Fabiana Rosi

Learning aspect in Italian L2

Corpus annotation, acquisitional patterns, and connectionist modelling

Materiali Linguistici
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Fabiana Rosi

LEARNING ASPECT IN ITALIAN L2

Corpus annotation, acquisitional patterns, and connectionist modelling

FRANCOANGELI

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1. Introduction

1.1. Goals of the study

The study investigates the acquisitional pattern of the Aspect category in Italian as Second Language (L2), by comparing Spanish-speaking and German-speaking semi-spontaneous learners with Italian native speakers. The development of interlanguage[1] followed by the two learners' samples is analysed in order to shed light on the role of the First Language (L1). The choice of Spanish and German as source languages intends to focus on the influence of different degrees of similarity between L1 and L2 with regard to the expression of tempo-aspectual categories. Spanish, like Italian, is a Romance language and it morphologically encodes Aspect features on the verb. German, on the other hand, belongs to a different branch of the Indo-European family, the Germanic one, and it does not morphologically encode aspectual properties on the verb. The different effect of the two source languages on the acquisitional pattern of learners is observed along three developmental stages.
The research focuses on the emergence of the expression of the Past, since the aspectual contrast between the perfective form, *Passato Prossimo*, and the imperfective form, *Imperfetto*, is morphologically encoded in Romance languages, such as Italian, and it constitutes a complex task to acquire by learners.

The interplay between Aspect morphology with Actionality and Grounding features of the predicates is examined in the interlanguage evolution, in line with the main theoretical explanations of the acquisitional patterns in first and second language acquisition.

According to the Aspect Hypothesis, AH (Andersen and Shirai 1994), several surveys (Salaberry and Shirai 2002, Ayoun and Salaberry 2005b) provide

1. The term *interlanguage* (Selinker 1972, 1992) refers to the learners' varieties of language, which are considered as independent linguistic systems that gradually evolve in order to increasingly approach the target language (Chini 2000, 2003c).

evidence for a strong interaction between Aspect markers and Actionality features in the acquisition of perfective and imperfective past forms. In early developmental phases, learners tend to associate perfective forms with telic predicates and imperfective forms with states. In later stages, learners gradually depart from these most cognitively salient and frequent associations and they learn to select Aspect morphology on the basis of context, irrespective of the Actionality of the predicates involved.

Together with the influence of Actionality, the relevance of discoursive function is tested on the basis of the Discourse Hypothesis, DH (Bardovi-Harlig 1992, 2000), which points out that learners prefer to select perfective past with foreground predicates and imperfective past with background predicates. Furthermore, the learners' production is compared to native speakers' narratives in order to examine the effect of Aspect distribution in the input that learners receive. The Distributional Bias Hypothesis, DBH, (Andersen and Shirai 1994), indeed, suggests that the observed distributional biases of Aspect morphology can also be found in native speakers' production, although natives can use morphological markers even in non-prototypical cases, as insiders' advantage (Andersen 1994).

Within the acquisition of Aspect, particular attention is paid to the Aspect that is most complicated to attain, the imperfective, and its functions: continuous, *John was tall*, progressive, *while the rain fell*, iterative/habitual, *I used to wake up at 7 o'clock* (Bertinetto 1986). So far mainly expression of progressive function has been investigated by acquisitional studies, in particular the emergence of the morphological devices dedicated to the progressive, such as the periphrasis '*stare* + gerund' in Italian L2 (Giacalone Ramat 1995b, 1997, 2002), or the marker *-te i-(ru)* in Japanese L2 (Sugaya and Shirai 2007). The acquisition of habitual function has been less studied (Shirai 2002). In our study, the analysis is broadened to the progressive function not encoded by the specific markers and to continuous and habitual functions of Imperfectivity. Moreover, our analysis compares emergence of the three imperfective functions, in order to comprehend which uses of the imperfective past are acquired earlier and which are main difficulties in acquisition of each function. On the basis on these data the developmental pattern of continuous, progressive and iterative/habitual perspectives is proposed.

