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Author(s): Raul Aranovich

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Spanish Casi as a Scalar Operator

RAUL ARANOVICH UNIVERSITY OF CALIFORNIA, SAN DIEGO

1. Distribution of casi

The Spanish adverb *casi* 'almost' can be used as a sentential modifier, as in (1a), as a modifier of adjectives, as in (1b), or as a modifier of quantifiers, as in (1c):

- (1a) Andy casi tradujo el poema.'Andy almost translated the poem.'
- (1b) Andy está casi sordo.'Andy is almost deaf.'
- (1c) Andy entiende casi todo.'Andy understands almost everything.'

The distribution of *casi* as a sentential modifier depends on a combination of the aktionsart of the verb and the polarity of the sentence. *Casi* is acceptable with an accomplishment verb in an affirmative sentence, as in (1a), but not in an affirmative sentence with an activity verb, as shown in (2a). If the polarity of (2a) is flipped, however, as in (2b), *casi* becomes acceptable.

- (2a) * Andy casi respira.'Andy almost breathes.'
- (2b) Andy casi no respira.'Andy almost does not breathe.'

In this paper I will argue that *casi* is a scalar operator, and that it selects a sentence that denotes the origin of a scale to yield a sentence that denotes the closest point on the scale. I will also show that the polarity of the sentence and its aktionsart determine whether a sentence can be associated to the origin of a scale. This will account for the data in (2). Finally, I will show that some well-known facts about the meaning of *casi* also follow from an analysis in terms of scales.

2. Two senses of casi

As an aspectual modifier, *casi* is ambiguous between an 'outcome' interpretation and a 'phase' interpretation (Binnick (1991) for English *almost*). The outcome interpretation is related to the telicity of the verb, whereas the phase interpretation is related to the process. Accomplishments, like the sentence in (1a), are ambiguous

between the two interpretations: (1a) can be translated as (3a), which gives the outcome reading, or as (3b), which gives the phase reading.

- (3a) 'Andy was going to translate the poem, but she didn't.'
- (3b) 'Andy is almost done with the translation of the poem.'

Achievement verbs, on the other hand, which are telic but do not refer to a process, can take *casi* only under an outcome reading. The sentence in (4a) can only have the meaning in (4b):

- (4a) Andy casi ganó la lotería.'Andy already almost won the lottery.'
- (4b) 'the event of Andy winning could have happened.'

Casi can be disambiguated by paraphrasing it as ya casi, literally: 'almost already', which can only take a phase interpretation. Casi cannot be paraphrased as ya casi with achievements, as (5b) shows. The paraphrase is possible with accomplishments, however, as (5a) ahows, since accomplishments admit of a phase reading.

- (5a) Andy ya casi tradujo el poema.'Andy already almost translated the poem.'
- * Andy ya casi ganó la lotería.'Andy already almost won the lottery.'

Casi can also appear with some activities, as in (2b), repeated under (6a). The ya casi test shows that this occurrence of casi is related to the phase reading of the adverb. Casi can be paraphrased as ya casi yielding (6b).

- (6a) Andy casi no respira.'Andy almost does not breathe.'
- (6b) Andy ya casi no respira.'Andy already almost does not breathe.'

Both senses of *casi* are sensitive to negation and to the aktionsart of the verb, with some differences. I will discuss the two reading of *casi* separately.

3. The phase reading of casi

3.1. Where can phase casi appear?

In affirmative environments, phase *casi* is acceptable only with accomplishment verbs. (7c), which is an accomplishment, can take *casi*. (7a), (7b), and (7d)

which are an activity, an achievement, and a state, respectively, cannot take *casi* in its phase reading.

- (7a) * Andy casi respira.'Andy almost breathes.'
- (7b) * Andy casi ganó la lotería.'Andy almost won the lottery.'
- (7c) Andy casi tradujo un poema.'Andy almost translated a poem.'
- (7d) * Andy casi tiene un auto. 'Andy almost has a car.'

With negation, accomplishment verbs can no longer take *casi*, as in (8c), but activities can, as in (8a). Achievements and states, on the other hand, do not improve under negation, as seen in (8b) and (8d), respectively.

- (8a) Andy casi no respira.'Andy almost does not breathe.'
- (8b) * Andy casi no ganó la lotería.'Andy almost did not win the lottery.'
- (8c) * Andy casi no tradujo un poema.'Andy almost did not translate a poem.'
- (8d) * Andy casi no tiene un auto.'Andy almost does not have a car.'

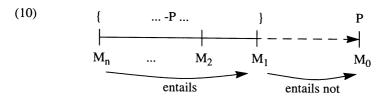
When the data in (7) and (8) are set against the results of standard analyses of the internal structure of states and eventualities, like the ones in Vendler (1967) and Mourelatos (1981), a generalization arises: *casi*, in its phase reading, can only apply to a sentence denoting the final stage of a process. In the next section I will give a more precise version of the generalization regarding the distribution of phase *casi* using scalar models.

