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Processability Theory: Current issues in theory and application

Camilla Bettoni and Bruno Di Biase, eds

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Development across languages: English, Italian and Japanese

Bruno Di Biase and Satomi Kawaguchi

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1. Introduction

In this chapter we draw the consequences of our integrated discussion of PT presented in chapter 1, and reconceptualise the staging of L2 development with reference to three typologically markedly different languages. The developmental sequences of English, Italian and Japanese that follow in the next three sections are not new, but we repropose them here because we wish to introduce several changes in their presentation. As we have seen in chapter 1, these changes are not merely terminological formalities, but substantial adaptations derived from recent developments in LFG itself. They replace older derivational labels with those of nonderivational syntactic theory, thus reflecting more directly the lexicalist approach which characterises not only LFG but also Levelt's Model.

Our first main innovation is the separation of morphological development from syntactic development. This is unlike earlier PT versions (Pienemann 1998, 2005b) and most PT work so far, but it is consistent with our presentation in § 4 in chapter 1. The reason for keeping them separate is that, although the two developmental sequences are related in some way, the full relationship between them is not as yet entirely clear (cf. § 4.3, ch. 1), and in any case they depend on two different sets of motivations. On the one hand, as we have seen in § 2.1 in chapter 1, we have the original psycholinguistic procedures of Kempen & Hoenkamp (1987) assumed by Levelt (1989) and adopted by PT in Pienemann (1998), who shows how these processing procedures can be modelled in LFG by the mechanisms of feature unification. These procedures trace the developmental path of the learner's morphological marking over the hierarchical levels of syntactic organisation beyond lexical learning, namely the phrasal, interphrasal and interclausal levels. On the other hand, as we have seen in § 2.2 in chapter 1, the development of syntax depends on two different kinds of correspondences that formally

relate the three LFG parallel structures: a-structure, f-structure, c-structure. One of these two kinds of correspondences describes the distribution of information according to discourse-pragmatic functions, such as topic and focus, and their prominence relative to other elements in the sentence. These functions are sketched in Levelt (1989), and formally implemented as the mapping of c-structure onto f-structure in LFG's recent work by Bresnan (2001), Dalrymple (2001), and Falk (2001). The other kind of correspondence is guided by the principles of Lexical Mapping Theory, which accounts for the mapping of a-structure (a hierarchically organised set of semantic roles) to f-structure (a hierarchically organised set of grammatical functions).

A second main innovation in our presentation here will attempt to reflect more consistently a basic assumption about language development PT shares not only with many SLA researchers but also with first language acquisition researchers and with typologists. With Andersen (1984), Brown (1973), Keenan & Comrie (1977), Krashen (1982), and many others, PT assumes that the learner proceeds from least marked, feature-scant forms and structures towards more feature-rich, more specified and more marked forms and structures. This is implemented, for instance, in the separate presentation of declaratives from other types of sentences, foremost among these the questions. Questions are kept separate from declaratives because they always include a focal element grammatically (or otherwise) marked in the relevant structure as FOC (Mycock 2007, **Bettoni & Ginelli, in this publication**).

The developmental schedules presentend in this chapter have all been tested, albeit some with more robust empirical evidence than others. Because we intend them to exemplify a way of reasoning across languages, rather than illustrate them in fine detail, the examples we use for the structures sometimes come from recorded interlanguage data; at others, for clarity's sake, given the often 'messy' learners' productions, they are fictitious, or cleaned up of pauses, false starts, etc. Likewise, for brevity's sake, we do not report the methodological details of the empirical work from which the schedules are drawn. For a fuller picture of the stages along the developmental paths, as well as for their evidence, the reader is referred to the original works.

2. The development of English L2

Many researchers have contributed to understanding the development of English as a second language, possibly the most studied L2 as can be gathered from well known introductions to the field (e.g., Larsen-Freeman & Long 1991, Doughty & Long 2003), as well as within PT (e.g., Pienemann 1998; **?some recent references?**) and its precursors (e.g. Johnston 1985, 1997; Pienemann, Johnston & Brindley 1988, Pienemann & Mackey 1993). So we will not repeat the history nor the detailed descriptions already offered by these and other authors. We will instead summarize a current PT sketch to ground theoretically the proposed terminological changes. To show these changes schematically we must refer to Pienemann's (2005: 24) recent presentation of the PT hierarchy, where morphological information and syntactic arrangements are assumed to depend on the same processing procedure as may be read from the table in (1).

