

Causality and non–iconic order in French

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Summary

This article explores the semantics and pragmatics of causal discourse, which is defined in terms of discourse segments that are used in consequence-cause order, otherwise known as causal non-iconic order. It will provide linguistic and pragmatic arguments in favour of non-iconic order, as well as thorough semantic and pragmatic analyses of the French connectives *parce que*, *donc* and *et*. Argumentative uses of *parce que* will be analysed in terms of epistemic use, which obliges the causal relationship to be compatible with the conclusion-argument order imposed by argumentative relationships. Finally, the semantic and pragmatic status of *parce que*, *donc* and *et* will be defined in terms of semantic entailment, implicature and explicature.

Key words: causality, *parce que*, entailment, implicature, explicature

0. Introduction

Causal relationships in discourse exhibit a specific linguistic property: the order of the discourse segments, as indicated by causal connectives, is not iconic; that is, it does not reproduce the order of events in the world. Causal order in discourse is in fact non-iconic, because it reproduces a consequence-cause order rather than the iconic cause-consequence order.

Non-iconic order appears to be universal in natural languages. Diessel & Hetterle (in press) argue that temporal and conditional clauses are predominantly initial (45%) or mixed (initial and final for 53,3%), whereas causal adverbial clauses show a very different distribution among languages: 45% are final, 30% are mixed, and only 25% are initial. This general data,

obtained using precise corpus-based, statistical and typological parameters, empirically illustrates one of the main areas of research that is currently being done in the Linguistics Department of the University of Geneva¹. This research, known as the CAUSE project, is based on four main issues:

1. A theoretical issue: what are the main criteria that define causal relationships in discourse? According to the theoretical perspective, it can be hypothesised that the order criterion (cause-consequence as opposed to consequence-cause) is the most relevant one. The CAUSE researchers claim, moreover, that the order criterion is not merely a general property of natural languages, and that it is widespread in languages of the world: our findings suggest that it is connected to a cognitive criterion.

2. A descriptive issue: How do pragmatic markers such as *parce que* (French), *because* (English), *perque* (Italian), etc. contribute to the expression of causality in discourse? This issue is particularly relevant when seen in light of the theoretical one: causal relationships can be expressed both with and in the absence of connectives.

3. A computational issue: which properties of explicit and implicit causal relationships in discourse must be identified in order for the listener to automatically extract causal relationships? In other words, do issues 1 (non-iconic order) and 2 (connectives) give enough information for a causal relationship among discourse segments to be detected?

4. An experimental issue: Can the backward orientation of causal discourse be tested? Can this inferential orientation be supported in terms of cognition?

Issues 3 and 4 will not be considered in this paper, primarily because they are still being investigated, and because they are specifically treated in the doctoral theses of Cécile Grivaz and Joanna Blochowiak. Issues 1 and 2, on the other hand, will be extensively explored.

Section 1 presents the main hypothesis of the CAUSE project, which asserts that causal discourse is consequence-cause ordered. Section 2 presents a linguistic argument based on the classic distinction between the causal *parce que* and the pragmatic, inferential or epistemic and speech act *parce que*. Section 3 further develops this argument, basing its claims on the systematic distribution of the causal *parce que*, the inferential *donc* and the temporal *et*.

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Section 4 gives a formal analysis of these connectives, whereas section 5 presents an innovative analysis of causal, temporal and inferential connectives. Section 6 proposes a new analysis of the argumentative uses of *parce que*, and defines their specific epistemic uses. Finally, section 7 addresses the nature of the pragmatic content triggered in causal relationships by connectives such as *parce que*, *donc* and *et*.

1. The main hypothesis

As mentioned above, the main hypothesis of the CAUSE Project is that consequence-cause order is often found in causal discourses. This order is known as non-iconic, because it does not reflect the order of events in the world. This hypothesis holds that causal discourses are about states of affairs, mainly between eventualities; that is, events and states.

Discourses (1)-(4) illustrate causal discourses between an event and an event (1), an event and a state (2), a state and an event (3) and a state and a state (4). It is a striking fact that these discourses are causal both with a causal connective such as *parce que* (*because*), as in (a) and in the absence of in this causal connective, as in the (b) sentences.

(1) a. Jean est tombé parce que Marie l'a poussé.

'John fell down because Mary pushed him.'

b. Jean est tombé. Marie l'a poussé.

'John fell down, Mary pushed him.'

(2) a. Le médecin soigne Axel parce qu'il est malade.

'The doctor is treating Axel because he is ill.'

b. Le médecin soigne Axel. Il est malade.

'The doctor is treating Axel, he is ill.'

(3) a. Axel est malade parce qu'il a trop mangé.

'Axel is ill because he ate too much.'

b. Axel est malade. Il a trop mangé.

'Axel is ill, he ate too much.'

(4) a. Marie ne peut pas boire d'alcool parce qu'elle est mineure.

'Mary cannot drink alcohol because she is underage.'

b. Marie ne peut pas boire d'alcool. Elle est mineure.

'Mary cannot drink alcohol, she is underage.'

It is interesting to note that in the first series of examples (Annex A) the causal, explanatory reading is the only possible reading, both with and in the absence of a connective. This fact raises the following question: what type of semantic contribution does a connective like *parce que* make to the interpretation process? Although *parce que* is an explicit signal indicating that the segment which follows IS the cause, it would seem when considering the canonical non-iconic order, that the semantic contribution of *parce que* is weaker than its original semantic content.²

This first property is in fact not immediately apparent. Another use of *parce que*, when fronted, as in (5), is that it conveys the iconic cause-consequence order, but with a very strong pragmatic effect: the causal proposition is clearly in a topic position (that is, in the position of old information), which seems rather strange for a causal and explanatory report:

(5) a. Parce que Marie a poussé Jean, il est tombé.

'Because Mary pushed John, he fell down.'

b. Parce qu'Axel est malade, le médecin le soigne.

'Because Axel is ill, the doctor is treating him.'

c. Parce que Axel a trop mangé, il est malade.

'Because Axel ate too much, he is ill.'

d. Parce que Marie est mineure, elle ne peut pas boire d'alcool.

'Because Mary is underage, she cannot drink alcohol.'

