THE FEATURES OF TENSE IN ENGLISH*

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1 Introduction

This paper is an initial attempt to establish lexical entries for the seven inflectional morphemes that can head English tense phrases (TP's). The morphemes under consideration are listed, with example sentences, in (1)-(7). The first five of these elements are robustly present in English. The sixth is present in most formal varieties, and the seventh appears in only a few contexts. All seven will be considered, for completeness.

(1) **ED**: finite past tense morpheme
   a. Bill *wrote* the letter.
   b. Marie *enjoyed* the party.

(2) **ES**: finite present tense morpheme
   a. Anna usually *walks* to work.
   b. Terry *lives* in Edmonton.

(3) **EN**: past participial morpheme
   a. Sue has *taken* the books.
   b. The books were *taken*.

(4) **ING**: present participial morpheme
   a. The children are *swimming* in the lake.
   b. We watched the boats *bobbing* in the harbour.

(5) **TO**: infinitival morpheme
   a. To *leave* now would be a mistake.
   b. Katie wants Jessie to *bring* the canoe.

(6) **SBJPRES**: present subjunctive morpheme
   a. We demand that the instructor *rewrite* the handout.
   b. If music *be* the food of love . . .

(7) **SBJPAST**: past subjunctive morpheme
   a. I wish I *were* in the mountains.
   b. If the Princess *were* here . . .

Rather than proposing a construction-based theory of tense, I take a morpheme-by-morpheme approach, with the view that, once the properties

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of each morpheme are well understood, the syntax and semantics of the various tense constructions ought to be straightforwardly derivable.

I adopt Johns' (1992) One Form/One Meaning Principle, and Cowper's (1995) Strong Monosemy Principle. These are given in (8). Johns' principle is a statement of relative markedness, whereas the Strong Monosemy Principle sets forth the conditions under which the marked option must be chosen, by limiting what can be found in a single lexical entry.

(8) a. One Form/One Meaning Principle:
Where morphemes are identical or similar in phonological properties, in the unmarked case, they are identical or similar in all lexical properties.

b. Strong Monosemy Principle:
The conceptual structure of a lexical entry may contain no disjunctions and no optional elements. If the conceptual structures of two uses of a lexical item cannot be unified through underspecification, then they must be treated as distinct lexical entries.

I assume, following Chomsky (1993) and Cowper (1995), that inflected words are inserted fully affixed into syntactic representations and are licensed by checking against abstract functional elements, either overtly or covertly. Following Cowper (1995), I also assume that the computational system of the morphological component has two parts: an inflectional system and a derivational system. A given affix may in principle be attached to a given host by either of these systems. If an affix is attached derivationally, its features become part of the category signature and the meaning of the derived word. If it is attached inflectionally, its features must be licensed by checking. Under this approach, some occurrences of some of the tense affixes under discussion here are derivationally attached, and thus not licensed by checking. These are the purely adjetival uses of words like broken and laughing,, shown in (9). These derivational uses are not under consideration in the present paper.

(9) a. We found the broken records under the sofa.

b. The laughing children woke up the dog.

Finally, I assume that the meaning of inflectional elements is expressed, not in terms of binary features such as [\text{-}past], but rather in terms of substantive elements with consistent properties. These elements may be present or absent, but, unlike the feature [\text{-}past], the absence of the element PAST cannot be directly referred to by any linguistic process.¹

¹ This approach is consistent with recent work using privative features in phonology. See also Trubetzkoy (1939, 1969) for a discussion of privative features.
2 The Elements of Tense

Having established the theoretical groundwork, I now turn to the elements of tense. Traditionally, English tense morphemes have been described in terms of features like [+PAST] and [+FINITE]. The feature [+REALIS] is also frequently found in descriptions of tense. I take these features as a starting point, in order to establish exactly what syntactic and/or semantic content they may have.

2.1 Finiteness

The feature [+FINITE] partitions the set of tense morphemes as shown in (10).²

(10) a. [+FINITE]
    ED
    ES
    SBJ|PRES
    SBJ|PAST

b. [-FINITE]
    EN
    ING
    TO

Assuming that this partition is valid, what then is the syntactic or semantic content that one of these subsets has and the other lacks? From a syntactic perspective, there is one very obvious difference. The [+FINITE] tense morphemes license lexical subjects in spec/TP, while the [-FINITE] morphemes do not.³ I will express this with the privative element CASE.

Semantically, there is nothing obvious which sets these four morphemes apart from the other three. I will therefore provisionally claim that ES, ED, SBJ|PRES and SBJ|PAST have CASE, while EN, ING and TO do not. The feature [+FINITE] is thus eliminated from the grammar.