(1). *Processing procedures applied to English as presented in Pienemann (2005: 24)*

PROCESSING PROCEDURE	L2 PROCESS	MORPHOLOGY	SYNTAX
6 subordinate clause procedure	main and sub. clause		Cancel INV
5 S-procedure	interphrasal information	SV agreement (= 3sg-s)	Do2nd, Aux2nd
4 VP-procedure	interphrasal information	tense agreement	Y/N inversion, copula inversion
3 phrasal procedure	phrasal information	NP agr Neg+V	ADV, Do-Front, Topi
2 category procedure	lexical morphology	plural possessive pro	canonical order
1 word/lemma	'words'	invariant forms	single constituent

For instance, in stage 4, the reader could assume that 'tense agreement' in the morphology column calls for an interphrasal procedure as much as 'Y/N inversion' or 'copula inversion' in the corresponding column for syntax. This assumption may cloud the issues under observation, because the morphological 'tense agreement' structure does not involve the Subject and hence may not require the same procedure as Y/N question, which does involve it. Indeed progress in one grammatical area does not guarantee progress in another. Recent studies of English L2 (e.g., Yamaguchi 2008, 2009) and of bilingual L1 acquisition involving English (cf. Itani-Adams 2009; Qi, Di Biase & Campbell 2006) report faster growth in syntax than morphology, sometimes even by two PT stages. These are the sorts of reasons that prompt us to present the implicational hierarchy for English morphology and its distribution over syntactic levels (cf. § 2.1) separately from syntax (cf. §2.2).

2.1. *The morphological development of English L2*

The table in (2) follows the original and well known morphological development distributed hierarchically, and implicationally, over phrasal, interphrasal and interclausal levels of information exchange at the respective syntactic nodes. We include here the interclausal level with subordination phenomena which in English affect morphological form, as the examples in the appropriate cell show. These highly optional constructions show an obligatory bare or a marked form of the verb in the subordinate clause belong to the 'educated' register of English. They are rather rare even in native speaker production and quite difficult to elicit in learners. Needless to say not all subordinate clauses belong here. As Pienemann (1998) argues, subordination requires a separate module and, we may add, further investigation from a PT perspective (cf. the relative-clause accessibility hierarchy of Keenan & Comrie 1977, and Doughty 1991 for an acquisitional investigation). **Gisela: S-BAR procedure has nothing to do with the different kinds of relative clauses in the accessibility hierarchy.**

(2) Developmental stages for English morphology (after Pienemann 1998, 2005)

PROCEDURE	MORPHOLOGICAL OUTCOME/STAGE	STRUCTURE	EXAMPLE
S-BAR PROCEDURE	INTERCLAUSAL MORPHOLOGY	e.g., subjunctive marking in subordination	<i>I suggest he eat less</i> <i>It's time you left</i>
S- PROCEDURE	INTERPHRASAL MORPHOLOGY	3rd person singular -s	<i>Peter loves rice</i>
PHRASAL PROCEDURE	VP MORPHOLOGY	AUX + V: <i>be + V-ed (passive)</i> <i>have + V-ed</i> MOD + V <i>be + V-ing</i>	<i>we are left out</i> <i>they have walked</i> <i>you can go</i> <i>I am going</i>
	NP MORPHOLOGY	phrasal plural marking	<i>these girls</i> <i>many dogs</i> <i>three black cats</i>
CATEGORY PROCEDURE	LEXICAL MORPHOLOGY	past -ed verb -ing plural -s	<i>Mary jumped</i> <i>he working</i> <i>I like apples</i>
LEMMA ACCESS	INVARIANT FORMS	single words; formulas	<i>station, here</i> <i>my name is Pim</i>

Proceeding now to a brief summary following the learner's development, after a first formulaic stage requiring only lemma access with practically no grammatical marking, the acquisition of lexical morphology at the next stage requires that the lexical category be annotated in the lemma, so that the category procedure can be called for the corresponding lexical item. The production of a lexical morphology then also requires that the diacritic features corresponding to the category (e.g. the English noun category requires the marking of number) be annotated in the lemma. For English nouns, a variation in lexical form means variation in number, between singular and plural. Learners of English L2 must learn to associate the conceptual information they want to express (e.g. whether the entity referred to is semantically countable in the language (*apples* vs *milk*) and, if so, whether the referent is considered as one entity or more (*cat* vs *cats*). They also need to learn that English uses plural forms for referring to generic entities (*I like apples*).

As for verbs, learners typically begin by marking them categorially with the *-ing* morpheme (*go* vs *going*) regardless of tense and/or aspect, mainly to differentiate them from the other major category of words, i.e., nouns (cf. Johnston 1997). This alternation may capture differences in function which do not correspond to the use native speakers

make of these two forms. Initial variation in verb forms tends to mark tense/aspect (*work* vs *worked*); and eventually the alternation between continuous and noncontinuous forms (*go* vs *going*) may be used in a way similar to natives.

The activation of phrasal procedure in English allows for intraphrasal agreement, or in any case for exchange of grammatical information. This seems to emerge at two separate stages. The first is characterized by unification of features at the NP node when a plural context is created by numerical or nonnumerical quantifiers bearing a plural value for the number feature (e.g., *three cats*, *many dogs*). Agreement between nouns and their determiners is also clearly intraphrasal. This is marginal in English, affecting only the demonstratives: *this* vs *these* and *that* vs *those*. The second agreement is between the auxiliaries and their lexical verbs, and seems to emerge after the NP phrasal procedure is in place. Strictly speaking, this agreement is across two phrases (namely, the auxiliary and the lexical verb), where the English L2 learner must learn to select the auxiliary according to a range of aspectual, tense or modal motivations, and unify these features with the relevant ones in the lexical verb (e.g. *is going* vs *has gone* vs *can go*, etc.). A proper PT treatment with an empirical investigation of this developmental stage requires more space than can be afforded here (but cf. Yamaguchi, forthcoming).

