

Italian Sequence of Tense: Complementation or Imperfectivity?

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To acquire Sequence of Tense (temporal simultaneity between a matrix and an embedded past tense), there are two aspects the child has to learn: the structural nature of the relation between the two tenses and the nature of these tenses themselves. The goal of the present study is to see how Italian learners develop their interpretation of embedded tenses, in particular, if both these aspects are used by the learner in determining Sequence of Tense, or, if not, which comes in first. The nature of the structural relation is formulated as the *Complementation Hypothesis*; the nature of the contribution of the semantics of tense is laid down in the *Imperfectivity Hypothesis*. This work is an extension of the work of Hollebrandse (2000) on the acquisition of Sequence of Tense in Dutch, English and Japanese. This paper extends the set of languages under investigation to a Romance language, Italian. Furthermore, while Hollebrandse only looked at the acquisition of the structural nature of tense relations in Sequence of Tense, we have also examined the acquisition of the aspectual nature of the tenses in the present study.

1 Sequence of Tense in Italian

Italian uses two different past tenses, the Imperfetto and the Passato Prossimo.¹ Sequence of Tense (a simultaneous reading) is expressed with an Imperfetto in the subordinate clause, (1a). Readings in which the time of the complement clause is prior to the time of the main clause (*real past readings*) are expressed with a *Passato Prossimo*, (1b). These readings are illustrated on a time line in (2).

- (1) a. *Mario ha detto che Gianni mangiava una mela.* *simultaneous*
M. said that G. ate-IMP an apple
'Mario said that Gianni was eating an apple'
- b. *Mario ha detto che Gianni ha mangiato una mela.* *real past*
M. said that G. has eaten an apple
'Mario said that Gianni ate an apple'

¹ In fact, the Italian spoken in the region of Trieste where we tested our subjects uses these two past tenses. In other dialects and registers, there is a third past tense, the *Passato Remoto*.



The fact that the two aspectual tenses are linked with different temporal readings in complement clauses makes Italian an ideal language to investigate the acquisition of the nature of tense in Sequence of Tense. The two tenses differ in terms of (im)perfectivity: the Imperfetto gives an imperfective aspect, whereas the Passato Prossimo yields a perfective aspect.

2 Syntax-Semantics of Tense Relations

We now examine the nature of the structural relation between two tenses (section 2.1) and the contribution of the aspectual nature of the tenses (section 2.2) and formulate the predictions of the acquisition of Sequence of Tense (section 2.3).

2.1 The Complementation Hypothesis

Hollebrandse (2000) proposed the *Complementation Hypothesis*, which states that the crucial factor in the acquisition of Sequence of Tense is complementation. A child has to learn the relation between direct and indirect speech before she is able to understand temporal readings in an adult-like way. A direct speech act with a present tense, as in (3a), and one with a past tense, as in (3b), can both be reported on by using an indirect speech act with a past tense in its complement clause, (4). However, the indirect speech act (4) cannot be a report of a direct speech act with a future tense, (3c).

- (3) a. John: "I am happy."
 b. John: "I was happy."
 c. John: "I will be happy"

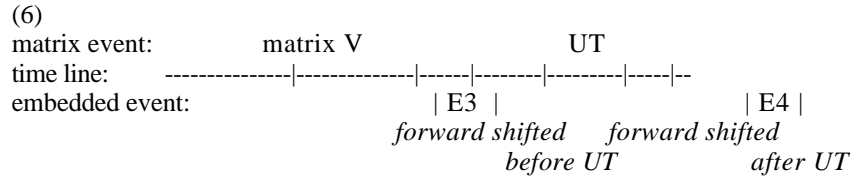
(4) John said he was happy.

Relative clauses, as in (5) allow forward shifted readings (the time of the relative clause event may be after the time of the main clause event). Complementation is the main difference between (4) and (5): forward shifted readings are not possible in complementation structures whereas they are allowed in non-complementation structures such as relative clauses.

(5) John saw a man who was on tv.

In the experimental design (see section 3), we included two different forward shifted situations, examining the subjects' acceptance of the forward shifted reading before utterance time and the forward shifted reading after utterance time (UT). These two conditions are important for the Complementation Hypothesis. Children who lack

complementation in their grammar will only have utterance time available for evaluating a "complement" tense and cannot link it with the time of the matrix tense (see (6)). Their "complement" tense will be evaluated independent of the matrix tense. They will therefore allow any reading for a complement past tense (4) as long as the "complement" event takes place before UT. However, they will not allow a reading after UT, because that is "future" with respect to UT.



