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A COMPOSITIONAL ANALYSIS OF ENGLISH TENSE*

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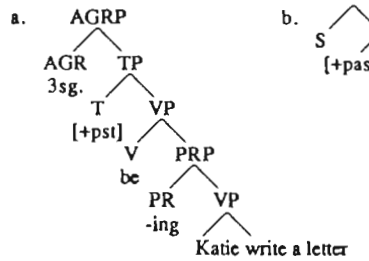
In this paper, I provide a strictly compositional account of the semantics of the English tense system. Standard analyses, such as Reichenbach (1947) and Hornstein (1977,1990) provide semantic representations for constructions such as the perfect and the progressive, but they treat the constructions atomically. That is, they do not make any connection between the lexical representations of the morphemes involved and the meaning of the construction as a whole. There is thus no apparent reason that the perfective is formed with the verb have and the past participle, while the progressive is formed with the verb be and the present participle. A semantic analysis which makes no reference to the particular morphemes involved could just as easily accommodate a language which formed the perfect with be and the present participle and the progressive with have and the past participle. I will show that given the right representations for each of the morphemes involved in the English tense system, the meanings of the constructions follow automatically, by simple composition, from the meanings of the morphemes making them up. This is in the spirit of the analysis of the passé composé in French proposed by Bouchard (1984).

The paper is in two parts. First, I will briefly present the theory, and show how the meanings of the various constructions are derived. Second, I will focus on the passive construction, and show that, despite initial appearances to the contrary, the theory correctly predicts that passive sentences are temporally identical to their active counterparts.

For the sake of clarity, I will be making use of a type of structure I call a temporal projection. This is essentially a syntactic D-structure, with all non-temporal information removed, and augmented by a node referring to the moment of speech. An example is given in (1). (1a) gives the syntactic structure, and (1b) the temporal projection[1].

(1) a.



b.

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1 Specifier positions have been omitted to save space.

Assuming, I think reasonably, that the point in time corresponding to the moment of speech is a universally available temporal element, the temporal projection contains no information that is not present in the D-structure. It is thus not an independent level of representation, but rather a visually simplified D-structure.

The morphemes involved in the English tense system are listed in (2).

(2) [-past] [+past] -en -ing have be

These morphemes can be divided into two classes, according to their temporal properties. While the verbs be and have are associated with temporal structure, expressed in terms of points and regions in time, the affixes are associated with temporal relations of precedence and coincidence. I shall refer to this type of element as a temporal connector. For example, in a simple main clause, the present tense morpheme places the verb it is attached to at the same time as the moment of speech, while the past tense morpheme places its verb at a point earlier than the moment of speech. I will express these relations by the notations in (3).

(3) $\uparrow=\downarrow$ The nearest c-commanding (i.e. higher) temporal structure coincides with the nearest c-commanded (i.e. lower) temporal structure

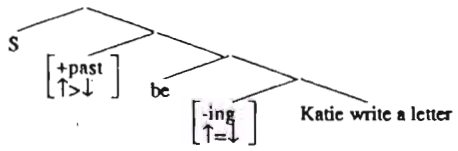
$\uparrow>\downarrow$ The nearest c-commanding temporal structure follows the nearest c-commanded temporal structure

The present tense morpheme and the present participial suffix -ing are specified as $\uparrow=\downarrow$, while the past tense morpheme and the past participial suffix -en bear the specification $\uparrow>\downarrow$, as listed in (4).

(4) $\left[\begin{smallmatrix}\text{-past}\\ \uparrow=\downarrow\end{smallmatrix}\right]$ $\left[\begin{smallmatrix}\text{+past}\\ \uparrow>\downarrow\end{smallmatrix}\right]$ $\left[\begin{smallmatrix}\text{-ing}\\ \uparrow=\downarrow\end{smallmatrix}\right]$ $\left[\begin{smallmatrix}\text{-en}\\ \uparrow>\downarrow\end{smallmatrix}\right]$

The meaning of this notation is clearest in the context of a temporal projection such as the one illustrated in (1). (5) shows the same temporal projection, this time including the temporal representations of the temporal connectors.

(5)



Evidence for the participial suffixes having the temporal specifications given in (4) comes from sentences like those in (6). Bouchard (1984) argues that in French, the equivalent of the English -en suffix is essentially a past tense marker, in that it backshifts the temporal reference of the event.