The activation of the S-procedure allows for sentential (interphrasal) agreement between the subject and the lexical verb. At this stage, learners of English can produce the verbal *-s* morpheme for the third person singular of the present tense, once they manage to merge the subject information in the NP_{SUBJ} [PERS=3; NUM=sg] with the relevant verb feature specifications [TENSE=pres; SUBJ PERS=3; SUBJ NUM=sg]. At this stage, in English morphology keys in with syntax: in order to produce this agreement learners must identify the first NP as SUBJ, and this means that functional assignment is in place. Furthermore, this processing resource of being able to assign grammatical functions, is a necessary pre-requisite for the processing of passive constructions, as we will discuss further in § 2.2.

This of course is not the full story, in more than one way, and several important issues are not mentioned here. Our focus in this chapter is not so much on the details of the schedules as on the reasoning behind them. For example, the activation of S-BAR procedure (cf. the table in (30) in ch. 1) yields a further stage in English, partly discussed earlier in this section, which includes, for instance, tag questions or indirect questions, requiring interclausal agreement between the verb in the main clause and the subordinate clause. In any case, questions – as we argued – require a further pragmatic motivation, a Focus, which is marked syntactically (and/or prosodically) in the sentence, and as such best treated separately. Other issues not discussed here include pronominals, genitive marking in English nouns, and the variation implicit in the Hypothesis Space (Pienemann 1998: ch. 6).

2.2 The syntactic development of English L2

The syntactic hierarchy for the development of English declarative sentences is illustrated in (3). As we have just seen for the development of morphology, the first formulaic stage, with practically no grammatical marking, requires only the activation of the lemma access procedure.

(3) *Developmental stages for English syntax based on the Topic Hypothesis – Declaratives (after Pienemann 1998; Pienemann, Di Biase & Kawaguchi 2005)*

STAGE	STRUCTURE	EXAMPLE
MARKED ALIGNMENT	OBJ topicalisation	<i>icecream she likes</i>
XP + UNMARKED ALIGNMENT	TOP + canonical order (TOP=ADJ)	<i>tomorrow they go home</i> <i>in Australia people eat pies</i>
UNMARKED ALIGNMENT	canonical word order = SVO	<i>Mary jumped</i> <i>he working</i> <i>I eat rice</i>
LEMMA ACCESS	single words; formulas	<i>station, here</i> <i>my name is Pim</i>

At the following stage, because English is a highly configurational language with obligatory subject, once learners can activate the category procedure – i.e., begin to differentiate the main nominal and verbal elements – they start organising their utterances using NVN sequences. That is, in accordance with the Unmarked Alignment Hypothesis (cf. § 4.2, ch. 1), learners map concepts and meanings by default onto an underspecified SV(X) constituent order, which corresponds to actor-action first, followed perhaps by another element such as patient, goal, instrument, time, and location after the verb, as in (4). This results in canonical word order, yielding sentences that are syntactically target-like, provided they are declarative, active, affirmative, grammatically simple, minimally presuppositional, and pragmatically neutral.

- (4) a. Vladimir eat
b. Vladimir eated rice
c. Vladimir is eating now

The next step forward in the development of syntax, accounted for by the Topic Hypothesis, is not a difficult one to achieve for learners of English, provided they proceed with their categorical differentiation. By placing in first topical position a constituent which is not a core element of the sentence – typically a time or place circumstantial adverbial – the production of declaratives is target-like,¹ as in (5). This target-like structure comes about effortlessly in a highly configurational language like English where canonical word order is undisrupted in declarative sentences that are pragmatically reasonably² neuter. On the other hand, further up the developmental path,

¹ Notice that this very same kind of operation would produce ungrammatical sentences in German, which requires the verb in second position (V2).

² We say ‘reasonably’ here, because of course even the topicalisation of ADJ is pragmatically marked, albeit minimally compared to the topicalisation of a core constituent other than SUBJ, which is topical by default.

marked alignment may come about with pragmatically highly marked, and therefore rare, sentences such as Bresnan's we reproduce here as (6) from (19b) in chapter 1.

(5) now Vladimir is eating

(6) Rosie I named her

The syntactic hierarchy for the development of English content questions is illustrated in (7).