2.2 Realis and Irrealis

While the content of the [+FINITE] feature turned out to be essentially syntactic, we will see that the REALIS/IRREALIS distinction is more purely semantic. The concept of REALIS has been defined by Comrie as a mood, involving situations that ‘are ongoing or were observed in the past’ (Comrie 1985:40), while IRREALIS is used for all other situations. Comrie cites Dyirbal as a language in which this distinction is more salient than the [+PAST] distinction found in English, but I would like to suggest that [+REALIS] is at

² While McCawley (1988:142) suggests that the subjunctive is a tenseless, or non-finite, form, the standard view is that given by Binnick (1991:77), who includes it among the finite moods. I adopt the standard view.
³ It might be thought that the [+FINITE] elements license nominative Case, but following Moorcroft (1995), I distinguish nominative, a morphological case assigned within VP, from structural subject case, an abstract element assigned by Tense.
⁴ Reuland (1983) argues that ING assigns case in certain adjunct constructions (John being tired, we left early). I do not adopt his analysis.
work in English as well. Specifically, I claim that the \textit{REALIS/IRREALIS} distinction has to do with what part of the temporal domain an event/state is linked to. In order to give this claim some substance, I must first develop some background assumptions about the temporal domain and how linguistic expressions are related to it.

\subsection{The Domain of Tense}

I take a referential approach to tense, similar in some respects to the one proposed by Partee (1973) among others, rather than the predicative approach proposed by McCawley (1971), and more recently by Stowell (to appear) who cites unpublished work by Zagona (1990).

I propose, in fact, that corresponding to Domain D, the universe of entities that can be indexed by nominal expressions, there is a domain of entities that can be indexed by temporal expressions. Let us call it Domain T. Domain T corresponds to what has often been called the time line. Domain D is organized around a deictic centre, which anchors indexical expressions like \textit{here}, \textit{me}, etc. Similarly, Domain T is structured around a temporal deictic centre, \textit{P}, that serves as an anchor for the sentence. \textit{P} may be determined by the narrative context, and in the absence of such a context is taken to be the moment of speech, or the utterance time.

We can now provisionally define Domain T as the set of moments and intervals \( m \) such that either \( m \) precedes \( P \) (\( m < P \)) or \( m \) is simultaneous to \( P \) (\( m = P \)).

This definition corresponds roughly to Comrie's definition of realis time. However, Domain T, as we shall see, is a dynamic entity, to which elements can be added by certain linguistic expressions. In this it is entirely similar to Domain D, which can be enriched by the introduction of new information in a sentence.

There are two ways in which Domain T can be enriched during a discourse. The first is by the labelling of points and intervals already contained in the domain. Expressions like \textit{yesterday, 1987, when electricity was discovered, the reign of Elizabeth I}, etc., serve to enrich the structure of Domain T by giving a name to some moment or interval within the domain.

The second way in which a discourse can change Domain T is by relabelling the discourse anchor, \( P \). This most often happens in a narrative context. In the examples discussed in this paper, \( P \) will almost invariably be taken as the moment of speech. Note that even without a narrative context, \( P \) is constantly moving forward, as time passes during any speech event.

Now let us consider how a linguistic expression is linked to Domain T. Again we take the nominal system as our model. DP's bear referential indices, which express the fact that they denote elements in Domain T. NP's by themselves cannot refer, but it has been proposed (Williams 1980) that they have an open argument place which is bound by the determiner. Analogously, Higginbotham (1985) argues that VP's have an open position (the so-called event \( \theta \)-role) which is bound by the tense morpheme heading
the clause. While I do not believe that the e-position associated with a VP is thematic in any substantive sense, I will adopt the essence of Higginbotham’s proposal, namely that a VP contains an open position (a temporal variable, in fact) which is bound by the element heading the TP in which the VP appears. The TP as a whole, like DP in the nominal system, bears the index that must be linked to the referential domain. I will use the letter \( \tau \) to express the temporal index, giving a representation like (11a), analogous to the nominal representation in (11b).

\[
\begin{align*}
\text{(11a) } & \quad \text{TP}_\tau \\
& \quad \Downarrow \\
& \quad \text{DP} \quad \text{T}' \\
& \quad \Downarrow \\
& \quad \text{Ruth}_i \quad \text{T} \\
& \quad \Downarrow \\
& \quad \text{ED}_\tau \quad \text{VP(e$_\tau$)} \\
& \quad \Downarrow \\
& \quad \text{DP} \quad \text{V'} \\
& \quad \Downarrow \\
& \quad \text{ti} \quad \text{V} \\
& \quad \Downarrow \\
& \quad \text{watched} \quad \text{DP} \\
& \quad \Downarrow \\
& \quad \text{the movie}
\end{align*}
\]

Within the pronominal system, there are three ways in which index-bearing elements can be linked to Domain D. The link can be obligatorily direct, as with R-expressions such as the teacher, Mr. Jones, etc. The referential index on an R-expression cannot be bound, but must point directly to the referential domain.