(6) a. Les enfants partis, on s'est mis au travail.
b. The broken glass lay on the floor.
c. The children being tired, we decided to stay home.
d. The sound of glass breaking interrupted our conversation.

In (6) we see that with -en, the event described by the participle precedes the main event, while with -ing, the event or state described by the participle is simulataneous with the main event.

We now turn to the verbs have and be. Assuming that these verbs are the same lexical items whether they occur as main verbs or as auxiliaries, we can independently establish their temporal properties from their behaviour in main clauses.

Looking first at have, we see that it defines a wide variety of event types. In (7), have is acting like a stative verb.

(7) a. She has something the matter with her spine
(= Something is the matter with her spine)[2]

b. He has several friends in China
(=there are several friends of his in China)

In (8), we see that it can also express an achievement, or punctual event.

(8) a. I had Mary bring the food.
(= I got Mary to bring the food)

b. He had the prisoner shot.
(= he ordered someone to shoot the prisoner)

c. Ronnie had an operation last week.
(= they operated on Ronnie last week)

In (9), it expresses an accomplishment, that is, a process culminating in a result.

(9) They had the room clean by noon.
(=They cleaned the room before noon)

Clearly, the temporal properties of the sentences in (7)-(9) are not due to the verb have. They are predictable from other material in the sentence. It is fair to say, then, that have contributes no particular temporal properties to these sentences. This means that have is temporally underspecified. We will thus adopt the working assumption that have is temporally null.

Sentences containing be as a main verb do not exhibit the same temporal variety as those containing have. The sentences in (10) show that sentences containing be express states.

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2 Note that the equals sign is used in these examples to indicate equivalence of temporal structure, not total synonymy.

(10) a. Mary was a good student.
b. The children are tired.
c. The building is very tall.

The only variation in the event-type of sentences with be as a main verb is between a temporally bounded state, as in (10a) and (10b), and an unbounded state, as in (10c). This difference follows entirely from whether or not the constituent following be expresses a stage-level or individual-level property. Thus it appears that the temporal structure associated with be is a region of time.

The set of primitive temporal structures is given in (11).

(11) Point in time •
Region in time ———

These two can be combined in various ways, so as to express more complex temporal structures. Some of these are given in (12)

(12) Bounded region •———•
Region containing a point ———•———
Region consisting of points —•—•—•—•—
Bounded region consisting of points •—•—•—•—•

This view of temporal structure draws on work by Jackendoff (1987,1990), and differs from standard treatments of tense in one important way. Reichenbach (1947), and most work on tense since then, analyzes the various tenses in terms of three elements. These are S, the moment of speech, E, the moment or period of the event described by the sentence, and R, a reference point. The different tenses are described by arranging these three elements in various ways along the time line. Although I retain S, the moment of speech, I dispense with E and R as elements of temporal representation. Like the syntactic elements subject and object, E and R are relational, not structural, concepts. E is a point (or region) of time that happens to be linked with an event. R is a point which happens to figure in the temporal structure, and with respect to which the event can be located. Just as the notions of subject and object do not figure as primitives in syntactic representations, E and R ought not to figure as primitives in temporal representations.[3] Returning then to points and regions, I assume, following Jackendoff, that any point in time can be viewed microscopically, as a bounded region, and any bounded region can be viewed macroscopically, as a point. Thus a punctual event can be viewed as a process with a well-defined beginning and end, and any bounded process can be viewed as a punctual event.

Elements in temporal representations thus belong to one of two categories: temporal connectors, such as the tense morphemes, -en, and -ing; and temporal structures. Temporal structures are associated with lexical items, and are combined in various ways to form larger temporal structures. I will not be concerned here with how to derive the temporal structures associated with verb phrases such as

3 It should be noted that while Reichenbach did not assume, or claim, that E and R were primitives, others following his approach (Hornstein 1990) have explicitly said that they are primitives.

'Katie write a letter' in (1), but I assume that this is done by composition of the verb with its arguments. The present paper is concerned with the composition of the temporal structure associated with the entire sentence, taking the lowest verb phrase as a component part.

For the sake of eliminating irrelevant complications, the verb phrases in the data will be restricted to one aspectual type: accomplishments. The temporal structure associated with accomplishments is shown in (13).

(13) Sue wrote the paper

•————•

(13) shows a region of time, bounded at each end by a point. Given that bounded regions can also be viewed as points, this gives the structure in (14) for a VP expressing an accomplishment.

