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Causes as events and facts

Abstract.
The paper defends the view that *events* are the basic relata of causation, against arguments based on linguistic analysis to the effect that only *facts* can play that role. According to those arguments, causal contexts let the meaning of the expressions embedded in them shift: even expressions possessing the linguistic form that usually designates an event take a factual meaning.
However, defending events as fundamental relata of causation turns out to be possible only by attributing a - different - causal role to facts as well. The role of facts in causation is characterized as "causal responsibility". This relation, and its connection to causation between events, is clarified by way of the analysis of different inference patterns between causal statements of the two sorts: statements linking events and statements linking facts.

Causes as events and facts

Recently, objections of a new kind have been raised against the view that causes and effects are particular entities. These objections are based on results of linguistic analysis of expressions designating causes and effects. In this paper, I shall attempt to respond to these objections and in so doing defend the view that causes and effects are particulars or, more precisely, events. It should become clear that I do not intend to demonstrate positively that events are always involved in causation. The aim is only to show that the linguistic facts are compatible with that view which, I take

it, is supported on grounds independent from linguistic considerations[1].

1. Two kinds of expression designating causes

Rather than rehearsing all the results of this linguistic analysis, I shall try to show the most important differences between two basic types of expressions capable of designating causes and effects, with the help of a standard example. In English, there exist at least the following types of expressions capable of identifying as a cause of my surprise something about Mary's performing the song.

(1) Her performing the song surprised me.

(2) The performing of the song surprised me.

(3) The performance of the song surprised me.

(4) That she performed the song surprised me.

(5) The fact that she performed the song surprised me.

In (1) and (2) the cause is designated by an expression resulting from the nominalization of a verb phrase. Since Vendler (1962; 1967a; 1967b), considerable efforts have been deployed to find clear criteria to distinguish various types of nominalized expressions of English.

According to Vendler's and Bennett's (1988) results, although the five expressions designating the cause in (1) through (5) are all syntactically different, they fall semantically into two groups: the expressions (1a), (4a) and (5a) designating the cause in (1), (4) and (5) have a factual meaning, whereas the expressions (2a) and (3a) designating the

cause in (2) and (3) have an eventive meaning. I shall make the hypothesis (cf. (H2) below) that this difference in meaning can be understood as one of reference: gerundive expressions of the type of (1a) designate *facts* whereas gerundive expressions of the type of (2a) designate *events*.

(1a) her performing the song.

(2a) the performing of the song.

(3a) the performance of the song.

(4a) that she performed the song.

(5a) the fact that she performed the song.

It is quite easy to show that there is a semantical difference between the first group and the second. Imagine that Mary used to perform the song in a small club (or in her bathroom) but that she is terribly frightened by the idea of doing the same thing before a large audience, in a big concert hall. Now I learn that she performed the song for the first time, to everyone's surprise, on the stage of the Paris Opera. In this situation, statements (1), (4) and (5) are false, for it is not the fact *that* she performed the song, but the *particular circumstances under which* she did it, that are responsible for my surprise. On the other hand, statements (2) and (3) are true, for there is *something about* her performing the song that causes my surprise. The following hypothesis explains why (2) and (3) can be true although they do not explicitly state the causally relevant factor.

The expressions (2a) and (3a) designate events. Events are particulars. They have more properties than those which are explicitely named in the expressions, (2a) and (3a), designating them. In this respect, events are like objects: "My

computer" refers to my computer as a particular thing - this thing is not only a computer and mine, but also black, has a German keyboard, a defective battery and innumerable other properties. In a similar way (3a) refers to Mary's performance as a particular entity that is not only a performance of a song by Mary, but that takes place let's say on May 15th, in the Paris Opera, before an audience of 500 people, in which Mary wears a blue dress, and so on.

Designating the particular event (3a) as the cause of my surprise is less precise than designating (1a) or, equivalently, (5a) as the cause of my surprise. (2) and (3) neither say nor imply what it is about Mary's performance that was so surprising. By contrast, naming the fact (5a) as being the cause means that it is one of the properties explicitly named, or their combination, which is causally efficacious in bringing about my surprise[2], namely that it is a performance of the song and that it is by Mary.

This difference in precision with respect to the property causally efficacious in provoking the effect, i.e. my surprise, makes it possible for the two types of statement to diverge in truth value. If (2) or (3) is true, then it is possible that it is the property of taking place in a large concert hall that produced my surprise, whereas this is impossible if (1), (4) or (5) is true. As the evaluation of (2) or (3) in the imagined situation shows, an eventive statement can be true without containing any information about the efficacious property of the cause. On the other hand, a factual causal statement designates as the cause a fact which consists in *the possession of a certain property by a particular*. The factual causal

statements (1), (4) and (5) imply that it is this very property, i.e. to be her performing the song, which is efficacious in bringing about the effect, i.e. my surprise. If this property has not in fact been efficacious in bringing about the effect, as in the situation imagined, these statements are false.

Some of the most important grammatical differences between expressions with a factual meaning of the type of (1a) - from now on called "G" for "verbal gerund" - and expressions with an eventive meaning like (2a) - from now on called "P" for perfect gerund - and (3a) - from now on "D" for derived nominal - are the following[3]:

G: (1a) Her performing the song.