(7) *Developmental stages for English syntax based on the Topic Hypothesis – Constituent questions (after Pienemann 1998; Pienemann, Di Biase & Kawaguchi 2005)*

STAGE	STRUCTURE	EXAMPLE
XP + MARKED ALIGNMENT	<i>wh-</i> + AUX + SUBJ VO ?	<i>why does she cry?</i> <i>what can we buy?</i> <i>what has he eaten?</i>
	<i>wh-</i> + Copula + SUBJ X ?	<i>when are you going?</i> <i>why is Peter sick?</i>
XP + UNMARKED ALIGNMENT	<i>wh-</i> + canonical order ?	<i>what he eat?</i> <i>where you live?</i>
UNMARKED ALIGNMENT	canonical order ?	<i>Mary eat what?</i> <i>you go where?</i>
LEMMA ACCESS	single words ? formulas ?	<i>what's your name?</i> <i>how much is it?</i>

After a formulaic stage, in which even complex questions can be reproduced mechanically, at the next stage up, in accordance with the Unmarked Alignment Hypothesis (cf. § 4.2, ch. 1), canonical word order results in constituent questions where the question word is in situ; that is, where the corresponding nonquestioned phrase would normally be in the corresponding declarative,³ as in (8). This means that, at his stage, English constituent questions are not target-like.⁴

- (8) a. *Mohammed eat what?
b. *Mohammed is going where?

³ For a new typological perspective on constituent question formation within the nonderivational framework of LFG, cf. Mycock (2007); for question formation in Italian L2, cf. ch. xx in this book.

⁴ As a matter of fact, these sentences could be correct in English if the questioned constituent were prosodically highly stressed – an eventuality which is however most unlikely to occur at this stage of interlanguage development.

Further up the developmental path, a significant progress takes place, accounted for by the Topic Hypothesis (cf. § 4.2, ch. 1). Having learned to disentangle the TOP and FOC discourse functions from SUBJ, learners can now place the focal questioned constituent in first position, as in (9). Of course, due to the steadiness of canonical word order, the outcome is still not on target. It could, however, be target-like if the questioned constituent were itself SUBJ,⁵ as in (10). However sentences questioning SUBJ are unlikely to occur in learners' data at this stage, because in order to produce them learners would need, first, to have the interrogative pronoun available lexically (e.g., *who*), and secondly, to be able to identify it as SUBJ.

- (9) a. *what Mohammed eat?
b. *where Mohammed is going?

(10) who come now?

At the following stage, marked alignment comes about when functional assignment is in place, and canonical order can be disrupted. Having learned at the previous stage that the focal question word is in first position, and now also that the subject follows either an auxiliary as in (11), or the copula as in (12), English constituent questions can be on target. Furthermore, thanks to functional assignment and a clear identification of SUBJ, also the questioning of SUBJ as in (10) is more likely to occur in practice at this stage, rather than at the previous ones.

- (11) a. when have they gone away?
b. where does she live?
c. what can we do?

- (12) a. why are they sick?
b. what is Peter eating?

The syntactic hierarchy for the development of English Y/N questions is illustrated in (13). With this type of questions, the focal function questions the whole sentence, rather than only the questioned constituent. So, in the first two stages of one-words or formulas, and of unmarked alignment, nothing changes compared to corresponding declaratives, except – perhaps – intonation; and any ambiguity between declaratives and interrogatives would have to rely on context.

⁵ The subject has a special status in content questions also in other languages besides English, according to Falk (2001).

(13) *Developmental stages for English syntax based on the Topic Hypothesis – Y/N questions (after Pienemann 1998; Pienemann, Di Biase & Kawaguchi 2005)*

STAGE	STRUCTURE	EXAMPLE
MARKED ALIGNMENT	AUX + SUBJ VO ?	<i>have you eaten?</i>
	Copula + SUBJ X?	<i>can Ann swim?</i> <i>is she happy?</i> <i>are they students?</i>
XP + UNMARKED ALIGNMENT	AUX <i>do</i> + canonical order ?	<i>do they have a cat?</i>
UNMARKED ALIGNMENT	canonical order ?	<i>*he is happy?</i> <i>*they are students?</i> <i>*Mary jumped?</i> <i>*you working?</i>
LEMMA ACCESS	single words ? formulas ?	<i>coffee?</i> <i>going?</i>

Then, further up, the Topic Hypothesis accounts for the emergence of the *XP + canonical order* structure. Here, the questioning of the whole sentence is marked by assigning the discourse function FOCUS to the auxiliary *do* in first position, as in (14).

- (14) a. do you like strawberries?
b. did they go home?

Finally, marked alignment comes about with Y/N questions when learners can both differentiate auxiliaries, and assign syntactic function to some constituents. With this type of questions, two functions are assigned, as in (15)-(16): first, the auxiliary or copula bear the focal function and questions the whole sentence; secondly the identification of SUBJ allows it to be placed after the auxiliary or copula.

- (15) a. have you eaten?
b. can she swim?
- (16) a. is Mary a student?
b. am I wrong?

The table in (17) places side by side the hierarchies for declaratives, constituent questions and Y/N questions presented separately in (3), (7) and (13). Whether all three paths develop in this parallel fashion, and all structures belonging to the same stage do actually emerge at the same time is an issue that will need substantiating with empirical data.