A second type of link is found with anaphors, which are referentially dependent on another linguistic expression and cannot link directly to Domain D. Finally, there are pronominals, which may refer directly to Domain D but which may also be referentially bound by another linguistic expression. I will show that all three of these referential types can also be found in the tense system of English. This is very much in the spirit of Partee (1973), who argued for a treatment of tenses as pronominals.

There is one way in which Domain T, as I have defined it, is slightly different from Domain D. Domain D has been assumed to contain mythical or imaginary entities like unicorns, dragons and the tooth fairy, whereas I have defined Domain T as, essentially, realis time. In fact, Domain T can be viewed as a subset of a larger set of moments and intervals, including those which have not yet happened at the time of the discourse anchor P, and those which failed to happen prior to P. These times are irrealis time, and as Comrie (1985) points out, future time can reasonably be seen as one type of realis time. I will express the difference between realis and irrealis time as in (12).
(12)  a. Realis: TP_{τ∈T}
b. Irrealis: TP_{τ∉T}

2.2.2 Realis Specification of Tense morphemes

Let us now consider the realsis/irrealis specification of the various tense morphemes. A first approximation of this specification is given in (13).

(13)  a. ES τ∈T
e. SBjPRES τ∉T
b. ED τ∉T
f. SBjPAST τ∉T
c. EN τ∈T
d. ING τ∈T

The subjunctive morphemes are marked as irrealis, while the finite indicative tenses and participials are marked as realis. Infinitivals are not included here, as their classification is not immediately obvious. It should also be noted at this point that there are two ING morphemes in English. The one under discussion here is a tense morpheme and corresponds to adjectives in -ing. The gerundive, or nominal ING has quite different properties. A detailed discussion of these two morphemes can be found in Cowper (1995). To return to the question of realis specification, then, I claim that the points and intervals denoted by subjunctive clauses are not in the set constituting the time line, while those denoted by indicative and participial clauses are. This distinction is clearly brought out by the pair of sentences in (14):

(14)  a. The principal insists that the teacher is in the classroom.
b. The principal insists that the teacher be in the classroom.

Here, we see that when the lower clause is indicative, as in (14a), it is interpreted as describing a state of affairs holding during an interval of time coincident with the moment of speech. In contrast, the subjunctive lower clause in (14b) describes a desideratum — a state of affairs whose coming into being is desired, in this case by the principal.

The past subjunctive is rarer than the present subjunctive, but again a contrast can be seen with the indicative form. Consider the sentences in (15):

(15)  a. If the popsicle was on the patio table, then it’s gone by now.
b. If the popsicle were on the patio table, then it would be melting now.

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5 In the spirit of privative specification, either τ∈T or τ∉T must be left unspecified. For the moment I will retain both, anticipating that evidence regarding how to eliminate the redundancy will arise in the course of the analysis.
We have seen that, in the near-minimal pair constructions in (14)-(15), TP's headed by ES and ED receive a realis interpretation while those headed by the subjunctive morphemes receive an irrealis interpretation.

Now let us consider the sentences in (16), which contrast participial and infinitival TP's.

(16) a. Terry is \( t_1 \) reading *A Midsummer Night's Dream.*
    b. Terry is \( t_1 \) to read *A Midsummer Night's Dream.*

(17) a. Kelly has PRO \( t_1 \) ordered the books.
    b. Kelly has PRO \( t_1 \) to order the books.

The contrast between the (a) and (b) sentences here is superficially similar to that between the indicative and subjunctive TP's just discussed. The (a) sentences show that TP's headed by EN and ING receive a realis interpretation. Given the unrealized interpretation of the subordinate clauses in the (b) sentences, one might conclude that TO, like the subjunctive elements, is irrealis. However, this cannot be maintained, as we see from sentences like those in (18) and (19):

(18) a. Mary was seen taking the money.
    b. Mary was seen to take the money.

(19) a. We know that Bill is honest.
    b. We know Bill to be honest.

In these sentences, the infinitival subordinate clause in the (b) sentences receives an interpretation that is as much realis as that of the participial or indicative subordinate clause in the (a) sentences. It thus appears that TO is not marked for realis/irrealis, and that something else must be governing the interpretation. A possible solution can be found in the analysis proposed in Cowper (1992) for sentences like (17b). In that paper, I proposed that the infinitival lower clause was headed by an abstract imperative complementizer. CP's headed by the imperative element are desiderata, and therefore interpreted as irrealis. If we extend that analysis to include sentences like (16b), the evidence for TO itself being marked as irrealis disappears.

It should be noted at this point that other material in the sentence can have an effect on how TP's are interpreted. World-creating verbs, modal and conditional contexts, as well as non-declarative complementizers, can affect the realis/irrealis interpretation of a clause. These issues deserve detailed attention, but the present paper is restricted to as impoverished a linguistic context as can be constructed.

