

Part II: English and Portuguese tense and aspect systems and their contrast

This part contains the main proposals of the present thesis.

In Chapter 5, I present a framework for describing monolingual tense and aspect systems precisely as well as for analysing particular sentences in that respect: the aspectual network, and describe the English system in general terms. Then, I suggest another framework for stating knowledge and describing particular translations: the translation network, and discuss its properties thoroughly.

Chapter 6 presents my view of the Portuguese tense and aspect system. Most of what is described there is original work and thus requires more extensive discussion than was the case for English. In addition, specific properties of Portuguese require some extensions to the monolingual model presented in the previous chapter, which are motivated and discussed.

Chapter 7 uses the contrastive model and the descriptions of each individual system to present a wide range of differences between English and Portuguese. These differences are conveniently illustrated by real translation pairs, whose selection was motivated by several detailed studies which will be described in Part III.

Finally, Chapter 8 adds to the descriptions in the previous chapters by making some of the notions used informally more precise, in formal terms, as well as considering the descriptive models from the perspective of practical applications. The chapter does not really embody a particular proposal, rather, its purpose is to throw some more light on the models and the whole enterprise of contrasting the tense and aspect systems of two languages.

Chapter 5: A descriptive model for tense and aspect and their translation

The challenge of this chapter is to put into practice the general ideas presented in the previous chapters, both on language contrast and on the analysis of tense and aspect. Here, I will only deal with Aktionsart. Strict temporal reference, perspectival aspect and quantification will, accordingly, only be dealt with in the next chapter.

I will present two informal models in which to state monolingual and contrastive knowledge (Sections 5.1 and 5.3, respectively), and will describe the English system in Section 5.2. The monolingual model will then be employed in Chapter 6 to describe the Portuguese tense and aspect system, and the contrastive model will be put to extensive use in Chapter 7. A formalization of these tools will be attempted in Chapter 8, where also possible computational applications will be discussed.

It may seem strange that I describe English in Section 5.2 while devoting a whole chapter to Portuguese. It should be obvious, however, that most English phenomena discussed in connection with the questions I need to address here have already been satisfactorily explained (or at least a partial description has been provided) in the vast literature on tense and aspect in English. The same is hardly the case for Portuguese: In fact, almost nothing has been discussed to the extent that I can take analyses off the shelf and direct readers elsewhere. Hence the apparent lack of balance, which is, furthermore, justified by the fact that the monolingual model I will use was originally conceived (and tested) for English.

5.1 A monolingual semantic model

Since Moens's dissertation in 1987 (Moens (1987), Moens & Steedman (1988)), his concept of aspectual network has significantly influenced the computational linguistics community, especially in tense and aspect studies. See e.g. Caenepeel (1989), Sandström (1993), Kent (1993), Lascarides (1988) and Santos (1993) for proposals using and extending Moens's insights.

In this section, I will propose a version of his aspectual network as a point of departure for the description of the monolingual model of a language, but with rather significant changes, which I will motivate in detail in the sections to follow.¹

5.1.1 The work of Moens

Let me attempt to summarize Moens's main contributions:

1. Moens provided a formalization of aspectual class in terms of the concept of a nucleus, i.e., "a consequentially related sequence of preparatory process, goal event, and consequent state"

¹ Keeping in line with Moens's proposal, I use the term "aspect" in this section (and the term "aspectual network") exclusively denoting Aktionsart.

(Moens, 1987:3), glued together by a notion of contingency, rather than simple temporal order. Different aspectual classes correspond to linguistic expressions depicting different parts of a nucleus.

2. Moens provided a formalization of the aspect calculus (i.e., the way several linguistic ingredients combine to give the final sentence its aspect) by geometrically modelling it as a path in a finite network. In addition to a purely compositional framework, where the existence of some devices would bring expected new aspect values, he tackled as well the cases where apparently incompatible devices add up to perfectly understandable English sentences: For this latter case, he introduced the notion of coercion, i.e. the (prior) reinterpretation of aspect brought about by the application of an aspect operator.

For example, in *he played the sonata for ten hours*, the *for*-phrase forces its argument (typically a culminated process²) to be read as a process, and so *he played the sonata* is coerced into a process (by iteration, in this particular case, but note that a process could be obtained by selecting a part of the sonata, which would be the reasonable case if *ten minutes* had been mentioned). The end result of adding the *for*-expression is then a new culminated process.

This concept of coercion models what Sandström calls the "contextual dependency of aspectual class", i.e., the context causes the reinterpretation of the aspectual class a given sentence (or part thereof) belongs to.

3. Finally, Moens suggested a uniform solution to several puzzles of English tense and aspect with the machinery above:

a) He related the perfect and the progressive aspect operators to parts of the nucleus, and modelled marked cases of the use of such operators by coercion in the aspectual network;

b) He related narrative progression and temporal connectives also to operations that selected, or added, parts of the nucleus.

In sum, by giving more structure to the semantics of tense and aspect, Moens was able to provide more adequate descriptions of the behaviour of several tense and aspect mechanisms.

5.1.2 The aspectual network as presented by Moens

Of the various proposals by Moens, I will make use here of the computational model called the aspectual network, whose rationale is to model the import of the several bearers of aspect in text, through transitions among the nodes in that network. Here are Moens's own words of motivation: "It would seem rather strange to say that *run* or a sentence containing the verb *run* is ambiguous between all these categories. It seems like a better idea of a Vendlerian taxonomy not as a fixed classification, but as a dynamic one where an element like *run* [...] can move from one category to the other, provided the context is such as to support the assumptions associated with

² With his proposal, Moens introduces a new terminology for events, namely processes, culminated processes, culminations and points. The first three correspond roughly to Vendler's (1967) activities, accomplishments and achievements. Points correspond to punctual non-resultative events such as *tap* or *knock*. In order to be more faithful to Moens's proposal, I will use his terminology when describing his work, but I will not use it later in my own proposal.

the transition in question" (Moens, 1987:44).

Moens is concerned throughout the dissertation with English, and he purports to describe all and only possible aspect transitions of English with the network. I will now describe his model in some detail.

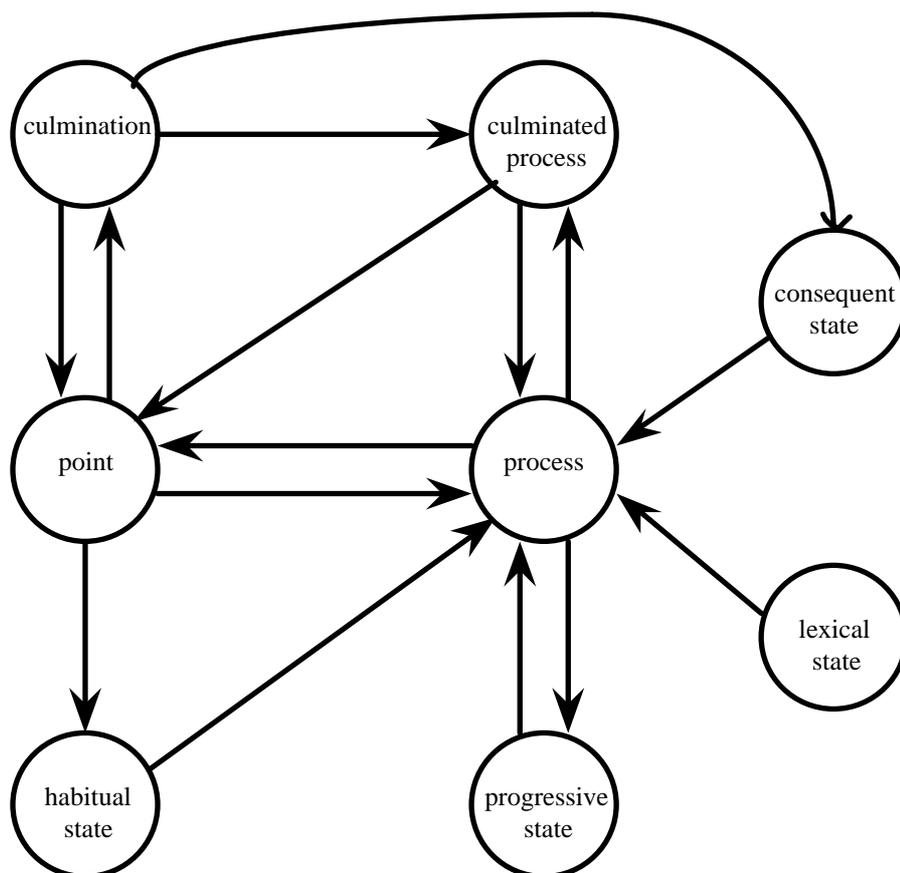
The ontology. Each node represents an aspectual class. Aspectual class is equated with event type. Aspectual class is defined in terms of a nucleus, which maximally comprises a preparatory phase, a culmination point and a consequent state. Basically, changes in aspectual class add or delete parts to events.

The nodes. Moens describes English as containing four nodes of the event kind (culminations only, culminations with resulting state, culminations with preparatory process and resulting state, and preparatory process only), and four nodes of the state kind (comprising consequent states, and three additional kinds of states: progressive, habitual, and lexical states).

Every node has the same status in Moens's network, that of classifying a possible English proposition. To start with, basic propositions in English are defined as those denoted by sentences in the simple past, with subjects syntactically and semantically singular. However, Moens also mentions that "the network can be used to classify all these linguistic units [smaller units than sentences, such as verbs or verb phrases]" (Moens, 1987:94), by actually classifying sentences whose remaining constituents do not bring any aspectual changes.

The transitions. The network specifies the transitions among aspectual classes that are possible in English. Figure 5.1 is my drawing of Moens's original network.

Figure 5.1



According to the motivation (and evidence) for the transitions suggested by Moens, there are three kinds of transitions contained in his aspectual network:

(1) Transitions corresponding to aspectual operators, which are brought about by some morphosyntactic device, such as the perfect, the progressive, or a *for*-adverbial. Moens describes specific linguistic operators in a functional way:

OPERATOR: aspectual class 1 ---> aspectual class 2.

(2) Transitions brought about by **coercion**, i.e., caused by the application of an aspectual operator whose definition requires a different kind of input.

(3) Transitions unmarked "all the way down", i.e., transitions made without an explicit clue, in which an expression is interpreted as belonging to a different aspectual class without any objective operator to license it (this is how Moens handles habituality in English, see below).