Although a fronted causal clause is possible in French for a temporal clause introduced by *quand* or *lorsque*, the fronted clauses in (5) are odd. The fronted causal clause is more

² A diachronic fact about *parce que* should be noted: there seems to be some confusion about its spelling and general meaning. An interesting example appears in the preface of Rabelais' *Pantagruel*: "Mieux est de ris que de larmes escrire. Pour ce que rire est le propre de l'homme." (*Mieux vaut écrire sur le rire que sur les larmes. Parce que le rire est le propre de l'homme*, 'It is better to write of laughter than of tears. For laughter is the defining quality of mankind.'). *Parce que* is expressed through *pour ce que*, that is a final as opposed to an explanatory reading.

acceptable when the cause is not stereotypical; that is, when the causal scenario is not a typical one. (6) is better than (5a), for instance, although it gives rise to a very different scenario: Mary pushed John BECAUSE he fell before, which is not a typical causal push-fall relationship, and thus belongs to a non-stereotypical scenario.

(6) Parce que Jean est tombé, Marie l'a poussé.

'Because John fell, Mary pushed him.'

It is now possible to ask what happens when the canonical cause-consequence order is used. Let us examine examples (7) to (10), which demonstrate the cause-consequence (or iconic) order:

(7) a. # Marie a poussé Jean parce qu'il est tombé.³

'Mary pushed John because he fell down.'

b. Marie a poussé Jean. Il est tombé.

'Mary pushed John. He fell down.'

(8) a. # Axel est malade parce que le médecin le soigne.

'Axel is ill because the doctor is treating him.'

b. Axel est malade. Le médecin le soigne.

'Axel is ill. The doctor is treating him.'

(9) a. # Axel a trop mangé parce qu'il est malade.

'Axel ate too much because he is ill.'

b. Axel a trop mangé. Il est malade.

'Axel ate too much. He is ill.'

(10) a. # Marie est mineure parce qu'elle ne peut pas boire d'alcool.

'Mary is underage because she cannot drink alcohol.'

b. Marie est mineure. Elle ne peut pas boire d'alcool.

'Mary is underage. She cannot drink alcohol.'

³ The # sign indicates that the reading has shifted from a consequence-cause to a cause-consequence order.

All of these examples result in very odd causal readings (#) if the consequence-cause order - the non-iconic causal order - is maintained. Strangely enough, although this plausible (although improbable) reading is possible in the (a) sentences including the connective *parce que*, it is impossible in the (b) sentences, all of which must be read inferentially; that is, in a cause-consequence order.

An inferential reading is, however, the most relevant reading in the presence of *parce que*. Sweetser (1990) has argued in favour of a link between the causal and the epistemic (or inferential) because in English for many years, as illustrated in her explanation of the examples in (11):

- (11) a. John came back because he loved her.
b. John loved her, because he came back.

“In the first example, [11a], his love was the real-world cause of his coming back. (...) Example [11b] does not most naturally mean that the return caused the love in the real world; in fact, under the most reasonable interpretation, the real-world causal connection could still be the one stated in [11a], though not necessarily. Rather, [11b] is normally understood as meaning that the speaker’s knowledge of John’s return (as a premise) causes the conclusion that John loved her.” (Sweetser 1990: 77).

An epistemic or inferential reading of *parce que* is rather odd, as it could be hypothesised that since the iconic order with *because* is possible, it should also be the canonical order for this type a causal relationship. In other words, why are causal relationships different from inferential ones?

This question can be answered in two ways. The first argument, a linguistic one, demonstrates that the causal *parce que* takes wide scope, including not only the proposition it introduces, but also the causal relationships between propositions. The second argument is linked to the behaviour of temporal and inferential connectives, like *et* (*and*) and *donc* (*therefore*). These arguments result in a surprising fact: *parce que* can only introduce a cause in the consequence-cause order.⁴

⁴ I will not address here an argument that is stronger but more difficult to prove, based on results of time-reading of causal and consequential propositions in cause-consequence and

2. Some basic semantic properties of *parce que*

It was demonstrated some time ago (Groupe λ -1 1975) that the causal *parce que* is a function that takes two propositional arguments (the cause and the consequence), and that the causal predication is within the scope of negation and question. In other words, when a *parce que*-clause is preceded by a negation or embedded in a question, the scope of the negation is the causal link, as is the topic of the question. (12a) can be completed by an alternate explanation (12b), as well as topicalized in a *parce que*-cleft sentence, as shown in (12c).

(12)a. Jean n'est pas tombé parce que Marie l'a poussé.

'John did not fall down because Mary pushed him.'

b. Jean n'est pas tombé parce que Marie l'a poussé, mais parce qu'il ne regardait pas où il mettait ses pieds.

'John did not fall down because Mary pushed him, but because he did not watch his step.'

c. Ce n'est pas parce que Marie l'a poussé que Jean est tombé, mais parce qu'il ne regardait pas où il mettait ses pieds.

'It is not because Mary pushed John that he fell down, but because he did not watch his step.'

The same phenomenon can be observed with questions. (13a) asks whether the causal relationship is true; that is, whether Mary having pushed John is the correct explanation for his falling down. (13b), on the other hand, shows that the cleft-construction can also be embedded in a question:

(13) a. Est-ce que Jean est tombé parce que Marie l'a poussé?

'Did John fall down because Mary pushed him?'

b. Est-ce que c'est parce que Marie l'a poussé que Jean est tombé?

'Is it because Mary pushed John that he fell down?'

consequence-cause orders. See Moeschler et al. (2006) for a detailed presentation of a series of experiments.

When *parce que* has a pragmatic reading; that is, when it introduces a justification rather than an explanation⁵, the scope of negation and interrogation is no longer the entire causal relationship, but the proposition preceding *parce que*; that is, the matrix sentence:

(14) a. Marie n'est pas malade, parce que je l'ai vue au travail aujourd'hui.

'Mary is not ill, because I saw her at work today.'

b. Est-ce que Marie est malade? Parce que je ne l'ai pas vue au travail aujourd'hui.

'Is Mary ill? Because I did not see her at work today.'

The following questions must now be asked: What happens when *parce que*, as in examples (7a) to (10a), introduces the consequence rather than the cause? In other words, what is the behaviour of *parce que* in negation and question tests? The answer is not surprising: *parce que* behaves exactly like the pragmatic *parce que* in (14). Examples (15) and (16) confirm this fact:

(15) a. Marie n'a pas poussé Jean, parce qu'il n'est pas tombé.