(17) *Developmental stages for English syntax – Declaratives, constituent questions and Y/N questions (after Pienemann 1998; Pienemann, Di Biase & Kawaguchi 2005)*

STAGE	DECLARATIVES	CONSTITUENT QUESTIONS	Y/N QUESTIONS
XP + MARKED ALIGNMENT		<i>wh-</i> + AUX + SUBJ VO ? <i>wh-</i> + Copula + SUBJ X ?	
MARKED ALIGNMENT	topicalisation of OBJ		AUX + SUBJ VO ? COPULA + SUBJ X?
XP + UNMARKED ALIGNMENT	ADJ + canonical order	<i>wh-</i> + canonical order ?	<i>do</i> + canonical order ?
UNMARKED ALIGNMENT	canonical order	canonical order ?	canonical order ?
LEMMA ACCESS	single words; formulas	single words? formulas ?	single words? formulas ?

Furthermore, as we have remarked about the development of English morphology above, so also here with syntax we should warn the reader that this is not the full story. For example, although usually included in a presentation of PT, indirect questions and tag questions are dealt with here. Our reason for leaving them out is that they both involve two clauses, the former through subordination, and the latter through the unification of verbal features across coordination; furthermore the latter also involve negation. We think these should be the focus of specific studies dealing with subordination and negation, as we remark in the Epilogue of this book. Other examples of our partial story in (17) are some empty cells in the table. The empty cell in the column for constituent questions will never be filled, because once learners have – quite early – learned to front the question word, the first position will never be empty of the discursive function FOC. But the highest stage for both declaratives and Y/N questions can indeed be filled with a topicalised ADJ preceding the structure of the previous stage. So, for example, (18b) belonging to the XP + marked alignment stage would follow (18a) belonging to the unmarked alignment stage, and the same would hold true for the pair of Y/N questions in (19). We have not cluttered the table in order to keep our main line of reasoning simpler, just as we do not deal here with complex structures involving, for example, both questions and exceptional verbs or passives, or indeed also negation, as in (20). Besides, they still need testing on empirical data (cf. the Epilogue)

- (18) a. I liked this best
b. this I liked best

- (19) a. was she able to meet him?
b. in Rome yesterday was she able to meet him?

- (20) yesterday morning why weren't the flowers watered?

Let us finally consider the syntactic development for English L2 based on the Lexical Mapping Hypothesis (cf. § 4.2, ch. 1). The application of the universal schedule showed above in (40, ch. 1) is here applied to English in (21). Convincingly tested on a variety of abundant empirical data up to the default mapping stage, this schedule is better attested on passive verbs than on so-called exceptional verbs such as *receive* or *please*. We refer here to Keatinge & Keßler's (2009) and especially Wang's (2009) studies of passive sentences. The latter study uses cross-sectional data gathered by means of patient-cued pragmatic contexts, and demonstrates that only the most advanced Mandarin-speaking learner of English are able to cope with the task by producing sentences using the pragmatically appropriate nondefault syntactic mapping.

(21). *Developmental stages for English syntax based on the Lexical Mapping Hypothesis – Declaratives (after Pienemann, Di Biase & Kawaguchi 2005: 246)*

STAGE	STRUCTURE	EXAMPLE
NONDEFAULT MAPPING	passives, causatives, etc.	<i>the blue fish is eaten by the green fish</i> <i>she let him sleep longer</i>
LEXICALLY NONDEFAULT MAPPING	exceptional verbs	<i>Silvie pleases Jacques</i>
DEFAULT MAPPING	e.g., agent-event-patient; experiencer-event-theme & canonical word order	<i>the green fish eats the blue fish</i> <i>Jacques likes Silvie</i>
LEMMA ACCESS	single words; formulas	<i>station, here</i> <i>my name is Pim</i>

3. The development of Italian L2

Italian is a nonconfigurational, prodrop language characterised by a rich morphology and a flexible syntax which is highly sensitive to pragmatic and discourse choices.⁶ These typological characteristics are of interest to PT in two fundamental ways. First, with regards to the notion of transfer of grammatical information within and between the phrases of a sentence (cf. § 4.1, ch. 1), Italian interlanguage data fully validate the universal hypotheses about the development of morphological structures at their interface with syntax (Pienemann 1998). Secondly, and perhaps even more importantly, with regards to the notion of alignment among the three LFG independent levels of linguistic representation, the need to account for the nonconfigurationality of Italian syntax has contributed substantially to the formulation of PT's hypotheses about the

⁶ For a brief description of Italian grammar written in English, cf. Maiden (1995), and Vincent (1990). For more comprehensive treatment in Italian, cf. Renzi, Salvi & Cardinaletti (2001), and Schwarze (2009).

development of syntactic structures at the interface with discourse-pragmatics (Pienemann, Di Biase & Kawaguchi 2005, cf. § 4.2, ch. 1).