3.2. Modelling the generalization

An accomplishment can be modelled as a sequence of moments with a culmination or 'outcome'. Accomplishments are non-homogeneous in their internal structure, since all the moments in the process can be distinguished from one another by the distance that separates them from the outcome. An affirmative sentence like (9a) denotes the outcome, whereas a negative sentence like (9b) denotes any moment previous to the outcome.

- (9a) Andy tradujo el poema.'Andy translated the poem.'
- (9b) Andy no tradujo el poema.'Andy did not translate the poem.'

The moments that make up an accomplishment like 'translating a poem' can be ordered according to a measure of completion of the action, which, for the sake of argument, I will assume is the number of words that remain to be translated. The outcome of the process is reached when there are no more words to translate. This model can be represented in a scale in which the outcome corresponds to the zero point or point of origin, and all the other moments are in the body of the scale. This is shown in (10).



I have drawn a dotted line between M_1 and M_0 because the entailment relations between the propositions denoting the moments on the solid line are different from the entailment that connects them to the outcome. If there are two words that remain to be translated, for instance, then it can be said that there is one word that remains to be translated. But if there is one word that remains to be translated, it cannot be said that there are zero words remaining. This is why the outcome is denoted by a proposition P, which is what sentence (9a) expresses, whereas any moment previous to the outcome is denoted by its polar opposite -P, which is what (9b) expresses. I will refer to scales of this sort, i.e. scales that start at the zero point, as zero-on scales. In this I am departing from the classical definition of a scalar model (Fauconnier 1975, 1978, Fillmore, Kay and O'Connor 1988, Kay 1990), which is based solely on the implication relations that connect a set of propositions. In these classical scalar models, the zero of the scale is left out, i.e. the point of origin is equal to 1.

The difference between (9a) and (9b), then, is that only (9a) denotes the origin of the scale that models the accomplishment. The main claim of this paper is that this is the factor that decides the distribution of *casi: casi* will not combine with (9b), only with (9a). The generalization about the distribution of casi can then be made explicit with the notion of a zero-on scale, as follows:

The Casi Condition. Casi can only apply to sentences that denote the origin of a scale.

3.3. Testing the Casi Condition

I will show next how this analysis explains the remaining data in (7) and (8). Achievements, being instantaneous, lack all internal structure, and cannot be mapped onto a scalar model. So, sententes like (11a) and (11b) can never take *casi*.

- (11a) Andy ganó la lotería. 'Andy won the lottery.'
- (11b) Andy no ganó la lotería. 'Andy did not win the lottery.'

Activities have a homogeneous structure, but unlike accomplishments, they have no culmination, no outcome. The moments that make up the activity $(M_a \dots M_e)$, then, cannot be arranged on a scale. A representation of an activity would be as in (13), where P is (12a) and -P is (12b).

- (12a) Andy respira. 'Andy breathes.'
- (12b) Andy no respira. 'Andy does not breathe.'

So, (12a) does not denote the origin of a scale and, as predicted, it cannot combine with *casi*.

The schema in (13) suggests that (12b) does not denote the end of a scale either. The fact that casi does combine with (12b), then, seems to be a counterexample for the Casi Condition. But activities can be mapped on a scalar model according to the intensity (I_i) with which they are performed. (12b) denotes the point at which the intensity of breathing is zero, whereas (12a) denotes any intensity of breathing. The representation that results from this is as in (14)



In this model, (12b) does denote the origin of a scale, and therefore can be combined with *casi*. (12a), on the other hand, can only be mapped onto the body of the scale, and not on the origin, since the abscence of activity does not have any discernible internal structure in terms of intensity. This mapping, then, will not license the use of *casi* either.

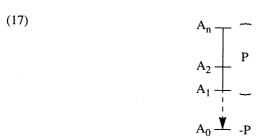
An interesting situation arises with states. States, like achievements, do not have any internal structure in terms of moments or intensity. Therefore, neither (15a) nor (15b) can be mapped onto the origin of a scale, and none of them can be combined with *casi*, as I showed in sentences (7d) and (8d).

- (15a) Andy tiene un auto. 'Andy has a car.'
- (15b) Andy no tiene un auto. 'Andy does not have a car.'

But some arguments may induce a measure of the state that makes it suitable to be mapped onto a scalar model. This is what happens with (16a) and (16b):

- (16a) Andy tiene pelo. 'Andy has hair.'
- (16b) Andy no tiene pelo. 'Andy does not have hair.'

