented by a clause composite containing an embedded *because* clause, whereas this is perfectly possible for cause-effect; and that, among the causal/reason clause composites, *since* /*as* clause composites serve to represent premise-conclusion. Thus, we have the following relations expressed by implications:

- (7) a) embedded *because* clause composite → cause-effect  
 b) premise-conclusion → *since* /*as* clause composites<sup>15</sup>

The question that poses itself at this point is: Are these implications reversible, i.e. are there reasons to assume (8)?

- (8) a) cause-effect → embedded *because* clause composite  
 b) *as*-/*since* clause composites → premise-conclusion

That is, are there reasons to assume that, if cause-effect is to be represented by a causal/reason clause composite, only an embedded *because* clause composite is appropriate; and that, if we are confronted with a *since* /*as* clause composite, this must be understood as a representation of premise-conclusion? I think this is an arguable thesis:

I claim that *since* and *as* are illocutionary force indicators of the propositions which they introduce.<sup>16</sup> The illocution which they

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<sup>13</sup> See also footnote 12. - In fact, an embedded proposition in causal/reason clause composites such as in adjunct *because* clause composites is *presupposed* (in the technical sense). I.e. both (i) and its negation (ii) imply that 'he was angry':

- (i) He did it because he was angry,  
 (ii) That he did it because he was angry, is not the case.

<sup>14</sup> In the following, I will replace the term 'adjunct *because* clause' by 'embedded *because* clause', firstly, in order to keep up the parallelism with 'embedded proposition' present, and secondly, because I think that a distinction between embedded and 'tactically' related adverbial clauses in a sense similar to that of Halliday (1985/1994) is more adequate than the distinction between 'adjunct' and 'disjunct' adverbial clauses as presented in the *CGEL*. See Breul 1997a: ch. 3, 1998; but see also Breul forthcoming.

<sup>15</sup> The a) and b) implications of (7) as well as of (8) below entail each other on the assumption, which is made throughout this paper, that

- (i) cause-effect ↔ ¬ premise-conclusion  
 (ii) embedded *because* clause composite ↔ ¬ *since* /*as* clause composite



indicate is: 'the respective proposition is used as a premise to that other proposition on which it is textually dependent (and which is used as a conclusion)'. It would be meaningless to say that there is an illocution of the following kind: \*'the respective proposition is used as a cause to that other proposition on which it is textually dependent'. This would be a confusion of Worlds in the sense of Popper or a confusion of orders in the sense of Lyons (see section 1 above). It is equally impossible to amend the above formulation of the putative illocution in the following way: \*'the respective proposition is used as a representation of a state-of-affairs that is the cause of another state-of-affairs'. In this case, the illocutionary force indicator would, so to speak, reach into the proposition and alter its semantic constitution, a situation which essentially contradicts the concept of illocutionary force indicator. In contrast to *since/as*, embedding *because* is a semantic component of a proposition. This is why it is possible to answer a *why*-question with a *because* clause only and not with a *since /as* clause.

(9) Why did he go home? - (He went home) Because/\*Since/\*As he felt bad.

An embedded *because* clause fills a semantically open slot *within* the proposition. *Since /as* clauses, on the other hand, are not capable of doing so, since they do not contribute to the semantic constitution of the proposition. They indicate a special use of a proposition, but this use is not called for in (9), where 'he went home' is not to be construed as a conclusion.

To make the line of argumentation clear: The correspondence expressed in (7) and (8) is derived rationally by taking certain philosophical and grammatical ideas (those described in section 1 and 2 above) as well as certain speech-act theoretical ideas (those mentioned in the previous paragraph) as axioms of the argument. On the assumption that the argument is correct, the situation in actual language use is predicted to be as described by this correspondence to the degree that text-producers really make a conceptual distinction between cause-effect and premise-conclusion along the lines presented in section 1. And it represents an idealisation in so far as text-producers do not make this distinction consistently. The correspondence is empirically obscured by the fact that text-producers may speak of premise-conclusion figuratively as cause-effect (see section 1 above). The correspondence is cognitively obscured by the fact that text-producers may think of premises as those propositions that cognitively cause one to consider certain other propositions (the conclusions) to be true (see again section 1 above). However, there are three points which make me think that the rationally derived necessity (if the validity of the argument is granted) of the correspondences described has an empirically manifest reflex: Firstly, the mere fact that there are syntactic differences of the relevant kind between *because* clause composites and *since /as*

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<sup>16</sup> Remember that the sentences introduced by *since* and *as* are assumed to be syntactically independent of (if textually dependent on) the sentence to which they relate.

clause composites may find its *functional explanation* in the conceptual differences between cause-effect and premise-conclusion. That is, the theory developed here has explanatory power in respect of the syntactic differences exhibited in the two groups of causal/reason clause composites. Secondly, the explication of the semantic differences between (5) and (6) above by Davison is a clear instance of the more general difference I have in mind. The third point has to do with the quantitative distribution of *because* and *since/as* clauses in different text genres and will be dealt with in section 4 below.