'Mary did not push John, because he did not fall down.'

b. # Marie n'a pas poussé Jean parce qu'il n'est pas tombé.

'Mary did not push John because he did not fall down.'

c. # C'est parce qu'il n'est pas tombé que Marie n'a pas poussé Jean.

'It is because John did not fall down that Mary did not push him.'

(16) a. Est-ce que Marie a poussé Jean? Parce qu'il n'est pas tombé.

'Did Mary push John? Because he did not fall down.'

b. # Est-ce que Marie a poussé Jean parce qu'il n'est pas tombé?

'Did Mary push John because he did not fall down.'

⁵ The word 'justification' is borrowed from Groupe λ -I terminology: it simply means that the relationship is pragmatic and metarepresentational rather than semantic. This example is similar to the speech act uses of *because* described by Sweetser (1990: 77): "Going a step further, [What are you doing tonight, because there's a good movie on] would be a totally incomprehensible sentence if the conjunction were understood in the content domain. (...) Rather, the because-clause gives the cause of the speech act embodied by the main clause."

c. # Est-ce que c'est parce que Jean n'est pas tombé que Marie l'a poussé?

'Is it because John did not fall down that Mary pushed him?'

In (15), readings (b) and (c) clearly make incorrect use of the cause-consequence relationship. Negation can therefore be said to take narrow scope, restricted to the negated proposition, exactly like in the justification of pragmatic use. In (16), readings (b) and (c), which involve questions, are also strange, and the only possible reading is given in (16a).

What are the implications of this basic analysis? It can be concluded that when *parce que* is used in a cause-consequence order, its epistemic or inferential meaning, rather than its causal meaning, predominates. In cases such as these, *parce que* is merely connected to the indication of a causal relationship, and provides no further information.

Parce que would seem, in other words, to have two types of content: conceptual causal content, and procedural or directional content. *Parce que* is a typical example of a backward causal connective.

3. Temporal and inferential connectives

A strong argument has been given in favour of the consequence-cause order in causal discourse. This argument is not complete, however, because it has not yet been shown that there is a fundamentally different meaning, at least as far as connectives are concerned, between the cause-consequence order and the consequence-cause order. Empirical rather than theoretical proof - proof that is robust enough to be tested – must be provided. This proof is necessary because when the semantics of inferential and causal discourses are compared, they seem to be identical at first glance. For instance, any consistent semantic theory should predict that (17a) and (17b) will have the same truth-functional meaning:

(17) a. Jean est tombé dans un précipice. Il s'est cassé la jambe.

'John fell from a precipice. He broke his leg.'

b. Jean s'est cassé la jambe. Il est tombé dans un précipice.

'John broke his leg. He fell from a precipice.'

Interestingly enough, the pragmatic meaning in (17) can be made explicit by the temporal and causal relationships given in (18):

- (18) a. PAST[JOHN FALLS] < PAST[JOHN BREAKS HIS LEG]
b. PAST[JOHN FALLS] CAUSE PAST[JOHN BREAKS HIS LEG]

Although (17a) and (17b) have the same truth conditions, they do not have the same pragmatics. An easy way to test this fact is to ask which question they answer. It is clear that (17a) answers question (19a) and not question (19b), whereas it is the other way around for (17b):

- (19) a. Qu'est-ce qui est arrivé à Jean?
'What happened to John?'
b. # Pourquoi Jean est-il tombé dans un précipice?
'Why did John fall from a precipice?'

- (20) a. Pourquoi Jean s'est-il cassé la jambe?
'Why did John break his leg?'
b. # Qu'est-ce qui est arrivé à Jean?
'What happened to John?'

In other words, question (19a) requires answer (21), and question (20a) requires answer (22):

- (21) Qu'est-ce qui est arrivé à Jean? Il s'est cassé la jambe.
'What happened to John? He broke his leg.'

- (22) Pourquoi Jean s'est cassé la jambe? Parce qu'il est tombé dans un précipice.
'Why did John break his leg? Because he fell from a precipice.'

Now that a method for distinguishing between the pragmatics of inferential and causal discourses has been provided, it is possible to demonstrate that inferential and temporal connectives do not have the same behaviour and do not result in the same readings as causal connectives. This demonstration, shown in Annex B, uses the same basic examples with aspectual combinations and both consequence-cause (causal) and cause-consequences (inferential) orders.

Annex B contains the main distributions of *donc* and *et*. These connectives can be used in the cause-consequence order (series 3 and 4), while *donc* can only be used in the consequence-

cause order. The oddness of the non-iconic order when *et* is used can be easily explained. *Et* can receive a richer explicature (Carston, 2002); that is, a temporal pragmatic meaning, which is incompatible with a backward interference reading, or a causal reading in the consequence-cause order (see Wilson & Sperber, 1998; and Bar-Lev and Palacas, 1980 for a similar semantic constraint on *and*). The consequence-cause order with *donc*, which is identical to the canonical non-iconic order of *parce que*, is more difficult to explain. This crucial point will be addressed later. For the moment, I will explore the iconic order in the presence of *donc* and *et*. *Et* should be compatible with a causal reading in the iconic order, and this is exactly what occurs. This reading is, nevertheless, restricted to situations in which the cause is represented by an event. When the cause is a state, the reading is either inferential or odd. Example (23) shows the classic causal reading in the presence of *et*, while (24) demonstrates the non-causal reading:

(23) a. Marie a trop mangé, et elle est malade.

‘Mary ate too much, and she is ill.’

b. Marie a poussé Jean, et il est tombé.

‘Mary pushed John, and he fell down.’

(24) a. Marie est mineure, et elle ne peut pas boire d’alcool.

‘Mary is underage, and she cannot drink alcohol.’

b. ? Axel est malade, et le médecin le soigne.

‘Axel is ill, and the doctor is treating him.’