3.1. The morphological development of Italian L2

PT-derived hypotheses for Italian must deal with its rich morphology instantiating all-pervasive and obligatory agreement patterns.

In terms of morphological typology Italian is located higher than English on the index of fusion continuum. This is the index which measures the extent to which morphemes are segmentable, with agglutination at one end, where segmentation is straightforward, and fusion at the other end, where there is no segmentability (Comrie 1989: 46). English morphemes (mostly free) are more easily segmentable than Italian morphemes (mostly bound). Segmentation of inflectional morphemes is often more problematic in Italian than even in other Romance languages such as French, Spanish or Portuguese, all of which, for instance, have adopted suffixation of *-s* to mark plural in nominal inflection, whereas Italian has a system of vowel alternation (Vincent 1990). This makes nominal number and gender hard to factor out, and more opaque for learners.

The other important characteristic of Italian morphology is that it is stem-based, like Russian and Hebrew, rather than word-based, like English or German. This is significant from a processing point of view, as we shall see later, because – for the vast majority of nouns and adjectives, and for all verbs – Italian stems do not amount to full legal words, and must always bear some inflectional ending. The function of these inflectional endings is to express grammatical categories such as number, gender, mood, tense (Maiden 1995: 92). For example, the lexical item in (22a) cannot be realised in its bare stem (22b), but it must have one of the four inflectional vowel endings typical of Italian nominals, as in (22c). The inflectional endings in (22c) mark the gender contrast (masculine vs. feminine) and the number contrast (singular vs. plural) in nominals. Learners appear to acquire the phonological and prosodic part of the process very early (namely, that Italian words typically display a vocalic ending), as discussed by Di Biase in [chapter 2](#) in this book. But then of course it takes them much longer to account for the grammatical information loaded in the vocalic variation they hear in the input at the end of words.

- (22) a. {ragazzo} (boy)
b. */ragats-/
c. /-o ~ -a ~ -i ~ -e/

Apart from the irregularities found in any system, nominal group marking in Italian is made more complex than the paradigm presented in (22) by the existence of several phonologically-based noun classes. In addition, from a semantic point of view, nouns with features +human and/or +animate do not always match their ‘natural’ and their grammatical genders. All other nouns are assigned by the grammar to one or the other gender in an arbitrary way, sometimes following phonologically based criteria: e.g. nouns ending in the unmarked singular citation form *-o* tend to be assigned to masculine gender (*libro*, “book”), and those ending in *-a* to feminine gender (*casa*,

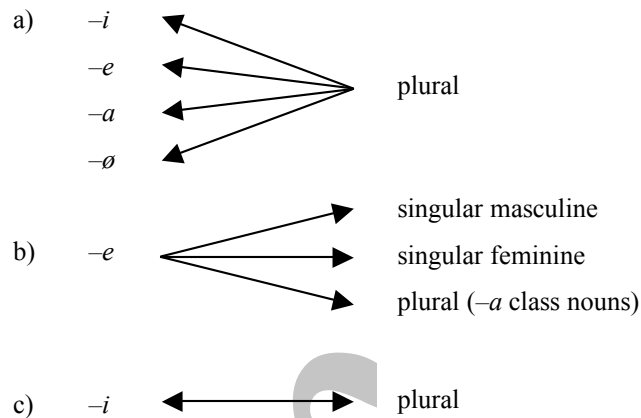
“house”). Yet nouns ending in *-e* are masculine (*pane*, “bread”) or feminine (*neve*, “snow”) in an arbitrary way.

Nominal modifiers, such as determiners, demonstratives and adjectives, must express the same gender and number values as the head noun. Nominal modifiers fall into two classes: those with the four endings seen in (22c) (*rosso*, “red”), and those which neutralise the gender distinction by having *-e* for singular (*verde*, “green”), and *-i* ending for plural (*verdi*), irrespectively of whether their head is masculine or feminine.

The task faced by the learner in sorting out Italian nominal inflection is complex enough. Yet it is rivalled by that imposed by verbal morphology. We will not deal with the latter here, except to mention briefly that Italian verbs fall into three classes, each with a characteristic thematic vowel distinguishing three conjugations (*-a-*; *-e-*; and *-i-*); and that a typical verb has 47 finite forms, marking tense, aspect and mood, as well as person and number.

The complexity of the Italian inflection system offers a good example of the way in which the primary PT notion of information exchange within and across constituents needs to be complemented by other principles in order to explain the acquisitional process. Among these, there is the form-to-function relationship (Pienemann 1998: § 4.3). That is, the actual learning of the morphological form of the affix in relation to its function is a different task from that of managing information distribution in the affixation process, where diacritic features have to be exchanged within different grammatical structures. Some morphemes may have a one-to-one form-function relationship, as expressed by Andersen’s (1984) “one-to-one principle in interlanguage construction”. Others may express a multitude of functions. Others again may also fall into several formal (e.g., phonological) classes without necessarily expressing particular functions. The figure in (23) illustrates how Italian nouns mark the *plural* value of their feature number through a complex set of form-function relations. On the one hand, there is the many-to-one relationship, where several morphemes mark one and the same feature, as shown in (23a). Here the plural number may be marked by one of a range of word-ending vowels. On the other hand, there is ‘one-to-many’ relationship, where a particular morpheme marks more than one function, as shown in (23b). A veritable labyrinth for the learner (and the teacher).