These distinctions were inspired by the discussion in Kent (1993). The terms marked and unmarked were introduced by Kent to denote, respectively, "transitions which correspond directly to syntactic constructions", and those "which do not correspond to any syntactic constructions" (Kent, 1993:90). The question is whether this definition is in terms of the system, or in terms of a particular instance. For "without an exhaustive study of syntactic constructions in English one cannot tell whether all so-called unmarked transitions actually are associated with a corresponding syntactic construction" (Kent, 1993:91). Kent suggests the terms explicit and implicit marking for what I labelled transitions of the first and second kinds.

Examples. I will use Moens's original aspectual network to illustrate the transitions. To make it possible to follow the examples easily (annotated with the page number in Moens's dissertation), I present here as well the definitions given by Moens of the operators FOR, IN, UNTIL and the progressive:

for: PROCESS ---> CULMINATED PROCESS;

in: CULMINATED PROCESS ---> CULMINATED PROCESS;

until: PROCESS ---> CULMINATED PROCESS;

progressive: PROCESS ---> PROGRESSIVE STATE.

So, the sentence *John ran for two hours* (p.46) is analysed as *John ran*, which is a process, plus a *for*-adverbial, yielding a final culminated process. Schematically, underlining the path label:

PROCESS(John ran) for (two hours) CULMINATED PROCESS

This simple example only features one transition of the first kind.

Now, in *he read a novel for a few minutes* (p.45), the expression *he read a novel* is a culminated process, so a transition from culminated process to process is effected through coercion caused by the *for*-adverbial, and then the addition of *for* brings about a new culminated process. Schematically, and using the symbol "@>" to denote coerced transitions:

CULMINATED PROCESS (he read a novel) @> PROCESS for (a few minutes) CULMINATED PROCESS

Two different transitions were thus involved in the analysis of this sentence.

A similar situation occurs in *The mountaineers reached the top in less than 5 hours* (p.47), where *The mountaineers reached the top*, which is basically a culmination, is first coerced into a culminated process, and then a new culminated process is obtained by the addition of the *in*-phrase:

CULMINATION (the mountaineers reached the top) @> CULMINATED PROCESS in (less than five hours) CULMINATED PROCESS.

And similarly, the analysis of the sentence *My program ran in less than four minutes this morning* (p.47) proceeds by adding a culmination to a process due to the presence of the *in*-adverbial:

PROCESS (My program ran) @> CULMINATED PROCESS in (less than four minutes) CULMINATED PROCESS.

Even though Moens states that "for other transitions, such as the one resulting in an iterated process or an habitual statement English has no explicit markers and they can be made freely" (Moens, 1987:51), he does not present an explicit example of habituality only, such as for example the sentence *John worked for IBM*. I will, however, present his example *I was walking to work last winter* (p.62), which, according to Moens, involves a transition into habitual state. Here is the analysis suggested:

CULMINATED PROCESS (I walked to work) @> POINT @> HABITUAL STATE @> PROCESS progressive PROGRESSIVE STATE.

This case is not the only one where coercion involves more than one transition. More than one unmarked transition appears in several analyses, as I will show. A case in point is the progressive of culminations: *John is reaching the top* (p. 59) is analysed by Moens in the following way:

CULMINATION (John reached the top) @> CULMINATED PROCESS @> PROCESS progressive PROGRESSIVE STATE.

Yet another example is *John arrived late until his boss told him off* (p.52), where one has the point *John arrived late* coerced into a process by iteration:

CULMINATION (John arrived late) @> POINT @> PROCESS until (his boss told him off) CULMINATED PROCESS.

Finally, for *John was solving the puzzle in 5 minutes* (p.54), Moens offers two readings, respectively

CULMINATED PROCESS (John solved the puzzle) in (5 minutes) CULMINATED PROCESS progressive PROGRESSIVE STATE

and

CULMINATED PROCESS (John solved the puzzle) progressive PROGRESSIVE STATE @> PROCESS @> POINT @> CULMINATION @> CULMINATED PROCESS in (5 minutes) CULMINATED PROCESS.

This illustrates the possibility of having more than one path in the aspectual network, corresponding to different interpretations.

5.1.3 Some problems of the original aspectual network

Using Moens's model does not mean I will not depart from it in several respects.

First of all, the ontology in terms of missing/existing parts of an entity (the nucleus) is only satisfactory as far as non-states are concerned: States are not really handled in Moens's theory. In fact, even though a schema comprising a part of each main aspectual class (an activity, an event, and a state, respectively) apparently cannot fail to be right, the consequent state is not allowed to occur without a culmination,³ which makes it unsuitable for modelling states in general.

Another objection to his typology is the fact that one category is missing: an aspectual class formed by a preparatory phase plus culmination, but no consequent state (perfectly possible, in my view). In fact, that category seems to express durative irresultative situations such as *take a bath, have lunch, read a book*, etc., where the concepts of change of state, and result, hardly seem applicable. The reason why Moens seems to have disregarded this possibility is because he identifies the feature "telic" with the existence of both culmination and consequent state, and the feature "extended" with the existence of a preparatory process. However, given his richer description in terms of nucleus, one wonders why he cared to introduce these two binary

³ It should be probably noted at this point that there is an unfortunate terminological clash in Moens's system regarding his use of the term "culmination": it means a part of the nucleus, and a specific aspectual class. "Culmination" as aspectual class is associated with a culmination and a consequent state. The aspectual class corresponding to a simple culmination is instead the one of "points".

distinctions at all.

This remark raises a more fundamental issue. Verkuyl (1989, 1993) has claimed that "aspectual class" is simply a distracting concept. Rather, its explanatory power is embodied in the features that are used to analyse it. I.e., in Verkuyl's terms, aspectual classes are no more than an idiosyncratic set of features, which, furthermore, are different according to different scholars. Lauri Carlson's (1981) and Dowty's (1979) proposals can also be seen in such a light, since they start from semantic criteria or primitives and produce a definition of aspectual class which is derived from more basic questions. In the Moensian framework, Sandström also made the point that features were more basic than aspectual class; cf. "rules should make explicit reference to parts of a nucleus that are required to be present, or that are added, by a temporal expression, rather than to aspectual class" (Sandström, 1990:66).

Now, my position in the present dissertation is that aspectual classes are the right descriptive level to describe a system and especially to contrast two languages. Apart from the positive evidence that the rest of this thesis may bring to the issue, I provide the following argument: how can a theory based on semantic features explain the apparent lack, in English, of the combination preparatory process + culmination (without consequent state)? This seems to be a fact about English (no scholars I know of have suggested such a class -- and I will discuss this issue below). A theory that departs from aspectual classes can simply postulate that such and such aspectual classes exist in one language (and is welcome to provide a description of them in semantic terms), but it seems to me that a theory that departs from (independent) semantic primitives is at odds to explain the lack of logically possible combinations.

In any case, the two previous issues -- namely, the fact that most states are not related to a nucleus, and that not all logically possible combinations of nucleus constituents were contemplated by Moens's network -- are enough justification for my dropping of a necessary identification of nodes in the aspectual network with (sets of) parts of a nucleus. Rather, I will use the nodes as representing distinct aspectual classes in a language, but not all nodes have the same status. Furthermore, and notwithstanding its basic adequacy for English, I suggest that the semantic entities necessary for other languages are not automatically covered by Moens's nucleus, nor is it automatically appropriate.

This brings me to another point of divergence from Moens's conception of the aspectual network: He uses it solely to handle propositions. In fact, he only specifies an aspect calculus as far as adverbials are concerned. The whole question of arguments and of other kinds of adjuncts is not actually addressed. For, even though he does discuss the import of the arguments, nowhere does he specify noun phrase properties as aspectual operators, despite his claim that "when talking about the aspectual category of a verb, one is really talking about the temporal characteristics of [...] a simple clause from which everything is excluded which we know might change the aspectual type of the expression" (Moens, 1987:94). As a matter of fact, his remarks on arguments are not very clarifying: for example, he mentions that a direct object does not "describe the culmination point -- it only helps the hearer to find a suitable one" (Moens,

1987:110).⁴ The difference between this "help" and the actual licensing of a transition is nowhere explained.

Tense is another area where Moens fails to give a detailed analysis, despite his claims that, in his model of temporal reference, "tense will also play a crucial role" (Moens, 1987:38). However, the crucial role is due to the fact that it is always through sentences in the simple past that a given expression is characterized. He states, in fact, that "tense fulfils the function of disambiguating the aspectual character of sentences which would otherwise be aspectually ambiguous" (Moens, 1987:95). This, incidentally, causes a problem for the extensibility of Moens's model to other languages, particularly to those where there is not such an aspect neutral tense (in fact, it is not even clear for English that the simple past is such a tense: Moens's statement quoted above actually implicitly denies such a claim).

One could, in fact, adapt Moens's system to handle tenses other than the simple past. For example, the simple present could be modelled as simple present: POINT -> HABITUAL STATE. But one must agree with Kent when he asks "But then how is the past element of meaning, which must be part of this proposition, removed? [...] this is a rather strange way of going about things" (Kent, 1993:82). This example raises, in addition, the independent issue of whether one can, with Moens, talk about transition types being unmarked without having exhaustively analysed all tense and aspect operators (another point made by Kent (1993), as mentioned above).

This question leads one from theory-internal matters into the empirical adequacy of the theory. Moens's neglect of tenses (and verb arguments) is not a minor point. On the contrary, from a coverage point of view, it is essential, given that these T&A devices are overwhelmingly more frequent than the aspectual operators Moens discusses, namely *in-*, *for-*, *until*-adverbials, the progressive, the perfect, and *when-* and *while*-clauses.

Another issue that one can relate to coverage is his use of paths involving several unmarked transitions which are not objectively motivated. This introduces an element of indeterminism which prevents evaluation. Contrary to the marked transitions and to the initial and final nodes of a coercion path, any intermediate nodes are not directly "observable" and at times look suspiciously artificial (cf. the examples presented above). I will therefore not allow this feature in my reinterpretation of the aspectual network, discussed below.