The feature [+REALIS] thus survives in the present analysis as the provisional specifications \( \tau \epsilon T \) and \( \tau \epsilon T \). A later section will explore the possibility of eliminating one of these specifications for a truly privative treatment.
2.3 Present and Past

The feature \([\pm past]\) is perhaps the most widely agreed-upon feature in descriptions of English tense. Let us now consider exactly how this feature is to be implemented in the referential approach being proposed here. Consider the present and past indicative constructions shown in (20).

(20)  
\begin{align*}
a. & \quad \text{Alex wants an apple.} \\
b. & \quad \text{Alex wanted an apple.}
\end{align*}

Each of the TP's represented in (20) is indexed to Domain T, and in each case, I claim, the index is to P, the discourse anchor point, or moment of speech. The difference between (20a) and (20b) derives, not from which element of Domain T the TP is indexed to, but rather from the nature of the indexing. (20a) is indexed so as to be simultaneous to P, while (20b) is indexed so as to precede P. This approach is reminiscent of work by Saxon (1984) on disjoint anaphors in Athapaskan. These anaphors require a local antecedent, but the relation between the anaphor and the antecedent is one of disjoint reference, rather than coreference. Just as disjoint reference/coreference is a lexical property of anaphors in Athapaskan, simultaneity/precedence is a lexical property of tense morphemes in English. The indicative tense morphemes can thus be specified as in (21). The realis property of these morphemes is expressed by the statement that the temporal index \(\tau\) belongs to Domain T. The second line expresses the nature of the coindexing between \(\tau\) and the temporal element that anchors it. Finally, the subject case-marking property is expressed by the element CASE. I assume that, as with nominal coindexing, the unmarked form involves identity, or in this context simultaneity. Thus the notation '=' has been omitted from the proposed lexical entry of ES.

(21)  
\begin{align*}
a. & \quad \text{ES: } [\tau \in T] \quad [\text{CASE}] \\
b. & \quad \text{ED: } [\tau \in T] \quad < \quad [\text{CASE}]
\end{align*}

The participial tense morphemes ING and EN also differ along this dimension. TP's headed by ING are interpreted as coincident with a higher
TP, while those headed by EN are interpreted as preceding a higher TP. This is shown in (22). In each of these \( \tau' \) is the index of the lower TP and \( \tau \) is the index of the higher TP.

(22)  

\begin{align*}
\text{a. Hilary is drawing a circle.} & & \text{b. Hilary has drawn a circle.} \\
\end{align*}

Another important difference between the participial tense morphemes and the indicative ones, implicit in the structures in (22), lies in their binding properties, to which I now turn.

3 Binding properties of Tense Morphemes

3.1 Binding and the \textit{REALIS} tense morphemes

If the referential approach to tense is correct, we should find within the tense system, as in the nominal system, elements that must be free, elements that must be bound, and elements that may be either free or bound. All three of these types are evident in the tense system. Let us first examine the referential properties of the realis morphemes ES, ED, EN and ING.

3.1.1 ES — a temporal R-expression

A TP with the binding properties of an R-expression should be able to appear in a matrix clause, provided no other conditions are violated. If it appears in an embedded context, its time reference will always depend, not on its governing TP, but on the discourse anchor P.

These are properties exhibited by ES, as illustrated in (23).

(23)  

\begin{align*}
\text{a. Kelly lives in Orillia.} & & \text{b. Marty says that Kelly lives in Orillia.} & & \text{c. Marty said that Kelly lives in Orillia.} \\
\end{align*}

In all three of the sentences in (23), the meaning is that Kelly lives in Orillia at the moment of speech. In (23a) and (23b) this is entirely
straightforward, since the clause in question is either in matrix position or embedded in another TP headed by ES. The interesting case is (23c), where the clause is embedded in a TP headed by the past tense morpheme ED. If ES could be bound, we would expect that (23c) could also mean that Kelly lived in Orillia at the time Marty spoke, but has since moved away. The fact that this reading is unavailable suggests that ES cannot be bound, but must be indexed directly to Domain T.

However, (23c) has another curious property that must be accounted for. As Stowell (1995a, 1995b) points out, the only well-formed meaning of (23c) is that Kelly lived in Orillia at the time Marty spoke, and still does at the moment of speech. Stowell calls this the dual-access reading of the present tense. We must therefore rule out, in a principled way, the other reading of (23c), namely that Kelly moved to Orillia sometime between when Marty spoke and the moment of speech.

I would like to suggest that this reading is to be ruled out, not because of the meaning of ES, but rather because of the pragmatically ill-formed situation it describes. First, note that, in sentences containing indirect discourse or verbs of propositional attitude, the degree of certainty expressed in the indirect discourse can never be greater than the degree of certainty of the corresponding direct discourse. For example, consider the following sequence of events:

(24)  
(On Tuesday evening, Alex says:)
  a. It might rain tomorrow.
(On Wednesday morning, it rains. On Wednesday evening, Bill says:)
  b. Alex said it would rain today.
  OR
  c. Alex said it might rain today.