Both qualitative and quantitative analyses are carried out on the correlation among Actionality, Grounding, and the L1 in the longitudinal data. The qualitative analysis presents particular instances in the corpus of the phenomena discussed, such as not target-like learners' production of Aspect morphology or of Actionality, across the three acquisitional phases. The quantitative analysis consists in logistic regression, a fairly sophisticated analysis of variance. This multi-variable statistical test has been considered appropriate for

the elaboration of categorical rather than discrete data, such as linguistic items (Woods et al. 1986, Berdan 1996, Agresti 2002, Vietti 2005, 2007).

Moreover, the study aims to provide an annotated corpus of Italian L2, which represents a longitudinal collection of the interlanguage development of a quantitatively significant learners' sample. The corpus (Rosi_Phd 2006) was specifically collected for this research by the author and it has made available a new resource of Italian L2 data. It comprises oral and written narratives (story retellings) elicited from twenty-four learners of Italian as L2, twelve German native speakers and twelve Spanish native speakers, interviewed for six months. Together with these story retelling data, a symmetrical corpus of narratives of the same stimuli was gathered from twenty-four Italian native speakers, as a control group. The texts have been transcribed and sixteen traits of predicates, such as Aspect, Actionality, Grounding, have been annotated, in order to better retrieve the occurrences of relevant features and to analyze their distribution in the corpus.

A further goal of the research is the comparison of the Aspect morphology development between human learners and computational simulations as neural networks, i.e. Self-Organizing Maps, SOMs (Kohonen 2001). The comparison intends to shed light on the cognitive principles and mechanisms that guide learners to acquire linguistic structures in a second language. Within the emergentist paradigm (Gasser 1990, McLeod et al. 1998, MacWhinney 2001, Ellis 2002), recent surveys (Li and Shirai 2000, Li 2003) interpret the initial interaction between Aspect and Actionality in L1 Acquisition as the result of the children's analyses of the co-occurrence probabilities between morphological forms and semantic value of predicates in the linguistic input. Children extract the statistical frequencies of the combinations between Aspect forms and Actionality classes from the input; these combinations, initially, strengthen the production of the most frequent associations, until prolonged exposure to the input reduces the statistical difference between the most and the less frequent combinations. This account has been verified in the connectionist model of SOMs that has shown the convergence of children's and network data.

The study intends to empirically test whether neural networks can display the acquisitional pattern of Aspect morphology and the interplay between Aspect, Actionality and Grounding in the acquisition of a second language as well, in order to help to understand, on the one hand, the correlations between frequency effects and cognitive mechanisms, and on the other, the role of the prior knowledge of L1 in L2 acquisition.

1.2. Innovative issues

The most challenging issues of the study are represented by the annotation of the verbal categories in the corpus and the computational simulations of the acquisitional pattern through SOMs.

The annotation intends to avoid the loss of contextual information that is necessary to understand aspectual codification of the predicate and to facilitate computerized quantification and analysis in a large amount of data. A specific annotation scheme, i.e. a *tag set*, is proposed for the tagging of the category of Aspect and of relevant contextual features, such as tempo-aspectual adverbials, the voice of the predicate, as well as Actionality and Grounding properties. The annotation takes into account further components of context in addition to the frequently encoded elements, i.e. Tense, Aspect, Actionality, and Grounding (Housen 1995), with the purpose of facilitating retrieval of the co-occurrences of Aspect markers and a broader set of contextual features, so as to deepen the analysis of linguistic factors potentially influencing the acquisition of Aspect morphology. The labelling of the linguistic parameters that are correlated to the aspectual perspective of the predicate permits intersected analysis among the factors studied and it allows investigation of the role of each factor in the learners' strategies across different acquisitional stages.

Such a scheme of annotation addresses several problems, determined by the semantic complexity of the tagged categories and by the learners' problematic productions, typical of learner corpora. As a collection of linguistic data that are produced by non-native speakers who communicate in a not completely mastered linguistic system, a learner corpus comprises not target-like forms, such as *ha sentivo*, 'has heard_IMPF', which are very difficult to analyse and annotate. On the basis of this experience, a proposal for tagging the aspectual value of problematic predicates in Learner Corpora is presented, in order to offer an objective description of the verbs produced, rather than to interpret the data, by projecting the researchers' expectations on not target-like forms (Rastelli 2006, 2007a). In this view, the annotation of learners' data aims to display how linguistic categories are formed during evolution of the non-native linguistic system and to examine which relations among features are acquired first.