The *donc* case is very interesting, because it should be the case that the cause-consequence order typically follows this inferential connective, and that a causal reading can be inferred. If this is true, the initial hypothesis - that causal discourse is non-iconic – would need to be significantly revised or abandoned. When examining the systematic distribution of *donc* in the cause-consequence order, it is surprising to discover that a causal reading is only possible when the cause is a state (25). From this point of view, *donc* is the opposite of *et*, and it follows that a causal iconic reading cannot be expressed by a single specialised connective. Series 3 shows that when the cause is an event, as in (26), the reading is no longer causal, but inferential:

(25) a. Marie est mineure, donc elle ne peut pas boire d'alcool.

'Mary is underage, therefore she cannot drink alcohol.'

b. Axel est malade, donc le médecin le soigne.

'Axel is ill, therefore the doctor is treating him.'

(26) a. # Marie a trop mangé, donc elle est malade.

'Mary ate too much, therefore she is ill.'

b. # Marie a poussé Jean, donc il est tombé.

'Mary pushed John, therefore he fell down.'

Examples (25a-b) are causal: in (25a), a causal rule connects being underage and being forbidden to drink alcohol; in (25b), there is a cause-consequence relationship between a state (being ill) and a consequent event (being treated by a doctor) which can be made explicit in a causal chain connecting events and states.

In (26), however, things are different. It is possible to represent causal rules connecting eating too much and being ill, and pushing and falling, as shown in (27):

(27) a. $\lambda x[\text{eat_too_much}(x) \text{ CAUSE sick}(x)]$

b. $\lambda x \lambda y[\text{push}(x,y) \text{ CAUSE fall}(y)]$

If these rules are accessible, the causal relationship, according to its semantics, does not entail that if the cause is true, the consequence will necessarily happen. We could imagine that it is true that Mary ate too much, and that it is true that Mary pushed John, but no logical consequence can be drawn from these statements. In these cases it could also be the true that Mary is not ill and that John did not fall down. The main argument for these facts is that the speaker in (26) uses the connective *donc*: its presence indicates that the consequence is an inference drawn by the speaker. In other words, the speaker believes that the consequence is true.

This very crucial semantic difference can be shown by adding epistemic modals to (26):

(28) a. Marie a trop mangé, donc elle doit être malade.

'Mary ate too much, therefore she must be ill.'

b. Marie a poussé Jean, donc il doit être tombé.

'Mary pushed John, therefore he must have fallen down.'

When *parce que* is used, however, the result is different: the epistemic modification of the consequence is odd, as shown in (29):

(29) a. Marie doit être malade parce qu'elle a trop mangé.

‘Mary must be ill because she ate too much.’

b. Jean doit être tombé parce que Marie l’a poussé.

‘John must have fallen down because Mary pushed him.’

The meanings of the utterances have now changed. In (28), the epistemic modality takes narrow scope; that is, it is restricted to the consequence. The meaning of (28a) is therefore that it is probable that Mary is ill, and the cause is that she ate too much. However, in (29), the epistemic modality takes wide scope. The consequence is factive, and the epistemic meaning introduced by the epistemic modality scopes over the causal relationship. (30) makes explicit the meaning that was inferred by *donc* in (28b), while (31) makes explicit the *parce que* meaning in (29b):⁶

(30) CAUSE [MARY PUSHED JOHN, POSSIBLE [JOHN FELL DOWN]]

(31) POSSIBLE [CAUSE [MARY PUSHED JOHN, JOHN FELL DOWN]]

The final example, which is the most surprising, will now be examined. What happens when inferential and temporal connectives in the canonical non-iconic order (that is, in the consequence-cause order) are used? It should be recalled that in the iconic order, either *et* (for events as causes) or *donc* (for states as causes) is required to do the job done by *parce que* in the non-iconic order. Nor should it be forgotten why *et* is incompatible with the non-iconic order: *et* has no causal power by itself, and it has long been observed that *and* is incompatible in P and Q with a backward reading; that is, that it cannot entail $Q > P$.⁷ As Bar-Lev and Palacas (1980) clearly showed, there is a semantic constraint on *and*: the second conjunct cannot temporally precede the first one.

⁶ This is a consequence of a generalisation made explicit in Moeschler (2007), according to which the semantics of connectives and logical constants take wide scope on their arguments, whereas their pragmatics takes narrow scope.

⁷ The same is true for *et*.

What occurs when *donc* is used? As Series 5 (Annex B) surprisingly shows, all combinations are possible in the non-iconic order, as seen in (32):

(32) a. Marie ne peut pas boire d'alcool, donc elle est mineure.

'Mary cannot drink alcohol, therefore she is underage.'

b. Le médecin soigne Axel, donc il est malade.

'The doctor is treating Axel, therefore he is ill.'

c. Marie est malade, donc et elle a trop mangé.

'Mary is ill, therefore she ate too much.'

d. Jean est tombé, donc Marie l'a poussé.

'John fell down, therefore Mary pushed him.'

The reading is inferential in all these examples: the speaker is able to infer a cause from a state or an event. Here again, he may be misled or be mistaken. For instance, it may be true that John fell down not because Mary pushed him, but because he didn't watch his step. The same truth-conditional test can be done: by introducing an epistemic modality before the cause in (32d):

(33) Jean est tombé, donc Marie a dû le pousser.

'John fell down, therefore Mary must have pushed him.'

The epistemic modality expressed by the verb *devoir* (a *dû*) is clearly about the possibility of the event that caused John to fall down. What happens if an epistemic modality is placed before the event-predicate introduced in a *parce que*-clause?

(34) Jean est tombé parce que Marie a dû le pousser.

'John fell down because Mary must have pushed him.'

Here again, the wide scope reading of the logical form given in (31) is involved.

The following question must now be asked about *donc*: how can an inferential reading result from a non-iconic order? One possible explanation is the following: *donc* is a strong inferential connective whose scope is a conjecture about a fact. One possible target of this inference could be a consequence, but in this case, the consequence would be either obvious or uncertain. It is therefore much more fruitful to conjecture a possible cause when no

information about the actual cause is accessible. A formal representation of these conclusions will be given in the next section. For the moment, I will present a general picture of the analysis of causal, inferential and temporal connectives, as seen in Table 1.

Insert Table 1 here

What conclusions can be drawn from Table 1? It can be observed that a causal reading is completely guaranteed by only one connective, *parce que*, and that when *parce que* is used, the cognitive cost is to process sentences in the non-iconic order. In other words, *parce que* guarantees that a causal relationship is at stake, but seriously jeopardises the non-iconic order. When iconic order is used, one of two connectives is necessary to convey the causal reading: (i) *donc*, when the cause is a state, and (ii) *et* when the cause is an event. *Parce que* can also be used in an iconic order; that is, in an inferential and epistemic way.