P: (2a) The performing of the song.

D: (3a) The performance of the song.

Expressions of types D and P, contrary to expressions of type G, can take an article (definite or indefinite), but the latter, contrary to D and P, can appear without a determinator; expressions D and P, but not G, can be modified by an adjective. By contrast, expressions of type G, but not those of types D and P, can be modified by adverbs and auxiliaries, and can be put into the past tense. G, but not P, can be negated[4].

These observations can be accounted for by the hypothesis that the nominal phrases (NP) of type G, but not the others, contain a verbal phrase (VP).

A VP cannot be modified by an article or adjectives; but it can be modified by adverbs and auxiliaries; it can be negated, and it can take tense. All these modifications are specific to

VPs. The fact that expressions of type G admit them speaks in favour of hypothesis (H1) which holds that they contain a VP. On the other hand, the fact that expressions of type D and P do not take the same kind of modifications can be most easily explained by the hypothesis that they are pure NPs, not containing a VP. D and P take precisely the sort of modifications that are typical of NPs, in particular, an article and adjectives.

Our hypothesis for the syntactical structure of the two types of gerundive expressions P and G - based on Zucchi's (1993) analysis - is the following:

> **(H1)** In English, there are two types of gerundive nominalizations of a verb phrase. Their syntaxical structure - (1a) exemplifies structure G and (2a) exemplifies structure P - is the following:
>
> (G) $[_{NP}$ $[_{NP}$ Her] $[_{VP}$ performing the song]]^5
> (P) $[_{NP}$ $[_{Det}$ The] $[_{N'}$ $[_{N}$ performing] $[_{PP}$ of the song]]]

We add a hypothesis concerning the semantic difference between expressions of type G and of type D and P:

> **(H2)** Expressions of type (G) designate facts; expressions of types D and P designate events^6.

In considering (H2) as an hypothesis of the semantics of two types of expressions of English capable of designating causes, we presuppose that the sense of the expressions occurring in it can be independently specified. (H1) indicates how the identity conditions of expressions of the kinds G, D and P can be specified in purely syntactical terms; (H2) conjectures that their meanings systematically differ according to their syntactical type. Now, (H2) can correctly be called a hypothesis, rather than a definition of the expressions "fact" and "event" only if the meaning of these terms too can be

independently specified. Whether this can be done is a difficult and controversial issue, and it is one of the aims of the present paper to help clarifying the distinction between facts and events by analysing the meaning of expressions designating these entities, when they occur in causal contexts. Nevertheless, one can also characterise them independently of the linguistic analysis of the expressions designating them. An event can be conceived as the particular entity filling some determinate portion of space-time. Events differ from ordinary objects, like tables and chairs, by the fact that the temporal boundaries of events contribute to their identity conditions whereas only the spatial boundaries of ordinary objects are an essential part of their identity conditions.

The concept of a fact is more difficult to characterise. Facts will be considered as individual entities reference to which can be made by singular expressions of type G[7]. With Fine (1982), we can distinguish three types of conceptions of facts. According to one (Ducasse 1940; Carnap 1947), facts are true propositions, according to another (Moore 1953), a fact is the truth of a proposition, i.e. a property of a proposition. In the present analysis of causal statements, the concept of facts will be taken in a third way. In our conception, facts are, to use Fine's expression, "worldly", i.e. they belong to the world, whereas in propositional conceptions, facts are descriptive of the world, rather than being part of it. I shall not try to dispute the merits of the other conceptions of facts and limit myself to the consideration of those worldly facts to which expressions of type G can make reference when they occur in nominal positions in causal statements. These facts are

complex objects which can be seen as "the result I(x,P) of applying an operation I of inherence to an individual x and property P" (Fine 1982, p. 54). What is crucial for our analysis of causation is the distinction between an event and a worldly fact. With singular terms of the appropriate type, one can make reference to both, and one can do so in particular in causal statements where these terms occupy the argument places of the cause and the effect. To put it briefly, the distinction between events and facts is this: an event is a particular which is individuated by the space-time zone it occupies but whose identity does not depend on any one of the intrinsic properties it possesses, whereas a (worldly) fact is a complex built out of a particular (event or enduring object) and one determinate property this particular possesses. We shall designate events by individual constants, like c or e, or variables like x or y, and facts by complex expressions like Fc and Ge, which stand for nominalized expressions of type G, namely c's being F and e's being G. It is true that symbolic expressions of the type of "Fc" and "Ge" are also, in other contexts, employed to represent statements expressing propositions but there should be no risk of confusion for they are never used this way in the present paper. This is also why it seems unnecessary to introduce an expression different from "fact", such as Fine's (1982) "circumstance" or Armstrong's (1997) "state of affairs", to make clear that what is meant are worldly facts, not facts of a propositional type.

Our examples given above seem to show that both types of nominalization are capable of designating causes and effects. The fact that there exist causal statements containing

expressions of both types, suggests that *both* types of expression are capable of designating causally interacting entities – whence the conclusion that language reveals the existence of *two* categories of entities playing the role of cause and effect.

We can sum up this idea by the following two hypotheses:

(H3) Gerundive nominalizations both of type G and of type P and derived event nouns of type D maintain their usual designation even when they are embedded in a causal context. As usual, expressions of type G designate facts, whereas expressions of types P and D designate events.