(23). Form-function relations of Italian plural markers.



Similar form-function mapping problems may be expected also with the acquisition of Italian verbal paradigms, where the vowel ending of one form, e.g. *mangia* (“(s/he) eats/is eating”) carries information regarding several features at once, such as subject person, subject number, tense, aspect and mood. In essence, the relationship between morphological forms and their functions exhibits different degrees of complexity. This adds another dimension to the learning task which is separate and different from the task on which PT is focused, namely the exchange of grammatical information and the use of diacritic features. So far PT has not made any predictions on how a fuller paradigm develops. However, on the one hand, Di Biase’s [chapter ?](#) below shows how the more regular and simpler on-to-one form-function relationships may help bootstrapping the more complex ones; and on the other hand, teasing out of different factors allowing to progress from emergence to full mastery of the whole system is one of the directions in which future research can go (cf. ch. [last](#)).

Let us now consider some of the main Italian L2 structural outcomes of the morphological processing procedures universally predicted by PT (cf. § 4.1, ch. 1). These are shown in (24). For reasons of space, only a limited characterisation of the Italian stages is given here.

(24). *Developmental stages for Italian morphology (after Di Biase & Kawaguchi 2002)*

PROCEDURE	MORPHOLOGICAL OUTCOME/STAGE	STRUCTURE	EXAMPLE
S-BAR PROCEDURE	INTERCLAUSAL MORPHOLOGY	agreement TOP & Clitic-OBJ	<i>i fichi li compro io</i> [the figs, I buy them]
		subjunctive marking in subordination	<i>immagino che Ada sia partita</i> [I imagine that Ada has left]
SENTENCE PROCEDURE	INTERPHRASAL MORPHOLOGY	agreement NP _{SUBJ} & Predicate	<i>i bambini sono partiti</i> [the children have left] <i>la bambina è buona</i> [the girl is good]
PHRASAL PROCEDURE	VERB PHRASAL MORPHOLOGY	agreement within VP: AUX & V COPULA & Adjective	<i>sono partiti</i> [(they) have left] <i>sono buoni</i> [(they) are good]
	NOUN PHRASAL MORPHOLOGY	agreement within NP	<i>questi bambini</i> [these children]
CATEGORY PROCEDURE	LEXICAL FORM VARIATION	past marking on Verb plural marking on Noun	<i>mangia vs mangiato</i> [eat vs eaten] <i>bambino vs bambini</i> [child vs children]
LEMMA ACCESS	SINGLE WORDS; FORMULAS	single words; formulas	<i>mi chiamo Ugo</i> [my name is Ugo] <i>no lavoro</i> [no work]

After the single-words and formulaic-chunks stage, at the lexical-morphology stage, as learners begin to incorporate language-specific procedures, categorial marking for nouns is achieved through the use of articles (mainly *la* or *il*), as in (25). This interpretation would not consider the combination of noun and article as a case of phrasal morphology, independently of whether or not the specific combination turns out to be target-like.⁷ In fact bare nouns are not usually produced at early stages of Italian L2 development, and are in any case highly restricted also in native Italian. Furthermore, the Italian article is prosodically not independent of the content word that follows, but groups under its stress field. This, in turn, would favour a sort of formulaic learning of article-noun combination. For all these reasons, such combinations are hypothesised as belonging to the lexical level, in the sense that article forms are considered categorial markers of nouns. At this stage, the plural *-i* diacritic turns out to be the first to emerge in conjunction with plural referents, as in (26).

(25) (*sotto nell'acqua?*) no no la acqua
[(under the water?) no no water]

(26) (*quanto tempo in tutto?*) tre mesi

⁷ The exclusion of articles as indicators of phrasal agreement is proposed in Di Biase (1998).

[(*how much time in all?*) three months]

Like nouns, also verbs show categorial marking, e.g. with infinitive *-re* ending, as in (27); past tense, with *-to* past-participle ending but not yet analytically in constructions with their auxiliary, as in (28). Some person marking on the verb is also attested at this stage, e.g. with the form *capisco* in (27) that may mark first person with the characteristic pro-drop in formal contrast between *capire* and *capisco*. This latter contrast, however limited, is sufficient to show that person marking appears at an earlier stage in Italian compared to English – a fact that can be explained by the pro-drop (or rather null subject) nature of Italian (cf. our discussion of this below).