(24b) is false; (24c) is true. The only difference between these two sentences is the choice of modal. The degree of certainty expressed by would is greater than that expressed by might, and this is sufficient to make (24b) an inaccurate report of the speech in (24a).

With this in mind, let us look again at (23c). If, in fact, Kelly had not yet moved to Orillia when Marty spoke, then Marty could not have uttered (25a), but only something like (25b).\(^6\)

(25)  
  a. Kelly lives in Orillia.
  b. Kelly will live/is going to live in Orillia.

The degree of certainty expressed by ES is absolute, and thus incompatible with predictions about the future. The indirect discourse in (23c)

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\(^6\) I exclude from consideration here the schedule reading of the present tense, illustrated in (i). For a discussion of such cases, see Cowper (1992, 1994).

(i) Mary goes to Paris next week.
thus cannot be an accurate report of the situation just outlined, and that reading is therefore unavailable.

I conclude from the foregoing that the finite realis present tense morpheme ES is a temporal R-expression, which must always be indexed directly to the discourse anchor P. Let us now turn our attention to the finite realis past tense morpheme ED, which, as we shall see, exhibits rather different binding properties from ES.

3.1.2 ED — a temporal pronominal

Consider the sentences in (26) and (27):

(26)  
a. Cory loved the opera.
    b. Tony said that Cory loved the opera.

Sentence (26a) shows that ED, like ES, can refer directly to Domain T. The TP in (26a) is coindexed with the moment of speech, with the relation between the TP and the moment of speech being one of precedence rather than simultaneity. Sentence (26b) has two possible readings, as follows: First, it could be that Tony was describing a state of affairs that was true at the time of Tony's speech. Under the second reading, Tony was describing a state of affairs that held at some point before the time of Tony's speech. This second reading is more salient in (27), where the first reading is pragmatically ill-formed.

(27) Tony said that George Washington loved the opera.

These two reading can be accounted for if we assume that ED has the referential properties of a pronominal. Pronominals can, in most circumstances, be either free or bound. If ED is bound, then it is coindexed with another TP, whereas if it is free, it refers directly to Domain T. The bound reading is the one associated with (27). Here, the matrix TP is coindexed with and precedes the moment of speech, while the embedded TP is coindexed with and precedes the matrix TP. The free reading is the more salient reading of (26b). There, both the matrix TP and the embedded TP are coindexed with and precede the moment of speech.

Under this approach, the simultaneity between the two clauses in the free reading of (26b) is not explicit in the representation. I claim that it is pragmatically rather than syntactically determined, deriving from the same considerations that gave us the dual-access reading of the present tense. As with those cases, the degree of certainty expressed by the indirect discourse in (26b) is absolute. The corresponding direct discourse must therefore also have expressed absolute certainty. This means that the time of the embedded clause could not have been later than the time of the matrix clause. The only possible interpretation of a free ED in (26b), distinct from the bound interpretation, thus has the embedded TP simultaneous with the matrix TP.
Let us now consider a slightly different case. The sentences in (28) are very similar to those in (26), except that the lowest VP here is an accomplishment, rather than a state.

(28) a. Mary borrowed the book.
    b. Tony said that Mary borrowed the book.

In (28a), as in (26a), ED is free, and thus refers directly to Domain T, coindexed with and preceding the moment of speech. Like (26b), (28b) has two readings, but there are some interesting differences. Whereas with (26b) the free reading was salient, with (28b) the bound reading is salient. In other words, the embedded TP in (28b) is most naturally interpreted as taking place before the time of the matrix TP. A second difference between (26b) and (28b) is that with (28b) the free reading requires a habitual interpretation of the embedded TP, as is shown in (29).

(29) Tony said that Mary usually borrowed the books she needed from the library.

Again, it can be shown that these differences are derivable, and do not require any modification to the representation I have proposed for ED. I have argued elsewhere (Cowper 1992) that in English, events are interpreted as points, rather than intervals, wherever possible. A state, by definition, extends over an interval and cannot be interpreted as a point, whereas an accomplishment, unless explicitly represented otherwise, denotes a point.7

For some reason, simultaneity between two punctual events seems not to be a normal interpretation. This can be seen in the following pairs of sentences. In each pair, the (a) sentence contains a state, or interval event, and a punctual event, and the two are interpreted as simultaneous. The (b) sentence forms a near-minimal pair with the (a) sentence, except that it contains two punctual events, and the normal interpretation is no longer simultaneous, but sequential.

(30) a. When Shelly arrived, Kim was sleeping.
    b. When Shelly arrived, Kim fell asleep.

(31) a. Bill was shivering, but we opened the window anyway.
    b. Bill shivered, but we opened the window anyway.