I wish to indicate briefly what kinds of statements one may make on the basis of the correspondence just described with respect to causal clause composites encountered in real texts. Consider for example the following passage from the LOB corpus:

I watched him because I was always fascinated by the way he looked when you tried to surprise him. (N06 99)

The use of *because* in the causal clause composite is much more natural than the use of *since/as* would have been. It describes a very specific causal relation between a mental state - the speaker's being fascinated by something (the cause) - and a certain action/habit - the speaker's watching someone (the effect).<sup>17</sup> And insofar as it is a descriptive representation, it is filtered through the consciousness of the speaker, i.e. it is his interpretation of a specific situation and in that sense subjective. The effect-situation is *not* presented as a logically necessary outcome that could have been predicted or concluded from knowing the cause-situation; the speaker does *not* argue for the truthfulness of his assertion that 'he watched person B' by adducing the assertion that 'he was always fascinated by the way person B looked when person C tried to surprise person B' as a warrant (this would be implied by using *since/as*).

In contrast, consider the following causal clause composite with *since* (equally from the LOB corpus):

But new house prices are likely to continue to rise faster than other prices, since productivity in house building increases more slowly than in most other industries. (J47 169)

Here, 'productivity' is naturally construed as a theoretical (economic) concept. Its slow increase (equally a theoretical concept) in house building compared to other industries justifies (within the given economic theory) the conclusion that house prices are likely to continue to rise faster than other prices. Productivity and price development are not seen as physical states-of-affairs (i.e. World 1 phenomena), which could be said to stand in a causal relation. Rather, the relation is a logical one

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<sup>17</sup> To say that mental states may cause actions/habits and thereby to assign this relation to the World 1 is philosophically highly explosive of course. Actually, I do not wish to commit myself to any position with respect to this debate by using the example above. (Or do I, necessarily? I am not sure here.)

based on the assumptions made in the respective economic model/theory.<sup>18</sup>

#### 4. Textual implications

I think the impression that causal/reason *since* and *as* are more formal than *because* is widespread. This is not without a cause, and it may be connected with an observation that I have already referred to above (section 2), namely the significantly higher frequency of causal/reason *as* and, especially, *since* compared to *because* in academic writing, which is probably the prototype of what is considered to display 'formal' style.<sup>19</sup> In contrast, in the narrative fiction genres of the LOB corpus, which are placed on the bottom of Biber's (1988) textual dimension indicating formality (cf. footnote 19), *since* and *as* play only a very minor role as regards frequency.

Table 1: Frequency of *because* vs. 'causal/reason' *since/as* clauses in the academic prose compared to narrative fiction genres of the LOB corpus<sup>20</sup>

	<i>because</i>	<i>since</i>	<i>as</i>	$\Sigma$
LOB cat. J Academic prose 161389 words	82 = 33.4 % 0.50 ‰ <sup>21</sup>	99 = 40.4 % 0.61 ‰	64 = 26.1 % 0.39 ‰	245 = 100.0 % 1.51 ‰
LOB cat. K-P Narrative fiction 235134 words	159 = 75.0 % 0.67 ‰	20 = 9.4 % 0.08 ‰	33 = 15.5 % 0.14 ‰	212 = 100.0 % 0.90 ‰

While the share of *because* clauses amounts to three fourths in the narrative fiction genres, it is only one third in academic prose. Correspondingly, the share of *since/as* clauses is one fourth in narrative fiction and two thirds in academic prose. (Within the *since/as* group, it is the frequency of *since* which is much more divergent between the two genres.)

My thesis is that these statistical facts do not simply reflect stylistic norms, but have a semantic-functional origin in that text-producers tend to differentiate - at least in writing and on

<sup>18</sup> The substitution of *because* for *since* in this example suggests an epistemic reading of *because*, thus a non-embedded reading of the *because* clause, and hence makes it fall out of the range of *because* clauses I am considering here. Such an epistemic, non-embedded reading results in an intuitive semantic oddity when constructing a corresponding cleft-sentence: *%It is because productivity in house building increases more slowly than in most other industries that new house prices are likely to continue to rise faster than other prices.* On epistemic causal/reason clauses see section 5 below.

<sup>19</sup> According to Biber (1988: 112f., 152), academic prose scores top on the text-categorical dimensions which "seems to mark informational discourse that is abstract, technical, and formal versus other types of discourse" (ib.: 112f).

<sup>20</sup> Cf. Breul 1997a: ch. 7.2, appendix 4.