(H4) Causal verbs can express two different concepts. They always take two arguments. However, in the case of eventive causal statements, the argument places of the causal verb are filled by expressions designating particulars[8], whereas in the case of factual causal statements, they are filled by expressions designating facts.

The position based on hypotheses (H3) and (H4) is opposed to the most influential views on the issue. Against (H4), Davidson (1980) explains the fact that there are two kinds of causal statements by his thesis that causal statements in the proper sense are always *eventive* and that statements in which *factual* expressions occupy the positions of cause and/or effect, are in fact "rudimentary causal explanations" (Davidson 1980, p. 161) and do not directly designate causal relations. For a nominalist such as Davidson, there is nothing more in the idea of an objectively existing property than the predicate which is satisfied by a certain number of objects or events. According to Davidson, when we explain a causal relation, we do indeed something different from just designating the events related as cause and effect and stating that they are causally

related. But in pointing out what aspects of a cause make it into a cause of a given effect, a causal explanation does not, according to his view, designate any relation between non-linguistic facts: In Davidson's words, "explanations typically relate statements, not events" (*ibid.*). Pointing to the relevant aspects of the cause makes a good explanation which can be nominalistically interpreted within the model of deductive-nomological explanation. In this model, a law of nature is considered to be a well confirmed universal generalization embedded in successful theories. For a nominalist, to say that an aspect of the cause explains firstly its being the cause of an effect, *e*, and secondly *e*'s having certain aspects, because these aspects of the cause and the effect are related in virtue of a law of nature, does not imply that such an explanation makes *reference* to aspects (properties) of events or to laws of nature linking these aspects.

My main objection to Davidson's theory that gives a realist interpretation to eventive causal statements, but a nominalist interpretation to factual ones, is the existence of relations of entailment between causal statements of these two kinds. According to the analysis I shall propose (cf. section 4) these entailments can be explained by a common referential element to events in both types of statements which is supplemented in statements of the factual type by the additional reference to properties which are instantiated by the cause and the effect and to a law linking these properties. Davidson's analysis seems unable to account for relations of entailment between eventive and factual causal statements because he takes them to

express relations between entities of an entirely different ontological type: particular events in one case and statements in the other. Nevertheless, although my analysis of the semantics of factual causal statements differs from Davidson's, the opposition is not as fundamental as it might seem at first sight. It is true that my analysis does not, as Davidson's, reduce factual causal statements to explanations in the sense in which such explanations express relations between linguistic entities. It implies on the contrary that factual causal statements designate relations between non-linguistic entities, namely facts, just as eventive causal statements designate relations between events that are not linguistic entities either. But the analysis of the nature of the causal relations between facts will make clear why factual causal statements expressing these relations are particularly apt to be used for explanatory purposes, and thus ends up vindicating Davidson's thesis as to the explanatory importance of factual causal statements.

I now propose to examine in some detail some arguments questioning not Davidson's analysis of the meaning of factual causal statements, but his central thesis on causation a version of which I defend in this paper. According to this thesis, the truth of many typical causal statements implies the existence of causal relations between *events*. Horgan (1978), Mellor (1987) and Zucchi (1993) argue that linguistic analysis licenses instead the conclusion that facts are the only (at least the only fundamental) type of entities capable of interacting causally[9]. They assert that, contrary to our hypothesis (H3), causal contexts let the meaning of the

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expressions embedded in them shift: in them, even expressions possessing the linguistic form that usually designates an event take a factual meaning. If it is true, as these authors contend, that the causal context has this property, it turns out that appearances nonwithstanding, facts are the *only* type of entities which are involved in causation; events fall out of the picture.

We can certainly agree that some contexts do force factual readings on expressions which would ordinarily be eventive. Here are two kinds of example. The first is the context created by the verb "to inform". All of the following

(15) I was informed of his clumsily stealing the bicycle.

(16) I was informed of his clumsy stealing of the bicycle.

(17) I was informed of his clumsy theft of the bicycle.

are synonymous, in spite of the fact that the predicate "was informed of" takes a factual argument of type G in (15), but an eventive argument of type P in (16) and of type D in (17). The explanation is that the *meaning* of "to inform" requires that its arguments designate *facts*, not particulars, be they objects or events. This has the consequence that whenever an argument of "to inform" is *grammatically* of a type which usually designates a particular, it gets its meaning shifted. The following example shows how the meaning of a NP designating an *object*, changes.

(18) I was informed of a new post office in my street.

can only be interpreted as synonymous with

(19) I was informed that there is a new post office in my street.

A sentence containing "to inform" can only be interpreted if the meaning of its argument is taken to be factual. If the actual argument doesn't have such a meaning by virtue of its grammatical structure, the context of "to inform" forces it to take one.

The second kind of example is constituted by sentences in which an eventive expression is *negated.* Negation also has the effect of forcing a factual meaning on the negated expression. Compare

(20) The train's unexpectedly not arriving in time caused some confusion in the station.

and

(21) The unexpected non-arrival of the train caused some confusion in the station[10].