(14)

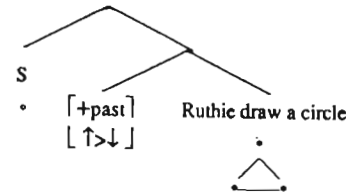
We have now developed temporal representations for all of the component parts of the English tense system, and are ready to look at how the temporal representation of a sentence is to be derived. Since space limitations preclude a discussion of all the possible combinations, a few examples will be discussed in detail to show how the representations are derived.

Let us first consider a simple past tense, such as (15).

(15) Ruthie drew a circle.

The temporal projection of (15) is given in (16).

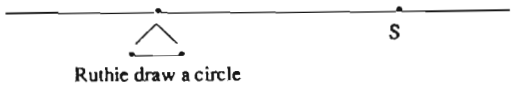
(16)



The composition of the temporal representation of (16) is best illustrated using a graphic representation of the time line. It should be borne in mind, however, that all the information in the time line pictures is present in the temporal projection, and therefore in the D-structure. Like the temporal projection, therefore, there is no reason to assume that the time line picture constitutes a separate level of representation. Consider now how the time line picture is built up from the temporal projection.

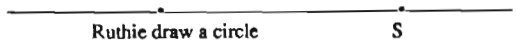
The past tense morpheme indicates that the temporal structure associated with the VP Ruthie draw a circle precedes the moment of speech. This places it on the time line, to the left of the point representing the moment of speech, giving (17).

(17)



This representation is in an expanded form, to show more clearly how it was put together. Actually, the conflated picture in (18) is a better representation.

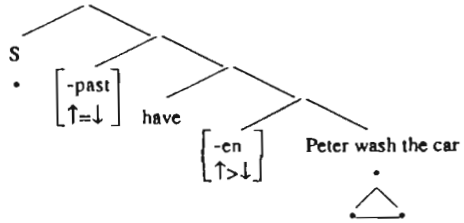
(18)



Turning to a slightly more complicated example, consider the present perfect construction in (19), whose temporal projection is given in (20).

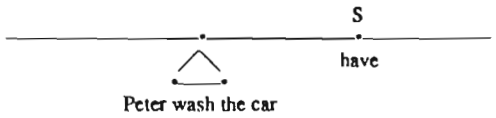
(19) Peter has washed the car.

(20)

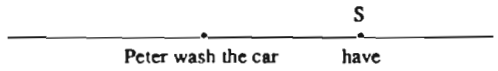


The time line picture is assembled as follows. The -en morpheme states that the temporal structure of Peter wash the car precedes the null temporal structure of have. The present tense morpheme indicates that have coincides with the moment of speech. Assuming that have takes on the temporal structure of anything it coincides with, this gives the expanded time line picture in (21) and the conflation in (22)

(21)



(22)

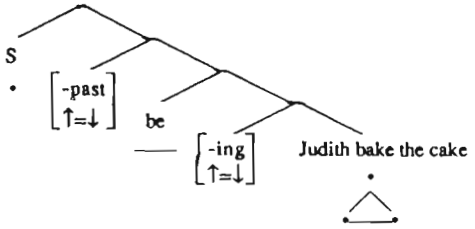


Finally, consider the progressive construction exemplified in (23).

(23) Judith is baking the cake.

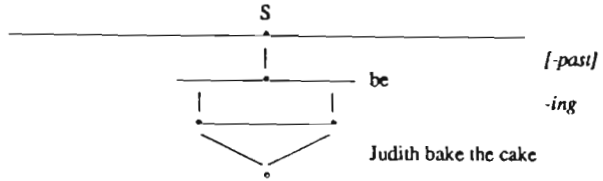
The temporal projection of (23) is shown in (24)

(24)



Here, the interpretation is slightly less obvious. Again we have two temporal relations, but this time they both express coincidence. The problem is that the three temporal structures which must coincide are not of the same type. The moment of speech is a point, be is a region, and the VP is either a point or a bounded region. I assume that when coincidence holds, it holds between like structures if possible. Thus the VP will be taken not as a point, but as a region, so as to match the region associated with be. The moment of speech, being a constant, can only be taken as a point. The region associated with be, not being bounded by points, cannot be taken as a point. This means that a relation of coincidence must hold between the moment of speech and the region associated with be. The only possible interpretation of this coincidence is that the moment of speech is contained within the region associated with be. This gives an initial approximation as in (25)[4].