This predicted pattern of acceptance by complementation failers is similar to the acceptance of temporal readings in relative clauses by adults. These are equally evaluated independently, that is, with respect to UT, not with respect to the matrix tense. Forward shifted readings after UT are also unavailable in relative clauses. Children with no complementation structure will not differentiate their temporal readings of "complement" and relative constructions.

In adult language past tenses in complement clauses are dependent on the matrix tense, whereas tenses in relative clauses are independent. The Complementation Hypothesis states that if a child has not acquired complementation, the tense in his or her clause is independent and therefore the child will allow the forward shifted reading before UT. The acquisition task is to learn the dependency of tenses by way of learning complementation structures. Hollebrandse (2000) in effect finds this result for Dutch and English learners. In the present study we will find out if the Complementation Hypothesis also holds for Italian learners.

2.2 The Imperfectivity Hypothesis

Boogaart (1999) and Hollebrandse (2000) show for English and Dutch that the aspectual nature of the embedded tense plays a crucial role in Sequence of Tense, arguing in favor of what we will refer to here as the Imperfectivity Hypothesis. For a simultaneous reading, the embedded past tense must be imperfective. Imperfective aspect presents an open view on an event with no regard to its boundaries, whereas perfective aspect presents an event with a closed perspective, including its initial and final boundaries (Dowty 1979; Smith 1991). The Imperfectivity Hypothesis states that the crucial factor children have to learn to acquire Sequence of Tense is the imperfective nature of the embedded past tense.

The Italian Imperfetto is an imperfective tense allowing simultaneity, while the Passato Prossimo as a perfective tense does not. The Imperfectivity Hypothesis thus correctly describes the aspectual nature of temporal relations in Italian. It predicts a relation between knowledge of the perfective or imperfective nature of the tenses and the acceptance of simultaneous readings. This factor has not been tested in Hollebrandse (2000).

2.3 Predictions

We have considered two hypotheses on the nature of Sequence of Tense. The Complementation Hypothesis refers to complement relations. If a child does not know complementation, she will allow forward shifted readings before utterance time (E3); if she knows complementation, she will reject them.

The Imperfectivity Hypothesis predicts that a child who knows the Imperfetto is an imperfective tense will allow simultaneous readings in a past-under-past construction. Similarly, knowing the perfective nature of the Passato Prossimo is a prerequisite for allowing real past readings. A child who does not know the aspects of these tenses will not be able to determine the temporal relations in an adult-like way.

3 Experiments

A total of 53 Italian children between the ages of 3 and 5 participated in this study; 15 adults acted as a control group.¹ All children were tested on three tests: a Sequence of Tense test, a Theory of Mind test and an Aspect test.

The Sequence of Tense experiment tested subjects' interpretation of temporal relations. It examines which direct speech acts the subject allows to be reported on with indirect speech acts containing either an embedded Imperfetto or a Passato Prossimo. The test was based on the Dutch, English and Japanese designs developed by Hollebrandse (2000).

All four potential readings (real past, simultaneous and both forward shifted readings) were tested in a truth-value judgement task. There were three tokens per type. One set of 12 sentences contained an Imperfetto, the SoT-Imp test; another set had a Passato Prossimo as the embedded tense, the SoT-PP test. Subjects were tested on the two tenses on different days.

The Italian example in (7) shows an excerpt of the SoT-Imp experiment. Note that *Winnie the Pooh* uses a future tense and *Ludo* uses an imperfective past tense. This particular item tests the possible acceptance of a forward shifted reading before utterance time (E3). The adult answer is "no".

(7) Excerpt from Imperfetto SoT protocol: Forward shifted (E3) situation

WP: *Oh, grazie, Pimpi. Che bello, fra poco avrò una bella banana.*
'Oh, thank you, Piglet. Wonderful, in a minute I will have-FUT
a beautiful banana.'

[Piglet puts the banana on WP's plate]

Exp.: *Ludovico, cosa ha detto WP?*
'Ludovico, what did WP say?'

Ludo: *Ha detto che aveva una bella banana.*
'He said that he had-IMP a beautiful banana.'

Exp. *Ha capito bene, Ludovico?*
'Did Ludovico get it right?'

Following De Villiers (1995,1998), the acquisition of complementation is an essential prerequisite to develop a Theory of Mind (ToM): the ability to express someone else's thoughts which are not necessarily the same as one's own. Wimmer and Perner's (1983) *unknown content in a familiar box* test was used to check the child's knowledge of a third person's knowledge who does not know the content of a box which is known to the child. Each subject got two questions examining his or her ToM. Following De Villiers, the child's responses on this test were taken as indicative of the child's knowledge of complementation. Hollebrandse (2000) found a correlation between the acquisition of Sequence of Tense and Theory of Mind in Dutch and English.