Finally, one last question is the applicability of his model to extra-sentential factors, i.e., what one could call temporal subordination and coordination (respectively, *when-* and *while-*

⁴ The argument runs as follows: *John ran in 4 minutes* requires more context to be interpretable than *John ran a mile in 4 minutes* does. But since both sentences are acceptable, and **John ran miles and miles for 4 minutes* is not, Moens concludes that direct objects simply provide extra clues. In my opinion, a (present or understood) direct object denoting a specified quantity is responsible for a transition. These facts could be modelled in the translation network as a transition to the culminated process node labelled by a direct object denoting any distance. *John ran in 4 minutes* was coerced from process to culminated process because of *in 4 minutes*. This coercion is conceptually equivalent to Moens's finding of a suitable one. Conversely, the sequence of coercion from process into culminated process (due to the *miles and miles* object) and (inverse) coercion from culminated process to process due to the *for*-phrase is ruled out on pragmatic grounds, i.e., it is clear that only one of the two modifiers of the above sentence should be there, since they force opposing interpretations. This is similar to the ban of co-occurrence of e.g. past and future adverbials, and is not related to the question of the contribution of verb arguments to sentence aspect.

clauses, and narrative sequence). Moens claims that his model is appropriate for dealing with these two issues as well (given his central claim that "the temporal referent of an expression is a part of a nucleus" (Moens, 1987:87)), but careful observation shows that he in fact uses a slightly different model when approaching these two domains. *When*-clauses are analysed as creating a culminated process, and non-stative narrative clauses as constituting a culminated process, as well. Both temporal clauses and narrative sequence are analysed as changing aspectual class (bringing about transitions) if the correct aspectual class is not already present, but they are not granted any coercion capability: The input class (responsible for coercion) is not specified, cf. when: EVENT -> CULMINATED PROCESS. (The treatment of narrative clauses is so sketchy that no functional equation is even provided -- one has to go to Caenepeel's (1989) dissertation to see (a modified) Moens's model dealing with sequences of main clauses.)

Sandström (1990), on the other hand, suggests that *when*- and *while*-clauses be modelled as having only coercion capability, since she notes that Moens's description in words actually conforms to such a pattern. So, one would have, in particular, when: CULMINATED PROCESS -> CULMINATED PROCESS, or, in her terms, *when*[+conseq], i.e., *when*-clauses would add a consequent state. I will present my own treatment below.

5.1.4 Some advantages of Moens's model

Before reformulating -- at times considerably -- Moens's model according to my views both of the desiderata of a semantic model of tense and aspect in general and of the English system, I want to highlight several clear advantages of Moens's approach which, to my knowledge, have not been pointed out previously:

1. One important issue for natural language semantics is vagueness. Vagueness is an essential property in linguistic description, and it contrasts with explicit specification. I have used the concept of vagueness in several places in this dissertation, and insist that it is one of the most important issues as far as translation is concerned.

In Santos (1991b) and (1992a), I argued for the distinction between having an aspectual class with different parts and having an aspectual class which is vague in relation to several meanings. In the aspectual network, this is formalizable (i) by having operators selecting different parts, and (ii) by having unmarked transitions (coerced) to describe vague lexemes or expressions, respectively.

Curiously, most researchers following up Moens's work not only have not recognized this feature as important but have even criticized it, cf. Lascarides (1988:115, emphasis added): "unlike Moens, we will view the linguistic context as disambiguating the aspectual class of the expression, rather than determining which transitions between the aspectual classes took place", and Kent (1993:81): "it is our contention that the second sentence does not give an alternative to saying that *run* is ambiguous between classes; on the contrary, it provides an explanation for that ambiguity".

Contrary to Kent and Lascarides, I believe this is one of the strengths of the approach of

Moens, who provided a classification of linguistic expressions which defies usual classificatory schemes proposed in linguistics, by allowing navigation among several classes.

2. Another important characteristic of Moens's work is its level of detail, which is considerably greater than in most semantic approaches in the literature, and therefore allowed falsification of his claims and gave rise to several attempts to formalize his proposals.

In addition, Moens's work seemed to cover many, if not most, major issues in tense and aspect, instead of being restricted to a specific problem.

These are, obviously, critical properties for language engineering.

3. Furthermore, Moens's proposal of a structured entity for the prototypical event, i.e., his ontological commitment, proved far superior to purely temporal accounts. Undoubtedly, it is intuitively more satisfying to understand natural language through a prototypical event than through abstract mathematical concepts concerning the structure of time.

Work in artificial intelligence has in fact followed this route before, by postulating structured entities to which human beings resorted in natural language understanding. It seems however that some researchers went too far in this respect, cf. Schank & Rieger's (1974) scripts and MOP's (Memory Organization Packets); see also Schank (1980). On the other hand, Moens's work seemed to be sufficiently linguistically motivated, while having concrete structured entities which are more plausible from a psychological point of view.

Even though I have not taken over his model wholesale, I will also argue for classes having some structure in the present work.

4. Finally, Moens explains seemingly opposite intuitions concerning linguistic devices by combining them (or, rather, distinguishing them) as properties of the input as opposed to those of the output. E.g., in the case of the progressive, the connotations of temporariness, and durative action in progress, are related to the input category, which is a process, while those other properties that demonstrate that the progressive is stative have to do with the final output category, a progressive state.

This is an invaluable property of his approach, to allow a combination of different -- even conflicting -- features of grammatical mechanisms in a clear way. It is my belief that one could and should extend this idea to many other linguistic phenomena. For example, the English perfect has been described by two competing theories as conveying essentially indefiniteness or present relevance. One way to combine the two would be to attribute the former property to the input category, and the latter to the output category (unfortunately, the specific analysis I provide in Section 5.2.4 below does not conform to this suggestion).

These properties, notwithstanding the several points of disagreement I have with Moens's (1987) model, are in my view sufficient to make it worth to continue in his path. Note also that his approach (or, at least, my personal view of his approach) is in principle compatible with several of the formal theories surveyed in Chapter 4, since its claims are primarily computational, despite the ontological hypothesis of the nucleus.

5.1.5 A new version of the aspectual network

Given the problems described in Section 5.1.3, I have re-worked the notion of aspectual network, in some respects considerably. First, I will concentrate on changes to the general model, and then propose changes in the description of English. I will try to present the new model in a self-contained way so that it may be used as a frame of reference on its own.

The presentation will be informal; only after the application of the model will a formal description be attempted in Chapter 8.

An aspectual network is a representational device formed by nodes and labelled directional arcs that link the nodes, to which an interpretation in terms of world situations as seen by the language is provided.

1. Nodes correspond to kinds of relations between linguistic expressions and situations according to their relationship with time (cf. my definition of Aktionsart in Chapter 4). More generally, they correspond to (sets of) semantically defined situation types. The number of the nodes, as well as their names, is motivated solely by the language they purport to describe.

2. Arcs correspond to changes in kind of linguistic expression. These changes always add information to the kind of situation described, even though the information itself may be, for example, that something is missing or that it did not occur. When arcs are labelled by grammatical devices, transitions along those arcs correspond, syntactically, to the use of that device.

3. Vagueness is modelled in the network by the introduction of nodes linked to (at least two) other nodes by unlabelled arcs. Discourse or grammatical context alone will be responsible for those transitions.

The aspectual network is simultaneously meant as a description of the grammatical system (a static model), and a dynamic model for the description of any particular sentence as far as aspect is concerned.

4. I will use the concept of path to describe the interpretation of a particular sentence. A path in the network is a sequence of connected arcs. A path starts with a lexical node and ends with a sentential one (see below point 6). At most one unlabelled arc can precede a labelled arc. Unlabelled arcs model coercion, and are thus licensed by the grammatical operator that labels the following arc in the path. Labelled arcs can only be followed (in other words, belong to a path) if the corresponding grammatical device appears in the sentence. Conversely, all grammatical devices appearing in the sentence must have contributed for the traversal of at least one arc.

5. The network is used for computing the final aspect of a sentence, starting from a classification of verbs. (Cf. Section 4.4.1.1 for arguments for such a standpoint.) Arguments change aspect: for example, goal arguments of activity verbs make them accomplishments, as in *run to the store*, while plural arguments of accomplishment verbs make them activities, as in *build houses*. In principle, all sorts of linguistic clues coming from the NP domain can have import in the aspectual network as well. Explicit quantification, however, as noted in Chapter 4,

may be strictly outside the scope of the aspectual network.

6. As more complex expressions containing a verb are built, aspect values can result which are not available at the lexical level. Examples of these non-lexical aspect values are habituality and plurality (brought about by plural NPs or tenses). Nodes may therefore be distinguishable according to the kinds of expressions they represent, and so one may talk of lexical or sentential nodes.

For those who equate meaning with truth, this will be a significant loss: What do nodes other than sentential ones mean? However, if one takes the aspectual network as a device for getting the reference to situations of the right type, one can dispense with a view of nodes referring to tensed propositions (except, obviously, for modelling the final nodes of a tensed sentence). Recall that Moens & Steedman (1988:17) describe verbs as dragging associated "uninstantiated propositions". I believe it is enough to provide a truth conditional interpretation to final nodes only -- especially because it seems to mirror adequately language behaviour itself.

7. The influence of extra-sentential context (i.e., linguistic context larger than the sentence) can be modelled also in the aspectual network (in line with Caenepeel's (1989) suggestions). Contextualized propositions, or sentences, can undergo transitions in the aspectual network due to the discourse context. Arcs corresponding to discourse-induced transitions can only depart from sentential nodes, though, and have different labels altogether, such as previous perception proposition, previous habitual state, and the like. (As pointed out below, Caenepeel introduces in her thesis a new node category, that of contingent states, which only occurs as the result of contextualization.)

In Section 5.3, in fact, I will claim that yet another kind of context, that of translating into a different language, may be responsible for unlabelled transitions.

8. Cases in which, for example, clauses function as arguments or temporal modifiers to other clauses seem to suggest that the aspectual network should be used recursively. This recursion seems to be bounded to one level, though, so I chose to introduce only one special feature to handle it: special arcs that change level (generally labelled by subordinating conjunctions). These arcs point to nodes whose sole purpose is further labelling arcs. For example, the label "when" takes a clausal node into a "temporal adverbial". A "temporal adverbial" is then used in the network as an ordinary tense and aspect device, labelling arcs.

5.2 A sketch of the English tense and aspect system

The model presented in the previous section obviously requires a reformulation of the original English aspectual network as presented by Moens (1987), regarding both the nodes and the arcs among them. I attempt to preserve most insights of Moens, while removing nodes for which there is no linguistic evidence, adding others which I believe are missing, or changing particular analyses. I will in this section rely heavily on previous improvements suggested by the work of some of Moens's followers. Therefore, I will survey and assess first the changes suggested in the literature, and then provide my specific contribution.