(25)



One matter of interpretation needs to be sharpened here. What does it mean for two regions to coincide? In particular, what does it mean for a bounded region to coincide with an unbounded region? I propose a convention, stated in (26), to make explicit the notion of coincidence of regions.

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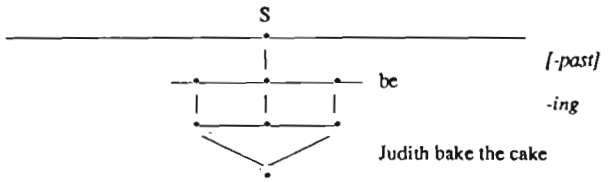
[4] The italicized notations on the right simply indicate which temporal connectors are responsible for which connections in the time line picture. They are not themselves elements of the time line picture.

(26) If two regions, R1 and R2, coincide, then all specified points in R1 are contained in R2, and all specified points in R2 are contained in R1.

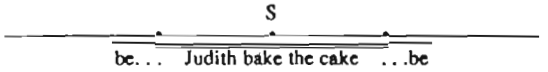
This convention ensures that the two points bounding the region associated with Judith bake the cake are contained within the region associated with be, and more importantly, ensures that the moment of speech, the only specified point in the region associated with be, is contained within the region associated with Judith bake the cake.

The expanded time line picture can therefore be given as in (27), and the conflation as in (28)

(27)



(28)

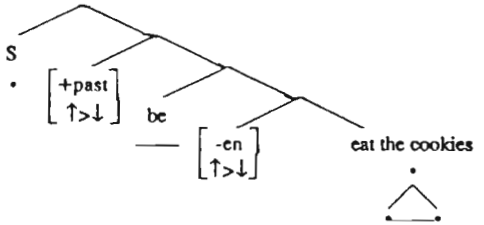


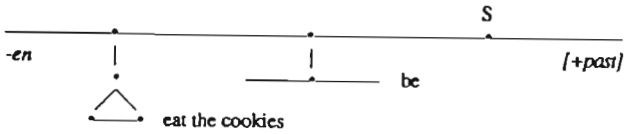
This correctly shows that the event of Judith baking the cake takes place during a bounded interval of time containing the moment of speech.

Let us turn now to the passive construction. Passive clauses present an interesting challenge to any compositional theory of tense and aspect. Unless something further is said, the analysis presented here appears to predict that the passive sentence in (29) will have the incorrect representation in (30).

(29) The cookies were eaten.

(30)





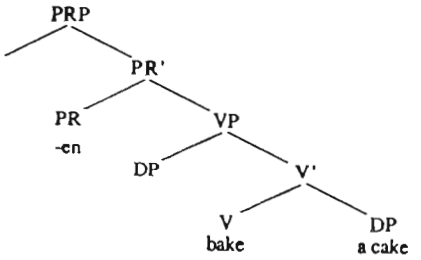
There are two temporal connectors here, both expressing precedence. This means that the eating of the cookies must precede the region associated with be, which in turn precedes the moment of speech. Effectively, this says that "The cookies were eaten" should be temporally like "Someone had eaten the cookies" rather than like "Someone ate the cookies".

This is entirely at odds with the facts. Passive clauses are temporally identical to their active counterparts, even though they contain two additional pieces of temporal structure: the verb be and the past participial suffix -en.

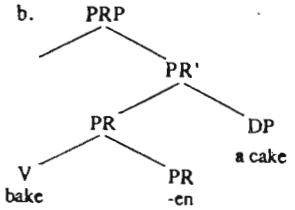
The solution to this problem can be found in a careful consideration of the syntactic structure of sentences containing participles. Comparing perfect and passive sentences, we see that there are two correlated differences between the constructions. In passives, the -en morpheme seems not to have the temporal effect it has in the perfect, while in perfects, the -en morpheme seems not to have the effect on argument structure and Case assignment that it has in passives.

Let us suppose that the subcategorization of -en in the lexicon is underspecified. Rather than requiring VP, or V°, for example, as its complement, it requires V^{i}. This means that either VP or V° will satisfy its subcategorization requirements. Assuming, simply for convenience, that -en belongs to the category PR (participle) X-bar theory permits the two structures in (31).

(31) a.



b.