The presence of the adverb *unexpectedly* shows that

(20a) The train's unexpectedly not arriving in time

possesses structure G, which means that in ordinary circumstances it designates a fact. On the other hand,

(21a) The unexpected non-arrival of the train

is of type D, and in ordinary circumstances designates an event : "arrival" is a noun derived from the verb "to arrive"; this noun is preceded by the adjective *unexpected*. One could therefore expect that (20) et (21) differ in meaning, more precisely that (21) admits of interpretations which are excluded for (20) because (21) is eventive and (20) is factive. But this is not the case. It is impossible that (21) be true, but that the confusion in the station be caused by a property not expressed in (21a). We can explain this by making the hypothesis that the negation in (21a) has the same effect on

its meaning as the context created by "to inform". Both let the meaning of expressions of type P or D embedded in them shift: the context gives them the meaning of a fact.

Now, as I have already said, Horgan (1978), Mellor (1987) and Zucchi (1993) hold that causal contexts are of the same type as those created by "to inform" and by the negation. This can't be true in general for I have introduced the distinction between eventive and factual expressions using as an example a statement where these expressions are precisely embedded in a causal context. On this occasion, I have shown that the causal context created by "to surprise" is not such as to cancel the semantic difference between expressions of the two kinds.

What kind of evidence speaks in favor of the opposite thesis, namely the thesis according to which the causal context is like the one created by "to inform", in that the meaning of expressions embedded in it is always *factual*, independently of their grammatical form? This thesis has been defended by providing an analysis of a number of specific types of causal statements, the result being in each case that the causes and/or effects involved can only be interpreted as being facts, not as being events.

Mellor (1987), for instance, analyses both

(22) John did not die because he did not fall.

and

(23) Don's rope being the weakest caused his fall to be the first.

in this sense. According to Mellor, when a negative - as in (22) - or comparative - as in (23) - predicate constitutes the fact referred to as the cause, no event is involved in the

causal relation described by the statement. In the next two sections, I shall expose in some detail Mellor's (and Bennett's) arguments for the thesis that those are cases of causation in which no events are involved. In section 4, I then attempt to show, with the help of the distinction between causation (linking events) and causal responsibility (linking facts), that these arguments are not conclusive.

2. Negative facts and omissions as causes.

Mellor's argument is the following : there are true causal statements like (22) where the expression designating the cause contains a negated predicate. So if causes are events, the cause designated by (22) is a "negative event". But negative events don't exist - the reason being the same as for "negative objects". The argument against negative objects is simple:

(24) Italy has no King.

is true. Suppose there were a negative person making (24) true. That negative person would have contradictory properties. This is because (24) entails both

(25) Italy has no unmarried King.

and

(26) Italy has no married King.

From the fact that the hypothetical non-King makes (24) true, and that (24) entails (25) and (26), it follows that this hypothetical negative person makes both (25) and (26) true. This proves that there can be no "negative person", i.e. no non-King of Italy: if he existed, he would have to be both married and unmarried.

Mellor (1987) constructs an argument having the same logical structure which is supposed to show that causes can't be events. It is a general requirement on a correct analysis of the logical structure of action statements and causal statements, that it should explain inferences of the following kind:

(27) Don dies instantly.

entails

(28) Don dies.

According to the analysis proposed by Davidson (1967) these inferences are possible because (27) has the structure

(27-D[11]) $(\exists\, e)$ (Dying(e) & By Don(e) & Instant(e)).

where the variable e ranges over events.

As a matter of fact, (27-D) implies

(28-D) $(\exists\, e)$ (Dying(e) & By Don(e)),

where (28-D) reveals the logical structure of (28).

Similarly, Parsons' (1990) analysis of (27) yields

(27-P) $(\exists\, e)$ (Theme(Dying,e) & Patient(Don,e) & Instant(e)).

and (28) as

(28-P) $(\exists\, e)$ (Theme(Dying,e) & Patient(Don,e)).

I shall not compare the merits of Davidson's and Parsons' analysis, but rather defend a presupposition common to both, namely that one is justified analyzing both (27) and (28) by quantifying over events. My aim is to show that Mellor's and Bennett's arguments do not establish that the ontological commitment to the existence of events carried by theses analyses is misleading.

Mellor (1987, p. 208) tries to refute that presupposition, namely that Don's dying is an *event e*, by a *reductio ad absurdum* analogous to the argument about the King of Italy. He begins by observing that

(29) Don does not die.

entails both

(30) Don does not die instantly.

and

(31) Don does not die slowly.

Then he supposes that, on Davidson's (and Parsons' which is posterior to Mellor's critique) analysis, (29) entails that there is a "negative event", namely Don's non-death.

(29-M) (∃ e) (Non-dying(e) & By Don (e))

Now, such a "negative event" cannot exist because it would have to have contradictory properties. For (29) to entail (30) and (31), (29-M) must entail both

(30-M) (∃ e) (Non-dying(e) & By Don (e) & Instant (e))

and

(31-M) (∃ e) (Non-dying(e) & By Don (e) & Slow (e)).

But this shows that the Non-dying doesn't exist because it would have to have contradictory properties, namely the properties of being instant and of being slow.