These sentences can be represented in a scalar model that takes into account amounts (A_i) of hair. This is shown in the schema in (17), which is identical to the schema in (13). The affirmative sentence (16a) expresses a proposition P that denotes any point in the body of the scale, whereas the negative sentence (16b) denotes a proposition -P that denotes the origin of the scale, the point of zero hair.



As predicted, *casi* cannot combine with (16a), as (18a) shows, but it does combine with (16b), as in the example in (18b).

- (18a) * Andy casi tiene pelo. 'Andy almost has hair.'
- (18b) Andy casi no tiene pelo.
 'Andy almost does not have hair.'

To summarize, *casi* in its phase reading can modify affirmative sentences with accomplishment verbs, and negative sentences with activities or measurable states. I have shown that all these sentences express propositions that denote the origin (the zero point) of a scale associated with the measure of completion, intensity, or degree of an eventuality or state. The sentences that cannot take *casi* either denote the body of a scale, or cannot be mapped onto a scale at all. In this way, the complex interaction of aktionsart and polarity with *casi* is reduced to a very simple principle, expressed in the *Casi* Condition.

4. Casi in its outcome reading

4.1. Where can outcome casi appear?

The distribution of *casi* in its outcome reading is less puzzling than the distribution of phase *casi*. Only telic verbs can take *casi* in its outcome reading. This is illustrated by the sentences in (19). Neither activities (19a) nor states (19d) can take *casi* under this reading. Only achievements (19b) and accomplishments (19c) can combine with *casi*.

- (19a) * Andy casi respira.'Andy almost breathes.'
- (19b) Andy casi ganó la lotería.'Andy almost won the lottery.'
- (19c) Andy casi tradujo un poema. 'Andy almost translated a poem.'
- (19d) * Andy casi tiene un auto. 'Andy almost has a car.'

Unlike the phase reading of *casi*, the outcome reading does not seem to be influenced by negation. When the sentences in (19) are negated, the same generalization holds: only telic verbs can be modified by *casi*. So, (20a), with an activity verb, is ungrammatical, and so is (20d), which has a state verb. An achievement like (20b) and an accomplishment like (20c), on the other hand, can have *casi* as a modifier.

(20a) * Andy casi no respira.'Andy almost does not breathe.'

- (20b) Andy casi no ganó la lotería.'Andy almost did not win the lottery.'
- (20c) Andy casi no tradujo un poema.'Andy almost did not translate a poem.'
- (20d) * Andy casi no tiene un auto. 'Andy almost does not have a car.'

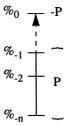
4.2. Extending the Casi Condition

The generalization for the outcome reading of *casi* is also driven by considerations of scalar values. Telic verbs, being bound events, bring about changes in the world. These changes can be associated with a probability value, since some changes are more likely to happen in one or another way. This value projects a scale. A sentence like (21a), for instance, which asserts that an event happened, also asserts that the probability of the event not happening was zero. Therefore, it can be mapped on the origin of a scale, as in the diagram in (22). The body of the scale, designated by (21b), contains the cases in which the probability of the event not happening was more than zero. At an intuitive level one can think of the points in the body of the scale as indicating how many things should have been different to produce the change.

- (21a) Andy ganó la lotería. 'Andy won the lottery.'
- (21b) Andy no ganó la lotería.'Andy did not win the lottery.'



Probability scales like the one in (22) are 'reversible': since sentence (21b) indicates that the probability of the event happening was zero, it can also be mapped onto the origin of a scale, as in the schema in (23).



The body of the scale in (23) contains the cases in which the probability of the event happening was more than zero. At an intuitive level too, one can think of these numbers as indicating how many things should have been different to avoid the change.

Affirmative sentences with achievement verbs, as well as negative ones, then, denote the origin of a scale, and both can combine with *casi* in its outcome reading. The same is true for accomplishments. States and activities, on the other hand, cannot be mapped onto scales that take into account a measure of probability, since they do not represent changes in a situation. Neither states nor activities can be modified by *casi* in its outcome reading. The conclusion, then, is similar to the one for the distribution of the phase reading: only sentences denoting the origin of a scale can take outcome *casi*. The *Casi* Condition can therefore be generalized to the outcome reading of *casi*. This result has some interesting consequences regarding the ambiguity of *casi*, to which I will turn next.

5. The meaning of casi

5.1. Truth conditions for casi

The Casi Condition can be used to account for the distribution of casi because it is possible to show that different scales can be associated with various sentences depending on their polarity and their aktionsart. A consequence of this approach is that the ambiguity in the meaning of casi vanishes: Casi can be assigned a constant meaning because the contrast between the phase reading and the outcome reading is due to the association of different scales with a given sentence. Generally speaking, a sentence of the form 'casi S' designates the point on the scale closest to the origin, which is designated by 'S' itself, i.e. by the 'argument' of casi. The meaning of casi, then, is a function that goes from the origin of a scale to the next notch up.