Suppose that the structure in (a) is what we find in the perfect construction in English, while the passive involves (b). The two differences in the behaviour of -en now make perfect sense. Following di Sciullo and Williams (1987), I assume that V° has no temporal referent, while VP does. This means that -en cannot behave as a temporal connector when it is directly adjoined to V. Temporal connectors, after all, are simply functions building complex temporal representations from simple ones. Just as the arguments of verbs must be complete functional complexes, the argument of a temporal connector must be temporally complete. A defining characteristic of a temporally complete constituent is that it be capable of temporal reference. Thus when -en takes V^0 as its argument, it cannot function as a temporal connector.

Just as VP has properties that V° lacks, V° has properties that VP lacks. In particular, V° has an argument structure, and is involved in case assignment. Assuming that the arguments of V are satisfied within VP, VP has no unsaturated argument positions. In addition, V assigns its case within VP, meaning that VP has no case features to assign. Thus when -en takes VP as its complement, it cannot absorb case or discharge a θ-role. Note that no particular stipulation is required here. -en simply has whatever effect it can have in any particular context.

This analysis of -en is similar in spirit to one proposed for a verbal affix in Hebrew by Borer (1991).

Independent motivation for this proposal can be found in the behaviour of the present participial suffix -ing. Jackendoff (1977) proposed that -ing can attach either to V or to VP, creating either N or NP, giving the results shown in (32).

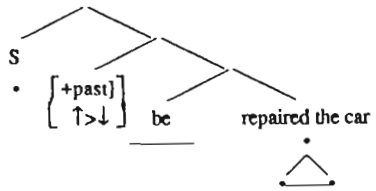
(32) a. Eating popcorn quietly is permitted, but loud noise is not.
b. The quiet eating of popcorn is permitted, but loud noise is not.

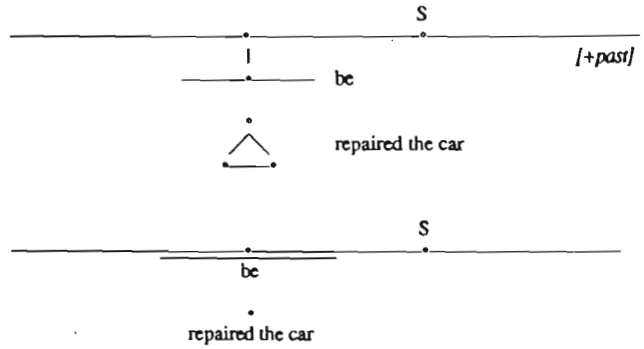
In (32a), -ing takes VP as its complement, leaving the verb free to assign case to its object, and to take adverbial modifiers such as quietly. In (32b), -ing takes V° as its complement, forcing the presence of of to assign case to the object, and requiring adjectival, rather than adverbial, modification.

Just as with -en, we see that when -ing attaches to V°, it has an effect on the argument structure and case-assigning properties of the verb, whereas when it attaches to VP, it does not.

If the foregoing is essentially correct, then the temporal structure of a passive sentence can be derived as in (33).

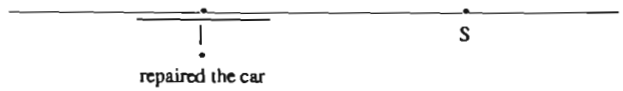
(33) The car was repaired.





Having eliminated -en as a temporal connector, we are now left with no explicit temporal relation between be and the material above it in the tree, on the one hand, and the PRP repaired the car on the other hand. Here, there is a default interpretation of simultaneity between the two pieces of temporal structure, which links them as shown by the vertical line in (34), giving the conflated representation in (35).

(34)



(35)

I conclude from this that the presence of -en in passive sentences in English does not provide evidence against a fully compositional analysis of tense such as the one proposed here. The properties of the two affixes -ing and -en are summarized in (36).

(36) -en: [__ V^i]
absorbs structural accusative case
absorbs external θ-role
↑>↓

-ing: [__ V^i]
absorbs structural accusative case
other effects on argument structure, θ-roles
↑=↓

The analysis just presented gives rise to an interesting generalization, while raising a number of questions. While lexical categories, such as verbs, have

temporal structure, consisting of points and regions, functional heads such as Tense, -en and -ing have no temporal structure per se. Instead they serve to tie together the pieces of temporal structure defined by the lexical categories. Auxiliary verbs emerge as lexical, rather than functional, heads under this analysis, lending further support to the increasingly accepted, although far from new, idea that auxiliary verbs are real verbs. The division of labour between lexical and functional categories is consistent with the idea, put forward by a number of linguists, that functional categories are essentially the glue which structures lexical representations into a coherent sentential whole. On the other hand, the analysis of the passive presented here suggests that the -ing found in nominals could be analyzed as the same -ing as is found in the progressive. This raises the questions of exactly which category -ing belongs to. If it is a nominal affix, then the generalization just stated does not hold. On the other hand, if it belongs to a functional category, then we must establish how that functional category can head what we normally think of as a nominal projection.

