Imperfectivity and Progressivity : The French Imparfait

Jacques Jayez
EHESS

1. Introduction

In this paper, I examine the status of the French past tense *imparfait* in relation with the general notion of imperfectivity. Although a clear–cut definition of this notion is perhaps out of reach, one can assume that there is a common intuition behind the different uses of the term.[1] Imperfectivity is a *perspective* on an event or state. It focuses on the interior region of the eventuality referred to be the sentence. Well–known analyses of the imparfait (Guillaume 1929, Smith 1991) assign to it a basic imperfective value. This position seems to raise various problems. I will show that Guillaume's and Smith's proposal is basically correct, however, when one takes into account different complications connected with recent studies of progressivity. The paper is organized as follows. In section 2.1, I give a very brief description of the ways of expressing imperfectivity in French. In section 2.2, I recall the proposals of Guillaume and Smith. In section 3, I indicate some problems for their approach. In section 4, I show that the aspectual problems mentioned in 3, far from pointing to weaknesses of the imperfective thesis, provide additional evidence in its favor. Finally, in section 5, I address other potential objections to the thesis. I won't be concerned here with non–temporal uses of the imparfait (politeness, conditionals, etc.)

2. Imparfait and imperfectivity

2.1.. *Imperfectivity in French*

There are two ways of marking imperfectivity at the VP level in French, the periphrastic construction *être en train de* and the past imparfait tense. The periphrastic construction means literally *to be in the process of* and denotes clearly the interior region of an eventuality.

(1)   a. Marie est en train   de courir
           Mary   is   in the process of run–INF
           'Mary is running'
       b. Marie courait
           Mary   run–IMP
           'Mary was running'

Like the English progressive, *être en train de* is incompatible with some kinds of states: *Mary is being* [?]*parked in the street, Marie est en train d'être* [?]*garée dans la rue*. Unlike the progressive, *être en train de* is restricted to the present and to the imparfait (in some cases, it can be used in the future, though[2]).

2.2. *The imperfective analysis*

It is impossible to mention all the linguists who accept the view of the imparfait as basically imperfective (see Binnick 1991, Vetters 1996 for some references). I will focus on two well–known theories, those of Guillaume (1929) and Smith (1991).

For Guillaume, the imparfait represents an eventuality as divided into an accomplished or effective part and a non–accomplished part. This is what Guillaume calls an 'intersecting view' (*vision sécante*) and he characterizes the imparfait as conveying such a view. He analyzes a sentence such as *Pierre marchait* ('Peter was walking') as meaning that Peter had already been walking for some time and that he was going to walk for some time. In contrast, the *parfait défini* (*passé simple* in the current terminology) does *not* divide an eventuality into an accomplished vs non–accomplished part. Guillaume notes that this difference does not amount to pair the imparfait with the non–accomplished and the passé simple with the accomplished. Actually, the passé simple simply does not make use of the non–accomplished dimension and the distinction between accomplished and non–accomplished pertains only to the imparfait.

Smith (1991) compares aspectual viewpoints to the lens of a camera, which can focus on different parts of a scene. They select what is visible in a situation, or equivalently, what is asserted in the description of the situation. The perfective viewpoint shows an eventuality in its entirety. The imperfective viewpoint shows only the interior region of an eventuality. In an interval–based language, this implies that, if I is a closed interval $[I_1, I_2]$, the denotation of an imperfective verbal construct with respect to I can be any interval I' included in I and such that $I_1 \notin I'$ and $I_2 \notin I'$ are compatible with the semantic information of the construct. Of course, pragmatic factors or additional semantic information may contribute to narrow the range of possible subintervals, for instance by imposing a particular size, a relative position in time, etc. The important point is that an imperfective sentence never strictly entails that one of the temporal endpoints of the interval it describes is actually reached. Hence the possibility of sentences like *Mary was walking to school, but she never got there* (Smith 1991:63).

The imparfait is the main imperfective viewpoint in French. There are several apparent counterexamples to this claim, which Smith dismisses as misleading. First, the fact that the imparfait occurs with achievements is explained by its ability to bear on the preparatory phase of the eventuality. So a sentence like *Il entrait dans un magasin* ('He was entering a store') denotes any subinterval of the preliminary phase of the entering event. Second, the imparfait occurs with semelfactives or *points* in Moens' (1987) terminology, which have no preparatory phase. In this case, it has an iterative reading, that is, it applies to a sequence of points of the same type. For in-

stance, *Marie toussait* ('Mary was coughing') denotes any subinterval of a sequence of coughing events. Finally, the imparfait can have an habitual value. It denotes then any subinterval of a period where a given event happens frequently, is typical, etc.

3. Problems for the imperfective thesis

There are two major problems. First, it has been proposed (de Swart 1998) that, contrary to a common assumption, the imparfait *is* sensitive to the differences between aspectual classes. If this is the case, it is not possible to maintain that the grammatical imperfective aspect is the main factor in the analysis of the imparfait. Second, there are some values of or constraints on the imparfait which do not seem to follow clearly from the imperfective thesis. We will review these problems in turn.

3.1. *Imparfait and aspectual classes*

De Swart proposes that the imparfait 'denotes states or processes' (1998:368) which have an *homogeneous* or non–*quantized* reference. A predicate P is *quantized* if and only if, whenever it applies to some object o, it does not apply to any proper part of o (cf. Krifka 1992). For instance, the predicate *to eat three apples* is quantized because, if it applies to an event e, it cannot apply to a proper subpart of e. In contrast, state and process predicates are non–quantized or homogeneous. *To be in the garden* or *to walk* can apply to proper parts of the eventualities they apply to. De Swart's proposal accounts for examples like (2a) and (2b).

(2)   a. Quand je suis arrivé dans le jardin, Marie lisait le livre [??]jusqu'au bout
            'When I arrived in the garden, Mary was reading the book completely through'
        b. Quand je suis arrivé dans le jardin, Marie [?? or iterative]sursautait
            'When I arrived in the garden, Mary was starting'

In French, *lire le livre jusqu'au bout* is quantized because it indicates that the book is read completely through. Therefore, no part of the relevant event can be described by the same predicate. The predicate *sursauter* ('to start') is quantized because it denotes a point without any proper subpart. De Swart's approach correctly predicts that such examples are odd or have some special value (iterative, etc.). While the same prediction is available in imperfective theories for examples of type (2b), this is not the case with (2a). An event of reading some book completely through has certainly a temporal width and it makes sense to consider its interior region. So, as it stands, (2a) supports de Swart's claim and is a counterexample to the imperfective theories.

3.2. *Loose ends*

There are various observations on the imparfait which cannot be connected with the imperfective thesis in a clear way.

First, the possibility of the iterative or habitual value does not follow straight-forwardly from the idea that an interior region is considered.

Second, it has been noted that the imparfait has a markedly anaphoric be-havior. For instance, out of the blue, a sentence like (3a) is certainly less natural than (3b). This can be explained by saying that the imparfait needs a temporal or situation anchor, which is lacking in (3a).

(3)   a. Mary ?ouvrait la porte
               'Mary was opening the door'
       b. Mary a ouvert/ouvrit la porte
               'Mary has opened/opened the door'

Third, it has been proposed (Ducrot 1979) that the imparfait is sensitive to *properties*. In other terms, the imparfait does not simply describe past eventualities, but selects eventualities which are characteristic of a given period. Either the eventu-ality spans the whole period or it is sufficiently important to be considered as the main event in the period. So, sentences like (4) are predictably anomalous because they hardly refer to an appropriate event, in terms of duration or importance.

(4)   L'année dernière, je ??buvais un verre d'eau
         'Last year, I was drinking a glass of water'

If the imparfait is actually sensitive to properties, that does not seem to follow from the imperfective thesis.

Finally, there is the problem of the so–called *imparfait narratif* ('narrative imparfait'). Consider a sentence like (5).

(5)   A huit heures, Jean pénétrait dans mon bureau
         'At eight, John was entering / entered my office'
(5')   **imperfective** : $\exists e, e'$ (e': John enter my office $\wedge\ e \subset e'\ \wedge\ e$ at eight)
(5'')   **narrative** : $\exists e$ (e : John enter my office $\wedge\ e$ at eight)

(5) has at least two readings. On the imperfective reading, there is a part of a global event of John entering my office which takes place at eight. Let $\subset$ be a *strict* whole-part relation on events. The imperfective reading can be represented as (5'). On the narrative reading, there is a global event of John entering my office at eight, and the representation is rather (5''). The problem is that the relation $\subset$ used for the imper-fective analysis is strict. The global event is not a strict subpart of itself. Therefore, (5'') is not just a special case of (5') where $e = e'$. Relaxing the strictness condition makes difficult to discriminate the imparfait and the other past tenses. For instance, how are we to distinguish the imparfait from the passé composé if the two tenses can refer to past eventualities in their totality?

So, problems seem to accumulate for the imperfective thesis, in the form of apparent counterexamples as well as properties that the thesis is unable to predict. In

the next section, I show that analyzing the imparfait as a progressive takes care of the problem evidenced by (2). In section 5, I address the other problems mentioned in 3.2.

4. Imperfectivity and progressivity

4.1. *The imparfait is aspectually neutral*

Contrary to de Swart's claim, the imparfait is not incompatible with quantized constructs. Admittedly, descriptions are frequently blurred by the existence of quantized and homogeneous readings for the same eventuality. One of the example mentioned by de Swart (1998:365) is *traverser la rue* ('to cross the street'). Some speakers accept examples such as (6).

(6)   Le char traversa la rue pendant quelques secondes avant d'être détruit par le missile
       ('The tank crossed the street for a few seconds before being destroyed by the missile')

The modification by *pendant* is taken to be a test for atelicity in French. Genuine quantized predicates are not compatible with *pendant* on a non–iterative reading. For example, *vider le puit pendant une heure* ('to empty the well for one hour') is strange or iterative. So, (6) shows that *traverser la rue* can be homogenous. According to de Swart's thesis, it should be compatible with the imparfait, which is actually the case. A sentence like *Quand je l'ai rencontrée, Marie traversait la rue* ('When I met her, Mary was crossing the street') is unproblematic.

However, there are perfectly quantized VPs which are compatible with imparfait. *Vider le puits* is one of them, but there are many more. Those VPs are clumsy or iterative when modified by a *pendant* PP and have only the iterative reading when they are the complement of *ne pas arrêter de* ('to not stop V–ing').

(7)   Il n'a pas arrêté de vider le puits pendant une heure
       'He did not stop emptying the well for one hour'
(8)   a   Caleb Carr a écrit *L'aliéniste* ??pendant/en deux ans
            'Caleb Carr wrote *The Alienist* for/in two years'
       b   Caleb Carr n'a pas ??arrêté d'écrire *L'aliéniste* pendant deux ans
            'Caleb Carr did not stop writing *The Alienist* for two years'

(7) can only mean that the agent emptied the well repeatedly for one hour. The *pendant* version of (8a) is odd because the iterative reading is preferred, which suggests at best that Caleb Carr wrote several versions of *The Alienist*. VPs like *manger la tarte* ('to eat the pie'), *refaire l'autoroute* ('to do up the highway'), *faire le tour du lac* ('to walk/drive round the lake') share the same distributional properties. Crucially, the reviewed VPs are perfectly possible in the imparfait.

(9)   a   Quand je suis arrivé, Jean vidait le puits
           'When I arrived, John was emptying the well'
       b   Quand je l'ai rencontré, Caleb Carr écrivait *L'aliéniste*
           'When I met him, Caleb Carr was writing *The Alienist*'
       c   Quand je suis arrivé dans la ville, ils refaisaient l'autoroute
           'When I arrived in the city, they were doing up the highway'

It might be argued that, while the mentioned VPs are quantized, they are compatible with the imparfait *via* a general operation of *coercion*, as used by de Swart (1998). In all the examples, the VPs would get an homogeneous process reading through coercion. Although coercion is certainly a reasonable device to account for frequent type shifts in the temporal and aspectual domain, it may not be systematically applied to get the aspectual machinery going. First, if coercion is available without restriction, what independent evidence is left for the aspectual sensitivity of the imparfait? If a VP is homogenous, it is compatible with the imparfait, if it is not, it is compatible with the imparfait all the same *via* coercion. Second, coercion does not always produce the right result. For a sentence like *Marie marchait pendant deux heures* ('Mary was walking for two hours'), which can only have a habitual reading (≈ Mary usually walked for two hours), coercion should construct a process reading, which is not observed.

I conclude that de Swart's claim is too strong and that the imparfait is not sensitive to the aspectual type of the eventuality it applies to, in agreement with the imperfectivity–based analyses. The claim is not unmotivated, however. (2) is still unexplained, and, more generally, if the imparfait can denote a part of an eventuality, how is it that it can do so through a description which applies in some cases (the quantized ones) only to the whole eventuality? It turns out that de Swart's analysis captures something essential about the imparfait, albeit in an indirect way, a point I will make clear in section 4.3.

4.2. *Progressivity*

I show now that Smith is right in treating the French imparfait and the English progressive as two forms of the more general imperfective viewpoint. Capitalizing on the recent literature on the English progressive (Dowty 1979, Asher 1992, Landman 1992, Glasbey 1996, Naumann & Piñon 1997, Bonomi 1997), one can say that three factors influence the use of the progressive.
– A mereological factor. The eventuality in progress (henceforth *subeventuality*) is a part of another eventuality (henceforth the *main eventuality*).
– A perspective–based factor. The subeventuality is related to the main eventuality from a certain perspective (which may be different from that of the speaker).
– An inferential factor. The setting and/or nature of the subeventuality makes it possible or probable that it will go on until the main eventuality takes place. So, the observation corresponding to the subeventuality can, with the help of additional as-

sumptions, lead to the conclusion that the main eventuality is a possible continuation.

A very simple language is sufficient to capture the main notions. Let E be a set of variables on eventualities, T a set of eventuality types and $\subset/\subseteq$ a subpart relation on eventualities. I use the notation $e : \sigma$ for the typing judgement which assigns the type σ to the eventuality e. For concreteness, one can assume that types are Davidsonian descriptions in terms of roles and role assignments (see (Link 1998:chapter 11) for a general presentation). Formulas are defined recursively by : (i) atomic formulas are of form $e : \sigma$, where e is in E and σ in T, or $e \subset/\subseteq e'$, where e and e' are in E, (ii) formulas are atomic formulas, Boolean combinations of formulas or quantifications over formulas. So, for instance, the expression $\exists e \neg \exists e'$ ($e : \sigma \wedge e' \subseteq e$) is a formula. I assume that a deduction relation $|-$ between sequences of formulas is available. I will not be concerned here with the properties of $|-$. It is enough that it allows one to derive typing and mereological judgments from sets of observations. A *perspective* π can be a set of formulas as in Attardi & Simi (1993, 1994).[3] A formula ϕ can be deduced from a subset of π, in which case one writes $in(\pi,p)$. We can then provide a rough characterization of the English progressive.

(10) **Progressivity**

A sentence S has a progressive value only if it refers to a subeventuality e such that, under some perspective π, $in(\pi,\exists e'$ ($e \subset e' \wedge e' : \sigma$)), where σ is the type described by S.

Very often, the perspective π is that of the speaker or that of the agent of e. Let us review some simple examples to see how the definition works.

Mary is going to the beach. If I see Mary walking on the track to the beach, I can entertain a perspective in which Mary is bound to reach the beach.

Mary is going to the beach, but she'll have to stop before. From Mary's perspective, she is going to the beach, but I know that there is some obstacle. Attardi and Simi's approach is very efficient in such cases because perspectives can be recursively embedded. Let π_a be the perspective of a. We have $in(\pi_{speaker}, in(\pi_{Mary}, \exists e'$ ($e \subset e' \wedge e' :$ Mary goes to the beach))) and $in(\pi_{speaker}, \neg \exists e'$ ($e \subset e' \wedge e' :$ Mary goes to the beach)).

If Mary is walking on the track to the beach, I may not say that *Mary is swimming*, even if Mary is going to swim. Suppose that the deduction $e :$ WALKING, $e' :$ SWIMMING $|- \neg(e \subseteq e')$ is a theorem. This is plausible since any reasonable system of types should warrant the deduction. If ϕ is a theorem $in(\pi,\phi)$ is true for any perspective π. So, no perspective can host the formula $\exists e'$ ($e \subset e' \wedge e' :$ Mary swims).

The same is true for well–known 'impossible' progressive like *Mary was swimming across the ocean, wiping out the Roman army*, etc. If it is a theorem that the type SWIM ACROSS THE OCEAN cannot be realized, that is, if $|- \neg \exists e$ ($e :$ SWIM ACROSS THE OCEAN), then, again, no perspective can host the formula which, according to definition (10), would license the use of the progressive form.

4.3. *Progressivity and infomorphisms*

Examples like (2) hide the fact that there are actually two different cases.

Some sentences are anomalous because the perspective π does not in general allow one to make a reasonable guess. Consider Ogihara's example quoted by Glasbey (1996).

(11)   Mary is drinking $^{??}$three glasses of beer

If I see Mary drinking a glass of beer, I may not infer in general what she has already drunk or what she is likely to drink. Will she stop drinking, will she try orange juice, will she keep to beer? It has been noted that the sentence improves significantly if one takes into account Mary's intention. If Mary intends to drink three glasses of beer in a row because of some stupid bet, (11) sounds like a description of what she is actually doing. In a perspective–based analysis, the variation about (11) can be reduced to commonsense rules. If a intends to do e' and e' is partially realized by e, then e culminates into e'.

e'' : a INTENDS THAT $\exists e'$ $(e' : \sigma)$, $e : \tau$, $\forall e'$ $(e' : \sigma \Rightarrow \exists e$ $(e : \tau \wedge e \subset e'))$ $\vdash \exists e'$ $(e' : \sigma \wedge e \subset e')$.

In contrast, there is no commonsense rule such as

$e : \tau$, $\forall e'$ $(e' : \sigma \Rightarrow \exists e$ $(e : \tau \wedge e \subset e'))$ $\vdash \exists e'$ $(e' : \sigma \wedge e \subset e')$.

Adopting such a commonsense rule would force us to assume that every event culminates into every possible continuation.

The hypothesis that the imparfait and the progressive are akin is supported by the fact that the same default oddness and the same possibility of improvement exist for the imparfait. *Marie buvait trois verres de bierre*, the translation of (11), is strange unless one assumes that Mary intends to do so. The parallel extends to sentences like *Marie marchait $^{??}$jusqu'à la plage* ('Mary was walking $^{??}$as far as the beach') or *Marie lisait le livre $^{??}$jusqu'au bout* ('Mary was reading the book $^{??}$completely through'), which are better when they describe an intentional behavior.

More interestingly, there are sentences which are not so easily redeemed by an assumption of intentionality.

(12)   Quand j'ai aperçu Marie, elle marchait $^{??}$pendant deux heures, comme
        chaque samedi
        'When I spotted Mary, she was walking $^{??}$for two hours, as every saturday'

What is strange is that, at first sight, the situations of (11) and (12) are entirely similar. One cannot infer from Mary's activity that she is bringing about a certain eventuality, unless some particular intention is ascribed to her. I am not aware of any solution to this problem in the current approaches to the progressive. Generally speaking, all the approaches predict that, in a perspective where there is enough informa-

tion for making a reasonable guess that *e* will culminate into *e'*, the progressive is licensed. But, clearly, this is not true for (12).

This difference is not accounted for in theories which see the progressive as simply mimicking an inference process. Bonomi's (1997) approach predicts that Mary is walking for two hours at time *t* iff, in view of the concomitant facts one can imagine a continuation of the event at *t* into an event described by the type MARY WALK FOR TWO HOURS and containing *e* as a part. However, we can certainly, given the intention of Mary and the assumption that there is no particular obstacle to this intention, imagine that what she is doing is walking for two hours. Similarly the battery of tests used by Naumann and Piñon (1997) to characterize the progressive does not filter out sentences such as (12). The four conditions they describe may perfectly well be realized in the case of (12). To wit, the observed event may be a part of Mary walking for two hours (their *Realization*), the speaker may believe that Mary is able to walk for two hours (their *Ability*), the speaker may believe that Mary does not intend to stop before (their *Intention*). The only debatable condition is the presupposition of non–radical indeterminism. They use it to explain the oddness of Dowty–style examples *The coin is *?*coming up heads*. In such sentences and in ordinary circumstances, the speaker is in no position to decide whether the coin will eventually come up heads or tails. So, the observed subeventuality may be a part of two *incompatible* main eventualities. The use of the progressive is subject to a presupposition that the speaker believes, at the time of utterance, that the subeventuality does not realize two incompatible main eventuality types. If we assume that this presupposition is not satisfied in (12), on the same account, practically *any* example of the progressive should sound strange. For instance, if Mary is reading a book, the subevent might be considered as realizing the type READING THE BOOK and NOT READING THE BOOK (if Mary stops before). This is intuitively absurd and, theoretically, it just shows that we are getting lost in the messy area of negative events. So, Naumann and Piñon's conditions may hold for (12) but probably do not exhaust the licensing conditions for the progressive.

How are we to formulate the difference between (11) and (12). In his recent analysis of telicity, Krifka (1998) resorts to the notion of *extensive measure function* (or *measure function* for short). A measure function μ, when applied to a part structure P, returns a real number for every part in P and every sum of non–overlapping parts in P. Krifka considers that the duration adverbial *for* is based on measure functions and has the following functional structure, illustrated here with *for two hours*. PRES is a general presupposition on measure functions, which I disregard for simplicity.

(13)   *for two hours* $= \lambda R \lambda x, e.\ [R(x,e) \wedge \mu\text{–}duration(e) = \mathbf{2hours} \wedge \text{PRES}]$

Measure functions apply also to quantities of matter. For instance, *two apples* $= \lambda x.\ [apples(x) \wedge \mu\text{–}number(x) = \mathbf{2} \wedge \text{PRES}]$. The important point is that, in French, when they apply to quantities of time (vs events), we obtain natural sentences in some cases.

(14)   Quand j'ai aperçu Marie, elle faisait ses deux heures de marche, comme
        chaque samedi
        'When I spotted Mary, she was doing her two hours of walking, as every
            saturday'

This and similar observations suggest that the progressive reading of the imparfait is
not natural when there is no quantity of matter/time or no endpoint which exists in-
dependently of the subeventuality. A sentence like (14) mimics a *measuring out* pro-
cess, in the sense of Tenny (1994) and Jackendoff (1996). A certain quantity of time
(*ses deux heures de marche*) is consumed by a process denoted by *faire*. In example
(12), the quantity denoted by *two hours* does not preexist to the process of walking
for two hours. One can speculate that the distinction reflects what the progressive
form says, in its literal interpretation. Let us consider (11) first. If Mary is drinking
three glasses of beer at t, this means literally that the main event manifests itself at t.
But this event is not yet real, since it is only inferred. So, on one side, a part of the
main event must take place at t, on the other side, it cannot take place at t *as* a part of
the main event, since this event does not exist. The subevent cannot strictly be cate-
gorized as a part of an event which has no existence. Hence the labels such as 'infer-
ential', 'intensional', 'type sensitive' which are used in the literature on the progres-
sive. Yet, the process behind the progressive is not limited to the construction of a
potential/plausible whole from some local evidence. In fact, in addition to this infer-
ential mechanism, there is an ontological requirement, namely that the main eventu-
ality be anchored to some object existing at the time of the utterance. When there is
some preexisting quantity of matter or time, the main eventuality measures out this
quantity, which means that there is some homomorphism between the parts of the
eventuality and the parts of the quantity. The reality of the main eventuality is to
some extent cashed on that of the quantity of matter/time. In contrast, there is no
such quantity in (12). The sentence is definitely strange because the subevent of
walking for some time is a part of a main event which is purely inferential.

   For atelic eventualities such as Mary walking, the situation is different be-
cause the subeventuality may coincide with the main eventuality, as shown by sen-
tences like (15).

(15)   Quand j'ai aperçu Marie, elle marchait, mais elle a peut–être cessé dès que
        j'ai eu le dos tourné
        'When I spotted Mary, she was walking, but she might have stopped as
   soon as I turned around'

So, the condition (10) has to be relaxed, $\subseteq$ being substituted for $\subset$ for atelic eventu-
alities. Why is this relaxation impossible for telic events? If the subevent and the
main event were to coincide, the end of the telic main/sub–event would be observed
by the speaker. The use of a progressive form would then be totally irrelevant. Why
use a progressive, that is, a form which refers to an eventuality in progress, to de-

scribe a completed event? There is no such irrelevance in the case of atelic eventualities since they have no intrinsic bound. At this stage, we can understand why de Swart's claim, while too strong, is not ill–founded. There *is* an aspectual difference between quantized and non–quantized eventualities, but it is amenable to the progressive nature of the imparfait, not to an intrinsically aspectual behavior.

To substantiate the difference, I resort to the notions of *infomorphism* and *channel* (Barwise & Seligman 1996, see Glasbey 1996 for a different but related analysis). Assigning types to eventualities is a special form of a very general operation of *classification*, that is, of the activity of assigning categories to tokens. A classification $C = (O, \Sigma)$ is a set of judgments $o :_C \sigma$, where o is an object of O and σ a type of Σ. The role of infomorphisms is to connect classifications. More precisely,

(16) **Infomorphism** Let $C = (O, \Sigma)$ and $C' = (O', \Sigma')$ be two classifications. An infomorphism between C and C' is any pair of functions $g_{objects} : O \to O'$ and $g_{types} : \Sigma' \to \Sigma$, such that $g_{objects}(o) :_{C'} \sigma'$ iff $o :_C g_{types}(\sigma')$.

So, when there is an infomorphism between C and C', the counterpart of any object from O in O' is assigned the type(s) whose counterpart(s) is (are) assigned to the original object. In a distributed system, O might represent the components of the system, considered as a causal/informational dynamic structure and O' might represent the various facets or 'views' that we use in our external description of the system. A standard example is that of a computer which hosts very complex causal processes, but which can be described in a rough way by indicating the state of external parts. Some buttons and some lights are on or off, some devices are running or waiting, etc. An infomorphism is usually represented as (A) below, but we can adopt the more compact diagram (B) for convenience.
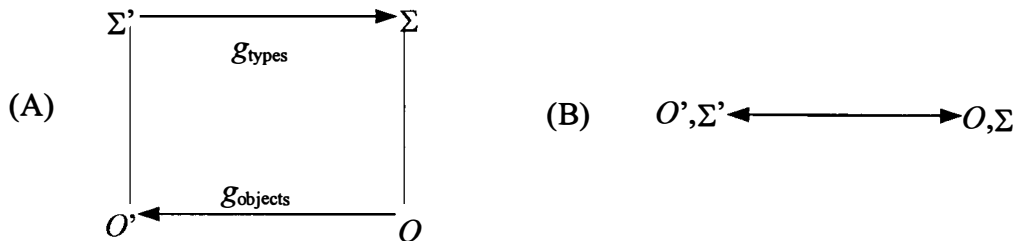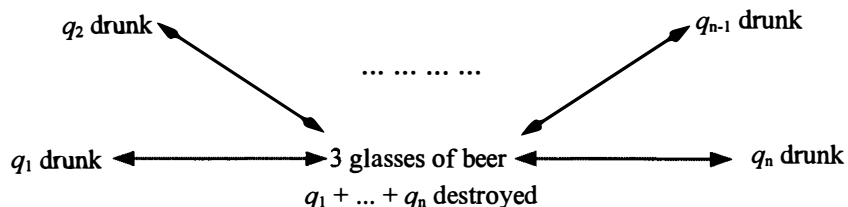

The binary case of infomorphism can be extended to the general case of *channels*. A channel is a multi–infomorphism with a common *core* which captures the central information distributed over the different parts/facets which are observed.

(17) **Channel** A channel is a family $\{C_i\}$ of classifications related by infomorphisms to a common codomain called the *core* of the channel.

An eventuality can be considered as the sum of its parts, but, in terms of channel theory, there is a crucial difference between eventualities like Mary walking for two hours and Mary drinking three glasses of beer. In the latter case, there is a certain

quantity of matter which exists independently of Mary drinking. In Krifka's (1998) terms, this quantity forms a part system which can be measured by a measure function. We can consider the quantity of matter as a core whose part structure determines the external observations corresponding to different actions, for instance drinking, *via* the general constraints on measure functions. Let $\{g_i\}$ be a family of functions which return parts of a given quantity of beer corresponding to three glasses. The differents g_i are our object–to–object functions. We can assign to each part of the three glasses a type which expresses that this part is drunk and yields a given value for the measure function μ. To define the infomorphisms we say that a certain quantity is drunk if and only if the original quantity (three glasses of beer) is destroyed on the same part. So we have a channel of the following form

$$q_2 \text{ drunk} \qquad\qquad q_{n-1} \text{ drunk}$$
$$\ldots \ldots \ldots \ldots$$
$$q_1 \text{ drunk} \longleftrightarrow 3 \text{ glasses of beer} \longleftrightarrow q_n \text{ drunk}$$
$$q_1 + \ldots + q_n \text{ destroyed}$$

Assuming a dense substance for simplicity, the core is subject to a constraint which says that a certain amount q is destroyed iff there exist two non–overlapping part whose sum is measured by q and which are destroyed. This constraint migrates to the different parts of the quantity of matter in the core. More precisely, we have

Infomorphism

$g_i(3$ glasses of beer) : DRUNK & $\mu(g_i(3$ glasses of beer)) $= q$ iff 3 glasses of beer : $(g_i(3$ glasses of beer) : DESTROYED).

Constraint ($\oplus$ is the sum operation on part structures)

3 glasses of beer : p DESTROYED $\wedge \mu(p) = q$ iff $\exists p_1, p_2$ $(p_1 \oplus p_2 = p \wedge p_1$ and p_2 do not overlap $\wedge p_1$: DESTROYED $\wedge p_2$: DESTROYED $\wedge \mu(p_1 \oplus p_2) = q)$.

The constraint propagates to the different parts through the informorphism. If p such that $\mu(p) = q$ is drunk, then, by the infomorphism, p is destroyed in 3 glasses of beer. By the constraint, we have that two non–overlapping parts p_1 and p_1 are destroyed and their sum is p and is measured by q. By the informorphism again, we have that the two parts p_1 and p_2 must be drunk, etc.

While this kind of channel if causally uninteresting, it is sufficient to illustrate the difference between (11) and (12). In (11), 3 glasses of beer, as a core part system, distributes the possible drinking scenarios over the different subquantities of beer. There is no such core available for (12), where the event of Mary walking for two hours is a purely inferential creation, without any real anchor which would create constraints on its partitioning.[4] In view of the fact that the English progressive, the imparfait and the *être en train de* construction exhibit the same sensitivity (*Marie est en train de* [??]*courir pendant deux heures*), I conclude that they share the common semantic mechanism of progressivity, as proposed by Smith (1991). On the basis of the present discussion, I propose to redefine progressivity as in (18).

(18) **Progressivity** A sentence S has a progressive value only if it refers to a subeventuality e such that, under some perspective π,
1. $in(\pi, \exists e' \ (e \subseteq e' \land e' : \sigma))$, where σ is the type described by S and e' is atelic, or
2. $in(\pi, \exists e' \ (e \subset e' \land e' : \sigma))$ and there is a channel whose core exists at the time of e and which partitions e' with respect to some measure function, where σ is the type described by S and e' is telic.

5. 'Special' properties of the imparfait

In section 3, four additional difficulties were noted for the imperfective thesis. I address the first three in 5.1, before turning to the narrative imparfait in 5.2.

5.1. *The imperfective properties of the imparfait*

The habitual value of the imparfait seems alien to any notion of progressivity. However, two remarks dissipate this impression. First, the habitual reading is not reserved to the imparfait. It can occur with many tenses. For instance, a sentence like *Marie conduit la voiture* ('Mary drives the car') can refer to a single distinct event of Mary driving the car or to a habit/disposition of Mary. This motivates the appeal to general operators which allow us to connect different interpretations (such as the various coercions in (de Swart 1998)). The question is rather whether progressivity *blocks* habitual readings in any way.

In the definition of progressivity, the eventuality e' is inferred on the basis of the subeventuality e. The size of e itself, or rather the size of the observation window which allows the speaker to witness e, is not determined. Consider a sentence like (19).

(19) a. A cette époque, il empruntait tout le temps de l'argent
            'at that time, he continually borrowed money'
        b. A cette époque il était tout le temps en train d'emprunter de l'argent
            'At that time, he was continually borrowing money'
        c. A cette époque, il était en train [hab ⇒ ??]d'emprunter de l'argent
            'At that time, he was [hab ⇒ ??]borrowing money'

The *être en train de* construction and the English progressive are similar in that they do not easily denote habitual eventualities in the absence of any frequency adverbial. This difference between the imparfait and the other two imperfective constructions can be explained by assuming that the type of the the eventualities is different. With the *être en train de* construction and the English progressive, the main eventuality must be a unique event or state (with possible repetitions). With the imparfait, the eventuality can be a series of events/states which gets a generic type. The idea of progressivity is retained if we modify definition (18) as follows.

(18')   **Progressivity with habituality**
        The condition in (18) is extended to the case where the sentence refers to a
        series S of eventualities such that under some perspective π, $in(\pi, \exists S'$ ($S \subseteq$
        $S' \wedge S' : \sigma$)), where σ is the habitual type described by S.

So, a sentence like (19a) is appropriate only if it refers to a series of eventualities S
such that, in some perspective, S is contained in S' : [CONTINUALLY] [e in S'] [e : he
borrows money]. As pointed out by Anastasia Giannakidou (p.c.), habitual sentences
license non–veridical determiners such as *any*, in contrast with the progressive form.
If non–veridicality is a form of negative sensitivity to actual events (see Giannakidou
1998), this is as expected. Habitual sentences do not refer to actual events but to se-
ries of events with global properties. However, in the two cases (habitual vs non–
habitual), there is the common intuition that what is observed is a part of a stream of
events and habituality does not convey any touch of meaning which would be con-
tradictory to progressivity.

        The same can be said of the anaphoric properties of the imparfait. Such prop-
erties are no surprise if we keep in mind that the imparfait refers to a *part* (not a
whole eventuality or series).[5] What would be the benefit of mentioning a part rather
than the whole? To indicate that a complete event of Mary walking occurred in the
past, it would be misleading to use the sentence *Mary was walking* or *Marie mar-
chait*. Such sentences are natural only under the assumption that the speaker intends
to refer to a particular point in time, or, in other terms, presupposes an anaphoric
temporal relation. Admittedly, the English present perfect progressive has no corre-
sponding construction in French. As a literal translation of *Mary has been walking*,
Marie a été en train de marcher just sounds horrible. Why? In French, the *passé
composé* (*a été en train de* V in the example) usually denotes a past event anterior to
the speech point, which coincides with the reference point, in Reichenbach's terms.
What is currently observed is temporally located in the past (before the speech point
and the reference point). But, the French progressive constructions demand that the
observation point coincide with the reference point. This cannot be the case with the
passé composé. In contrast to the passé composé, the *passé simple* has a reference
point anterior to the speech point. Therefore it might in this respect host a progres-
sive construction. Yet, *Marie* [?]*fut en train de marcher*, where *fut* is the passé simple
of *être*, is deviant. This is because, in addition to its temporal profile, the passé sim-
ple has an aspectual perfective value. It can only refer to completed events, which is
not compatible with the basic progressive value. In contrast, the simple past progres-
sive form does not inherit the perfective value from the simple past. Therefore, the
relevant difference is between the present perfect progressive form and the offending
être en train de in the passé composé. I suggest that progressivity in French is sub-
ject to the following condition of *contemporaneity*. To understand this condition,
recall that the progressive value depends on a certain perspective π. π can be decom-
posed into general commonsense rules, particular facts and circumstancial observa-
tions. For instance, in interpreting *Mary is walking to the beach*, one makes uses of

general constraints on spatial and bodily movement, particular facts which make possible to assign some reference to *the beach* and circumstancial observations (the speaker presumably happens to know that Mary is doing something). The *observation interval* is defined to be that temporal window where the circumstancial observations take place.

(20)   **Contemporaneity**   In addition to the conditions in (18) and (18') the *être en train de* construction demands that the reference point and the observation interval corresponding to the perspective π be contemporaneous. The imparfait satisfies this condition in virtue of its own semantic profile.

We will see that **Contemporaneity** is important to understand the special status of the narrative imparfait.

According to Ducrot (1979), the imparfait applies to whole periods (short or long) and expresses a characteristic property of the period (see also de Swart, 1991 on the mass–like nature of the imparfait), cf. (4). Ducrot's observation is empirically quite robust, but it seems to have a derivative status. Suppose that a certain expression E indicates a time interval I. If the observation interval coincides with I, the eventuality described by the sentence in the imparfait must be of a type compatible with this assumption. In (4), this is impossible, unless the sentence has an habitual reading. If I includes the observation interval, mentioning I could sound irrelevant. If the speaker observed something at a time I', why would she mention the fact that I' is included in some I. One possible reason is that the described eventuality is particularly important in the temporal context corresponding to I. So, the saliency of the described eventuality appears to be a side–effect of the progressivity conveyed by the imparfait.

From this subsection, one can conclude that the imparfait conveys special semantic configurations (cf. **Habituality** and **Contemporaneity**). This explains why it occupies a particular place in the French literature on tense and aspect. However, such constraints are *elaborations* (overspecifications) of the imperfective/progressive value. **Habituality** says that the described 'eventuality' can be in fact a series of eventualities. **Contemporaneity** connects the reference point and the observation interval. Those constraints do not threaten in any way the imperfective thesis, since they are based on it.

5.1. *The narrative imparfait*

Ever since Guillaume, the so–called *imparfait narratif* has been a stumbling block for imperfective theories of the imparfait. This imparfait has at least three salients properties. First, it denotes the main eventuality, not a part of it. For instance, in (21), the observation spans the whole discussion, not a part of it.

(21)   A huit heures, les voleurs entraient dans la banque, ils discutaient avec un employé puis se dirigeaient vers le guichet principal

'At eight, the robbers entered the bank, they discussed with a clerk, then
they moved towards the main desk'

Second, as in narratives, states are not possible if they are interpreted as describing
episodes of the narrative. In (22), the sentence corresponding to 'they were nervous'
is appropriate only if it indicates the psychological background of the next action
(the motion towards the main desk).

(22)   A huit heures, les voleurs entraient dans la banque, ils étaient nerveux et se
        dirigeaient vers le guichet principal
        'At eight, the robbers entered the bank, they were nervous and moved
        towards the main desk'

Third, the narrative imparfait has a special flavor of simultaneity. Things are de-
scribed 'as they happen', by a fictitious 'direct witness', etc.

    This bundle of properties suggest that this imparfait is a *blend* in the sense of
Fauconnier and Turner (1994) or a *mixed category* in the sense of Malouf (1998).
That is, it partially inherits from two different sets of constraints. Constraints on nar-
ratives generally prevent states from being in the foreground (cf. (22)). Constraints
on progressivity (cf. (18')) prevent sentences in the imparfait from explicitly denot-
ing complete events. This hybrid character of the narrative imparfait explains the
endless discussions about its nature. In fact, with respect to the imperfectivity crite-
rion, the narrative imparfait is *not* an imparfait. However, with respect to the con-
temporaneity criterion, the imparfait narratif *is* an imparfait. The *in medias res* effect
comes from the interaction of **Contemporaneity** with the relaxation of imperfectiv-
ity. The observation interval is viewed as spanning the whole event (imperfectivity
fails) but not beyond (it remains parallel to the reference point of the eventuality by
Contemporaneity), whence the peculiar flavor of the narrative imparfait : one fol-
lows completely some eventuality, then shifts to the next one, etc.[6]

6. Conclusion

What I have proposed here can be summarized in two points. First, I have offered a
defense of the imperfective thesis. I do not pretend that this thesis is crystal–clear
and totally convincing as it is. However, I claimed that it is on the right track and
that the problems it faces must be addressed by complicating the analysis, not by
rejecting the intuitive core of the thesis, which proves quite robust. Second, I have
shown that the imparfait and the English progressive share a non–trivial informa-
tional constraint, which goes beyond the inferential treatments advocated for the
progressive. More work is needed to determine whether the progressive value plays
also a significant role in the other, non–temporal, uses of the imparfait.

Endnotes

[1] Binnick (1991) presents different historical approaches to imperfectivity. His inventory makes clear that many apparent differences in the definition of the term are superficial.

[2] Sentences like (a) are odd, in contrast with their English progressive counterpart (a'). Sentences like (b) are standard.

(a)   Est–ce que tu seras ^{??}en train de sortir ce soir?

(a')   Will you be going out tonight?

(b)   Demain, à cette heure–ci, il sera en train d'atterrir

          'Tomorrow, at this time, he will be landing'

[3] Attardi and Simi use the term of *viewpoint* but I prefer to avoid any confusion with aspectual viewpoints.

[4] I assume that examples like *Quand je suis arrivé, Marie marchait ^{??}jusqu'à deux heures* ('When I arrived, Mary was walking ^{??}until two') are strange for the same reasons. There is no preexisting quantity of time which can partition the event of walking until two. This is because reaching two (*qua* temporal endpoint) is quite independent from the walking activity. Mary will move along the path which leads to the temporal endpoint no matter whether she walks or not. Moving along the path is 'automatic' since it results from the movement of time itself, not of any measuring out activity.

[5] The connection between anaphoricity and the progressive is noted by Smith (1991:90).

[6] Lack of space precludes a discussion of the foreground/background distinction in connection with the imparfait (see Anscombre 1992, Glasbey 1998, Irandoust 1998 for some approaches pertaining to this question).

References

Anscombre, Jean Claude (1992). Imparfait et passé composé: des forts en thème/propos. L'information Grammaticale 55, 43–53.

Asher, Nicolas (1992). A Default, Truth–Conditional Semantics for the Progressive. Linguistics and Philosophy 15, 463–508.

Attardi, Giuseppe and Maria Simi (1993). A Formalization of Viewpoints. TR–93–062, ICSI, University of Berkeley.

Attardi, Giuseppe and Maria Simi (1994). Proofs in Context. In Jon Doyle *et al.* (eds), *Proceedings of KR'94*, San Mateo: Morgan Kaufmann, 15–26.

Barwise, Jon and Jerry Seligman (1996). *Information Flow. The Logic of Distributed Systems*. Cambridge: Cambridge University Press.

Bonomi, Andrea (1997). The Progressive and the Structure of Events. Journal of Semantics 14, 173–205.

Binnick, Robert I. (1991). *Time and the Verb. A Guide to Tense and Aspect*. Oxford : Oxford University Press.

Dowty, David (1979). *Word Meaning and Montague Grammar*. Dordrecht: Reidel.

Ducrot, Oswald (1979). L'imparfait en français. Linguistische Berichte 60, 1–23.

Fauconnier, Gilles and Mark Turner (1994). Conceptual Projection and Middle Spaces. TR–9401, Department of Cognitive Science, UCSD.

Giannakidou, Anastasia (1998). *Polarity Sensitivity as (Non) Veridical Dependency.* Amsterdam: John Benjamins.

Glasbey, Sheila (1996). The Progressive: A Channel–Theoretic Analysis. Journal of Semantics 13, 331–361.

Glasbey, Sheila (1998). Progressives, States and Backgrounding. In S. Rothstein (ed.), *Events and Grammar*, Dordrecht: Kluwer Academic Publishers, 105–124.

Guillaume, Gustave (1929). *Temps et verbes. Théories des aspects, des modes et des temps.* Paris: Champion.

Irandoust, Hengamesh (1998). Reference Frames: An Application to Imparfait. In J.–P. Koenig (ed.), *Discourse and Cognition. Bridging the Gap*, Stanford: CSLI Publications, 309–321.

Jackendoff, Ray (1996). The Proper Treatment of Measuring Out, Telicity and Perhaps Even Quantification in English. Natural Language and Linguistic Theory 14, 305–354.

Krifka, Manfred (1992). Thematic Relations as Links between Nominal Reference and Temporal Constitution. In I. Sag and A. Szabolcsi (eds), *Lexical Matters*, Stanford: CSLI Publications, 29–54.

Krifka, Manfred (1998). The Origins of Telicity. In S. Rothstein (ed.), *Events and Grammar*, Dordrecht: Kluwer Academic Publishers, 197–235.

Landman, Fred (1992). The Progressive. Natural Language Semantics 1, 1–32.

Link, Godehard (1998). *Algebraic Semantics in Language and Philosophy.* Stanford : CSLI Publications.

Malouf, Robert (1998). Mixed Categories in HPSG. Ph.D. dissertation, Stanford University.

Moens, Mark (1987). Tense, Aspect and Temporal Reference. Ph.D. dissertation, University of Edimburgh.

Naumann, Ralf and Christopher Piñon (1997). Decomposing the Progressive. 11th Amsterdam Colloquium, 241–246.

Smith, Carlota S. (1991). *The Parameter of Aspect.* Dordrecht: Kluwer Academic Publishers (2nd edition 1997).

de Swart, Henriëtte (1991). Adverbs of Quantification: A Generalized Quantifier Approach. Doctoral dissertation, University of Groningen

de Swart, Henriëtte (1998). Aspect Shift and Coercion. Natural Language and Linguistic Theory 16, 347–385.

Tenny, Carol (1994). *Aspectual Roles and the Syntax–Semantics Interface.* Dordrecht: Kluwer Academic Publishers.

Vetters, Carl (1996). *Temps, aspect et narration.* Amsterdam: Rodopi.