Bennett's (1988) attack against events is stated in somewhat different terms. He doesn't argue that causes and effects are *never* events and *always* facts, but rather that, in his words, "the fact causation approach is superior". He offers a statement of *omission* as an example of a statement

designating a "negative cause". It is indeed frequent that we assign moral responsibility in cases like the following.

(32) "Something bad happened because a gate remained open; John could have closed it, but he didn't." (Bennett 1988, p. 140).

Depending on the circumstances, we would blame John or not "in the light of the negative fact that he did not close the gate" (Bennett 1988, *ibid.*). But, as Bennett argues convincingly, it is misleading to search for an event underlying this negative fact. The thesis that all causation is event causation seems to have the unwelcome consequence that there must be such an event : perhaps the cause of the disaster alluded to by (32) is an "act of omission" which John committed by not closing the door. Now, Bennett argues that one can bypass such obscure questions, by simply dropping the thesis that causes must always be events. It is more simple and thus more satisfying, he says, to remain within the domain of facts. John has not prevented the disaster. This *fact* gives us the reason for blaming him.

We shall return to both Mellor's and Bennett's challenge in section 4.

3. Comparative facts as causes

Comparative causes are the second type of case Mellor (1987) takes to support his thesis that causes are facts, and not events.

(23) "Don's rope being the weakest caused his fall to be the first." (Mellor 1987, p. 211).

(23) identifies both the cause and the effect to be comparative facts. Why does Mellor hold that (23) does not express, or at least imply, a relation between particulars ?

His argument in the case where cause and effect are identified by way of a comparative predicate, is the following. (23) is equivalent, Mellor says, to

(33) Don's fall is the first fall because Don's rope is the weakest rope.

Then suppose that there exists an event which is the cause of Don's fall and an event which is the effect of Don's rope being the weakest. Both "Don's fall" and "the first fall" refer to the latter event, just as both "Don's rope" and "the weakest rope" refer both to the same thing. From this Mellor infers that (33) implies all of the following:

(34) Don's fall is Don's fall because Don's rope is the weakest.

(35) The first fall is the first fall because Don's rope is the weakest.

(36) Don falls first because his rope is his rope.

(37) Don falls first because the weakest rope is the weakest rope.

But all of the statements (34) to (37) are false.

What is going on here? Mellor admits that (33) refers to particulars, but contests that one can "get from it a relevant truth of type 'c causes e'" (Mellor 1987, *ibid.*). He justifies this claim by observing that "'Don's rope being the weakest' is a nominalised sentence, not a singular term. It does more than refer to Don's rope: it asserts in the context that his rope is the weakest." (Mellor 1987, *ibid.*). Thus far I agree. My

proposal is actually based on the fact mentioned by Mellor. But I don't follow him any more when he says: "What [(33)] says is that each of two particulars satisfies two given descriptions - and that one does so because the other does. That is why this causal claim depends for its truth on how these particulars are referred to, which a report of a relation between them would not do." (Mellor 1987, pp. 211f.).

4. An analysis according to which causation between facts is dependent on causation between events

To see why it is possible to resist Mellor's conclusion while accepting his premiss, I propose to introduce two distinctions. The first is between eventive causal statements and factual causal statements. Statements of the latter type express a relation between two facts

(O) C_F (Fc, Ge)

where the first fact is said to be *causally responsible* for the second fact. C_F designates the relation of causal responsibility and takes two factual arguments, Fc and Ge. Fc and Ge can take the form of a nominalized expression of type G (as in (1a)) or other forms capable of designating facts (like in (4a) and (5a)). I propose to analyse the meaning of (O) to be:

(O') $C_E(c,e)$ **Erreur ! Signet non défini.** Fc **Erreur ! Signet non défini.** Ge **Erreur ! Signet non défini.** N(F,G),

where C_E represents a predicate expressing the causal relation between the events c and e. The proposition Fc attributes an efficacious property F to the cause, and the

proposition G*e* attributes the property G to the effect, where e's exemplifying G is due to the instantiation of a law of nature linking properties F and G. F*c* and G*e* are facts. The law statement is represented by N(F,G). The form of (O') makes apparent that the factual statement C_F (F*c*, G*e*) implies the eventive statement $C_E(c,e)$, but not *vice versa*.

The second distinction we need to introduce is between the linguistic surface structure of a causal statement and its logical deep structure. In the simplest case, the surface structure of the causal statement is such as to show overtly the logical structure (O), as in "*e* is G because *c* is F", where the connective "because" is interpreted as expressing the relation of causal responsibility.

Let us call "FACT"[12] the explicit grammatical expression naming the causally responsible fact, where FACT need not have the structure F*c* of attributing the property F to an explicitly named event c. Let us first consider the special case where it is possible to transform FACT into the EVENT expression corresponding to it. As we have seen, in English this transformation can be carried out by taking an expression of type G as its input and an expression of type P as its output. Then the following inference is valid, by virtue of a purely grammatical transformation.

(I1) FACT causes .... (is causally responsible for)
Therefore, EVENT causes ...

The expression FACT has a complex meaning : it refers to a particular (an object or an event) *as* possessing a certain

property. This contrasts with the expression EVENT which designates *directly* a particular entity[13]. Here is an exemple of an inference of type (I1). It is possible to infer both (2) and (3), from (1).

(1) Her performing the song surprised me.