A word of warning must be added, though. Even though the work I cite here is to a large extent based on Moens (1987), each researcher has taken some standpoints diverging from the original model. Therefore, and specifically in what concerns the definition of aspectual class, it is founded on different assumptions, for example, in Kent and in Caenepeel. So, even if I were just attempting to merge all contributions (which I am not), I could not take their views as referring to exactly the same question without running a serious risk of misinterpretation.

5.2.1 The nodes for English

The evidence furnished by Moens for his own classes is of two sorts: his belief as regards lexical categorization (supported by several linguistic tests, common in the literature),⁵ and their use in operator definitions, either as start or final node. Let me start by looking more closely at this latter issue.

Without for the moment questioning the particular analyses, repeated here, let me note that points, lexical states and habitual states are never involved explicitly:

when: EVENT -> CULMINATED PROCESS

while: EVENT -> PROCESS

for: PROCESS ---> CULMINATED PROCESS

in: CULMINATED PROCESS ---> CULMINATED PROCESS

until: PROCESS ---> CULMINATED PROCESS

progressive: PROCESS ---> PROGRESSIVE STATE

perfect: CULMINATION ---> CONSEQUENT STATE

Interestingly, only a very small subset of nodes are output nodes, too: namely, culminated processes, and special kinds of states that are related univocally to an aspectual operator. This seems to indicate that, contrary to what he claims, also in Moens's original proposal not all nodes are equal, i.e., only a subset of the nodes are final nodes, some are only intermediary and others, still, are only initial (lexical).

Regarding habitual states, I do not believe there is evidence in English for such a node except possibly in a final position (sentential node), and due to further contextual specification. In my view, sentences in English simple tenses are always vague regarding habituality. Therefore, instead of a node termed "habitual states" to which other operators can apply, I advocate the existence of a general node representing an action (thus vague between habituality or semelfactivity). As to the (only) example presented by Moens and described above, *I was walking to work last winter*, analysed as a progressive being applied to an habitual state, I believe that a better analysis assigns to the adverbial *last winter* the transition to an iterative

⁵ Namely, stative propositions are such that, "combined with a punctual reference time, this reference point can be temporally situated within the state" (Moens, 1987:99). As far as events are concerned, atomic events are those compatible with punctual adverbials (like *at*), and telic (with consequences) are those compatible with the perfect and/or with *in*-adverbials.

interpretation.⁶

On the question of points, I believe that the English predicates presented by Moens are actually vague between a repeated (or series) reading and a point reading. This explains, actually, the common coercion of points into processes. They seem to be mainly used for this purpose in Moens's aspectual network, as pointed out by Caenepeel (1989:74): "Basic point propositions are very rare, but the category constitutes an important node for a number of transition paths" and "Points [...] occur so rarely as decontextualized propositions that they are negligible" (ibidem, 81).

Kent (1993:53) suggested the class of "repeated accomplishments" to account for expressions such as *eat sandwiches* or *waltz*, on the grounds that *Judith is eating sandwiches* \neq (does not entail) *Judith has eaten sandwiches* and *Judith has eaten sandwiches* \neq *Judith has stopped eating sandwiches* (the first entailment being valid for activities (e.g. *run*) and the second for accomplishments (e.g. *build a house*)).⁷ Kent also notes that accomplishments which are repeated share this behaviour, as for example *Max is running 100 m*. This is in full agreement with Freed's (1979) inclusion, in her semantic study of English aspectualizers, of "series" as a relevant aspectual class of English, cf. "A series is an aspectual verb-type which has the temporal characteristics of either an activity, an accomplishment, or an achievement (or some states), which is considered to occur repeatedly or habitually" (Freed, 1979:53).

Incidentally, Kent also denies that there is empirical evidence for points: "points actually behave like accomplishments, implying that there is no case for identifying a separate class" (Kent, 1993:88). I would rather say that they behave like repeated accomplishments (or series), though, as claimed in Santos (1992a:1134): "series can mean both an individual change and a set of them".

The other use of points, however, more developed by Caenepeel, who extended Moens's analysis of states, links them to habituality. I recall that, in Moens's original network, habitual states can only be reached from points. Caenepeel analyses habitual states (her "structural states") as resulting from "structural operators" such as frequency adverbs and generic constituents in the following way: POINT --> HABITUAL STATE. However, I do not believe, and will show data to the contrary later, that this is a proper analysis of frequency adverbials: what they express, in my opinion, is repetition, iteration. So, this additional argument is not relevant to keep either points or habitual states in a description of English aspect.

⁶ It is better on several different grounds: First, because it avoids the complicated semantic question of defining the meaning of the progressive generally enough to apply to habitual states. Then, if one accepts *Last winter, I was walking to work*, this new sentence cannot be analysed as having the adverbial in the scope of the progressive: *Last winter* is rather "applied" to the progressive. Finally, my suggested analysis is also better because it does not involve habituality at all, and I in fact fail to read Moens's sentence as anything but the statement of an indefinite number of walkings contained in last winter, as opposed to the corresponding simple past formulation, which would be compatible with habituality although not requiring it.

⁷ His observation that some linguistic expressions somehow share properties of different classes is something I will develop at length in several places in this dissertation, as evidence for the major role vagueness plays in natural language.

Finally, Caenepeel also mentions (p.154) coercion into points by structural operators in connection with *Suzanne remained for the most part in her office*. Given that no direct transitions from states to points exist in the network, it is not clear whether one has to consider the class of processes as an intermediate node from lexical states to points, or if she is actually advocating a new link from restrictive states to points. In my opinion, it is simply inadequate to consider *for the most part* a structural operator (i.e., habitual in Caenepeel's terminology), and so the whole argument is invalid.

I will thus, for the description of English, dispense with both points and habitual states, which are closely related categories, and include repeated events, which I call series. (Note, however, that my series differ subtly from both Freed's and Kent's, because they do not exclude a single occurrence. They could probably be considered the union of Moens's points and Freed's series.)

Turning now to Caenepeel's proposals concerning states, she divides Moens's lexical states into "unrestrictive" and "restrictive", as had already been hinted in Moens (1987). Even though I have argued extensively in Santos (1993) for the relevance of the difference between these two kinds of stative entities (which I called "temporary" and "permanent") -- and I contend that such a distinction is essential in the Portuguese system; cf. Chapter 6 --, I believe that most English states are vague regarding these categories, as will be discussed in Chapter 7. Therefore, one may add them, but not replace a state node. And thus I will use the three nodes in the English aspectual network.

In addition, Caenepeel suggested the existence of "contingent states", roughly to explain the fact that, in a narrative, states can have some event features. Sandström (1990), in turn, suggests instead adding a transition from lexical states to consequent states, in order to model inchoative states in *when*-clauses, "viewing the state in question as the result of its coming into being, rather than as simply holding" (Sandström, 1993:46). An example of the phenomenon is provided in *When we were outside the laundromat we turned, both at once so that we almost collided*. Later in Chapter 7, I discuss in depth the motivation and evidence for my alternative model for this phenomenon, which is to consider the existence of the class of English acquisitions, a class vague between a state and its inception.

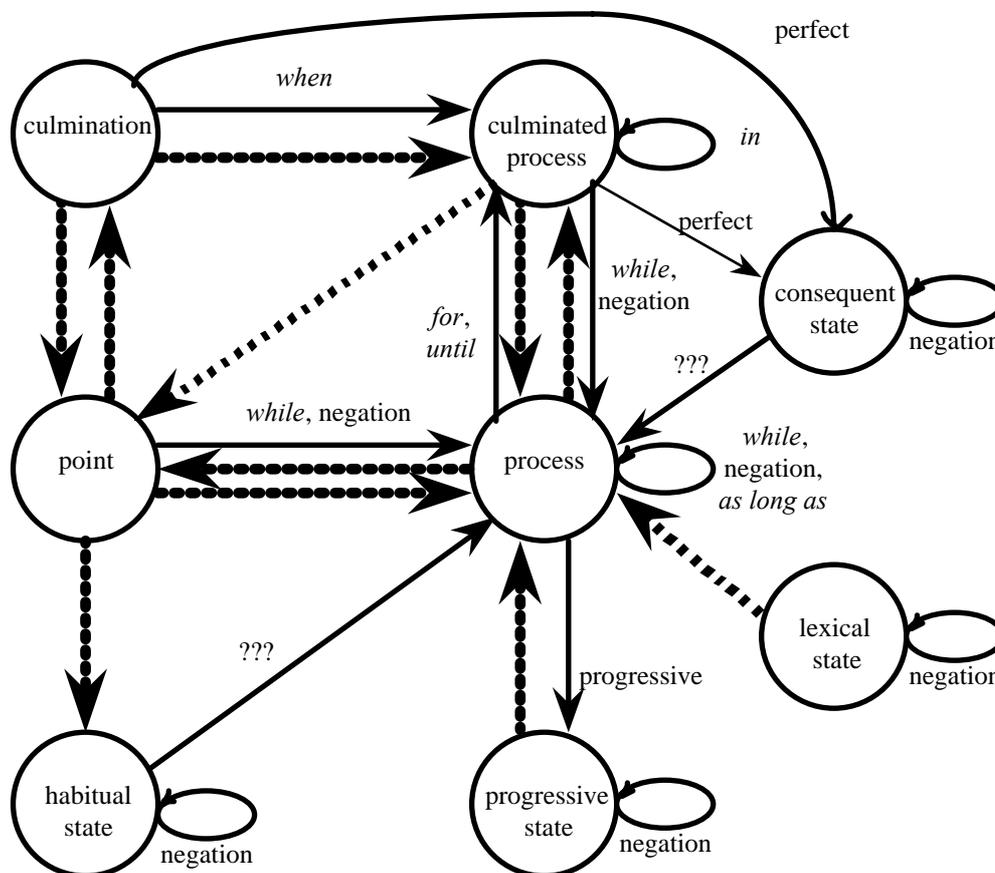
Finally, Sandström (1990) has noted that the application of some linguistic operators seemed to result in some class(es) other than those represented in Moens's network. The category she pointed out, which I call "bounded processes", corresponds precisely to the logical gap already mentioned above, namely, process plus final bound, but no consequent state. I will analyse the relevant transitions involved in the next section, before deciding against its inclusion.

5.2.2 The transitions for English

As explained above, Moens's original network only contains possible transitions among English aspectual classes: "the aspectual network describes permissible transitions from one aspectual category to another under the influence of sentential and extra-sentential context

together with the associated changes in meaning and assumptions which the context must support" (Moens, 1987:44).

Figure 5.2



In Figure 5.2, I have added as labelled arcs the transitions brought about by linguistic material, which Moens only specifies in a functional form in his dissertation. Unmarked transitions are represented as dotted arrows.