The computational simulations of the acquisitional pattern intend to contribute to the debate on emergence of the Aspect category, which has a fruitful tradition in second language acquisition research (Slabakova 2002), with new evidence gathered by application of the connectionist model that has been recently employed in acquisitional studies (MacWhinney 1998, Bybee and Hopper 2001).

The connectionist paradigm may provide useful support for linguistic theory since it facilitates investigation of the correlation between the frequency of verb forms in the input and in the interlanguage produced by learners (Ellis 2003). In addition to the relevance of the saliency of preferential associations between Aspect and both Actionality and Grounding (AH, DH), the effect of the frequency of these association in native speakers' production is verified as a determinant factor in the acquisitional pattern. In the present study, the quantitative distribution of input data is modelled by means of unsupervised neural networks, the SOMs. The SOMs are unsupervised associative neural networks of 'knot receptors' that classify input data by translating relationships of similarity into topological relationships of proximity. Through an incremental exposure to an increasing amount of data, the receptors are topologically organized on the network in such way that associated receptors have the tendency to recognize homogeneous classes of data. SOMs are biologically plausible models: the human cerebral cortex can be conceived as essentially a multiple feature-map, where all neurons are initially co-activated and the associative strengths between neurons become more focused in parallel with the distributional increase in the corresponding co-occurrences in the input.

Whereas previous experiments on the emergence of Aspect (Li and Shirai 2000) address first language acquisition, the present study investigates the developmental pattern of a second language. The role of prior linguistic knowledge constituted by learners' mother tongue is taken into account in the simulations. With respect to the research by Li and Shirai, we experiment also a new methodology for representing the semantics of predicates to the SOMs, in order to go beyond the distributional co-occurrence model of verb meaning (Burgess and Lund 1997) and to deepen knowledge on the interplay between Aspect, Actionality and Grounding in the classification of predicates. In this way, the connectionist simulation of language acquisition offers an innovative device to model the internal dynamics of linguistic systems (Lenci 2004) and to provide evidence for theoretical hypotheses on the learning process.

1.3. Structure of the book

After introducing the main goals and innovative issues of the research in chapter 1, the theoretical framework regarding Aspect, Actionality, and Grounding categories and the main acquisitional hypotheses are illustrated in chapter 2. Chapter 3 reports on the methodology of the data collection and corpus compilation. In chapter 4, the annotation scheme of verbal categories is described and considerable attention is paid to the tagging of not target-like

forms. Chapter 5 addresses the qualitative and quantitative analyses of data on the emergence of both past and imperfectivity in the interlanguage. In addition, phenomena concerning the expression of Actionality and several peculiarities of learners' production are focused on. In chapter 6 the acquisitional patterns are commented and compared with the findings of relevant literature. In chapter 7 the computational simulations are described, by giving an overview of neural networks mechanism and of previous research that has applied these models to language acquisition. The procedure and the results of our experiments are presented. Chapter 8 provides a general summary and discusses the concluding remarks to be drawn from the study about the annotation of corpus, the learners' strategies that have emerged from the data, and the experiments through the neural networks. Finally, implications for future research are outlined.

2. Theoretical background

2.1. The category of Aspect

2.1.1. Temporal reference and Aspect

Temporal Reference codifies temporal deixis, i.e. relation of anteriority, simultaneity or posteriority between an event[1] and a reference point, which is usually the time of speaking/writing. In Reichenbach's terms (1947), basic notions for the temporal collocation of the event are: *Speech Time*, indicating the moment when the utterance is produced; *Event Time*, referring to the moment, or temporal interval, when the event takes place; *Reference Time*, indicating the moment that is individuated as reference with respect to Event Time. As example, for the event *era partito*, 'he had left', in (1), Event Time is anterior to Speech Time and to Temporal Reference, expressed by the adverbial *ieri alle sei*, 'yesterday at six o'clock'.

(1) Ieri alle sei Gianni era partito.
Yesterday at six o'clock Gianni had left.

Reference Time is sub-distinguished by Bertinetto (1986) into two further concepts: *Temporal Localization*, describing actual individuation of the moment when the event happens; *Reference Moment*, presenting the moment when the result of the event that has previously concluded is still relevant for the speaker[2].

1. Throughout the study, the term *event* is used according to the definition by Chung and Timberlake (1985: 203) «Intuitively, an event is simply whatever occurs at some time period under some set of conditions» rather than in opposition to the terms *process* or *state*.

2. The Reference Moment occurs when the event is encoded by a compound Past and it expresses the perfect Aspect, as argued below.

The category of *Aspect* encompasses «different ways of viewing the internal temporal constituency of a situation» by the speaker (Comrie 1976: 3). The speaker may conceive an event as entirely concluded and considered from an external point of view, or as incomplete, during its development, from an internal perspective (Smith 1983, 1991, Hopper 1982). The former viewpoint corresponds to perfective Aspect, whereas the latter is covered by imperfective Aspect.

Selection of the Aspect codification is a subjective choice by the speaker, who can present the same event in both perspectives. For example, the event of *mangiare la cena*, 'to eat the dinner' is presented as concluded by means of perfective past *ha mangiato*, 'he ate' (2) and as ongoing through imperfective past *mangiava*, 'he was eating' (3). Even in the second perspective the event is concluded at the Speech Time, although the conclusion is not explicitly pointed out by the speaker.

(2) Gianni ha mangiato la cena.
John ate the dinner.

(3) Gianni mangiava la cena.
John was eating the dinner.

According to Comrie (1976) the particular attention to past tenses in Aspect studies is correlated to explicit expression of the aspectual contrast in the past rather than in present, future, or infinite tenses. In many Indo-European languages, such as Romance, verb systems morphologically distinguish a perfective past, that represents the prototypical value of the past dimension (Dahl 1985), and an imperfective past, the so-called 'present in the past', because it conveys the aspectual perspective more typical of the present than of the past.

Both Temporal Reference and Aspect are expressions of the notion of temporality, but Temporal Reference locates situation in deictic relation to the referent point, while Aspect reports the speaker's perspective on the temporal development of the event. The two semantic concepts are encoded by means of the grammatical device of *Tense*.

2.1.2. Perfective Aspect

Perfective Aspect presents events as single and unified situations (Bybee et al. 1994), where the beginning, middle, and end are included, as «a complete unit» (Bache 1985: 146-147). Comrie describes perfective Aspect in terms of totality and specifies that perfective may be defined as a complete reading of

the event in preference to completed reading, in order to focalize not only on the terminal phase, but on «all parts of the situation as a single whole» (1976: 18). The ideas of punctuality and boundness are implicatures of this core meaning.

According to Bertinetto (1986), perfective Aspect may be sub-distinguished into two semantic functions: *aoristico*, aoristic, and *compiuto*, perfect or perfectal, corresponding to English perfect or French *accompli*. The aoristic meaning addresses complete events that have no consequences at the Speech Time and it is conveyed by the simple past form, while perfect function refers to perfective events having results that persist at the Speech Time and is typically expressed by compound past tenses. On the basis of Reichenbach's concepts, the difference between the two functions is mirrored by the fact that only perfect Aspect *è tornato*, 'has been back', is compatible with Temporal Localization, as in the adverbial *da tre giorni*, 'for three days' (4), whereas the aoristic sense *tornò*, 'went back', does not accept it (5).

(4) Gianni è tornato a casa da tre giorni.
John has been back home for three days.

(5) * Gianni tornò a casa da tre giorni.
John went back home for three days[3].

This divergence between perfect and aoristic Aspect is explainable by the fact that the former involves the result of an event in its temporal structure, whereas the latter does not allow for the persistence of a resultant state.

In Comrie's terms, the aoristic Aspect coincides with perfective Aspect, whereas perfect perspective is defined as a third value, which refers to the relation between two time-points: «on the one hand the time of the state resulting from a prior situation, and on the other the time of that prior situation» (Comrie 1976: 52).

2.1.3. Imperfective Aspect

Imperfective Aspect «pays essential attention to the internal structure of the situation» (Comrie 1976: 16). Its core meaning is description of an event in the middle of its development, without reference to a terminal point. Givón (1993) suggests a spatial metaphor to clarify the difference between perfective

3. In the English sentence, the adverbial 'for three days' is acceptable but it indicates a temporal span concluded in the past that has no consequences at the Speech Time.