The Aspect test was a picture selection task which tested the child's knowledge of the completion or ongoing entailments of the Imperfetto and Passato Prossimo in simple, matrix sentences. A story with accompanying pictures introduces a story character who is about to perform an action (e.g., repairing a car that was taken apart, washing a dirty dog). Then the curtains on the picture close, so child and experimenter cannot see whether the event finishes or is still ongoing. The final picture of the story is missing. The subject's task is to choose the final picture prompted by a sentence with either an Imperfetto or a Passato Prossimo. One of the two pictures the child needs to select from shows an ongoing situation, the other a completed situation. Knowing the imperfective nature of the Imperfetto, a subject will choose the ongoing event and knowing the perfective nature of the Passato Prossimo, a subject will choose the completed event. This was what our adult subjects did. There were four tokens for each type. An excerpt with an Imperfetto question is given in (8). An example of a test question with a Passato Prossimo (without the introductory story) is given in (9).

(8) Excerpt from Imperfetto Aspect protocol:

Guarda, c'era una volta Mickey Mouse che stava riparando la sua macchina dietro una tenda. Poi la tenda si è chiusa e non abbiamo potuto vedere più niente. Improvvisamente la tenda si è riaperta e sai che cosa ho visto?

'Look here. Once upon a time Mickey Mouse was-IMP repairing-PROGR his car behind the curtains. Then the curtains closed-PP and we couldn't-PP see anything anymore. Suddenly the curtains opened-PP up again and do you know what I saw-PP?'

Trigger: *Mickey Mouse riparava la sua macchina.*

mickey mouse repaired-IMP the his car

'Mickey Mouse was repairing his car.'

Exp: *Quale dei due disegni è il disegno giusto?*

'Which of the two pictures is right?'

(9) *Marisa ha lavato il suo cane.*

marisa has washed-PP the her dog

'Marisa washed her dog.'

Summarizing, the Complementation Hypothesis predicts that ToM failers will allow forward shifted readings before UT (E3). Both ToM passers and failers will reject forward shifted readings after UT (E4). The Imperfectivity hypothesis predicts that an Aspect passer, the child who can aspectually distinguish the Imperfetto and Passato Prossimo, will only accept simultaneous readings (E2) given an Imperfetto but not a Passato Prossimo, and similarly she will only accept real past readings (E1) given a Passato Prossimo, but not an Imperfetto. An Aspect failer will behave at chance here.

4 Results

The Theory of Mind (ToM) test and the Aspect test were used to divide the children into passer and failer groups, characterizing them as knowing or not knowing complementation and knowing or not knowing aspect, respectively. We used a strict criterion for passing ToM, i.e., a subject had to give correct answers on both counts of the ToM question. For the Aspect test we took as a passing criterion 3 or 4 (out of 4) correct for each tense.

Complementation passers versus failers give different answer patterns on both SoT tests (Anova, ToM by SoT-Imp: $p=.026$; Anova, ToM by SoT-PP: $p=.013$). Furthermore, comparing the results on the two forward shifted readings (E3 and E4), we find that failers distinguish between the two readings, but passers do not (t-tests are summarized in (10)). A ToM failer tends to accept the forward shifted reading before UT (E3), while rejecting the forward shifted readings after UT (E4), hence differentiating the two. ToM passers tend to reject both. This is as predicted by the Complementation Hypothesis.

(10)

t-tests	SoT-PP E3 - E4	SoT-Imp E3 - E4
ToM fail	.04	.03
ToM pass	.12	.17

Looking in more detail at the answer patterns on the forward shifted situations, Theory of Mind passers and failers, as predicted, differ significantly on forward shifted readings before UT (E3). They also differ on forward shifted readings after UT (E4). This is surprising since we had expected that both groups would reject them equally. T-test values are given in (11).

(11)

t-tests	SoT-PP E3	SoT-Imp E3	SoT-PP E4	SoT-Imp E4
fail - pass	.01	.001	.02	.02

Examining now the predictions of the Imperfectivity Hypothesis, we find significantly different answer patterns between Aspect failers and passers on the SoT test with the Imperfetto (Anova, Aspect by SoT-Imp: $p=.044$). Looking in more detail at the simultaneous situation (E2) for which the hypothesis predicted acceptance by aspect passers and chance behavior by Aspect failers, we find that the Aspect failers versus passers differ on the simultaneous reading (E2) only with near-significance ($p=.06$). This may suggest that there is a trend that Aspect passers are better than Aspect failers at accepting simultaneity with the Imperfetto.