(2) The performing of the song surprised me.

(3) The performance of the song surprised me.

As I have tried to show, the factual statement (1) - and the synonymous statements (4) and (5) mentioned in section 1 - contain a more specific information on the causal relation than the eventive statements (2) and (3). To say that the information the former convey is more specific than that conveyed by the latter, is to say that the former imply the latter, but not vice versa. In this case, it is possible to retrieve, from the factual statement, the information about the identity of the events c and e. One possesses all the ingredients of the logical structure

(O) C_F (Fc, Ge).

where c designates

(2a) The performing of the song,

or equivalently

(3a) The performance of the song.

and e designates me at a suitable time which is fixed by the context of the utterance.

Now, the factual causal statement says of event c that the fact that c has property F is causally responsible for the fact that e has property G. According to our analysis,

(1) Her performing the song surprised me.

has the same meaning as

(1-O) Is causally responsible for (Is her performance of the song (The performance of the song at t), Am surprised (I at t)).

(1-O) means, more informally : the fact that the performance of the song has the property of being her performance of the song was causally responsible for my surprise.

By contrast, eventive statement like (2) and (3) do not contain any information on the causally relevant properties F and G. Their content is only a part of the content of a factual statement.

(2) The performing of the song surprised me.

(3) The performance of the song surprised me.

have the structure:

(T) C_E (c,e).

(2) and (3) can be restated in the form (T) :

(2-T) Causes (The performing of the song, my surprise).

(3-T) Causes (The performance of the song, my surprise).

By designating an event, i.e. a particular, as the cause (the analog is true of the effect), one does not affirm of any particular property of the cause that it is efficacious in bringing about the effect. Still, if the nomological theory of causation is correct, there must be *some* causally efficacious property. We can express this idea by postulating that we can infer from a statement of type (T) an existential generalization where the relevant properties of cause and effect are quantified over.

(TE) $(\exists F)(\exists G) C_F$ (Fc, Ge)

As (O) is equivalent to (O'), (TE) is equivalent to

(TE') ($\exists$F)($\exists$G) [$C_E(c,e)$ **Erreur ! Signet non défini.** Fc **Erreur ! Signet non défini.** Ge **Erreur ! Signet non défini.** N(F,G)]

Informally spoken, eventive statements like (2) and (3) imply that *something about* Marys performance caused my surprise, but without containing the information on *which* particular property that was.

On the other hand, if we start from the factual statement (1), we can retrieve all the information required to reconstruct it in the logical form (O). But then we see immediately that one can infer from it, via (O'), an eventive statement (T). It is also clear that the opposite inference is not possible. From (T) one can only infer (TE), not (O).

But it is not always possible to infer an eventive statement from a factual causal statement. It is not possible whenever the factual statement cannot be reconstructed in the logical form (O). My hypothesis is that this is the case if and only if the fact designated as the cause is *negative* or consists in an *external relation*[14].

The causal statements analysed by Mellor and Bennett are of this type. They do not have the surface structure (O); in particular, they do not contain the information which is necessary to construct explicit expressions naming the events *c* and *e*. In their case, one can only infer the *existence* of an event playing the role of the cause, according to the inference pattern (I2).

(I2) FACT is causally responsible for ...

Therefore, it exists an event *e* which is the cause of ...

Now we can see how to resist Mellor and Bennett's arguments to the effect that in the cases they analyse, there can *be* no causing event. The distinction between the surface structure and the logical deep structure suggests the following response. What their examples show is that factual causal statements do not always contain explicit information permitting to *explicitly designate* the causing event. However, this does not imply that there *is* no such event.

Let us reconsider Mellor's and Bennett's examples in the light of our analysis.

(22) John did not die because he did not fall.

has the structure

(22-O) Is causally responsible for (Not fall (John at t), Not die (John at t+dt)).

The cause event consists of a time slice of John at instant t, the effect event of a later (at t + dt) time slice of the same individual.

The reason why we can't explicitly designate the cause event by virtue of a complete expression EVENT is simply that in (22) both the cause and the effect are designated by *negative predicates*. But this doesn't prevent the events "John at t" and "John at t + dt" from existing and the former from being the cause of the latter. Furthermore, nothing Mellor has said gives us reason to doubt that these events have properties which are responsible for their being causally related. It's just that (22) doesn't tell us which properties they are. The following seems to be a plausible guess:

(38) Is causally responsible for (Hangs on (John at t),
Lives (John at t+dt)).

These predicates being positive, we can use them to form a
positive causal statement where both cause and effect are
designated by eventive expressions.

(39) John's hanging on at t caused (was causally
responsible for) his surviving at t+dt.

Still we should not forget that (22) *does not imply*
(38)/(39), although the converse is true. If we admit the truth
of (22) as a premiss, then (38)/(39) is only a "plausible
guess". John could have had some other causally efficacious
property at t which had a causal impact on the event "John at
t+dt" which has the property that John is alive. For example,
John could have released his hold at t but still been held by a
security rope. Then (38)/(39) would be false, and (22) would be
true in virtue of *other* properties of the related events "John
at t" and "John at t+dt". This is just to say that in case FACT
is constituted by a negative predicate, we cannot infer to
EVENT by virtue of (I1), but only to the *existence* of some
event or other, by virtue of (I2). We can guess at what the
causing event is, but the factual statement doesn't contain
sufficient information for explicitly constructing an EVENT
expression designating it.

As to Mellor's non-existence proof of the "negative event"
of Don's "non-death": if Don does not die at t, then Don lives
at t. The time-slice of Don at t is an event. What we have to
conclude from Mellor's observation that (8) entails both (9)
and (10), is that the negative predicate "does not die" doesn't

give us the means necessary to construct an eventive expression. In particular "Don's non-death" is *not* a possible EVENT expression which is capable of figuring in a causal statement. Still if (8) is true, there exists an event, consisting of Don at t. But to name it by virtue of an explicit EVENT expression we would have to know some positive property of Don's at t, which (8) doesn't give us. In particular we don't know whether this event has the property of being instant or the property of being slow. These could indeed only be properties of Don's death, not of Don's non-death.

To return to Bennett's omission example: to account for it, it suffices to distinguish moral responsibility and causal responsibility. An omission involves the former but not the latter. If we say of John that he is responsible for the disaster, we are attributing moral responsibility to him. But that does not imply that anything *causal* links him - or some act of his - to the disaster[15]. In the case of an omission, it is true that there is no event causally responsible for the result, but this can be explained by the fact that no causation is involved either. This conclusion will result from any analysis of causation which requires some kind of physical interaction between cause and effect[16]. The situation described by Bennett in (32) is compatible with John being completely physically isolated from the gate. In that case, his relation to what happens to the gate cannot be causal. Note that our position is compatible with Bennett's thesis that moral responsibility is always assigned in terms of facts. John is responsible for the disaster because he did not close the door.

"He did not close the door" expresses a fact, and the contexts gives the expression "the disaster" a factual meaning, namely the meaning of "that the disaster occurred".

Similarly, if

(23) Don's rope being the weakest caused his fall to be the first.

is to be interpreted as a causal statement at all - rather than as an explanatory statement linking two properties of the same event - we can analyse it as

(40) Is causally responsible for (Is weaker than the other ropes (Don's rope at t), Falls earlier than the others (Don at t+dt)).

Once again, (23)/(40) don't tell us which property of Don's rope at t it is that caused Don's fall at t+dt. But this does't constitute at all an argument against the *existence* of both the event and the efficacious property. That property is presumably the combination of the pull exerted on the rope together with the rope's internal structure. In any case, (23) itself doesn't designate that property for if no other ropes had been there and thus no other falls to be compared with, the causal process designated by (23) would still have taken place.

To sum up, in cases in which the cause is designated by a FACT expression whose predicate is *negative* or expresses an *external relation*, we can only infer - according to (I2) - that there *exists* a cause event, but we cannot extract an explicit expression designating this event.

5. Disjunctive cause

Bennett (1988) presents another example of a factual causal statement which is not equivalent to any eventive causal statement. The information contained in the factual causal statement *exceeds* the information which could possibly be expressed by an eventive statement. In the light of our analysis, the existence of such statements comes as no surprise because the logical structure of (O) and (O') is richer than that of (T). Furthermore, Bennett's example is of a type where it is only possible to make an inference of type (I2), i.e. where one can only infer an existential generalization over the causing event. But this doesn't mean that there *is* no causing event. I shall try to show this by suggesting a plausible candidate for that role.

In Bennett's example, the expression designating the cause has the form of a disjunction: he considers "an electric motor that is hooked up symmetrically to two sources of power, each circuit having a switch. Current from either source would suffice to make the motor go, though its speed depends on how much current it gets. Now, both switches are closed at the same instant, whereupon the motor starts" (Bennett 1988, p. 139). Bennett now argues that *only a factual* causal statement can correctly designate the causal process resulting in the motor's starting, namely the following.

(41) The fact that at least one of the switches was closed brought it about that the motor started[17].

This is once again an example where we can only infer according to (I2), to the *existence* of a cause event. (41) does not tell us whether it was the closing of flip 1 or that of flip 2 or that of both that was the cause of the motor's start.

But if (41) is true, then we are certain that one of these three possible situations was realized.

Eventive and factual causal statements provide very different types of information. Eventive statements inform us only of the actual situation, and they don't identify the causally efficacious property of the cause. But it reveals a misunderstanding of the semantics of eventive statements to accuse them, as Bennett (1988, p. 140) does, of not doing the job of factual statements. The latter, it is true, can carry more detailed information about both cause and effect. First, they can convey information on the efficacious property of the cause, and on the property of the effect which is affected by the cause. Second, they can convey counterfactual information. Let's say, both flip 1 and 2 were closed and caused the motor's start together. Then the eventive statement

(42) The closure of both switches at the same time caused the motor's start.

cannot tell us what *would* have happened *if* only one switch had been closed. On the other hand, (41) is shown to be more informative by the fact that it can provide this information.

Bennett protests against the idea to consider "the closure of both switches" as an event because that would mean that "the motor's start was caused by a spatially discontinuous event, namely the fusion of the two switch-flips. But not everyone is happy with such fusions, and in any case this account of the matter is misleading at best, because it seems to imply that the two flips collaborated on getting the motor to start, and that is not so." (Bennett 1988, *ibid.*).