(32) a. Mike's daughter was crying, so he took her home.
    b. Mike's daughter cried, so he took her home.

---

7 This is true for English; in many other languages the facts are exactly the opposite, with events being interpreted as intervals unless explicitly represented otherwise. See Cowper (1992) for discussion.
(33) a. The band was playing and the conductor dropped his baton.
b. The band played and the conductor dropped his baton.

Looking again at (28b), let us consider what happens when the embedded TP is free. Both TP's are coindexed with and precede the moment of speech. Since the degree of certainty expressed by the embedded TP is absolute, it cannot be interpreted as taking place after the matrix TP. Since both the matrix and the embedded TP are punctual, they will not be interpreted as simultaneous. There remains only one possibility: that the embedded TP takes place before the matrix TP, giving an interpretation identical to the bound reading. On the other hand, if the embedded TP is interpreted as habitual, then it is no longer punctual and is straightforwardly interpreted as simultaneous with the matrix TP.

If the pragmatically-based accounts described above are correct, then the lexical representations of ES and ED are as shown in (34).

(34) ES: \[
\begin{array}{c}
\tau \in T \\
\tau \text{ free} \\
\text{CASE}
\end{array}
\]  
ED: \[
\begin{array}{c}
\tau \in T \\
< \\
\text{CASE}
\end{array}
\]

We have now seen, in the tense system, examples of two of the three types of reference found in the nominal system. The third type is found in the behaviour of the participial morphemes ING and EN.

3.1.3 ING and EN — Temporal Anaphors

Since ING and EN lack CASE, they never appear heading a matrix TP. TP's headed by EN appear in the so-called perfect tenses,\(^8\) and ING appears in a number of progressive constructions. Let us first consider EN, since its distribution is more limited.

(35) a. Terry has returned the book.
b. Terry had returned the book.

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\(^8\) The EN in a passive construction is an incorporated X\(^n\)-level argument of a verb, and does not head its own TP. See Cowper (1995) for discussion.
(36) 

$\text{TP}_\tau$

$\text{DP}_i$

$\text{T'}$

$\text{Terry}$

$\text{T}$

$\text{VP}$

$\text{V}_j$

$\text{T}$

$\text{DP}$

$\text{V'}$

$\text{has}$

$\text{ES}$

$t_i$

$\text{had}$

$\text{ED}$

$\text{V}$

$\text{TP}_\tau'$

$\text{t}_j$

$\text{EN}$

$\text{DP}_i$

$\text{V'}$

$\text{PRO}$

$\text{DP}$

returned the books

In both of these sentences, the TP headed by EN takes place before the matrix TP. (35a) does not allow us to decide whether EN is free or bound, since the matrix TP is simultaneous with the moment of speech, and the two readings are therefore identical. With (35b), it initially appears that only the bound reading (past-of-a-past) is available. However, recall from the discussion in the previous section that two punctual events are not normally interpreted as simultaneous. It might be that EN can actually be free, but that the reading of (35b) in which the two TP's are simultaneous is pragmatically ill-formed, as it was for (28b). This possibility can be ruled out, however. First, consider what happens when we replace the lower VP in (35b) with one denoting an interval, as in (37).

(37) Tony had lived in Montreal.
(38) Tony lived in Montreal.

The difference between (37) and the corresponding simple past in (38) is that in (37), the period of residence in Montreal must precede some moment (Reichenbach's reference point) which in turn precedes the moment of speech. This is the meaning predicted by the bound interpretation of EN.

There is a second reason to doubt that EN can be free. Recall from the discussion of ED that a third reading of an embedded past tense clause was ruled out because of a pragmatic constraint on indirect discourse. There is no indirect discourse in (35b), and the third reading out therefore to be available. Under this third reading, both TP's precede the moment of speech, but the embedded TP occurs later than the matrix TP, giving a future-of-a-past reading. Since such a reading is unavailable for sentences like (35b) and (37), I conclude that EN must be bound, and is therefore a temporal anaphor, with the representation in (39).
In (39) EN: \[
\begin{array}{c}
\tau \in T \\
< \\
\text{\tau is bound}
\end{array}
\]

It is quite straightforward to establish that ING, like EN, must be bound. Consider the examples in (40).

(40) a. The children were playing.
b. We heard the bells ringing.

Each of these sentences contains two TP's. The matrix TP in each case is headed by ED and is therefore interpreted as prior to the moment of speech. The embedded TP is headed by ING. If ING is bound, the embedded TP's will be interpreted as simultaneous with the matrix TP's, that is, prior to the moment of speech. If ING is free, the embedded TP's will be interpreted as simultaneous with the moment of speech, and will possibly have the dual-access reading we found when ES was embedded under a TP headed by ED. Since only the first of these readings is available, it appears that ING must also be bound, and is therefore a temporal anaphor.