The general picture given in Table 1, therefore, is that *parce que* is the best way to insure a causal reading. It appears that there is no linguistically conventional way to insure an iconic causal reading, as Diessel & Hetterle (in press) demonstrate in their typological analysis. The first and very important conclusion to have been reached here is that there is in fact no forward causal connective in natural languages.

4. A formal analysis of French connectives

Some logical and pragmatic properties of connectives have been referred to implicitly in section (3). I will now explore these properties more explicitly, presenting a robust truth-functional analysis of causal, inferential and temporal connectives in French. The theoretical background on which my arguments are based is the classic distinction in pragmatics between truth-functional aspects of meaning - which belong to the domain of semantic entailment - and pragmatic non-truth-functional aspects of meaning, which rely on implicature.

What are the entailments conveyed by causal, inferential and temporal discourses? I propose the following:

1. In causal discourses, *parce que* entails the truth of the discourse segments; that is, the cause and the consequence, as stated in (35):

$$(35) P \text{ parce que } Q \rightarrow (P \wedge Q)$$

The nature of this entailment is not clear, however. When a speaker uses *parce que* to connect two propositions, is the conjunction ($P \wedge Q$) an entailment or a presupposition? In other words, are these propositions true as logical consequences or as background information? The classic logical explanation cannot clearly answer this question. An experimental procedure must be used to obtain an answer.

2. The conjunction of the two propositions is not guaranteed in inferential discourses:

$$(36) P \text{ donc } Q \leftrightarrow (P \wedge Q)$$

More specifically, a *donc* inferential relationship entails the first conjunct and a possible (epistemic) second conjunct, as stated in (37):

$$(37) P \text{ donc } Q \rightarrow (P \wedge \Diamond Q)$$

This formalisation is the formal counterpart of my analysis of the scope of modal operators in the second conjunct with *donc*.

3. In temporal discourses (*et*), the conjunctive implication is guaranteed, although the causal implication is not always involved (38). A causal relationship is one possible relationship, whereas *parce que* is conventionally associated with a causal relationship such as in (39):

$$(38) P \text{ et } Q \rightarrow (P \wedge Q) \wedge \Diamond(P \text{ CAUSE } Q)$$

$$(39) P \text{ parce que } Q \rightarrow (P \wedge Q) \wedge (Q \text{ CAUSE } P)$$

4. Inferential discourse does not guarantee a causal relationship, as example (26) shows. This demonstrates that a consequential as well as a causal relationship is possible:

$$(40) P \text{ donc } Q \rightarrow (P \wedge \Diamond Q) \wedge \Diamond(P \text{ CAUSE } Q)$$

Table 2 examines these truth-functional relationships:

Insert Table 2 here

It is now easy to formulate a conclusion. Causal discourse, conveyed by *parce que*, implies the truth of its conjunct and a backward causal relationship. Compared to the information triggered by *donc* and *et*, this information is much more complex. It is in fact the most complex semantic relationship that can be conveyed by a connective.

Now that the semantics of *parce que* have now been given, it is necessary to go one step further and to explain why a connective like *parce que* can have very complex uses, one of which is its argumentative use.

An example of argumentative use, which will be analysed in section 5, is as follows:

(41) Le Concorde ne s'arrêtera pas vraiment, parce qu'il ne sortira jamais de l'imaginaire des hommes.

'The Concorde will not really stop flying, because it will never leave people's imagination.'
(Jean-Cyril Spinetta, President of AirFrance)

The next section will show why such an odd and unlikely juxtaposition is possible.

5. *Parce que*, causality and argumentation

It has long been recognised that *parce que* has an argumentative use: when it is used in this way, *parce que* introduces an argument rather than a cause. Example (42) is typical of argumentative use:

(42) Je ne veux pas manger les broccoli, parce que j'aime pas ça.

'I don't want to eat this broccoli, because I don't like it.'

It is interesting to note that when it is used argumentatively, *parce que* appears to be very different from its causal use. When it is used argumentatively, *parce que* introduces an argument. The clause that precedes *parce que* is the conclusion upheld by the argument. In its causal use, on the other hand, *parce que* introduces a cause and is followed by a consequence. Moreover, the causal connection between cause and consequence can be explained through a causal chain. Causes precede consequences in a string of events and states, which are always accessible when a causal reading is accessible. On the contrary, arguments and conclusions are not eventualities that follow each other in causal chains; they are propositions. Arguments have varying degrees of strength in argumentative scales: the stronger the argument, the

stronger the conclusion (Anscombre & Ducrot, 1983; Moeschler & Reboul, 1994; Moeschler, 2006).

In order to explain the argumentative uses of *parce que*, it is first necessary to find a way of linking argumentation and causality. This section suggests a new way of converting causal relationships into argumentative ones. The general idea is to alter the direction of the consequence-cause order to obtain the correct result. In other words, argumentative uses are epistemic uses of *parce que*, which guarantee the causal relationship defining its semantics. How can the argumentative analysis be introduced into this analysis? According to the classic linguistic argumentative analysis (Anscombre & Ducrot, 1983), the test for attributing an argument status to an utterance is the adjunction of the argumentative operators *presque* (*almost*) or *même* (*even*), which respectively convey positive orientation and argumentative force.

Although utterances (43) are argumentative - the adjunction of *presque* or *même* gives argument status to the clauses they introduce - the addition of *parce que* is incompatible with these argumentative operators (44):⁸

(43) a. La Suisse ne méritait pas d'être éliminée de l'EuroFoot: elle a presque gagné contre la Turquie.

'Switzerland should not have been eliminated from the EuroFoot Tournament: they almost beat Turkey.'

b. La Suisse aurait pu gagner l'Euro : elle a même battu la meilleure équipe du tournoi.

'Switzerland could have won the EuroFoot Tournament: they even beat the best team of the tournament.'

(44) a. ? La Suisse ne méritait pas d'être éliminée de l'Euro, parce qu'elle a presque gagné contre la Turquie.