I will suggest one way to formalize this analysis. As a functor that maps sentences onto sentences, the contribution of casi to the sentence it appears in is like that of a modal operator. The meaning of casi can thus be defined in possible-world semantics. Scales of the sort I have been considering in this paper impose a structure on a set of worlds, based on accessibility relations. In the case of accomplishments like 'translating a poem', for instance, each moment in the process corresponds to a possible world W_i (i.e. each moment defines a state of affairs), and only the worlds that are adjacent to each other in a scale like the one in (10) are 'accessible' to each

other. Given a structure like that, the question is which relation holds between the world in which 'casi S' is true, and the world in which 'S' (the argument of casi), is true. The answer is that 'casi S' is true in the first accessible world from the world in which 'S' is true. Assuming that sentences are functions from worlds (indices) to truth-values, the truth conditions for casi can then be defined as in (24):

(24) Let S be a proposition that denotes the origin of a scale. Then

casi
$$S^{W_i} = \begin{cases} T \text{ iff } S^{W_{i-1}} = T \\ F \text{ otherwise.} \end{cases}$$

An analysis of *casi* as a scalar operator, then, accounts for certain generalizations about its distribution and its meaning. An analysis in terms of scales uncovers a very simple condition behind a complex pattern created by the interaction of the polarity of the sentence and its aktionsart. By making refence to zero-on scales, a general feature of the meaning of *casi* that was hidden under a superficial ambiguity can be made explicit. All that is needed is to enrich the model of the language with zero-on scales, the existence of which is probably justified by enough independent evidence. What is left for further work is to see how this same analysis extends to the cases in which casi modifies quantifiers or adjectives, as in (1b) and (1c). Other features of *casi*, like its 'orientation' or argumentative value (as it comes out in the contrast between *almost* and *barely* in English) may also be amenable to an analysis in terms of zero-on scales. I will finish this paper by showing how one curious feature about the semantics of *casi* can be clarified by an analysis in terms of scales.

5.2. Sadock's paradox

An analysis of *casi* as a scalar operator can also help in solving a paradox, which Sadock (1981) pointed out for *almost*, the English translation of *casi*. I will adapt Sadock's discussion to the Spanish example. The problem that leads to the paradox is that a sentence of the form '*casi* S', like (25a), conveys a sentence of the form '*no* S', like the one in (25b).

- (25a) Andy casi tradujo el poema. 'Andy almost translated the poem.'
- (25b) Andy no tradujo el poema. 'Andy did not translate the poem.'

Is the relationship between these two sentences an implicature or an entailment? There is evidence to believe, Sadock says, that (25a) implicates (25b), since a sentence like (25a) can be combined with a sentence expressing 'no S' without redundancy, as in (26).

(26) Andy casi tradujo el poema, pero no del todo. 'Andy almost translated the poem, but not quite.'

Sadock recognizes that this is a funny implicature, however, since it cannot be cancelled. This is shown in example (27).

? Andy casi tradujo el poema, y lo que es más, lo tradujo.'Andy almost translated the poem, and what's even more, she translated it.'

The noncancellability of the relationship between (25a) and (25b) can be accounted for if it is assumed that (25a) entails (25b). But given the lack of redundancy of an example like (26), it would be necessary to conclude that it is a funny entailment. Hence Sadock's paradox.

Sadock's answer to the problem is to say that the relationship between (25a) and (25b) is a funny implicature. I suggest that the other way is to be preferred, given the meaning of *casi* as a scalar operator and the structure of zero-on scales. In a zero-on scale the origin and the body of the scale are designated by polar opposites. Since *casi* maps the origin to a point in the body of the scale, it is only natural that it will entail the polar opposite of the sentence which it modifies. How is the informativeness of an example like (26) going to be explained, then? I will suggest that (26) is not really redundant. The tag *no del todo* 'not quite' works as a cancellation of an implicature associated with certain uses of *casi*. Sometimes, by uttering a sentence of the form '*casi* S' instead of '*no* S', a speaker implicates that the current state of affairs should be taken as making 'S' true even though 'S' is not the case. So, for instance, an Italian soccer fan could have said something like (28a) after Brazil defeated Italy in the '94 World Cup, implicating that Brazil's victory is nothing to be really proud of. A Brazilian fan, on the other hand, could have very well answered with (28b).

- (28a) Italia casi le ganó a Brasil. 'Italy almost defeated Brazil.'
- (28b) Casi, pero no del todo. 'Almost, but not quite.'

By considering the meaning of *casi* as a scalar operator, then, it is possible to gain some insight on Sadock's paradox.

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