But, or so it seems to me, in case the motor started upon closing of both switches, they *did* collaborate in the sense that the current starting the motor was the sum of the currents that had flown through the two switches. What Bennett should say is just that their collaboration is not *necessary* for the effect. But this information is something that an eventive causal statement could not possibly convey, because it is information of a counterfactual type: if flip 2 had not been closed, the motor would have started nevertheless.

As to the "fusion" of events, it can be correct to say of an event that it is a cause of some given effect without needing to identify *all of its causes*. The latter would always be a "fusion" of spatiotemporally discontinuous events because the causal ancestors of an event may spread out in many directions. But if we want to embrace more than one cause, it is not misleading to name an event which is identified through a fusion of the spatio-temporal locations of its parts.

Conclusion

The aim of this paper was to defend the traditional position, according to which events are basic entities involved in all causation, in the face of the linguistic evidence. This defense turned out to be possible only by attributing a causal role to facts as well, although one distinct from the role played by events. I tried to characterize the role of facts in causation as "causal responsibility". This relation, and its connection to causation between events, has been clarified by way of the analysis of different inference patterns between

causal statements of two sorts: statements linking events and statements linking facts. From a factual causal statement, it is possible to infer an eventive causal statement if the predicate of the expression FACT designating the cause is neither negative nor expresses an external relation. Otherwise, one can only infer the existence of an event which is the cause, but one cannot derive an expression EVENT explicitly naming it. From an eventive causal statement, one can *never* infer a factual causal statement, naming the properties which the causal relation between two events brings into play. This is because the assertion of the existence of a relation between particulars is weaker than the assertion of the causal responsibility of one fact for another.

I agree with Bennett (1988) insofar as it can sometimes be misleading to use eventive causal statements, because the pragmatic rules of relevance let the hearer expect that the events are named by virtue of their causally efficacious properties. If this is not the case, the eventive statement is misleading. Yet this doesn't imply that it is false[18].

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[1]This is not the place to enter into the discussion of how causality should be understood from a physical point of view. But analyses according to which causality is, or at least always implies, some sort of physical

interaction (see, e.g., Dowe 1992, Salmon 1994, Kistler, forthcoming), provide independent support for the thesis that events are the fundamental relata of causality.

[2]At this stage, I use the following two expressions indifferently: (1) "The fact that r is F (or r's being F) is causally responsible for the fact that p is G." (2) "the property F, as it is exemplified by s is causally efficacious in making p have the property G." The relation between the closely connected meanings of these locutions will be clarified in section 4 below.

[3]These differences have been analysed in detail by Vendler (1962; 1967a; 1967b), Bennett (1988) and Zucchi (1993).

[4]Negated derived nominals (D) are marginally possible, but their meaning is the same as that of the equivalent expression of type G. This point will be discussed below. A further difference is that G, but not P, can take a CP complement.

[5]Cf. Chomsky (1981); Zucchi (1993, p. 48).

[6]We shall see that this hypothesis is valid only *ceteris paribus*. In particular, there are contexts in which expressions of types P and D are interpreted as having a factual designation; I shall give the exemples of the context created by the verb *to inform*, and by the adjunction of a negation *non*. Yablo (1992, p. 440, note 29) maintains that the opposite case also exists, i.e. contexts in which an expression of type G designates an event. But he is wrong.

[7]Fine (1982, p. 45) shows that the theory of facts according to which reference to facts is made by expressions in nominal position, rather than by expressions in sentential position, can account much more naturally for many linguistic facts.

[8]Either the expression directly designates an event, or it designates an object. In the latter case the causally interacting event is that object *at the time* of the predication of the causal verb, in other terms a "time slice" of the object.

[9]Vendler (1962; 1967a; 1967b) argues that causes are facts whereas effects are events.

[10]The fact that expressions of eventive type have a factual meaning when they contain a negation, has been observed by Baeuerle and Zucchi (1993, pp. 23-25, 184-187). However Zucchi doesn't examine the question whether this phenomenon can occur in causal contexts as well, for he maintains (1993, p. 109) that causal contexts anyway force a factual meaning on the clause embedded in them. This claim will be examined below.

[11]"27-D" indicates the analysis of sentence (27) according to Davidson's theory; "27-P" the analysis of the same sentence according to Parsons' theory.

[12]"FACT" and "EVENT" stand for expressions which are explicitely represented, whereas "c" and "e" are variables, taking events as their values.

[13]On the logic of direct reference, cf. Recanati (1993).

[14]A relation is called external if its relata can exist independently of the relation. On the distinction between external and internal relations, cf. Mulligan, Simons, and Smith (1984), Mulligan and Smith (1986), and Mulligan (1991).

[15]This is in line with Nordenfelt's analysis who comes to the conclusion "that omissions, although agentive are not causative episodes" (Nordenfelt 1977, pp. 55/6).

[16]Cf. Dowe (1992),Salmon (1994), Kistler (forthcoming).

[17]Cf. Bennett (1988, p. 140).

[18]I should like to thank Joan Cullen, Steven Davis, Dorothy Edgington, Kevin Mulligan, Joëlle Proust, and an anonymous referee for "dialectica" for their helpful suggestions and critique.