'Switzerland should not have been eliminated from the EuroFoot Tournament, because they almost beat Turkey.'

b. ? La Suisse aurait pu gagner l'Euro, parce qu'elle a même battu la meilleure équipe du tournoi.

⁸ Cf. Moeschler & Reboul (1994: chapter 10) for a description of argumentative orientation and force.

‘Switzerland could have won the EuroFoot Tournament, because they even beat the best team of the tournament.’

On the other hand, when it is used without *presque* or *même*, *parce que* is acceptable, as shown in (45):

(45) a. La Suisse ne méritait pas d’être éliminée de l’Euro, parce qu’elle a gagné contre la Turquie.

‘Switzerland should not have been eliminated from the EuroFoot Tournament, because they beat Turkey.’

b. La Suisse aurait pu gagner l’Euro, parce qu’elle a battu la meilleure équipe du tournoi.

‘Switzerland could have won the EuroFoot, because they beat the best team in the tournament.’

A conflict between two properties occurs in these examples: one of the properties gives an argument, which is made explicit by *presque* and *même*, while the other gives an explanation, which is made explicit by *parce que*.

When the semantic and pragmatic properties of *parce que* and the properties of the argumentative relationship are taken into account, the following analysis can be derived:

- i. *Parce que* introduces a cause or an explanation.
- ii. An argumentation is a relationship between an argument and a conclusion.

Therefore, if *parce que* is causal and argumentative, two relationships should be true:

(46) a. CONSEQUENCE *parce que* CAUSE (causal *parce que*)

b. CONCLUSION *parce que* ARGUMENT (argumentative *parce que*).

In other words, the argumentative *parce que* introduces an argument. Because of the oddity of (44), the following questions become relevant: Can a cause be an argument? Can an explanation be an argument? In other words, is explaining synonymous to arguing for?

The answer is clearly no. Now, this answer must be justified, and I will do so with a definition of what an explanation is (Blochowiak, 2007 for a profound examination of explanations). An

explanation is basically an answer to a why-question. To demonstrate the relationship between explanation and argumentation, I use the following fictitious situation.

Suppose that only a few of my students pass their pragmatics exam.⁹ The explanation that my class is too difficult for BA students could be put forward. Utterances (47) are appropriate descriptions of this situation:

(47) a. Peu d'étudiants de Jacques ont réussi leur examen de pragmatique. Son cours est trop difficile pour des étudiants de BA.

'Only a few of Jacques' students passed their pragmatics exam. His class is too difficult for BA students.'

b. Peu d'étudiants de Jacques ont réussi leur examen de pragmatique parce que son cours est trop difficile pour des étudiants de BA.

'Only a few of Jacques' students passed their pragmatics exam because his class is too difficult for BA students.'

c. Peu d'étudiants de Jacques ont réussi leur examen de pragmatique. Pourquoi? Parce que son cours est trop difficile pour des étudiants de BA.

'Only a few of Jacques' students passed their pragmatics exam. Why? Because his class is too difficult for BA students.'

d. Pourquoi peu d'étudiants de Jacques ont-ils réussi leur examen de pragmatique? Parce que son cours est trop difficile pour des étudiants de BA.

'Why did only a few of Jacques' students pass their pragmatics exam? Because his class is too difficult for BA students.'

Suppose now that someone would like to prove rather than explain that my class is too difficult: his argument could not use the explanation given in the previous examples (the class is too difficult), because the fact that only a few students passed would then become an argument for the conclusion that the class is too difficult. In this situation, the way to express this relationship explicitly would be to use the connective *donc* (*therefore*), as in example (48), which implies the argumentative relationship given in (49):

(48) Peu d'étudiants de Jacques ont réussi leur examen de pragmatique. Donc son cours est trop difficile.

⁹ In fact, almost all my students passed their exams!

‘Only a few of Jacques’ students passed their pragmatics exam. Therefore his class is too difficult.’

(49) ARGUMENT [only a few students passed] \wedge CONCLUSION [Jacques’ class is too difficult]

The paradox of the situation represented in (48) and (49) is that the argumentative relationship is exactly the same as the explanatory situation given in (47). Is it possible to change the argumentation in (50) into an utterance containing *parce que*? This can indeed be done, but the result is surprising because the relationship given in (50) is causal in (51) rather argumentative, as shown in (51):

(50) Peu d’étudiants de Jacques ont réussi leur examen de pragmatique, parce que son cours est trop difficile.

‘Only a few of Jacques’ students passed their pragmatics exam, because his class is too difficult.’

(51) CONSEQUENCE [only a few students passed] \wedge CAUSE [Jacques’ class is too difficult]

Unfortunately, a contradiction arises between what the classic argumentative analysis hypothesises – that *parce que* introduces an argument as in (50) – and what the pragmatic analysis predicts – that *parce que* introduces a cause as in (51). The argumentative use of *parce que* does not allow a cause to also be an argument. On the contrary, it requires that the cause also be a conclusion. In other words, causes introduced by *parce que* are conclusions rather than arguments.

How could this data be changed to preserve the similarity between the causal and argumentative analyses? The next step in the demonstration consists in inverting the order of the discourse segments, as in (52):

(52) Le cours de Jacques est trop difficile pour des étudiants de BA, parce que peu d’étudiants ont réussi leur examen de pragmatique.

‘Jacques’ class is too difficult for BA students, because only a few students passed their pragmatics exam.’

Strangely enough, (52) confirms the common sense representation of argumentation: *parce que* indeed introduces an argument in this example:

(53) CONCLUSION [Jacques' class is too difficult] \wedge ARGUMENT [only a few students passed]¹⁰

The best possible usage, with an acceptable balance between causality and argumentation, has now been attained. *Parce que* is used epistemically, however, since (53) corresponds to the causal analysis given in (54):

(54) CAUSE [Jacques's class is too difficult] \wedge CONSEQUENCE [only a few students passed]

This conclusion confirms a previously-mentioned hypothesis (argumentations are special cases of causal relationships), although with a substantial modification: argumentative uses of *parce que*, in which *parce que* introduces an argument (54), have been proved to be epistemic and not causal.

There are, therefore, two types of *parce que* related to argumentation:

- (i) an explicative *parce que*, which introduces a cause or a conclusion;
- (ii) an epistemic *parce que*, which introduces a consequence or an argument.