Regression analyses tell which variables contribute to the effects that are found in the t-tests. We find that the independent variable Theory of Mind (ToM) is a good predictor for the forward shifted reading before UT (Imp E3, PP E3), but not for the forward shifted reading after UT (Imp E4, PP E4), as predicted by the Complementation Hypothesis. Only age turns out to be a good predictor for the forward shifted reading after UT (Imp E4). The independent variable Aspect is not a good predictor for any of the readings. This is summarized below.

(12) Regression analysis: Predictors

	Imp E1	Imp E2	Imp E3	Imp E4	PP E1	PP E2	PP E3	PP E4
Age	-	-	-	* $p=.052$	-	-	-	-
ToM	** $p=.008$	-	** $p=.007$	-	-	-	** $p=.011$	-
Asp	-	-	-	-	-	-	-	-

5 Conclusions

In this paper we have tested two hypotheses in the development of Sequence of Tense: the Complementation Hypothesis and the Imperfectivity Hypothesis. The goal was to determine the relative importance of acquisition of structural relations, i.e., complementation, and the acquisition of semantic properties of tense, i.e., imperfectivity. We have used a Theory of Mind test to divide the subjects on their knowledge of complementation and an Aspect test to divide them on their knowledge of the aspectual tenses (Imperfetto and Passato Prossimo).

Acquisition of complementation played a significant role in the acquisition of Sequence of Tense. We also found a trend in the effect of the acquisition of the aspects. These results suggest that the child's knowledge of the imperfective nature of a tense may become crucial at a later stage of development than complementation which plays a crucial role for our 3-5 year olds.

We have thus been able to distinguish structural properties from semantic properties in the acquisition of a phenomenon at the syntax-semantics interface of temporal relations. It turns out that in the development of Sequence of Tense,

complementation is acquired first and the contribution of the aspectual tenses comes later.

In this study we have not looked at the acquisition of another possible factor that contributes to Sequence of Tense in Italian: the anaphoric nature of the embedded tense. Partee (1973) argues that tenses cannot only be quantificational, but are sometimes anaphoric. For example, we understand both events in the discourse in (13) as overlapping in time.

(13) Mary went to a party last night. Sam got drunk.

Giorgi and Pianesi (1998) observe that sentence (14a) with an Imperfetto uttered without any context is infelicitous. Sentence (14b), on the other hand, is felicitous due to the time adverbial which binds the temporally anaphoric Imperfetto.

- (14) a. #*Gianni mangiava una mela.*
G. ate-IMP an apple
'John was eating an apple.'
b. *Alle 4 Gianni mangiava una mela.*
at 4 G. ate-IMP an apple
'At 4 John was eating an apple.'

Crucially, a Sequence of Tense construction with an Imperfetto as in (15) is also fine, as the anaphoric tense finds it antecedent in the tense of the main clause.

- (15) *Mario ha detto che Gianni mangiava una mela.*
M. said that G. ate-IMP an apple
'Mario said that he was eating an apple.'

Giorgi and Pianesi argue that this is due to the anaphoric nature of the Italian imperfective tense. The Imperfetto must be bound, either by an adverbial or by a matrix tense.

We can formulate this theory as the Anaphoricity Hypothesis. It states that the crucial factor in the acquisition Sequence of Tense is the anaphoric nature of the embedded tense. If the child does not yet know the anaphoricity of the Imperfetto, or the non-anaphoricity of the Passato Prossimo, she will not be able to compute adult-like temporal relations.

The Anaphoricity and the Imperfectivity Hypotheses are possibly related. One may argue that the Italian Imperfetto is both an anaphoric tense and carries an imperfective aspect. To learn adult temporal readings, the child has to acquire both aspects of the Imperfetto. However, it may also be that Sequence of Tense in adult Italian is solely determined by the Anaphoricity Hypothesis with no role for the Imperfectivity Hypothesis (this is Giorgi and Pianesi's theory).

Future research with an added dimension of an Anaphoricity task will be able to shed light on these views so that acquisition data may be employed to decide among competing theories of Sequence of Tense in Italian.

Endnotes

* Hollebrandse is at Groningen and Utrecht Universities, Delfitto at Utrecht University, Van Hout at Groningen University and Vroeg-Peixoto at Utrecht University. We are very grateful to Paola Crisma (Trieste University) for her help with all the practicalities with the experiments, including the fine-tuning of our stories and the connections with the kindergarten. Thanks to Pino Longobardi for lending his voice to Ludovico. We thank the audiences of the Utrecht University language acquisition lab and the Groningen University Linguistics Colloquium for their questions and feedback. 1. We thank the children and teachers at the Casa dei Bambini kindergarten in Trieste, Italy, for their willing cooperation and our assistant Maria for her help with the SoT tests. Students of Trieste University (none of them enrolled in a Linguistics program) acted as our control subjects.

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