3.2 Binding and the Irrealis Tense Morphemes

The binding properties of the irrealis tense morphemes are rather less obvious than those of the realis morphemes. One problem is that the irrealis morphemes are specified as \( \tau \in T \), while the realis ones are specified as \( \tau \notin T \). These contradictory specifications would rule out any coindexing between a realis and an irrealis TP. However, as shown by the sentence in (41), ED can apparently be bound by a subjunctive TP.

(41) I request that my ashes be scattered throughout whichever house I was living in at the time of my death.

In this sentence, the verb in boldface is interpreted as past, not with respect to the moment of speech, but rather with respect to the irrealis time of the infinitival or subjunctive TP headed by the underlined element.

In order to resolve this apparent contradiction, let us reconsider the specifications \( \tau \in T \) and \( \tau \notin T \). Recall that ultimately, one or the other of these was to be eliminated from the lexical specifications of the tense morphemes, thus becoming the unmarked member of the pair. The sentence in (41) suggests that, in fact, the realis specification \( \tau \in T \) should be eliminated. If ED were not specified as \( \tau \in T \), then the interpretation of (41) would be straightforward, under the bound reading of ED. The free reading is ruled out on obvious pragmatic grounds, but is straightforwardly available in (42).

(42) I insist that my students be taught that King John signed the Magna Carta.
If realis elements are unspecified for the relation between $\tau$ and $T$, then the irrealis elements are specified as $\tau \in T$. We therefore predict that an irrealis TP cannot be bound by a realis TP. If it were, an unmarked element (the index on the realis TP) would be overriding a marked element (the index on the irrealis TP), contrary to what is found in grammar generally.

Let us therefore investigate the prediction that irrealis TP's cannot be bound by realis TP's. This means that the time reference of embedded subjunctives and infinitivals cannot depend purely on the time reference of the realis TP's they are embedded in. With this in mind, consider (43).

(43) The principal demanded that the teacher mark the papers.

The matrix TP is coindexed with and precedes the moment of speech. The embedded TP, being marked as $\tau \in T$, cannot be coindexed with either the matrix TP or the moment of speech. The temporal contribution of the embedded tense morpheme is therefore simply to place its TP outside Domain T. Any more specific temporal interpretation must be shown to follow from other elements in the sentence or in the discourse context.

It might be argued that the embedded TP in (43) must be interpreted as denoting a point in time after the time associated with the matrix TP, and that this interpretation is due to the meaning of the subjunctive tense morpheme. However, this interpretation can be directly attributed to the meaning of the verb demand. Specifically, the object of demand is a desideratum. If the object is sentential, like the one in (43), this means that the object has not yet been obtained, in other words has not yet come to pass, at the time of the matrix
TP. In different contexts, subjunctive TP's receive different temporal interpretations, as illustrated in (44).

(44)  a. The teacher prefers that homework be carefully typed and placed in a folder.
      b. If this be treason, make the most of it.

In (44a) the matrix TP extends over an interval possibly covering the teacher's entire professional career. The embedded subjunctive TP refers to any number of typing and filing events, presumably also happening throughout the teacher's entire career. In (44b), the complementizer if places its clause in a hypothetical domain parallel to the moment of speech.

These examples have shown that the temporal interpretation of a present subjunctive TP varies widely, and depends on many properties of the context in which the TP appears. What is always true is that the subjunctive TP is interpreted as lying outside Domain T.

I now turn to the past subjunctive, illustrated in (45).

(45)  a. If I were you, I would wear a jacket.
      b. I wish the concert were over.

To the extent that the past subjunctive is used at all in current spoken English, it always has a contrary-to-fact reading. This can be derived from the interplay of the two lexical markings τε ῃ T and <.

Initially, it appears that these two specifications might be incompatible. The notation < expresses a relation of precedence between two coindexed temporal elements, while τε ῃ T ensures that a subjunctive TP does not appear on the same time-line as any realis TP it might conceivably be coindexed with, nor indeed on the same time-line as the moment of speech. In order to reconcile these two elements, then, we must develop some idea of what an irrealis TP might be coindexed with. Let us suppose that Domain T is the privileged member of an arbitrarily large set of possible temporal domains, as pictured in (46). Domain T is shown in boldface, with the moment of speech, or discourse anchor, labelled P. Temporal precedence is iconically represented by left-to-right ordering.

(46)  \[ \Omega_1 \] ...
      \[ \Omega_2 \] ...
      \[ T \] ...
      \[ \Omega_3 \] ...
      \[ \Omega_4 \] ...
      etc.