<sup>21</sup> These figures indicate the frequency of the respective items per 1000 words.

a certain level of sophistication - between the expression of cause-effect and premise-conclusion by causal/reason clause composites with *because* on the one hand and *since/as* on the other hand. Frey (1980) associates the use of *because* with the question "What things happen in the world?" (ib.: 3); the use of 'causal/reason' *since* is said to be associated with the question "How is the world made that such things happen?" (ib.). The first of Frey's question is characteristic of narrative, the second is characteristic of texts which offer theories and models of how the 'things' in the world relate to one another, i.e. scientific texts. This view ties in very well with the ideas put forward in the previous sections of this article and the statistics just presented: A typical feature of narrative prose is the *representation* of events, an important one of which being cause-effect phenomena, thus mirroring (fictional or nonfictional) World 1 entities. A typical feature of academic prose is expository *argumentation* by combining propositions in terms of premises and conclusions thus creating theories and models of the world, i.e. World 3 entities.<sup>22</sup>

Of course this thesis does not imply that we should find only *because* clauses and no *since/as* clauses in narrative genres and only *since/as* clauses and no *because* clauses in scientific genres. One reason is, as for example Biber (1988) among many others has pointed out, that one text genre may very well display textual features typical of other genres. Another reason lies in the conceptually very subtle distinction and relationship between cause-effect and premise-conclusion, which may lead to empirical and cognitive blurring of their distinction as mentioned towards the end of section 3 above (i.e.: speaking of premise-conclusion figuratively as cause-effect; thinking of premises as those propositions that *cause* one to consider certain other propositions (the conclusions) to be true).

## 5. Comparison with approaches taken by other authors

The ideas presented in the present article do not match the distinctions of 'restrictive vs. non-restrictive subordination' (Rutherford 1970), 'propositional vs. epistemic relations' (e.g. Sweetser 1990) or 'semantic vs. pragmatic relations' (e.g. Sanders & Spooren & Noordmann 1992, 1993), although some intersections between these distinctions and the one suggested here exist. What Rutherford (1970) calls a restrictive *because* clause is essentially the same as what Quirk et al. (1985) call an adjunct *because* clause expressing direct reason or expressing a semantic (causal) relation in terms of Sanders & Spooren & Noordmann (1992, 1993), i.e. a relation in which "the discourse segments are related because of their propositional content" (ib.: 1993: 99). The Rutherfordian (1970) non-restrictive *because* clause corresponds to the style-disjunct *because* clause expressing indirect-reason (CGEL) or a pragmatic (causal) relation, i.e. one

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<sup>22</sup> Popper's World 3 "arises together with argumentative language: it is a by-product of language" (Popper 1972/1979: 137).

in which "the discourse segments are related because of the illocutionary meaning of one or both of the segments." (Sanders & Spooren & Noordmann 1993: 100).<sup>23</sup> Of the two types of *because* clauses, it is the 'restrictive', 'semantic relation' type which I have concentrated on in this paper. I have contrasted this type with causal/reason *since/as* clause types from the content-disjunct category of the *CGEL* (see section 2 above).<sup>24</sup>

Apart from the two semantic/discourse functional types of causal/reason clauses just referred to, Sweetser (1990) establishes a third one, the epistemic-causal/reason clause, which marks "the cause of a belief or a conclusion" (ib.: 81). I have argued elsewhere (Breul 1997a: ch. 4.2) for recognising this type as a specific sub-category of the speech-act relational type - 'speech act relational' (*sprechaktbezogen*) being the term used in Breul 1997a for the cases subsumed under 'pragmatic relation' by Sanders & Spooren & Noordmann (1992, 1993).<sup>25</sup> However, the intersection between Sweetser's argumentation and the one I suggest consists in the fact that 'premise-conclusion' is an epistemic relation. Thus a *since/as* clause, unless it is textually dependent on a non-representative speech act (such as a question or a directive), inherently manifests an epistemic relation.

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<sup>23</sup> Historically, the Rutherford-paper is one of the sources for the distinctions in Quirk et al. 1985 and Sanders & Spooren & Noordmann 1992, 1993.

<sup>24</sup> According to Quirk et al. (1985), *since/as* clauses exhibit the same two types of relations as *because* clauses with regard to their semantics (or discourse function), but these two types do not differ syntactically as do the corresponding types of *because* clauses. This is reflected in the *CGEL*'s terminology according to which both types of *since/as* clauses are disjuncts syntactically, but either content- or style-disjuncts - i.e. expressing either a semantic or a pragmatic relation in terms of Sanders & Spooren & Noordmann (1992, 1993) - semantically (or discourse functionally).

<sup>25</sup> Sanders, Spooren and Noordmann (1992, 1993) seem to agree with me in assigning the epistemic-cases to the same category (their 'pragmatic relation') as those discussed under the headings 'indirect reason' or 'style disjuncts' in the *CGEL*. For them, the example

(i) 'Theo was exhausted, because he was gasping for breath.', which is of the epistemic type, belongs to the pragmatic relation category as well as the example

(ii) 'Theo was exhausted, because he told me so.'  
(see Sanders & Spooren & Noordmann 1993: 99f.).

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