This addition was not straightforward in the cases where Moens uses the variables STATE or EVENT instead of a class in the aspectual network, because he does not discuss all possible instantiations of those transitions. For example, as far as transitions concerning STATE are concerned, transition from state into process is only discussed in connection with lexical states and progressive states (these latter in connection with the perfect progressive).⁸ Hence my question marks labelling the transitions from the other states to process in the figure.

Then, there are two transitions that seem to be stated explicitly in Moens's dissertation but are not accounted for by his network: 1) The transition from culmination to process; and 2) The transition from culminated process to consequent state.

The first derives from Moens's claim that negation transforms an EVENT into a process.

⁸ Caenepeel (1989:126) provides another example of a lexical state turned into a process: coerced by the progressive. *Fred is being polite* would correspond to the following path: RESTRICTIVE STATE (Fred was polite) @> PROCESS progressive PROGRESSIVE STATE. In addition she seems to imply that unrestrictive states, as in *Fred is being a real racist*, would have to undergo a double coercion (first to restrictive, then to process).

There does not seem to be any reason to coerce a culmination into a point and then into a process (which is the only path allowed by the network). However, since I will not be concerned with negation here, I did not add the corresponding arc.

The second transition is more crucial. First of all, it is explicitly invoked by Moens in connection with the perfect progressive, cf. "This process is then given an (arbitrary) culmination point, to the consequences of which (181) [*John has been writing a novel*] refers" (Moens, 1987:75). Then, it is hardly acceptable that there is no sensible interpretation provided of a perfect of a culminated process by his aspectual network. Sandström (1993:43) explicitly notes this as a mistake, and suggests that the perfect arc should depart from all events that have a consequent state. This is tantamount to saying that a new arc, from culminated process to consequent state, is missing. I have thus added it, I believe in agreement with Moens's own views.

Caenepeel, incidentally, also suggests the following path to explain sentences like *Fido has been very good* (p.138f), therefore assuming that this transition is there:

RESTRICTIVE STATE (Fido was very good) @> PROCESS @> CULMINATED PROCESS
perfect CONSEQUENT STATE

In addition, she invokes other relations of the perfect with states: restrictive states are coerced into contingent states in order to allow the perfect (p.137f), i.e., the perfect is charged with a further transition from contingent states into consequent states. While this is consistent with her treatment of contingent states, it is not necessary in my treatment with acquisitions.

Turning now to the treatment of the aspectual network by Lascarides (1988), there are two points I want to discuss here. The first is her distinction between INC and START, two operators which, respectively, select the initial moment of a process and of an (added, context-dependent) process to a moment (i.e., event). This is motivated by Lascarides' contention that the inchoative readings of *At 3 pm, he ran*, and *At 3 pm, he ran to the store* are different because the latter entails that the store was reached, i.e., the inchoativity does not select a part of the event. In aspectual network terms, she proposes thus at: PROCESS -> MOMENT and at: MOMENT -> MOMENT. This claim is, however, rejected by Kent (1993), for whom the same interpretation obtains for activities, accomplishments, and repeated accomplishments with *at*-adverbials, namely the inchoative reading.

Even though Lascarides furnishes very little empirical data, a detail of her analysis caught my attention: Adverbials in her proposal do not change output class. In fact, one would say that (at least *in* and *at*) adverbials do not have aspectual import except for coercing their arguments. Their import is different, namely, in terms of duration or time localization.

This strikes me as a relevant intuition also for other adverbials which Moens claimed brought about a transition, namely *for* and *until*. Their import is surely also in terms of duration. It remains to be shown whether there is indisputable evidence in favour of the view that a sentence with a *for*-adverbial is like any other culminated process. For one thing, it accepts the progressive, and the perfect, with a different interpretation or acceptability than without the *for*-

phrase; cf. *He was running for two hours (but I did not let him finish)* and *He has run for two hours: he deserves the prize*. But it is not obvious that a time frame brings about a culmination plus consequences. Rather, I believe the *for*-phrase adds strictly temporal limits, and no consequences. This latter is easier to add, though, as can be seen by the above examples. Sandström (1990:66), in her concluding remarks, also notes that a culminated process is not the best analysis for *for*, since *when* does not combine with clauses involving *for*-phrases.

I mentioned above the possibility of introducing a new class, which I called "bounded processes". Here, I will look into its possible members. The first and most obvious case would be processes modified by *for*, but also lexical non-resultative events could be considered, like *watch a movie*, or *read a book*. To those cases it would be easier to add consequences than simple processes, but they would not have intrinsic consequent states.

It is hard to find linguistic properties that show that this class is relevant for English, though. Sandström (1990) has suggested that *while* and *as* would constitute such a case, removing the consequent state of a culminated process, but not its culmination. Even though I provide no analysis of these connectives in the present dissertation, they seem to me to be amenable to a temporary state description instead.

Because, furthermore, this would constitute a claim departing from all analyses so far of the English system, and thus to motivate it adequately would be a major task, I decided not to add such a class. Rather, I analyse the class of processes in English to be simply vague between having a limit or not, i.e., *run* denotes the manner of moving or any stretch of movement (limited, in general), and it is the context that specifies, in some cases, which meaning is at stake. So, in *he ran for five minutes* the emphasis is on the stretch, while in *he ran to the station* the emphasis is on the goal of running. In this way, *for*-adverbials do not bring a transition, but only furnish more specific temporal information.

(Near the conclusion of the writing of the present dissertation, I came across a paper by Egg (1995) which actually argues for such a class, which he calls "intergressive". However, I do not think my option was particularly damaging in what the comparison of the two languages is concerned.)⁹

If *for* can be modelled as simply giving duration to a process, i.e. for: PROCESS -> PROCESS, I believe the same is even more unproblematic for *until*. There is no culmination or consequences. Only the end point of a process is specified.

Therefore, I will adopt Lascarides's way of using adjuncts as identity functions, i.e., as only coercing its input as far as aspect is concerned. The same, following Sandström, for temporal clauses, which I will consider functionally as temporal adverbials: Sandström (1990) has convincingly shown, I believe, that *when* requires the presence of a consequent state, *while* the

⁹ This is also related to the question of distinguishing between boundedness and telicity, which I will discuss in Section 6.10 below.

presence of an extended situation, and *as* the absence of a consequent state.¹⁰ This contrasts with auxiliaries, which label transitions, and with (semantic properties of) arguments, which may or not produce transitions. In fact, I believe it to be a satisfying property of this decision that different syntactic behaviour also results in different aspectual/semantic import.

Finally, I believe that tenses should also be explicitly present in the aspectual network, as already mentioned, and that they should be allowed to specify transitions: i.e., to have ontological import, in addition to having coercing capabilities and expressing specific temporal information (namely, localization in the time line).

5.2.3 The English aspectual network

Given that my main aim in this thesis is not to describe the English aspectual system in itself, I will here only discuss the general changes to Moens's network that have not yet been commented on, and leave for Chapter 7, in connection with the contrast with Portuguese, the discussion of specific analyses.

The nodes I use for English are acquisitions, states, temporary states, permanent states, activities (Moens's processes), achievements (Moens's culminations), accomplishments (Moens's culminated processes), series, and gradual accomplishments. I thus need to motivate the last ones, as well as explain the disappearance of progressive and consequent states.

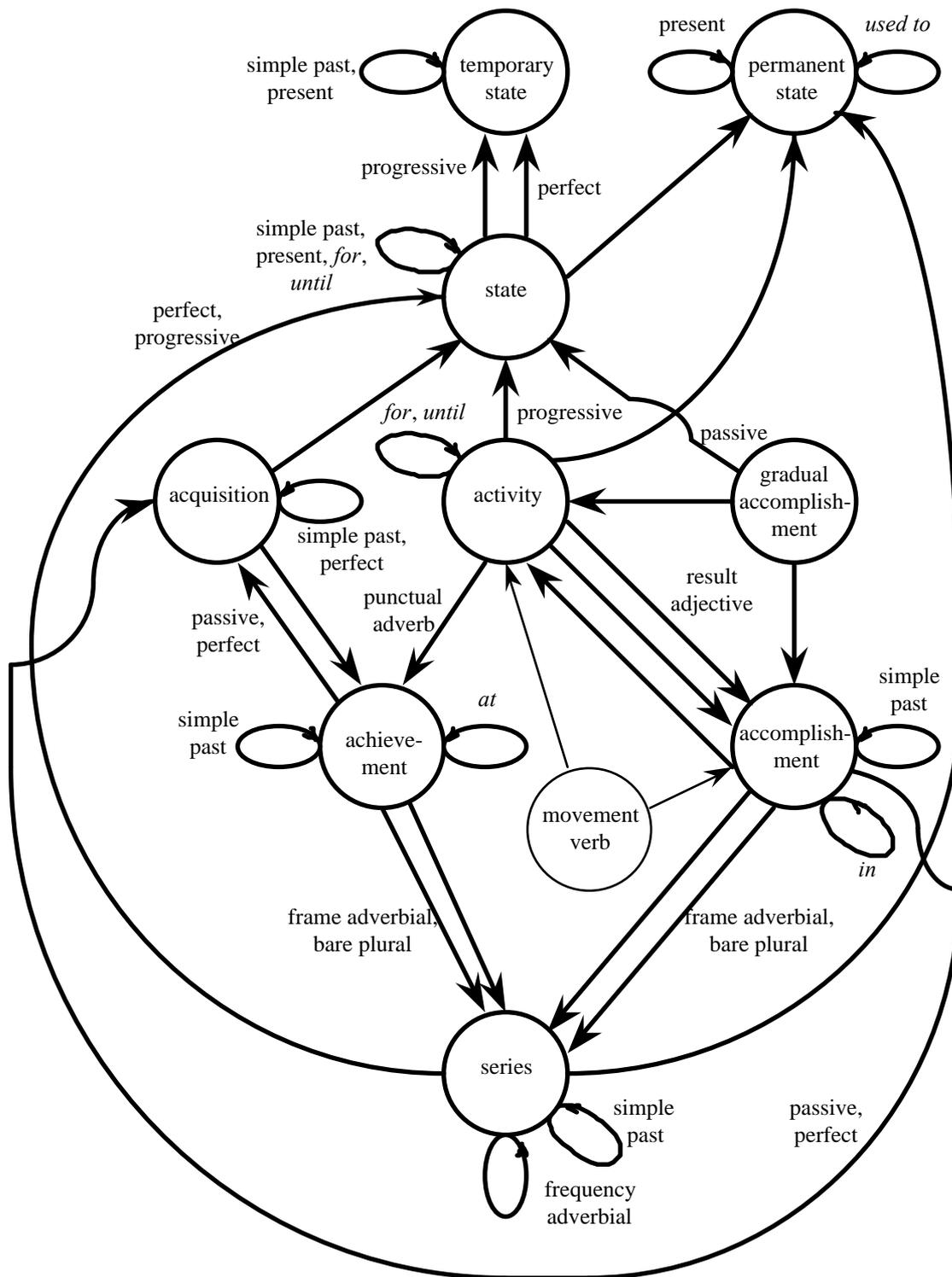
This latter issue is related to the observation that, as Moens himself notes, progressives behave like states. If one handles the different behaviour of lexical states under acquisitions, then one can merge temporary states of the two sorts, and the same holds for perfect states.

As regards the merging of progressive and consequent states, note that Moens has not provided any evidence whatever on their different aspectual behaviour. Possibly, he uses the name "consequent state" to denote the consequent state of a nucleus, but since he provides no model for the other kinds of states, the distinction is left unexplained. I think it is thus justifiable that both states be considered "temporary states". The more specific temporal location implications are brought about by the operators, i.e. progressive would denote a state before a culmination, and perfect one after.

Gradual accomplishments, on the other hand, have been noted to have special properties by several authors. Dillon (1977:35), for example, mentions "degree-inchoatives" (*fade, swell, grow*) and "gradual achievements" as well (*age, land, ripe*). Basically, they take time and have a result, like accomplishments, but their result holds homogeneously, like activities. I note that this is a kind of event which is hard, if not impossible, to state in Moens's model of aspect: could one invoke a culmination distributed in time?

Figure 5.3

¹⁰ Sandström (1993) then considerably reworks her analysis of *when*-clauses, namely dropping the identification of having a consequent state, a notion belonging to aspectual classification, and having consequences, another notion related to narrative time movement and narrative interpretation in general. I will however not address temporal connectives in detail in this dissertation, and so I will not enter the matter here.



Finally, I added, in an unstressed way, the node "movement verb" to the network, mainly to illustrate that more specific semantic classes can be added which, depending on their special meaning, may have a special pattern of aspectual behaviour. Some movement verbs, for instance, can be perceived as an accomplishment or an activity, as will be noted in Chapter 7 below.

5.2.4 A brief reminder

Despite the considerable job achieved by the aspectual network for the description of

English, and the weight given by English to Aktionsart compared to other components of the tense and aspect system, no claim is being made here that Aktionsart alone exhausts the interesting issues of English tense and aspect.

In particular, the import of temporal reference that tenses have (in English as in most languages) produces effects and behaviour which cannot be explained without taking it into account. I will illustrate such a claim, monolingually, with the English present perfect.

I analyse it as having two imports: one in terms of Aktionsart, selecting a temporary state after the occurrence of an event (as depicted in the aspectual network); and another in terms of temporal reference, identifying an extended now (i.e., a period starting in the past and ending now). (The same applies *mutatis mutandis* to the past perfect, replacing "now" by reference time.)

Whenever the two cases do not conflict (i.e., both apply), the present perfect picks the result state and locates it in an extended now. This, I would say, is the prototypical use of the present perfect, as in *I have moved to Oslo*.

When there is no result state, the present perfect can only indicate that its argument is in an extended now. If it is a state, a probable interpretation is that it overlaps with the whole of the extended now, but not necessarily, as adverbs can contradict or suggest it explicitly; cf. *I have been in Oslo before / since last January*. If it is an event, by contrast, the only interpretation possible is that it is located inside the extended now, as in *I have read War and Peace*. This then entails that the location in time of the reading is not interesting, i.e., it is indefinite (because instead of identifying a location, it is asserted that such a location is included in a larger period -- which can be left unspecified, or be indicated explicitly as in *I have read War and Peace since we met*).

Later in Chapter 7 (particularly in Section 7.4), I will show that the interaction of temporal reference matters with Aktionsart is a general phenomenon which turns out to be relevant contrastively as well.

For expository grounds, I chose not to dwell on temporal reference in English systematically here, and only invoke it as it turns out to be necessary for an adequate explanation of contrastive matters. The next chapter, however, due to the wealth of the morphological tense system in Portuguese, will take a different path concerning Portuguese.

5.3 A contrastive model

As the contrastive descriptive model, I propose two aspectual networks (one for each language) joined by a set of directional links: the Translation Network.

A translation network is thus meant as a device which allows a fine-grained description of actual translation pairs, in addition to being a model of the differences between the two systems. The complexity of the links accounts for the complexity of the language comparison/contrast, while the comparison of the particular paths in particular translation pairs provides a model of the complex processes involved in translation.

The following sections will contain a detailed description, as well as present some examples and discuss some problems.

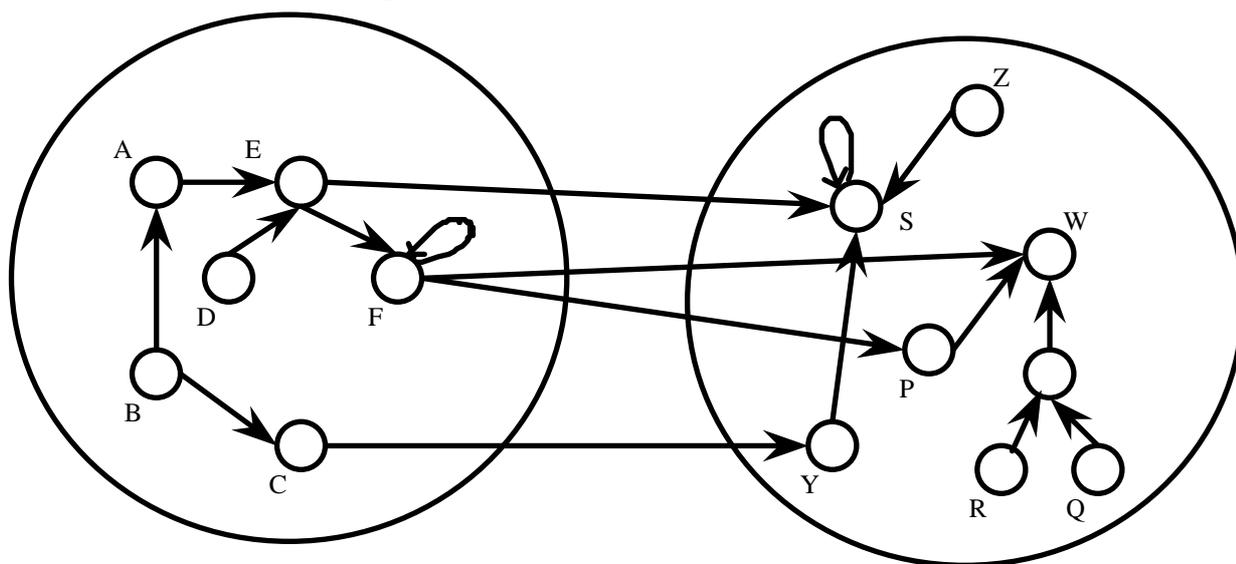
5.3.1 The translation network

A translation network is, basically, a set of unlabelled directed arcs that bridge the two (sets of) monolingual categories. These arcs, which I call "translational arcs", correspond to the linking of two different language systems.

I begin by identifying some properties of this device which are worth noting at once.

1. A translation network is, by definition, directional. Even though such a requirement follows from my previous discussions of translation, I would like to stress this point once more.
2. Secondly, the source nodes and the target nodes do not usually have the same names. Rather, it is often the case that they do not, since it is known that most categories (and thus node names) do not have a perfect correspondence in the target language.

Figure 5.4: A fictitious translation network



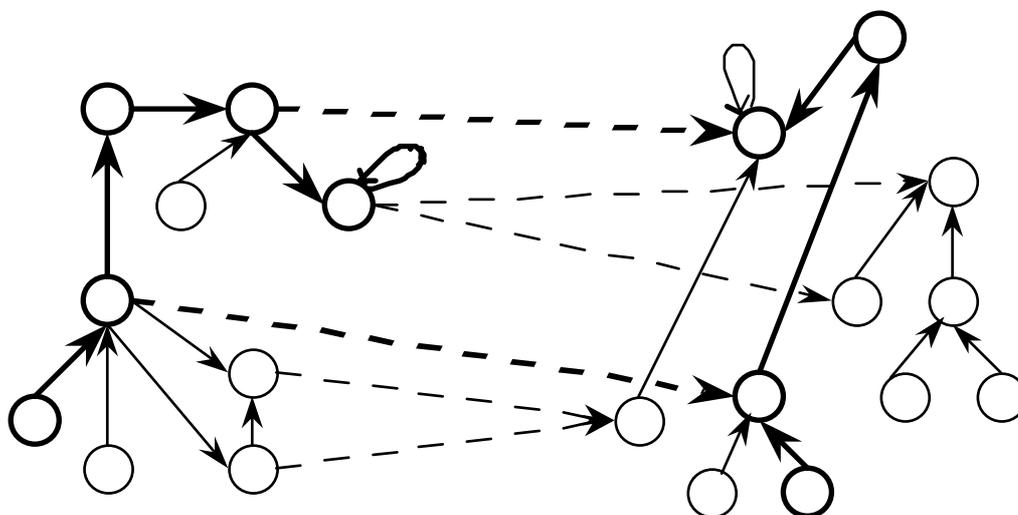
It is a very satisfying property of this model, in my opinion, that it uses no common metalanguage. It allows for different semantic concepts and different semantic primitives in each language, as well as different semantic operations. This is, as argued in Santos (1992b), important also from a practical point of view: a) Grammar developers for each individual language would certainly benefit from using a metalanguage closer to their intuitions. b) The increasing use of on-line dictionaries, thesauri, and corpora to semi-automatize language processing implies that the metalanguage used has to be somehow related to the original natural language. c) It will not conceal dissimilarities between "similar" constructions in different languages.

3. A third property of the translation network is that it can be read as a static description of the relationship between the two language systems, or be used for the description of a particular

translation pair. So, as in (my proposal of) the aspectual network, it is at the same time a static model and a dynamic device.

Considering this latter use, actual translations are represented by one (or n) path(s) in the source network, one (or m) path(s) in the target network, and one (or $n \times m$) set(s) of pairings among nodes of the two paths. This set of pairings is intended to model a possibly parallel compositional derivation. Pairings occur when there are nodes linked in the two networks by translational arcs, occurring in a compatible sequence.¹¹ But only one pairing is required (at the sentential level) for two sentences to be translations of each other. (These pairings will then play a role in the evaluation and classification of translation pairs, to be described presently.)

Figure 5.5: A fictitious translation pair



Note that, in individual translation pairs, nothing prevents translational arcs from performing a level shift. For example, one whole complex expression may be replaced by a lexical item, or vice versa.

An illustration of this case is given in Figure 5.6, where the path a-b-c that takes a lexical item of class A into a complex expression of class Y, in the source language, is translated by a (lexical) element of class Z in the target language.

4. From the previous point it can be seen that the description of particular translation pairs using the translation network allows several forms of assessing or evaluating them, if one takes into account:

- 1) the comparability of the final nodes;
- 2) the number of pairings compared to the number of nodes;
- 3) the number of alternative paths that were added or deleted by the translation.

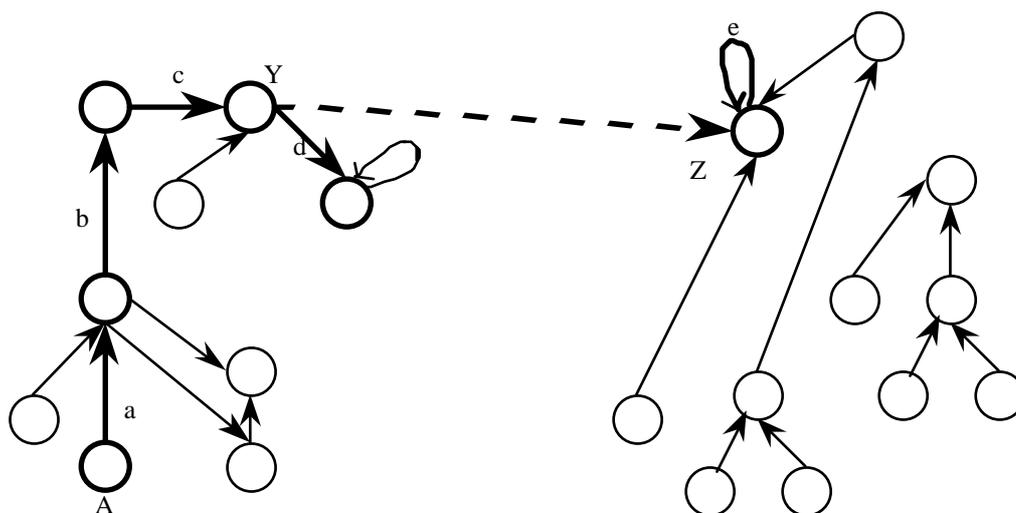
In fact, using this set of parameters, one can provide some measure of the relative degree of translatability achieved by particular translations. However, one should not forget that the comparability of two paths is dependent on two separate issues, namely: (i) the extent to which

¹¹ The pairing is computed from end nodes to lexical nodes, and not all nodes are required to have a pair.

the nodes in the two networks describe the same concepts (a matter of comparability of language systems, already "hard coded" in the translation network), and (ii) the extent to which an actually occurring translation conforms to the best possible pairing of the final, and intermediate, nodes (a matter of performance).

When several translations are available, this framework can obviously also be used as a scale for ranking them, in terms of path (and final node) similarity, as well as information preservation.

Figure 5.6: A fictitious level shift in a translation pair



5. Some specific cases of information addition, or information loss, associated with translation receive a direct model in the translation network and can even be quantified.

First, the interpretation of a (source) sentence may proceed through different paths, either leading to the same end result or giving rise to different ones. Translators may have to decide, in the case of two different possible interpretations, which one to render, i.e., the translator may have to choose one source path. Conversely, a translation may add new paths in the target network.

Second, translation pairs being modelled as two paths in their respective monolingual networks, these paths are hardly ever perfectly parallel, and thus some information may be lost or added, by the introduction of nodes in the target path with no corresponding ones in the source path.

6. The translation network also accounts neatly for the non-uniqueness of translation: given a particular sentence in one language there are often many different ways to render it in the other, none of which can be claimed to be better on objective grounds. In the network, this is modelled in two different ways: (a) by the possibility of several different target paths sharing the same number of translational arcs, albeit different (alternative target paths with the same score); and (b) by the possibility of choosing, among several possible source paths for the same sentence, a particular one to translate. In sum, the freedom of the translator is acknowledged by this model,

and, in addition, a formal description of some cases of such a freedom is provided.

7. Finally, there is one feature of the translation network I propose which does not necessarily follow from the set-up described, i.e., from the directional coupling of two aspectual networks. This feature is the admission of unlabelled transitions in the source language, a phenomenon I will call "coercion brought about by translation". I use it, for example, to model cases involving vagueness: a vague sentence in the source language is translated (and interpreted) as belonging to a more specific category of that very same language, which is then translated into the "corresponding" category of the target language. This case will be illustrated by Figure 5.7 below.

Of course, in a sense, every translation brings coercion, because translational arcs rarely mean pure equivalence. But, in addition to this inescapable situation of seeing one language through the other language's spectacles, I consider it handy to have this extra explicit coercion capability.

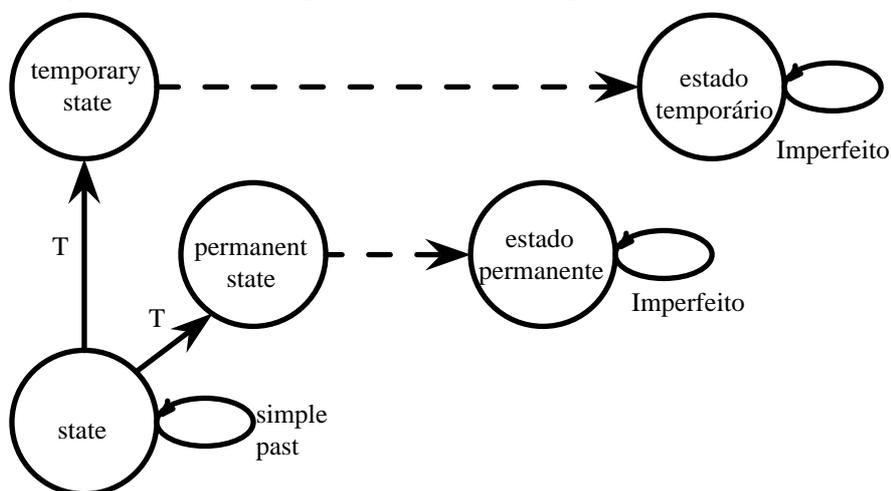
I should nevertheless note that this feature implies that the coupling of two aspectual networks may produce some changes / additions to the source network. This feature will be further discussed in Section 5.3.3 below.

5.3.2 Examples

In order to clarify at once the use of a translation network, I present some examples here. The readers must wait until Chapter 7 for a fuller picture, though, as well as consult Part III for empirical justification and proper discussion of the particular examples. Here, I will content myself with a broad view of the translation network as a system for describing translations.

Since so far I have only presented the English aspectual network, I will analyse here only (real) translations from English into Portuguese. For the sake of clarity, only the relevant parts of the network will be presented, and some particular analyses will be simplified compared to the model of Chapter 7. So, the reader should keep in mind that these examples mainly serve an illustrative purpose.

Figure 5.7: An example of coercion brought about by translation



I start by considering a simple sentence in English whose Portuguese rendering is not equivalent, because it conveys more specific information:

Beside him on a table was a small Oriental gong and a bowl of cigarettes.
ao lado, na banca de cabeceira, havia um pequeno tantã oriental e um maço de cigarros.

'beside, on the bedside table, there was a small oriental gong and a cigarette pack'

Figure 5.7 shows how this translation pair could be modelled in the translation network. Note that the last transition in the English aspectual network, the one from state to permanent state, is unlabelled, i.e., is coerced (by translation) rather than grammatically marked.

The corresponding paths can be followed thus (T> denotes "coerced by translation"):

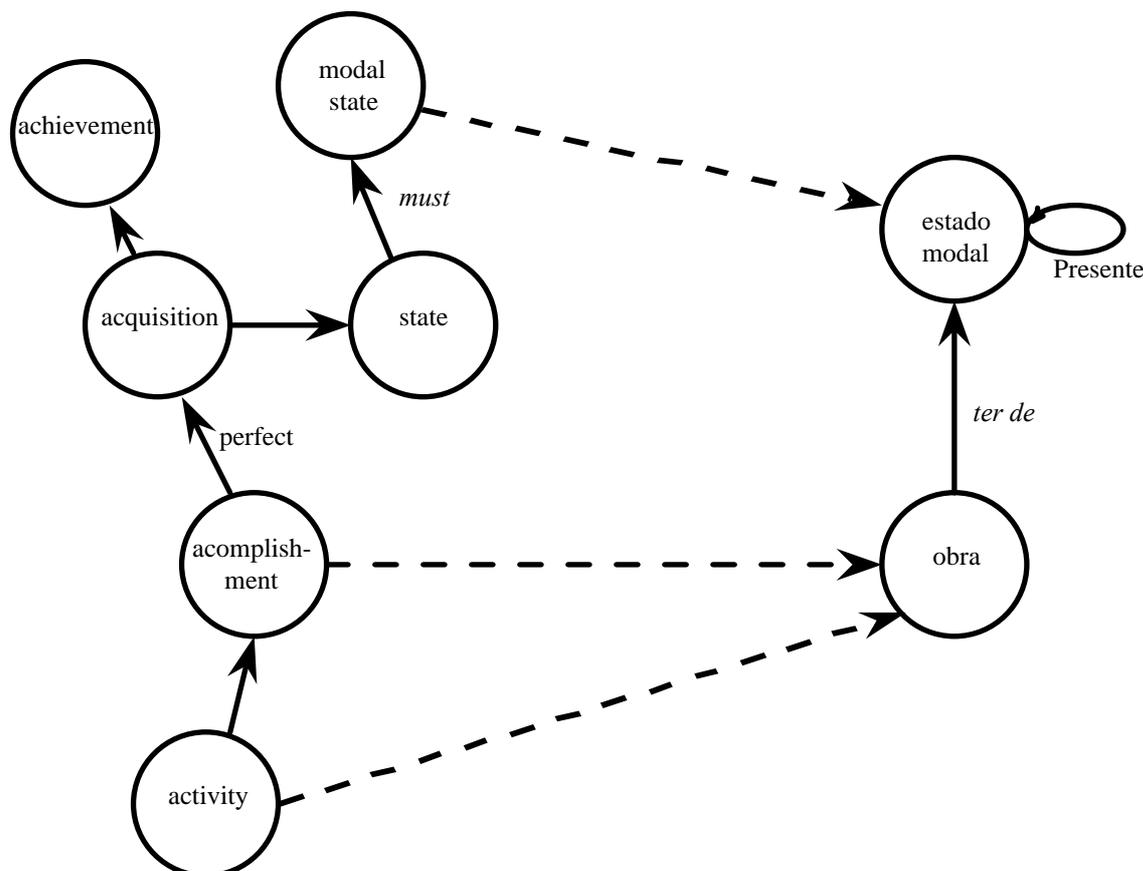
STATE (on a table be a gong) simple past STATE T> PERMANENT STATE.

ESTADO PERMANENTE (haver um tantã) Imperfeito ESTADO PERMANENTE.

Next take the pair, in which the analysis of *must* and *ter de* ('have to') is not relevant to my concerns here (I assume that the two devices have the same import in this example):

we must be gone
temos de fugir
 'we have to run away'

Figure 5.8: An example of rather different paths but corresponding final node



The paths corresponding to each sentence in the corresponding monolingual aspectual networks are as follows:

ACTIVITY (we go) @> ACCOMPLISHMENT perfect ACQUISITION @> STATE must MODAL

STATE.

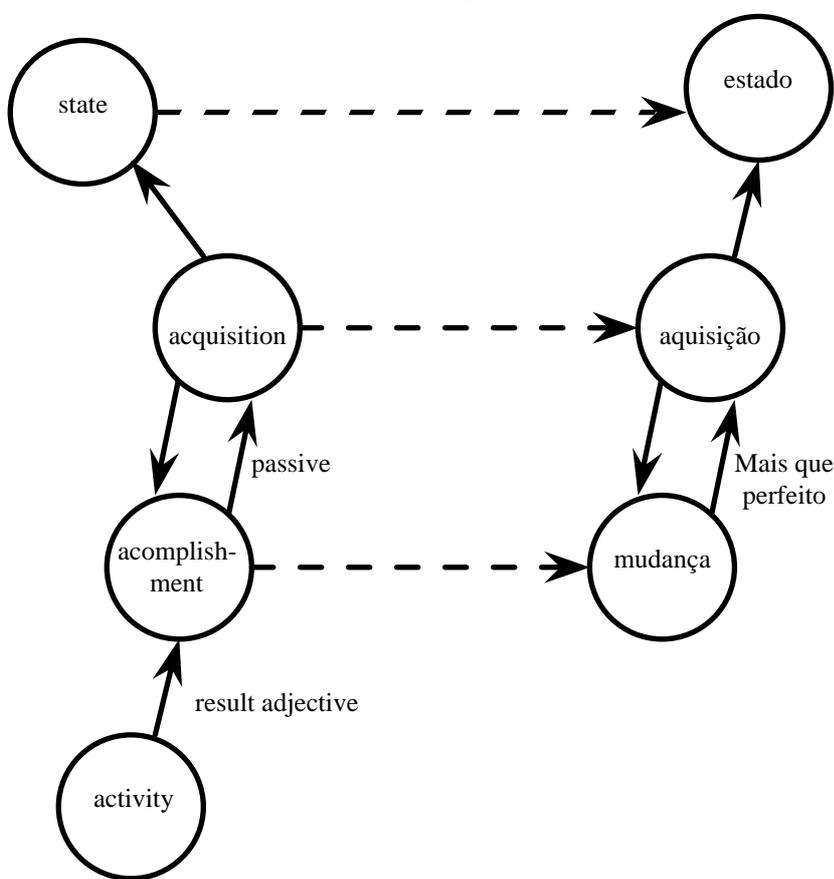
OBRA (nós fugir) ter de ESTADO MODAL presente ESTADO MODAL.

Now, the representation of this pair in the translation network would produce the following set of pairings:¹² ((modal state - estado modal) (state - 0) (acquisition - 0) (accomplishment - obra) (activity - 0)), highlighting the fact that reference in English to the consequent state is lost in Portuguese.

Consider now the pair

the sky was brushed clean by the wind
o vento limpou o céu
 'the wind had cleaned the sky'

Figure 5.9: An example of level shift



For English and Portuguese, respectively, we have

ACTIVITY (the wind brush the sky) adjective (clean) ACCOMPLISHMENT passive ACQUISITION.

MUDANÇA (o vento limpar o céu) Mais que perfeito AQUISIÇÃO.

where "aquisição" and "acquisition" (extensively discussed in Chapter 7 below) are classes vague between the inception of a state and the state itself. Because of this vagueness (modelled by the

¹² The pairings are displayed from end to start of path, in other words, from the most encompassing category inwards. The reason for this is that a translator will in principle choose to convey similarity in the larger passage rather than in its individual pieces.

existence of unlabelled arcs from "aquisição" to "estado" and "mudança", and from "acquisition" to "state" and "accomplishment"), one has a vagueness preserving translation.

The pairing suggested will thus be ((acquisition - aquisição) (accomplishment - mudança) (activity - 0)). Here the translation preserves most steps, except for losing reference to the (manner of) activity. The sameness of the information conveyed is, however, also dependent on the similarity between the nodes "state" and "estado", and between "mudança" and "accomplishment". This last is less obvious than that of the modal states in the example above: In fact, if the two sentences are read with the event interpretation, note that one could continue the Portuguese sentence with *mas agora estava nublado outra vez* ('but now it was overcast again'), while a similar operation would not be possible with the English sentence. Note, furthermore, that this particular translation pair succeeds in preserving the same sort of vagueness in the two languages, something which is not usually the case.

Finally, in my last example I present a pair where the translation is definitely less appropriate:

(she) fanned it alive
pôs-se a soprá-la
 'she set about to fan it'

The paths involved are

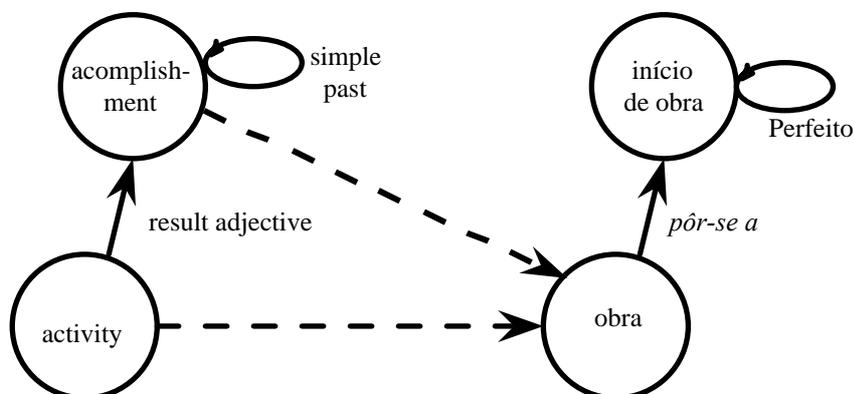
ACTIVITY (she fan) adjective (alive) ACCOMPLISHMENT simple past ACCOMPLISHMENT.

and

OBRA(ela soprar) pôr-se a INÍCIO DE OBRA Perfeito INÍCIO DE OBRA.

Even though there is one translational arc at the lexical level, not anywhere in the continuing nodes is there a match: ((accomplishment - 0) (accomplishment - 0) (activity - obra)). And, in fact, while duration is conveyed and the particular activity performed is named in the two languages, the result state is simply not mentioned in Portuguese.

Figure 5.10: A non-optimal translation pair



5.3.3 Discussion

From the few examples above (and this will be abundantly confirmed by a large body of data below) one can see that actual translation pairs constitute many more cases than those

predictable by the differences and similarities of the languages as systems only. In fact, there are a large number of factors at play in each individual translation. Therefore, it should not be surprising that a comparison of paths in two monolingual networks be a required step to understand it.

So far, I have given a number of arguments for the adequacy of this descriptive apparatus, and suggested that it is appropriate for translation evaluation. Applications where this model can be put to good use will be discussed in Chapter 8. Now, it is time to comment on its two main limitations.

1. The first one is that it cannot provide by itself a measure of the quality of a given translation pair. As motivated in Chapter 3, a different parameter, namely, a measure of translationese, should be added to the numbers and overall information provided by the translation network. This is due to the fact that a given translation may succeed in conveying every transition of the original only at the cost of being extremely awkward as a target language sentence. One should thus rate such a translation as poor.

Two separate measures are thus necessary to evaluate a given translation, one based on the translation network concerning closeness to the original meaning, the other reflecting closeness and typicality in the target language system. These two measures should, in addition, be kept distinct, not only because it is unclear how to combine them but also because they could be used for different purposes. For example, by generalizing over cases of marked translationese one could be able to pin-point actual language differences not as yet noticed, as well as classify translation problems for translation teaching.

Incidentally, note that this framework introduces a subtle difference in perspective regarding translationese. In fact, contrary to the way it is generally conceived, translationese is not modelled by the translation network by influence of the source language on the target language, but the other way around. Namely, a different interpretation of the source language text brought about by translation is posited (in other words, interpretation through target language eyes). Now, this may still result in special properties of the target text, but the explanation of translationese may prove to be more adequate this way -- at least when natives of the target language perform the translation.

(In fact, in the course of the application of the translation network model to a large number of real translation pairs, it turned out that still more radical changes to the source language network were required. The reader is thus warned that the model presented here is the basic model in which the contrastive data in Chapter 7 will be presented. Its application, however, has led to an extension which will be discussed and motivated in Chapters 7 and 8 below.)

2. The second, and hardest, problem involved in the formalization of the translation network is undoubtedly the status of the translational arcs (a question which will then have import on the evaluation and description of the translations). The problem is that there is no sound evidence for the translational arcs, except perhaps translation practice. But, as noted in

Chapter 3 and also explicitly stated by Neubert, "it is an illusion to think that practical results alone will decide what is communicatively equivalent or not" (Neubert, 1986:35). For example, in the case of the pair discussed in the previous section (Figure 5.9), to what extent is it overlap of meaning or coercion brought about by translation when one goes from "accomplishment" to "mudança"? It is natural to believe that not all translational arcs are equal either. Some of them entail more loss or addition of information than others. Yet one other factor must be introduced in the evaluation of a translation, weighting translational arcs: the semantic relationship among nodes in the two different language systems.