All of the possible temporal domains \( \Omega \) converge at P. The difference between T and the other domains is that T ends with P, whereas the other domains are temporally unbounded. The region of any \( \Omega \) that precedes P can be thought of as a set of points and intervals that did not happen and are not
happening, while the region following P can be thought of as a set of points and intervals that might still happen. The specification \( t \in T \) ensures that a past subjunctive TP is not located within the boldface area. The notation \(<\) means that such a TP is located prior to \( P \). A past subjunctive therefore denotes an interval that did not happen and is not happening, giving the required counterfactual reading.

It therefore appears that irrealis elements do not need to be bound by realis elements, whereas apparently realis elements are frequently bound by irrealis elements and consequently interpreted in irrealis time. I conclude, then, that the specification \( t \in T \) is a lexical property of the subjunctive tense morphemes, but that the specification \( t \in T \) does not figure in the lexical entry of the so-called realis elements ES, ED, EN and ING. These elements are unmarked, and take on the realis or irrealis properties of the elements they are coindexed with.

3.3 **Properties of infinitival TO**

Finally, let us turn to infinitival TO, which we left aside earlier. We concluded, based on data like (18), (19), (16) and (17), that TO was unspecified for realis. Since we have now decided that only irrealis elements are marked for this feature, TO ends up like the participial and indicative tense morphemes, unmarked for irrealis. TO also lacks CASE, and has no marked coindexing properties. This leaves only the question of the binding status of TO. Are infinitival clauses obligatorily free, obligatorily bound, or neither?

Consider the data in (47).

(47)  a. George believed Nancy to be living in Maine.
    b. On December 5, the president will declare the students to have satisfied the requirements.

In both of these sentences, the infinitival TP is temporally dependent on the matrix clause, indicating that TP's headed by TO can be bound. This means that TO cannot be a temporal R-expression. It remains to determine whether it is obligatorily bound, like an anaphor, or optionally bound, like a pronoun. Unfortunately, there is a large class of infinitival clauses whose temporal referential properties are difficult to discern. Some of these are illustrated in (48).

(48)  a. Mary prefers PRO to eat breakfast in the living room.
    b. It is advisable PRO to carry an umbrella.
    c. We intend PRO to raise issue again.

In all of these sentences, the infinitival clause appears to have either an irrealis interpretation, or an atemporal interpretation. I assume that in these cases, some property of the CP dominating the infinitival TP is playing a role in the referential properties of the TP, and that TO is free, that is, not
dependent on the matrix TP for its temporal interpretation. This leaves TO as a temporal pronominal, like ED.

TO therefore has no syntactically relevant features whatsoever. It is interesting that the tense morpheme with absolutely no syntactic or semantic specification is the one functional head among the tense morphemes that has a phonological feature matrix.

4. Conclusion

To sum up, then, the seven tense morphemes heading English TP’s have the following lexical entries:

(49) ES

\[
\begin{align*}
\text{CASE} \\
\text{t is free}
\end{align*}
\]

ED

\[
\begin{align*}
< \\
\text{CASE}
\end{align*}
\]

ING

\[
\begin{align*}
\tau \text{ an interval} \\
\text{t is bound}
\end{align*}
\]

EN

\[
\begin{align*}
< \\
\text{t is bound}
\end{align*}
\]

SBJ\text{pres}

\[
\begin{align*}
\text{CASE} \\
\tau \not\in T
\end{align*}
\]

SBJ\text{past}

\[
\begin{align*}
\text{CASE} \\
\tau \not\in T \\
<
\end{align*}
\]

TO

\[
\emptyset
\]

There are two interesting consequences that follow from the representations given in (49). The first has to do with the disappearance of the past subjunctive. We see in (49) that the lexical entry of the past subjunctive morpheme is, in fact, one of the possible instantiations of the past indicative morpheme. Since realis is unmarked and since ED can be bound, any time it appears in an irrealis context it will take on the irrealis specification, giving it a representation identical to that of the past subjunctive. This means that the past subjunctive paradigm is redundant, at least in irrealis contexts, and it is therefore not surprising that it has essentially disappeared from the language.

The second interesting result is that the present indicative morpheme, apart from its binding properties, has no temporal specification whatsoever. The only lexical marking it has is is the property of assigning CASE to its
specifier. In other words, it is primarily a morpheme marking subject agreement, not tense. This has been claimed by Stowell, among others, but it is interesting that the result emerged, unbidden, from an analysis that began by treating it as a tense morpheme.

The conclusion to be drawn from this investigation is that any approach to tense that attempts to come up with so-called universal treatments of constructions like the simple present, the past progressive, etcetera, is doomed to failure. Like any other lexical items, tense morphemes have idiosyncratic properties that can vary from language to language. For example, it might be that the present indicative tense morpheme in another language has the binding properties of a pronominal rather than those of an R-expression. That language would then lack the obligatory dual-access reading of the present tense that we find in English. Under a lexical approach, this would be easily accounted for. The constructional properties of tenses, like those of sentences in general, follow from the lexical properties of morphemes that make them up, and from the way they are arranged in syntactic structures.

References: