Tense, Aspect and Aktionsart in Spanish and Japanese

SILVIA P. GENNARI

Abstract

In this paper, the author analyzes in detail the temporal interpretation of Spanish and Japanese tenses. In particular, she discusses simple past and past imperfect tenses in Spanish, and the past and non-past Japanese tenses. She argues that the temporal interpretation of a given sentence is not only determined by tense meanings, as often assumed, but also by aktionsart properties and pragmatic implications. This enables different languages to express similar sentential readings even when the tenses are not equivalent in meaning. The author also argues that the way aktionsart and pragmatics interact varies cross-linguistically depending on the lexical content of tense (whether the tense convey aspectual meaning) and the entire paradigm in a language.

Introduction

Spanish and Japanese tenses are interesting to compare to English ones because their tense morphology carves out the space of logical possibilities in different ways. While English and Spanish lexicalize distinctions in the past, present and future domain, Japanese only lexicalizes the past/non-past domain. In addition, English and Spanish differ as to which distinctions are lexicalized in the past domain: While English distinguished between simple past and progressive, Spanish distinguished between simple past, progressive and imperfect. Such cross-linguistic differences immediately raise the question of how languages with non-equivalent tense meanings can generate fairly equivalent temporal readings.

In this paper, I discuss the meaning of some Spanish and Japanese tenses and show how aktionsart properties interact with each language's lexical tense meanings to yield similar final temporal readings. In particular, I suggest that, contrary to what is often assumed, tense meanings alone sometimes underdetermine the final temporal interpretation in a particular utterance situation. The exact extension and location of the meant or interpreted interval may depend on independent facts of the grammar such as aktionsart and pragmatic implicatures. This is particularly true in languages with less rich temporal morphology like English and Japanese, so that underlying aktionsart assumptions can surface. Also, I argue that the effect of aktionsart and pragmatic implicatures on the temporal readings varies cross-linguistically depending on the lexical specification of the tense at hand, (e.g., on whether the tense carries aspectual information), and on the entire temporal system of a given language.

In what follows, I first introduce the general framework within which Spanish and Japanese tenses are analyzed. Second, I discuss the interpretations of past tenses in Spanish. I show how imperfect tenses are complex temporal and

aspectual operators. Third, I discuss past and non-past tenses in Japanese, showing how the temporal reading often depends on aktionsart properties. I propose truth conditions that capture the interpretations of these tenses, together with their aspectual contribution (if any).[1] Finally, I discuss similarity and differences across languages and obtain some generalizations.

1 Theoretical framework

1.1 Basic definitions

In this paper, I assume the traditional view of tenses as quantifiers, and of embedded sentences as sets of world-interval pairs. Thus, *a* believes *Q* at *w* and interval *i* is true if and only if (henceforth *iff*) for all *w'* and *i'* compatible with *a*'s beliefs at *w* and *i*, *Q(w')(i')=1* (as in von Stechow, 1995). Also, I take the event time (ET) of a sentence to be the interval at which the sentence is true. Following Dowty (1986), Hinrichs (1986) and others, I assume that reference times (RTs) are given either by adverbs that temporally locate the sentence or by the previous sentence in discourse, which itself may be temporally located. Finally, the notion of local evaluation time is understood as in the traditional logical sense: the evaluation time (or interval) of a quantifier tense is the time with respect to which its truth is evaluated. For example, in an expressions such as $\exists i[i < i' \& Q(i)]$, *i* is the ET at which the sentence Q holds and *i'* is the local evaluation time. This time can be bound by a lambda operator (as in embedded sentences) or indexically refer to the speech time (ST) (as in independent sentences).

1.2 The effect of aktionsart on temporal readings

I adopt Taylor's (1977) and Dowty's (1979, 1986, see also Vendler 1967) defining criteria of aktionsart classes. The criteria are logical entailments of a sentence *Q* at any interval *i* if *Q* is a sentence of a given class as determined by the internal semantic composition (Verkuyl, 1993). A sentence *Q(i)* is stative iff it entails that *Q* is true at all instants within *i*. A sentence *Q(i)* is an accomplishment-achievement (or a telic event) iff it entails that *Q* is false at all subintervals of *i* (where *i* is the minimal interval at which the change of state takes place.[2] *Q(i)* is an activity (or an atelic event) iff it entails that *Q* is true at all subintervals of *i* down to a certain limit of size. Note that in general, the duration of the interval or subinterval at which any sentence is true depends on world knowledge about the

1 I will not discuss Spanish future tenses here. For such a discussion, see Gennari 2000.

2 This entailment follows from Dowty's truth conditions of telic events represented with the BECOME operator. BECOME[Q] is true at an interval *i* iff (a) *Q* is false at an interval *j* containing the initial moment of *i*, (b) *Q* is true at an interval *k* containing the final instant of *i*, and (c) there is no subinterval of *i* in which conditions (a) and (b) hold. It follows that the event is not true at any subinterval of *i* and that this interval is the minimal interval at which the relevant change of state could take place.

event or state in question (Dowty, 1986). For example, activities such as *gardening* may not hold at very small subintervals. Similarly, the intervals of *being sad* or *writing a letter* are typically shorter than those of *being German* or *living a corrupt life*.

The way in which these aktionsart entailments lead to certain temporal interpretations can be seen in the relation between a sentence's ET and its local evaluation time. For instance, consider the interpretation of an independent telic sentence:

(1) John will leave (now).
FUT'(leave'(j)(i))= ∃ i [i > st & leave'(j)(i)]

Under the standard analysis of future tense, (1) is true at the ST iff there is an interval *i* after the ST such that John leaves at *i*. Note that (1) does not mean that John is leaving at the ST but that he is about to leave. To understand why an overlapping reading with the ST is not possible, consider the aktionsart entailments. First, a telic sentence *Q(i)* entails that *Q* is false at all subintervals of *i*. Second, this entailment in turn entails that if *Q* is true at an interval *i*, *Q* is false at all superintervals of *i* as well (Dowty, 1986), for if *Q* were true at some superinterval *i'* of *i* and at *i* itself, it would be false at all subintervals of *i'*, including *i*, according to the telicity entailment, contradicting the assumption. Thus, if *John leaves* is true at some future interval *i*, the sentence entails that John's leaving does not hold at any subinterval within *i*, and therefore, it does not hold at any superinterval of *i* either. Given this and the standard meaning of future, it follows that *John will leave now* crucially cannot overlap with the ST, despite the adverbial modification.[3]

Now consider a stative sentence:

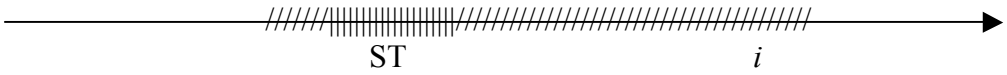
(2) John will be at home (now).
FUT'(be-at-home'(j)(i)) = ∃ i [i> st & be-at-home'(j)(i)]

This is a use of simple future traditionally considered modal rather than temporal, since the sentence seems to refer to the ST instead of a future interval. However, the fact that the sentence is stative determines the overlapping reading with the ST.[4] (2) entails its truth at all subinstants (rather than subintervals) of *i*. In contrast to (1), this does not exclude the possibility that the sentence is actually true at a

3 What I have just said seems incompatible with the occurrence of *now* in (1). If the adverb modifies the ET of the sentence (the leaving time), this information contradicts the future tense. The solution to this puzzle is that *now* denotes an interval and not an instant. Such an interval could be extended enough to include both the interval in which John leaves and the ST.

4 There is a modal component in the meaning of *will* which I will not discuss here.

larger interval that properly includes its ET, the future interval *i*. In fact, when states are asserted, the normal assumption is that they are true at a larger indefinite interval surrounding their ETs. I call this assumption the superinterval property. According to Dowty (1986), this is a pragmatic implication because it can be cancelled in certain contexts (for example, when states receive change of state readings, the so-called inceptive readings, as in *Suddenly, John was asleep*). Given this pragmatic implication, *be-at-home(i)* in (2) may hold at an indefinite larger interval or superinterval in which the future interval *i* and the ST are included. The slashes below represent this superinterval:



The overlapping reading comes about because the superinterval is able to overlap with the evaluation time of the entire sentence.

The superinterval property is also present in English simple past sentences. As noted in Discourse Representation Theory (Hinrichs, 1984, Partee, 1984, Kamp & Reyle, 1993, see also ter Meulen, 1995), a stative sentence in a narrative is most usually interpreted to hold before and after the event denoted by the previous sentence as in (3). The superinterval of a state can obtain even beyond the RT or the temporal location given in discourse (in (3), beyond *this morning*):

(3) Mary went to see the president this morning. He was sick.

(4) Mary went to see the president this morning. She asked him questions about the project.

This contrasts with events in general which normally receive sequential interpretations as in (4).

The intuition behind the superinterval implication is that states, as opposed to events, lack any internal structure. States remain true without the aid of an external force and their persistence is independent of whatever caused them. In principle, if a state holds at an interval *i*, and no intervening event occurs between *i* and *i+1* that changes this state, then the state also holds at *i+1* (Katz, 1994, ter Meulen, 1995). Dowty (1986) calls this implication the principle of inertia.[5] Thus, the world knowledge associated with event types (e.g., causal properties) further

5 See also Lascarides and Asher's (1993) principle of States Overlap, which they interpret to express Grice's maxim of relevance.

specify the content of the tense, which merely indicates that the event/state in question occurred at some past or future time.

Now consider an activity sentence:

(5) John will run (now).
FUT'(run'(j)(i)) = ∃ i [i>st & run'(j)(i)]

(5) entails its truth at all subintervals of *i*. As with states, but unlike telic events, this entailment is compatible with the superinterval implication so that the overlapping reading with the ST should be possible. However, this reading is not available, so that activities pattern with telic events in this respect. This is because activities have temporal implications and implicatures which turn out to negate the superinterval implication. To see this, note that activities are normally assumed to be contained within their interval of evaluations. Episodic activities, in contrast to states, typically implicate that they take place within some arbitrary initial and end point of their interval of truth (Smith, 1991). Consider the following (where ⇒ means *implicates*):

(6) John danced this morning. ⇒ He started and stopped dancing this morning.

(7) John was sad this morning. * ⇒ He started and stopped being sad this morning.

As expected on the basis of the superinterval property, states are not implied to be wholly contained within their ETs. But this pragmatic inference is available with episodic activities. I call this implication the ET-containment implication. This explains why (5) only receives a future reading (the running obtains within the future *i*) and indicates that the superinterval property is not operative with activities.

The ET-containment implication is not mysterious but derives from the fact that a quantity pattern of implicature is triggered by the grammatical elements of the sentence. Consider the following:

(8) John ran. = *∃ i [i < st & run'(i)(j)]*

(9) John was running. = *∃ i [i < st & **prog**-run'(i)(j)]*[6]

6 See section 1.3. for the compositional treatment of *prog*.

As shown in detail in section 1.3, by the definition of progressive, (9) logically *entails*, rather than implicates, that there is a superinterval containing *i* during which the process of running took place (Dowty, 1979). In contrast, (8) simply says that the process took place at a past interval *i*. The choice of the simple past over the past progressive triggers a quantity pattern of implicature. For if the speaker does not choose past progressive (the most informative form) but simple past, he/she implicates that the superinterval does not obtain. The same implicature arises with the future counterparts of (8) and (9), but does not arise with states because they do not occur with progressive. Thus, given the existence of an alternative and more informative form, episodic activities are not typically interpreted to hold at a superinterval. Rather, they are implicated to be maximally contained within the limits of their ETs. Therefore, activities do not yield overlapping readings relative to the evaluation time but sequential ones.

In sum, different aktionsarten have different effects on the temporal interpretations. Telic events and activities have temporal entailments or implicatures that are incompatible with the possibility of their truth at larger intervals. Therefore, they do not overlap with the local evaluation time. In contrast, states have the superinterval property. This property is an implication that there is a larger interval (containing the state's ET) at which the state holds. Given this, the implied superinterval is able to overlap with the local evaluation time.

1.3 Progressive aspect

I follow Dowty (1979), Smith (1991) and many others in distinguishing between aktionsart or event types and aspect (or viewpoint aspect), which coerces event types into other types. Also, following Dowty's treatment of tense and aspect composition, I assume that **prog** is treated as a VP modifier of type $<e,<i,\ t>>$, $<e,<i,\ t>>$ (i.e., a function from set of individuals to sets of individuals), rather than as a sentential operator. Its meaning applies to a VP-meaning, the subject argument and a temporal argument. Thus, ***prog*** $(Q_{<e,<i,t>>})(x)(i)$ is true at w iff (a) there is an superinterval *i'* properly containing *i*, (b) *i* is not the final or initial subinterval of *i'*, and (c) for all worlds *w'* in the inertia set of possible continuations of *w* at *i*, *Q(x)(i')* is true in *w'*. Dowty (1986) argues that the possibility that *i* is the initial subinterval of *i'* should be excluded because progressive sentences do not receive inceptive interpretations and their ETs are clearly understood in the middle of the event denoted (e.g. *At 5, I was sleeping*). The modal part of the definition captures the fact that progressive sentences do not entail the completion of the event in question in the actual world, although the completion may take place at some possible continuing world.

An important property of this composition is that the tense operator provides the local evaluation time for the aspectual operator. For example, in an

expression such as *PAST'[**prog**'-run'(j)]*, the aspectual operator ***prog*** is evaluated relative to the past interval of PAST. Also, note that the definition of progressive satisfies the defining criterion of stative aktionsart: If ***prog****[Q]* is true at *i*, for any subinstant *t* of *i*, there is a superinterval containing *t* (and *i*) where *Q* is true, therefore, ***prog****[Q]* is also true at every subinstant of *i*. Thus, ***prog*** applies to any other aktionsart and returns a stative proposition (Moens and Steedman 1988 call this a progressive state).

The standard definition of progressive contains the key to understand its temporal interpretations. The definition entails, rather than implicates, that there is a superinterval *i'* in which the modified proposition is true. As with other stative sentences, this property explains why progressive sentences usually generate overlapping readings relative to the local evaluation time. Consider some examples:

(10) John said that Mary was going to the party.
*∃i [i < st & say'(^λi_0 ∃i' [i'<i_0 & **prog**-go-party'(m)(i')])(i)(j)] = ∃i [i < st & say'(i,j, ^λi_0∃[i'[i' < i_0 & ∃i_s [i' ⊂ i_s & ¬final/init(i')(i_s) & go-party'(i_s, m)]])]*

(11) John said that he would tell his mother that they were having their last meal.
*∃ i [i < st & say' (i, j, ^λ i_0 ∃i' [i' > i_0 & tell'(i',j, his-mother', ^λi_1 ∃ i'' [i''< i_1 & **prog**-have(i'', meal', they')]])])]*

(10) is true iff John said in the past that there was another prior time surrounded by a superinterval in which Mary was in the process of going to the party. The overlapping reading obtains as in the case of the superinterval property, i.e., the superinterval introduced by the truth requirements of **prog** can overlap with John's saying interval. Similarly for (11). The superinterval introduced around the past time i" before the telling interval may overlap the telling.[7]

1.3.1 Progressive aspect and aktionsart Note that the definition of English progressive requires the interval introduced by the tense operator to be not final or initial in the superinterval introduced by the progressive. This can be taken to mean that progressive singles out the process phase of an event. Following Moens and Steedman (1988), I assume that events are divided into sub-events or phases: the preparatory phrase, the process, and the resulting state. When the progressive modifies an accomplishment verb, the definition leads us to construct a superinterval surrounding the process sub-event, hence the progressive

7 For an account of embedded temporal readings in English, see Gennari 1999b.

interpretation of the event. But when progressive combines with states or achievements (a telic event that, in contrast to accomplishments, do not have the process sub-event), progressive coerces them to be viewed as having a process sub-event: The change of state of the achievement takes place at a longer interval and states are seen as a activities or processes. Thus, (12) means that John was in the process of dying, although typically, this event is not construed this way, while (13) means that John was actively behaving in a rude manner.

(12) John was dying.

(13) John was being rude.

When the existence of such a process or activity is incompatible with our world knowledge of the event, the use of the progressive is not acceptable:

(14) ?John was noticing the picture.

(15) ?John was being sick.

It is more difficult to imagine these events as having a process sub-event. Thus, English progressive entails the existence of a process in the event modified around which the relevant superinterval is constructed. This follows from the requirement that the superinterval introduced by the progressive encircled the evaluation time (point (b) in the definition of the progressive above) and the assumption that events are divided into relevant sub-events or subintervals.

2. Spanish tenses

In this section, I show how aktionsart and aspect interact in Spanish. Because most Spanish tenses convey aspectual information, aktionsart assumptions such as the superinterval property do not always surface. The initial aktionsart is changed into some other. However, aktionsart matters when determining the readings available for aspectual operators or the possible combinations of event type + aspect.

2.1 Past tenses: *Pretérito* and *Imperfecto*

Traditionally, Spanish past tenses have been considered to convey both temporal and aspectual information (Bello 1847, RAE 1973, Gili Gaya, 1961, King 1992, Suñer, 1990). This is clearly the case for the so-called compound tenses (present and past perfect), none of which are discussed here. Aspectual and temporal information are also combined in the so called simple tenses, in particular the two contrastive forms of the past domain, the *pretérito* and the *imperfecto*. The

pretérito is similar to English simple past, except that it implies the end of the event or state denoted. Gili Gaya (1961) also attributes to the *pretérito* a sense of perfection and punctuality, particularly when occurring with telic events. In contrast, the *imperfecto* is normally said to represent an event in progress and not necessarily finished.[8]

Consider some examples of the readings of *pretérito* and *imperfecto* in independent sentences. Examples in (a) have *pretérito* forms while those in (b) have *imperfecto*:

(16) a. Juan escribi-ó un manifiesto político.
John write-pret/3rd per-sg a manifesto political
'John wrote a political manifesto'

b. Juan escrib-ía un manifiesto político.
John write-imperf/3rd per-sg a manifesto political
'John was writing a political manifesto'

(17) a. Juan sali-ó de su casa.
John exit-pret/3rd per-sg of his home
'John left home'

b. Juan sal-ía de su casa (cuando lo llamaron).
John exit-pret-3rd per-sg of his home when him call-pret-3rd per-pl
'John was leaving home/was about to leave (when somebody called)'

(18) a. Los militares lo busca-ron (durante meses).
The military-pl him search-pret-3rd pl (for months)
'The military looked for him (for months)'

b. Los militares lo busca-ban.
The military-pl him search-imperf-3rd pl.
'The military were looking for him'

(19) a. Juan estuv-o enfermo (por varios dias).
John be-pret/3rd sg sick (for several days)
'John had been sick (for several days)'

b. Juan esta-ba enfermo.
John be-imper/3rd sg sick
'John was sick'

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8 Both *pretérito* and *imperfecto* can receive habitual readings, as all tenses in Spanish and English. We will not discuss habitual readings here under the assumption that standard independent mechanisms as those resulting from the generic operator will account for these readings (see Carlson and Pelletier 1995).

These sentences exemplify the use of the *pretérito* and *imperfecto* applied to propositions of different aktionsart. Consider first the readings of the *pretérito*. As English simple past, *pretérito* sentences have the same aktionsart entailments as the modified propositions. The *pretérito* in (16a) and (17a) with telic events entails that the events are false at each subinterval of the interval of evaluation. The change of state denoted takes place within the interval of evaluation. In (18a), *the military look for him* is an activity that may hold for a while. The proposition resulting from the application of the *pretérito* ***pret****[the military look for him]* is also an activity because it has the subinterval entailment, as the adverbial modification suggests. Likewise, the internal and resulting propositions of (19a) have the subinstant entailment of states. As Cipria and Roberts (2000) and Cipria (1996) have indicated, this shows that the *pretérito* is compatible with all aktionsarten, depending on the internal semantic composition of the sentence. What the *pretérito* indicates in all examples is that the event or state modified has come to an end before the ST (what Cipria and Roberts (2000) call *the end-point requirement*). This precludes the inference of a superinterval surrounding the state, as the superinterval property suggests.

Consider now the readings of the *imperfecto*. In (16b), (17b) and (18b) the reading is progressive, i.e., whatever event is denoted is presented as being in progress like their English counterparts. In (17b) also, there is the possibility of an intentional reading, i.e., John was about to leave when somebody phoned. This reading is usually available with punctual events since these events do not entail processes. The denoted event is in its preparatory or intermediate phase leading to the culmination. Cipria and Roberts correctly consider this reading a sub-case of the progressive reading, where the preparatory sub-event, rather than the process sub-event as in English, is *in progress*. In contrast, (19b), where the *imperfecto* combines with a stative proposition, indicates that the given state obtained for a while in the past and possibly kept obtaining. In all examples, the *imperfecto* both introduces a superinterval at which the event or state takes place and entails the truth of the sentence at all sub-instants of the relevant past interval. Like the English progressive, *imperfecto* changes the aktionsart of the initial proposition into stative aktionsart.

Consider now the readings of *pretérito* and *imperfecto* in embedded complements:

(20) a. Juan dij-o que María estuv-o enferma.
John say-pret/3rd.sg that Mary be-pret/3rd.sg sick
'John said that Mary had been sick'

b. Juan dij-o que María est-aba enferma.
John say-pret/3rd.sg that Mary be-impf/3rd.sg sick

'John said that Mary was sick'

(21) a. Juan dij-o que Pedro escribi-ó una novela.
John say-pret/3rd.sg that Peter wirte-pret/3rd.sg a novel.
'John said that Peter wrote a novel'

b. Juan dij-o que Pedro escrib-í -a una novela.
John say-pret/3rd.sg that Peter wirte-impf/3rd.sg a novel.
'John said that Peter was writing a novel'

(22) a. Juan dij-o que Pedro se cas-ó.
John say-pret/3rd.sg that Peter refl. marry--pret/3rd.sg.
'John said that Peter got married'

b. Juan dij-o que Pedro se casa-ba.
John say-pret/3rd.sg that Peter refl. marry--impf/3rd.sg.
'John said that Peter was getting married'

Pretérito complements receive a backward shifted reading (i.e., a reading where the interval denoted is prior to the time of the matrix verb), even when a stative proposition is involved. This agrees with the intuition that *pretérito* implies the end of the state or event in question. In contrast, *imperfecto* behaves like English progressive generating overlapping readings with the evaluation time. Backward shifted readings are also possible if context or adverbs make it clear. In (22b), there is an intentional reading according to which Peter is about to get married at the time of John's saying. This could be thought as a future reading but it is not. As indicated by Cipria (1996), the preparatory phase of the event of getting married starts in the past of the evaluation time and overlaps with this time, although the culmination of the event may take place after the evaluation time. This is not different from progressive readings in which the culmination of the process may take place after the evaluation time, in both English and Spanish.

2.1.1 ***Truth conditions for*** **pretérito** Cipria and Roberts have proposed truth conditions for the *pretérito* within the framework of situation semantics. In their definition, the *pretérito* has the end-point requirement and is compatible with all aktionsarten. The end-point requirement amounts to an entailment that the proposition modified ends in the past. However, the entailment of an end-point is problematic because this requirement does not have the characteristic of an entailment, particularly with atelic propositions. Consider the following examples:

(23) Juan escribi-ó un libro. *Pero no lo termin-ó.
*John write-pret/3rd.sg a book. * But not it finish-pret/3rd.sg.*
'John wrote a book. * But he did not finish it'

(24) Juan estuv-o enfermo ayer. Y todavia (lo) est-á.
John be-pret/3rd.sg sick yesterday. And still (it) be-pres/3rd.sg
'John was sick yesterday. And he still is'

(25) Juan estuv-o enfermo el lunes, y también el martes.
John be-pret/3rd.sg sick the monday, and also the tuesday
'John was sick on Monday. And also on Tuesday'

(23) contains an event *pretérito* sentence. Since telic events, if true at an interval *i*, entail their culmination, the discourse in (23) is clearly contradictory. In contrast, stative *pretérito* sentences have the sub-instant entailment and so they are in principle compatible with their truth at a superinterval. If the *pretérito* entailed an end-point, one would expect (24) and (25) to have a similar judgment to that of (23). However, (24) and (25) are possible discourse in Spanish and there is nothing contradictory. The intuition in these examples is that the speaker makes a clarifying comment, possibly to add more information or correct a possible misunderstanding.

The explanation for this difference in judgment between (23), on the one hand, and (24) and (25), on the other hand, is that the end-point requirement is actually a pragmatic implication, rather than an entailment. In particular, it is equivalent to the ET-containment implication discussed for English. Note that the first sentences of (24) and (25), uttered out of the blue, imply that the state in question does not obtain beyond the time specified. As with activities in English simple past, the availability of an imperfective form generates a quantity implicature. If the speaker uses *pretérito*, s/he implicates that the state in question does not obtain at a superinterval, otherwise, he would have used *imperfecto*, which does entail a superinterval. However, in certain contexts the implication can be cancelled, as the second sentences of (24) and (25) do.

Note that in contrast to Spanish, English does not have the end-point or the ET-containment implication with states because there is no alternative progressive form in English, as progressive does not typically occur with states. But in Spanish, since the *imperfecto* occurs with all aktionsarten, the end-point implicature obtains everywhere. This is a clear example of how implicatures associated with the meaning of tenses are not cross-linguistic. They depend on language specific facts, i.e., on the overall distribution of the tense and aspect paradigm relative to aktionsart.

Given this, if we drop the end point requirement from the definition of *pretérito*, nothing is left but the temporal past information. The *pretérito* simply requires the proposition it modifies to be true at a time prior to the ST. As English simple past, its meanings is $\lambda i\ [\exists i' < i \ \&\ Q(i')]$. The end-point requirement is an

implicature. That *pretérito* is compatible with either telic or atelic aktionsart is taken care of by the fact that *pretérito* does not involve any aspectual requirement. It simply inherits the aktionsart entailment from the modified proposition, in a way parallel to English simple past.

As an illustration, consider (19) above. ***pret****[John be sick]* is true iff there is an interval *i* prior to the ST at which John is sick. Since John being sick entails its truth at all subinstants, ***pret****[John be sick]* also does. However, due to the end-point implication, the state of being sick is interpreted to hold within the interval of truth *i* but not beyond. The superinterval implication of states does not obtain. For events sentences, moreover, the *pretérito* behaves as English simple past. From the definition of *pretérito* and the pragmatic implicature discussed, it follows that when the *pretérito* is embedded under another past tense, the only reading available is the backward shifting reading. Thus, the definition accounts for both embedded and independent *pretérito* readings.

2.1.2 ***Truth conditions for*** **imperfecto** Cipria and Roberts capture the readings of the *imperfecto* with truth conditions that involve quantification over worlds or situations, like the English progressive, given that telic events do not necessarily entail completions. Also, Cipria and Roberts' definition explicitly requires truth at subsituations thus making the *imperfecto* compatible with the superinterval implication of statives. However, the definition does not require truth at a superinterval, although there is evidence in Spanish that the *imperfecto*, like the English progressive, entails a superinterval as part of its meaning. The evidence comes from discourse examples in which *imperfecto* cannot receive an inceptive reading, i.e., a reading in which the *imperfecto* is interpreted as a change of state. Recall from section 1.2 that statives occurring with English simple past do allow such readings so that the superinterval implication is clearly not an entailment. Compare English and Spanish cases in which the context is compatible with an inceptive reading (I indicate the Spanish tenses in the English translations):

(26) ???Juan repasó mentalmente los intensos sucesos del día una vez más. De pronto, estaba dormido.
'John went over (pret) the day's perplexing events once more in his mind. Suddenly, he was (imperf) asleep'.

(27) ??Todos estábamos ansiosos esperando que Juan entrara. Finalmente, entró en el aula y todos estábamos aliviados/nos sentíamos aliviados.
'We were (imperf) all anxiously expecting John to come in. Finally, he came in (pret) and we all were/felt (imperf) relieved'.

(28) Juan se acostó en el sofá. Munitos despues, dormía aplácidamente.

'John laid down(pret) on the sofa. Minutes later, he was sleeping (imperf)'

(29) ?? Juan se acostó en el sofá. Dormía plácidamente.
'John laid down (pret) on the sofa. He was sleeping (imperf)'

(30) ?? Juan salió de su casa. Corría desesperadamente.
'John went out (pret). He was running desperately (imperf)'

(26) and (27) examples are Dowty's. All Spanish counterparts are either unacceptable (they are hard to interpret with adverbs such as *after* … or *suddenly*) or the inceptive reading does not obtain as in (27). In this case, the *imperfecto* means that people were already relieved when John came in, so some other event is implied in the story that caused the change before John came in. For the case of (28), Cipria (1996) claims that there is an inceptive reading involved, thus exemplifying the cancellation of the superinterval implication. However, the reading is not inceptive in the sense that the *imperfecto* indicates a change of state. It rather indicates the overlap with the last reference point mentioned in the discourse, the adverbial *minutes later*. This is supported by (29) and (30) where the absence of adverbials makes the discourse unacceptable. Imperfect in discourse simply overlaps the RT.

If these intuitions are correct, *imperfecto*, like progressive in English, requires a superinterval, which is the contribution of its aspectual meaning. *Imperfecto* thus has two components in its meaning: the past temporal component (the usual past operator) and the imperfect component, which is defined as follows:

(31) *-ba/-ía* = PAST-**impf**[Q] where **impf**[Q] is true at *i* in w iff $\exists\, i_{sup}[i \subset i_{sup} \,\&\, \neg final(i)(i_{sup}) \,\&\, \forall w'[Iner(<i, w>) \,\&\, [[Q(i_{sup})]]^{w'}]]$

The *imperfecto*, like that of the progressive in English, is true at a time *i* iff (a) there is a superinterval i_{sup} that contains *i*, (b) *i* is not final in the superinterval i_{sup} and (c) for all worlds *w'* that are possible continuations of the actual world *w* from *i* on, the proposition *Q* is true in *w'* at i_{sup}. This definition differs from English progressive in that *imperfecto* is neutral as to the sub-event modified. This can be the preparatory or the process sub-event. Thus, *imperfecto* does not entail the existence of a process as English progressive.

This definition correctly accounts for independent and embedded readings of the *imperfecto* with different aktionsarten. When *imperfecto* combines with telic or atelic events, progressive readings are available as in English progressive, possibly overlapping the matrix's ET. The intentional readings of telic events are also accounted for because in contrast to English, the past interval at which the

imperfecto sentence is true could be initial in the superinterval, i.e., it can refer to the preparatory phase of the event. The completion of the event in question may take place in the future of the matrix's ET, thus, allowing a futurate reading (see Cipria 1996 for a detail account of this reading). When the *imperfecto* combines with a stative proposition, the resulting reading is simply stative rather than progressive or intentional. In this case, the use of the *imperfecto* simply introduces a superinterval where the state may have different possible continuations.[9]

This account provides a natural explanation for why statives do not occur with progressive forms in English or Spanish periphrastic progressive form *be + verb + ing*. These progressive forms entail a process-sub-event. Thus, if the proposition modified does not entail such a sub-event, incompatibility arises as in *John is noticing the picture/is being sad*. In contrast, Spanish *imperfecto* is neutral as to whether the superinterval surrounds the process or the preparatory phase of the event, hence both progressive and intentional readings are available. Thus, the proposed definition of *imperfecto* and its interaction with aktionsart predict the available readings.[10]

2.2 Spanish tenses: summary

Spanish *pretérito* is similar to simple past in English, except for the fact that *pretérito* implicates completion of the event modified with all aktionsart. This is because the Spanish paradigm contains an alternative form, the *imperfecto*, that the speaker could use and be more informative. Thus, states in *pretérito* do not have the superinterval property as states do in English with simple past. Also, *imperfecto* contrasts with progressive in English and Spanish in that it receives preparatory readings and it typically occurs with all event types. In sum, Spanish temporal interpretations depend on aspectual and aktionsart considerations as well as pragmatic implicatures, in a systematic and consistent manner.

3 Japanese

According to Kuno (1973), Soga (1983), Nakau (1976) and Ogihara (1996), Japanese has basically two simple tenses: past and non-past. These tenses have progressive counterparts: progressive non-past and progressive past. These four forms are the ones discussed here, although Japanese has a rich set of aspectual and modal markers that also convey temporal information. The forms discussed

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9 The inertia worlds introduced by the *imperfecto* do not change the stative reading. That is, the set of worlds in which possible continuations of the state obtain may or may not be like the actual world, thus leaving the possibility open for the state to stop obtaining at some possible continuation. This seems to be intuitively correct since imperfecto sentences may not overlap the local evaluation time, i.e., the state may stop at some point before the evaluation time as in backward shifted readings.

10 See Kamp and Rohrer (1983) for an alternative but compatible treatment of imperfect in French.

here interact with aktionsart and with one another, triggering implicatures of the sort observed in English and Spanish. The examples used in this section either are taken from Kuno (1973), Soga (1983), Nakau (1976) and Ogihara (1996) or have been validated by a native Japanese speaker.

3.1 Non-past forms

3.1.1 ***Simple non-past*** **-(r)u** The non-past form is the morpheme *-(r)u* attached to the verb, although certain verbs have irregular forms such as *da*. Consider some examples (I follow the literature in translating the non-past forms as present):

(38) Taroo-wa Hanako ga Siatoru-ni i-ru to it-ta.
Taro-top. Hanako nom. Seattle in be-pres that say-past.
'Taro said that Hanako was in Seattle'

(39) Taroo-wa Hanako ga shigotoru-ni ku-ru to it-ta.
Taro-top. Hanako nom. Work at come-pres that say-past
'Taro said that Hanako would come to work'

In (38), the non-past tense in the embedded sentence denotes an interval that overlaps with the attitude time (the time of Taro's saying), although embedded future readings are also possible as in (39). This indicates that Japanese non-past need not refer to the ST when the evaluation time is not the ST but the attitude time.

In independent sentences, the non-past form may also receive both a reading overlapping with the ST and a future reading.

(40) John-wa Mary-ga suki da.
John-top. Mary-nom. fond-of pres
'John likes Mary'

(41) Koko-ni isu -ga aru.
Here-at chair-nom. Exist-pres
'There is a chair here'

(42) John-ga ku-ru.
John-nom. come-pres
'John is coming/will come'

(43) John-ga kono hon-o yom-u.
John nom. this book acc read-pres
'John will read this book'

The examples in (40) and (41) receive a present reading while those in (42) and (43) a future one. The non-past form is thus usually considered ambiguous or vague regarding the two temporal readings. For example, Ogihara (1996) proposed two different meanings, one corresponding to the present operator, another to the future one. Other linguists such as Kuno (1973), Soga (1983) and Nakau (1976) suggest that the actual temporal reading depends on the sentence's aktionsart, thus indicating that the form is vague, but the interpretation is determined by other elements. These linguists all point out that the non-past receives a future reading when occurring with event sentences, as exemplified in (42). In this case, a non-durative reading is obtained. In contrast, the present (durative) reading is only available with stative verbs, be + adjective constructions also considered statives (Kuno, Soga) and habitual readings of events, also known to be statives. This reading is default for statives unless future adverbs or future RTs trigger a future reading, as in (44):

(44) John-wa asita shigoto-ni ko-nai. uchi-ni iru.
John top. Tomorrow work at come-neg-pres. Home at be
'John will not come to work tomorrow. He'll be at home'

Note that activities do not overlap the ST because of a quantity implicature: overlap with the evaluation time would be equivalent to a progressive reading in which the event is going on at the ST. Since the non-past progressive form *te-iru* can be used instead and be more informative, the use of the simple form implies that the overlapping reading does not arise.[11] Telic events, in turn, do not overlap with the evaluation time because of their aktionsart entailments. Overlap with the ST would entail that the event is false at the ST (telic events are false at all subintervals). Thus, the speaker cannot assert that the event in question overlaps with the ST without being contradictory, unless progressive is used.[12] These facts together with the observation that Japanese non-past does not allow progressive readings (it lacks imperfective aspect) suggest that the temporal meaning of the non-past form is precisely non-past: $\lambda\, i_0\, \exists\, i[\neg(i < i_0)\ \&\ Q(i)]$, where i_0 is the evaluation time. The actual temporal reading, i.e., whether *i* overlaps or follows the evaluation time, will depend on aktionsart and pragmatic inferences. The Japanese non-past meaning is thus the non-indexical counterpart of Spanish and English present tense, which are both typically considered indexical. But because the ET of the sentence can either overlap with or follow the evaluation time,

11 Note that this reasoning does not apply to states because the progressive form does not normally occur with states (cf. Soga, 1983).

12 This is confirmed by Soga's observation that even an adverb like *ima* 'now' occurring with events does not receive a present reading. It rather indicates that the event is about to happen.

Japanese non-past is more general. Its meaning can be interpreted in different ways depending on the local evaluation time.

3.1.2 *Progressive non-past* te-iru

te-iru is the present progressive form composed by the non-past form of the verb *iru* 'to be/to exist' and the progressive marker *te*. Most grammarians agree that this form receives a progressive readings, although it could also receive a perfective reading, particularly with punctual verbs, unless iteration is possible. Consider some examples taken from Soga and Kuno:

(45) Kare-wa hon-o yon-de iru.
He-top. Book-acc read-prog be
'He is reading a book'

(46) Kare-wa benkyoosi-te iru.
He top. study - prog be
'He is studying'

(47) Kare-wa tyoozyoo-ni tui-te iru.
he top. top-at arrive-prog be
'He has arrived to the top'

(48) Tomodati-ga ki-te iru.
friend-nom. come-prog be
'My friend has come'

Examples in (45)-(46) contain accomplishment-internal propositions and receive progressive present readings, while those in (47)-(48) are achievements and receive prefective present readings. The availability of the perfective present reading depends on the aktionsart. One way to explain the distribution of the readings of the progressive form is to assume that both progressive and perfective readings are generally available for *te-iru*, i.e., the form is ambiguous between the two readings.

Evidence for this hypothesis comes from the fact that future readings of the non-past progressive do allow both perfective and progressive readings, particularly when the this reading is triggered by adverbials such as *made ni* 'by then' (cf. Nakau):

(49) Boku wa asu no asa ronbun-o kai-te-iru desyoo.
I top. tomorrow-of morning paper-acc. write-prog-be modal
'I will be writing a paper tomorrow morning'

(50) Boku-wa asu-no hiru-made ni-wa ronbun-o kai-te-iru desyoo.
I-top. tomorrow-of noon- by-top paper acc. write-prog-be modal.
'I will have written a paper by noon tomorrow'

The same ambiguity reappears in the past progressive form as shown later. According to Nakau and Soga, events in past progressive (except achievements) could receive both perfective and progressive readings.

The question that arises with this hypothesis is why progressive present readings only appear with accomplishments, while perfective readings only appear with achievements. One could argue that achievements do not receive progressive readings because this particular aktionsart is incompatible with the entailments of **prog**. This operator entails the existence of a process sub-events, which is incompatible with most achievements. It is not entirely clear, however, why **prog** cannot marginally force a process or an intentional reading as English progressive and Spanish *imperfecto* does. The existence of a perfective reading seems to preclude this possibility.

Alternatively, one can explain why accomplishments do not have the present perfective reading by appealing to pragmatic principles. Although the reading is not totally excluded according to my Japanese informant, it seems that there are other ways to convey it. Note that for an event to have a perfective present reading, the event must have taken place before the ST and its result should obtain at the ST. Note also that simple past in Japanese could be used here if the past event is closer to the ST. As I will show later, this is a situation in which the simple past applies and entails that the result of the event in question obtains at the ST. This is shown below:

(51) John-wa moo tegami-o kai -ta.
John-top already letter-acc write -past
'John has already written the letter'.

Thus, given that the progressive form is ambiguous between the progressive and the perfective reading, this form is less informative. If the speaker intends a past perfective reading, simple past should be chosen. This is supported by the fact that future readings of the non-past do show the ambiguity, since simple past is not an option. Thus, when no other more informative alternative expression could be used, the ambiguity of the progressive form is apparent. The perfective present reading of *te-iru* with events other than achievements seems to be pragmatically excluded.

The meaning of *te-iru* could thus provisionally be considered to include both the perfective and the progressive meaning, in addition to the non-past

temporal component noted above for the non-past simple form. That is, *te[Q]* is true at *i* iff ***prog****[Q]* or ***perf****[Q]*, where **prog** is as shown in section 1.3 and ***perf****[Q]* is true at *i* iff there is an interval *i'* immediately preceding *i* at which *Q* is true, i.e., the change of state takes place at *i'* and the resulting state holds at *i*. Whether one or the other reading obtains depends on aktionsart and pragmatic implicatures.

Whichever the appropriate account of the *te-iru* form is, the important point is that both the progressive and the perfective readings entail the truth of the proposition at every sub-instant, i.e., they are stative propositions. This predicts that given the temporal meaning of the non-past form *ru*, overlapping readings with the evaluation time will be available when the *te-iru* form is embedded under other tenses:

(52) John-wa Mary-ga ki-te iru to it-ta.
John-top. Mary-nom. come-prog be that say-past
'John said that Mary had come'
∃ i[i < st & say(i,j, ∃ i' ¬(i'< i) & ***perf****-come(i', m)]]*

(53) John-wa Kare-ga hon-o yon-de iru to it-ta.
John- top. he-nom. book-acc read-prog be that say-past.
'John said that he was reading a book'
∃ i[i < st & say(i,j, ∃ i'[¬(i'< i) & ***prog****-read(i', he, a-book)]]*

Since *te-iru* is formed with the simple non-past form discussed above, the temporal interpretation of the progressive form is also evaluation time sensitive. When *te-iru* is embedded under past, it denotes an interval not prior to the evaluation time at which either ***prog****[Q]* or ***perf****[Q]* is true. This agrees with the interpretations of (52) and (53). (52) receives an interpretation such that the state of Mary's having come obtains at the saying time. (53) indicates that the reading was taking place while John said so. These readings are more salient due to the stativity of the *te-iru* form. Future readings are also available if an adverb such as *tomorrow* is used in the embedded sentence. As exemplified in (49) and (50), accomplishments with future readings receive either a progressive or a perfective reading. When these cases are embedded under past, (49) would mean that *John said that I will be writing the paper tomorrow* and (50) would mean that *John said that I will have written the paper by tomorrow*. Thus, the correct temporal readings are predicted.

3.2 Past forms

3.2.1 ***Simple Past*** Most Japanese grammarians consider that the past form *-ta* conveys completion. Nakau claims that simple past is potentially ambiguous

between a simple past in English and present perfect, particularly when it occurs with adverbs such as *moo/sudeni* 'already'. Thus, a sentence such as (54) is equivalent to the two English translations provided:

(54) Boku-wa (moo) ano hon-o yon-da.
I top. already that book acc. read-past
'I read that book. /I have (already) read that book'

(55) Kinoo zisin -ga at-ta.
Yesterday earthquake nom. be past
'There was an earthquake yesterday'

(56) Sensyuu-wa koko-ni ki-ta.
last week top. here to came-past
'Last week I came here'

These sentences indicate that the past interval denoted by the past tense could be either distant from or closer to the ST. When the interval is close to the ST as suggested by the adverbial *moo* 'already', the result of the past event obtains at the ST, hence the present perfect reading. This reading seems an aktionsart entailment, rather than part of the meaning of the simple past, since telic events entail results, which may obtain at the ST according to context. This is supported by the fact that in 'distant' readings, the tense does not denote the resulting state (with stative entailments) as one would expect with perfective markers. In this case, simple past rather denotes that the event has come to end (Soga).

Consider now the readings of simple past in embedded contexts:

(57) John-wa Mary-ga sin-da to it-ta.
J. top. M. nom. die-past that say-past
'John said that Mary had died'

(58) John-wa Kare ga hon-o yon-da to it-ta.
J. top. he nom. book-acc read-past that say-past
'John said that he read (had read) the book'

(59) John-wa Mary-ga byookidat-ta to it-ta.
J. top. M. nom. be-sick-past that say-past
'John said that Mary had been sick'

Sentences of different aktionsart all receive a backward shifted reading. The event or states denoted by the embedded past sentence ends before the evaluation time.

These examples and those in independent sentences indicate that simple past in Japanese denotes an interval prior to the local evaluation time, i.e., $\lambda i_0 \exists i'[i' < i_0 \& Q(i')]$. One question regarding the completion of the event in the past of the evaluation time is why an overlapping reading is not possible with activities or states which could, in principle, be true at a superinterval. It may be that an implicature arises from the past/non-past contrast. Activities and states in past tense embedded under past imply termination because if they still hold at the evaluation time, (i.e., if they are not prior to the evaluation time), the non-past form would apply and be more informative in this situation. Thus, by Gricean maxims, the use of the past tense implicates that the state or event does not overlap the evaluation time, i.e., that the non-past form does not apply.

3.2.2 ***Past progressive*** **te ita** As indicated above, the past progressive could receive either a progressive or a perfective reading. The two readings seem available here with any type of verbs (Nakau), in contrast to the non-past progressive, the present readings of which only receive progressive readings except for achievements:

(60) Boku-wa kinoo go zi ni yuuhan-o tabe-te-i-ta.
I top. yesterday 5 o'clock at dinne-acc eat-prog-past
'I was eating supper at 5 o'clock yesterday'

(61) Boku-wa kinoo go zi made ni yuuhan-o tabe-te-i-ta.
I top. yesterday 5 o'clock by dinner-acc eat-prog-past
'I had already eaten supper by 5 o'clock yesterday'

(62) Kare wa (moo) kekkon-si-te ita.
He top. marriage do-prog past
'He was/had already been married (then)'

The past component of the form locates the event/state in the past of the evaluation time and the aspectual marker *te* provides either a perfective or progressive reading as indicated for the present progressive form *te iru*. The presence of adverbs such as *made ni* 'by then' helps to trigger the perfective reading. As predicted, when these are embedded under past, the readings obtained are backward shifted:

(63) John-wa boku ga kinoo go zi (made ni) yuuhan-o tabe-te-i-ta to it-ta.
I top. yesterday 5 o'clock by dinner acc. eat-prog-past that say-past.
'J. said that I was eating/had eaten supper yesterday at 5'

(64) John-wa Kare-ga kekkon-si-te-i-ta to it-ta.
John-top. he-nom. marriage do-prog past that say-past.
'John said that he had been married'

In both cases, either the progressive or the perfective reading receives a backward shifted reading. As with simple past *ta*, the contrast with the non-past form gives rise to a quantity implication. In both independent and embedded cases, the non-past form could be used to indicate overlap with the evaluation time. Past progressive thus can be compositionally obtained by applying the past meaning of *ta* to the progressive/perfect *-te*, where $ta = \lambda\, i_0\ \exists\, i'[i' < i_0\ \&\ Q(i')]$ *and* $te =$ ***prog****[Q] or* ***perf****[Q]* as before. This meaning predicts the readings shown above.

3.3 Japanese tenses: summary

In Japanese, aktionsart entailments and implications determine whether the present or future reading of the simple non-past form obtains. The meaning of the tense alone simply imposes constraints on the location of the interval denoted. Aktionsart also determines the readings of the progressive form in the non-past domain. In addition, pragmatic implicatures seem to be available depending on the characteristics of the paradigm. The past form (simple or progressive) does not receive overlapping readings with the local evaluation time because it implicates that the non-past form does not obtain. In general, the principles influencing temporal interpretations proposed in the theoretical framework find corroboration in languages such as Japanese which do not have very rich temporal morphology.

4. Concluding Remarks

It is evident from the English translations that Spanish and Japanese tenses do not have the same distribution of readings as the English tenses. For example, Spanish simple past differs from English simple past in that Spanish simple past implicates completion with all aktionsart, while English simple past does not have such implication with states. Thus, English simple past statives are equivalent in meaning to an *imperfecto* sentence. Similarly, *imperfecto* has readings and distributions that English progressive does not, because it does not entail a process sub-event. In turn, Japanese tenses are the most unlike English or Spanish ones. The non-past tense subsume present and future English tenses. Likewise, the aspectual marker discussed can either receive progressive or perfective readings, each of which are expressed with different operators in English and Spanish.

To yield similar temporal interpretations across-languages when tenses have non-equivalent meanings, languages resort to aspect and aktionsart entailments and implications. Aktionsart properties such as the superinterval

implication of states surface in two main situations: with simple tenses, because they do not impose further restrictions to internal temporal development of the event, and with aspectual operators, determining their readings and their distribution. The way this happens vary cross-linguistically depending on the possibilities left alive by the meaning of the tense. In contrast, aspectual properties are lexically specified together with the tense and coerce other aktionsarten into a resultative or progressive state. The exact content of the aspectual component varies cross-linguistically, thus explaining the different distribution of readings. Finally, pragmatic implicatures also come into play when determining the intended reading of a given form. Such inferences also vary cross-linguistically as a function of the alternative forms available in each language's paradigm.

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