It is now possible to conclude that the argumentative *parce que* is epistemic and that it introduces an argument, just as the classic theory of argumentation predicted.

What does this excursus in argumentation shows us about causality? If argumentative uses are indeed epistemic, this means that the core semantic component of causal relationships is preserved, whatever the order of the clauses. This property corresponds to a conservative relationship, which I define as follows:

¹⁰ Note that the conclusion-argument order cannot be reproduced by *donc*:

?? Les cours de Jacques sont trop difficiles pour des étudiants de BA, donc peu d'étudiants ont réussi leur examen de pragmatique.

'Jacques' class is too difficult for BA students, therefore only a few students passed their pragmatics exam.'

Conservative relationship

A relationship R is conservative if and only if R succeeds in imposing the preservation of the conceptual relationship between propositional representations, despite procedural instructions carried by linguistic markers.

Unlike temporal relationships, therefore, which can be defeated by connectives and by contextual assumptions through pragmatic accommodation (Moeschler, 2003a), causality causes accommodation to alter the causal order: non-iconic causal order becomes a more transparent iconic order in its epistemic and argumentative uses.

The final question that must be addressed is to what extent this general description of the argumentative use of *parce que* can succeed in explaining the Air France example given above (41):

(41) Le Concorde ne s'arrêtera pas vraiment, parce qu'il ne sortira jamais de l'imaginaire des hommes.

'The Concorde will not really stop flying, because it will never leave people's imaginations.'

I demonstrated some years ago (Moeschler, 2003b), that argumentation does not connect two eventualities in a single causal chain. Instead, it connects two states resulting from a causal relationship occurring in two different causal chains. My thesis, generally speaking, was that argumentation is not about events. It is instead a process that creates a specific connection between propositions that are not semantically and conceptually connected in a causal way. The Air France example was interesting in this context, although my analysis was rather unconvincing and did not lead to a general rule.

I would like now to test the prediction of the argumentative framework developed in this section. In keeping with the claim that argumentation is a special case of the epistemic use of *parce que*, the Air France example could be explained as follows: the first clause (*Le Concorde ne s'arrêtera pas vraiment*) is presented as a conclusion and *parce que* introduces an argument (*le Concorde ne sortira jamais de l'imaginaire des hommes*). As the connection between two negative clauses is difficult to understand, this analysis cannot be neither tested nor refuted. There is only one way to prove that such propositions can be connected conceptually, by asking whether it is possible to imagine any causal connection between their

positive counterparts. In other words, is the causal connection given in (55) conceptually acceptable, when it is conceptually reduced, as in (56)?

(55) Le Concorde s'arrêtera, parce qu'il sortira de l'imaginaire des hommes.

'The Concorde will stop flying, because it will leave people's imaginations.'

(56) CAUSE[stop_flying(Concorde), leave(Concorde, people's imagination)]

In other words, is there any possible causal connection between the events STOP_FLYING and LEAVING_PEOPLE'S IMAGINATIONS? Conceptually, it could be argued that when people die, friends and relatives progressively forget them and finally do not think about them any longer. On more practical grounds, it could be argued that when artefacts disappear from our lives, they are forgotten.

In other words, the argument is acceptable even if its linguistic translation is not optimal: this implies that when something disappears, it is forgotten. The argumentation of the Air France example is based on this common sense causal connection. It is surprising, however, that (56) is formulated in the negative. However, such a negative formulation cannot be given by the negative counterpart of (56), that is, (57):

(57) CAUSE[not-stop_flying(Concorde), not-leave(Concord, people's imagination)]

This formulation does not make sense: it is obviously false. The only possible conclusion, therefore, is that (56) triggers a contrapositional causal relationship, as in (58):

(58) CAUSE[not-leave(Concord, people's imagination), not-stop_flying (Concorde)]

In other words, the argumentation given in (55) is based on the forward epistemic relationship given in (56), whereas the result of the argumentation is the backward causal relationship between states, because of the negative nature of connected propositions.

It can be observed that argumentation uses different ways of connecting propositions causally: it can use a forward causal relationship between events, as in (56), or it can refer to the negative counterparts of the proposition through a negative contrapositional rule given in (59):

(59) CAUSE [P, Q] \leftrightarrow CAUSE [not-Q, not-P]

6. The pragmatic status of causal relationships

The final point to be discussed is the nature of the interpretation triggered by *parce que* and other connectives such as *donc* and *et*. What is the status of interpretations such as in (60), which reproduces the main results of the semantics of causal, inferential and temporal connectives?

(60) a. *P parce que Q* \rightarrow (P \wedge Q) \wedge (Q CAUSE P)

b. *P donc Q* \rightarrow (P \wedge \diamond Q) \wedge \diamond (P CAUSE Q)

c. *P et Q* \rightarrow (P \wedge Q) \wedge \diamond (P CAUSE Q)

These relationships are entailments, or truth-functional implications of utterances, and since they are complex conjunctive propositions, they all imply the truth of the conjuncts, as shown in (61):

(61) a. *parce que*: (i) P \wedge Q; (ii) Q CAUSE P

b. *donc*: (i) P \wedge \diamond Q; (ii) \diamond (P CAUSE Q)

c. *et*: (i) P \wedge Q; (ii) \diamond (P CAUSE Q)

Minimal semantic information is based on the conjunction given in (i), which consists of the reduced analysis of (61), as shown in (62):

(62) a. *parce que*: (i) P; (ii) Q

b. *donc*: (i) P; (ii) \diamond Q

c. *et*: (i) P; (ii) Q

Hence, from a truth-functional point of view, *parce que* and *et* are factive connectives: they both claim the truth of their conjuncts. As shown in section 3, however, *donc* is not a factive connective. When P is true, Q can be either true or false. \diamond Q is therefore not an entailment, but a conventional implicature, or a non-truth-functional aspect of meaning.

The status of the second complex proposition given in (61); that is, the causal relationship reproduced in (63), must now be investigated:

(63) a. *parce que*: Q CAUSE P

b. *donc*: \diamond (P CAUSE Q)

c. *et*: \diamond (P CAUSE Q)

It can be seen that the directional causal relationship is forward for *donc* and *et*, and that their causal reading is the only possible one, and that it presupposes a condition on the cause: The cause must be a state for *donc* and an event for *et*. This information is therefore not truth-functional, and cannot be an entailment. Since *donc* can be given another reading, the inferential reading in which the possible causal relationship is backward (\diamond Q CAUSE P) (63a) cannot be a conventional implicature¹¹. If \diamond (P CAUSE Q) is not a conventional implicature, it must then be a generalised conversational implicature, since the contents of the causal relationship do not contribute to the truth-conditional meaning of the discourse, and can be cancelled out.

The last crucial point to be defined is the status of (63a). The direction of the causal relationship can be altered in epistemic use (P CAUSE Q), which shows that (Q CAUSE P) cannot be a conventional implicature. Since P and Q are factive, they contribute to the truth-condition of the utterance. Therefore (Q CAUSE P) is an explicature of causal discourse. Table 3 sums up the semantic and pragmatic properties of simple and complex propositions triggered by *parce que*, *donc* and *et*:

Table 3 to insert

7. Conclusion

This paper has given linguistic and pragmatic arguments for the explanation of the non-iconic order of causal discourses. A discussion of the principal semantic and pragmatic properties of *parce que*, as opposed to those of *donc* and *et* – French inferential and temporal connectives – has been provided. A very strong distributional and linguistic argument in favour of non-iconic order was given, as was a pragmatic argument based on the analysis of argumentative uses of *parce que*, which manifest the same pragmatic properties as their epistemic uses. A formalisation of the semantics and pragmatics of these three connectives was given, and it was shown that the nature of the propositions conveyed varies depending upon which

¹¹ It should be recalled that conventional implicatures are detachable, conventional and non-cancellable (Grice, 1975; Sadock, 1978).

connective is used. *Parce que* is the most semantic connective, because it triggers entailments and explicatures. *Donc*, on the other hand, triggers propositions at the level of entailment and both conventional and conversational implicature. *Et* is the most pragmatic connective in that, apart from its factive property (both conjuncts are entailed), it triggers a conversational implicature that can be cancelled.

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Vitae

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Annex A: distribution of *parce que* in the consequence-cause and the cause-consequence order

Series 1: Causal discourse with a causal connective (*parce que*)

Causal readings	Consequence (E1)	
	State	Event
Cause (E2)	State	Marie ne peut pas boire d'alcool parce qu'elle est mineure. 'Mary cannot drink alcohol because she is a minor.'
	Event	Axel est malade parce qu'il a trop mangé. 'Axel is ill because he ate too much.'
		Le médecin soigne Axel parce qu'il est malade. 'The doctor is treating Axel because he is ill.'
		Jean est tombé parce que Marie l'a poussé. 'John fell down because Mary pushed him.'

Series 2: Reversed discourses including *parce que*

Inferential readings	Consequence (E2)	
	State	Event
Cause (E1)	State	Marie est mineure, parce qu'elle ne peut pas boire d'alcool. 'Mary is a minor, because she cannot drink alcohol.'
	Event	Axel a trop mangé, parce qu'il est malade. 'Axel ate too much, because he is ill.'
		Axel est malade, parce que le médecin le soigne. 'Axel is ill, because the doctor is treating him.'
		Marie a poussé Jean, parce qu'il est tombé. 'Mary pushed John, because he fell down.'

Annex B: distribution of *donc* and *et* in cause-consequence and consequence-cause order

Series 3: Reversed discourse including *donc*

Causal or inferential readings (#)		Consequence (E2)	
		State	Event
Cause (E1)	State	Marie est mineure, donc elle ne peut pas boire d'alcool. 'Mary is a minor, therefore she cannot drink alcohol.'	Axel est malade, donc le médecin le soigne. 'Axel is ill, therefore the doctor is treating him.'
	Event	#Axel a trop mangé, donc il est malade. 'Axel ate too much, therefore he is ill.'	#Marie a poussé Jean, donc il est tombé. 'Mary pushed John, therefore he fell down.'

Series 4: Reversed discourse with *et*

Causal and inferential readings (#)		Consequence (E2)	
		State	Event
Cause (E1)	State	#Marie est mineure, et elle ne peut pas boire d'alcool. 'Mary is a minor, and she cannot drink alcohol.'	? Axel est malade, et le médecin le soigne. 'Axel is ill, and the doctor is treating him.'
	Event	Axel a trop mangé, et il est malade. 'Axel ate too much, and he is ill.'	Marie a poussé Jean, et il est tombé. 'Mary pushed John, and he fell down.'

Series 5: Non-reversed discourse with *donc* and *et*

Inferential readings	Consequence (E1)	
	State	Event
	Marie ne peut pas boire d'alcool, donc/?? et elle est mineure. 'Mary cannot drink alcohol, therefore/and she is a minor.'	Le médecin soigne Axel, donc/?? et il est malade. 'The doctor is treating Axel, therefore/and he is ill.'
Cause (E2)	State	Event
	Axel est malade, donc/?? et il a trop mangé. 'Axel is ill, therefore/and he ate too much.'	Jean est tombé, donc/?? et Marie l'a poussé. 'John fell down, therefore/and Mary pushed him.'

Table 1: distribution of reading of causal, inferential and temporal connectives

	Causal reading			Inferential reading		
	<i>parce que</i> CON-CAU	<i>donc</i> CAU-CON	<i>et</i> CAU-CON	<i>parce que</i> CAU-CON	<i>donc</i> CON-CAU	<i>et</i> CON-CAU
event-event	+	-	+	+	+	-
event-state	+	-	+	+	+	-
state-state	+	+	-	+	+	-
state-event	+	+	?	+	+	-

Table 2: truth and non-truth-functional aspects of meaning triggered by causal, inferential and temporal connectives

	P	Q	$P \wedge Q$	P CAUSE Q	Q CAUSE P
<i>parce que</i>	√	√	√		√
<i>donc</i>	√	◇		◇	
<i>et</i>	√	√	√	◇	

Table 3: truth- and non-truth-functional aspects of meaning triggered by *parce que*, *donc*, and *et*

	Entailment		Implicature		Explicature
			conventional	conversational	
<i>parce que</i>	P	Q			Q CAUSE P
<i>donc</i>	P		◇Q	◇(P CAUSE Q)	
<i>et</i>	P	Q		◇(P CAUSE Q)	P < Q