Finally, we can conclude from this analysis that the semantics of tense, at least in English, is significantly less complex that has been thought. As with other semantic properties of sentences, temporal structure is straightforwardly derivable by the simple composition of the relevant morphemes.

REFERENCES:

Borer, Hagit. 1991. "The Causative-Inchoative Alternation: A Case Study in Parallel Morphology." Paper presented at GLOW, Leiden.

Bouchard, D. 1984. "Having a Tense Time in Grammar." Cahiers Linguistiques d'Ottawa 12: 89-113.

di Sciullo, Anna Maria, and Edwin Williams. 1987. On the Definition of Word. Cambridge, Mass., MIT Press.

Hornstein, Norbert. 1977. "Towards a Theory of Tense." Linguistic Inquiry. 8: 521-557.

— 1990. As Time Goes By: Tense and Universal Grammar. Cambridge, Mass., MIT Press.

Jackendoff, Ray. 1977. X' Syntax: A Study of Phrase Structure. Cambridge, Mass., MIT Press.

— 1987. "The Status of Thematic Relations in Linguistic Theory." Linguistic Inquiry 18: 369-411.

— 1990. Semantic Structures. Cambridge, Mass., MIT Press.

McCawley, James D. 1988. The Syntactic Phenomena of English. vol. I. Chicago, Ill., University of Chicago Press.

Reichenbach, H. 1947. Elements of Symbolic Logic. New York, The Free Press.

ON SCHWA IN QUÉBÉCOIS*

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1. Where do schwas come from?

In generative analyses of Standard French, schwa has been assumed to be present in underlying representation. Words with a schwa-zero alternation like *souvenir* 'remember' [suv(ə)nir] are accounted for by either a deletion rule (Dell 1973/1985, Selkirk 1978), or by licensing conditions on empty nuclei (Anderson 1982, Charette 1988).

Section 1 presents Québécois data which suggest that some occurrences of schwa are epenthetic. In section 2, additional evidence is given in support of schwa epenthesis at the word-level, and against underlying schwa in word-final position. In section 3, the status of schwa in clitics is appraised. Section 4 closes with remarks on some instances of schwa in Québécois which resist an epenthesis approach.

1.1 Schwa in Standard French

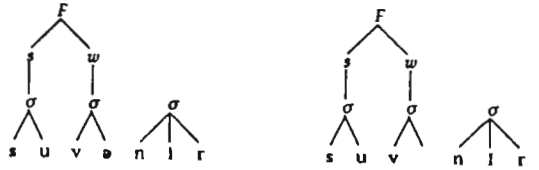
Dell (1985: 228) has a rule deleting schwa if it is preceded by a vowel and a consonant:

(1) $\text{ə} \rightarrow \emptyset \;/\; \text{V C}\_\_$

The rule in (1), Dell's VCE_2, is one of several schwa-deletion rules. The others are: VCE_1 (a version of (1) which applies across word-boundaries, e.g. deleting the italicized *e* in 'terrain de sport'), Elision ('*l*e avion'), Initial Deletion ('*v*enez'), Final Deletion ('vit*e*'), and Post-Vocalic Deletion (e.g. 'jou*e*riez').

Selkirk (1978) attempts a unified, metrical analysis of schwa-deletion. She argues that schwa is deleted in the weak branch of a binary foot, as in (2).

(2)



Because there must be a vowel to the *left* of schwa for deletion to occur, Selkirk's analysis covers Dell's VCE_2, VCE_1 and Final Deletion, but separate rules are still needed to handle Elision, Initial Deletion, and Post-Vocalic Deletion.

Anderson (1982) posits an underlying empty nucleus which surfaces as zero or schwa. A syllable with zero deletes, and the remaining material resyllabifies, as in (3):

(3)

Developing Anderson's proposal in the KLV framework, Charette (1988) holds that schwa corresponds to an underlying nucleus which may be phonetically null if it is properly governed (licensed) by a following vowel, as in (4).

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