(27) non.. capire.. non capisco
[(I) don't... understand... (I) don't understand]

(28) preparato il cibo. per la mia famiglia
[(I used to) prepare the meals, for my family]

The morphological processes that characterise the next, phrasal stage in Italian interlanguage include the nominal and verbal agreements. Within the noun phrase, learners start producing the agreement of determiners (other than articles and numerals, as we have just seen), and/or adjectives in attributive function, with the gender/number of the head noun, as *mia mamma* in (29) or *tanti studenti italiani* in (30). Within the verb phrase, unification of number value (singular or plural) produces two types of agreement: one of the copula with a predicative adjective or a nominal shows, including presentative structures, as *ci sono tanti studenti italiani* in (30); the other agreement may match a plural person in the auxiliary to a plural ending in the main verb, as in (31).

(29) sono cugini della mia mamma
are-3PL cousins-PL.MASC of my mother
[they are my mother's cousins]

(30) ci sono tanti studenti italiani
there are many-PL.MASC students-PL.MASC Italian-PL.MASC
[and there are many Italian students]

(31) siamo andati al mare
are-1PL gone-PL.MASC to-the sea
[we went to the seaside]

Notice that in English, on account of obligatory subjects, person variation in the verb-form is placed high the processability hierarchy (cf. § 2.2). Italian, on the other hand, being a pro-drop language, maps the person/number (singular or plural speaker, addressee or third person) directly on the verb form without a necessary co-reference to a separate nominal or pronominal subject. Indeed the subject may not be expressed at all, or be generated after the verb (cf. § 3.2 below). Results from psycholinguistic experiments (e.g., Vigliocco, Butterworth & Semenza 1995; Vigliocco, Butterworth & Garrett 1996) tend to support the hypothesis that subject-verb agreement in pro-drop languages is generated differently from non pro-drop languages; and, at least for the

former, they suggest some kind of independent retrieval of the features of the verb and the features of the subject. If that is the case, then interphrasal morphology, for Italian and other pro-drop languages, may be more clearly expressed by structures other than subject-verb agreement, to allow for the fact that at least some of the different person-number forms of the verb may be acquired, as we have just seen, at an earlier stage.

In Italian too, of course, interphrasal morphology requires S'-procedure, that is the procedure for unifying different categories of constituents at sentence- or clause-level. This means that, for the emergence of structures belonging to this stage, the learner must recognise the grammatical relations (e.g., SUBJ, OBJ) expressed by the various constituents of the clause – as well as identify the category of each constituent, and more generally recognise the relationship between predicates and their arguments, including predicates of an adjectival or nominal nature, as we have already seen in (29)-(30). So what are the candidate structures for Italian at the sentence agreement stage? One structure that can be built on (30)-(31) is the unification of the subject features (gender and number) with nonverbal predicates, as in (32).

- (32) *i miei parenti sono tedeschi*
 the-PL.MASC my-PL.MASC relatives-PL.MASC are German-PL.MASC
 [my relatives are German]

Also good candidates are agreements in verbal analytic constructions (with auxiliaries) that are likely to be unified online, provided they require nondefault unification. By this we mean not the unification of the person feature of the subject, which is carried by the auxiliary, but of the values for its number and gender features which must be unified with the lexical verb, as in (33). Here the feminine plural of the lexical verb form *andate* (“gone”) is unified with the pronominal subject number (*noi*, “we”): plural in both cases. The gender value on the other hand is not marked in the pronoun itself (which could indifferently refer to males or females). But, we may ask, where does the feminine gender information of the lexical verb-form come from? Certainly not from the grammatical features of the pronominal subject *noi* (since it can indifferently refer to males, females or mixed referents). The answer to this question must be that the gender feature is retrieved by the verb lemma directly from conceptual structure, and both features (gender and number) are required by the verb. The pronominal subject, on the other hand, requires only the number value.

- (33) *noi siamo andate da Napoli a Palermo*
 we are-1PL gone-PL.FEM from Napoli to Palermo
 [we went from Napoli to Palermo]

Di Biase (2007: § 1.2) suggests that this kind of feature distributions and unification patterns lends support to the ‘independent retrieval’ assumption of Vigliocco and her co-workers, who carried out numerous experiments concerning subject-verb agreement in a range of typologically different European languages (e.g., Vigliocco, Butterworth & Garrett 1996; Vigliocco, Hartsuiker, Jarema & Kolk 1996; Vigliocco & Franck 1998). This line of research leads to the suggestion that in languages with subject-verb agreement both the subject and the verb retrieve features independently from conceptual structure and then merge at the S-node.

At the S-bar stage, referring to the table in (24) above, the last structure hypothesised for Italian L2 is the object-verb agreement occurring in clauses that topicalise the object by (dis)placing it to the left of the verb from its canonical postverbal position (cf. § 3.2 on syntactic development). When OBJ is mapped as TOP, and placed at the beginning of the clause, Italian requires that a resumptive clitic pronoun, co-referential with this topic and agreeing with its number and gender values, be placed before the verb, as in (34). Furthermore, if the verb is in an analytic construction with an auxiliary, the past participle will have the same number and gender values as the object, as in (35). This structure then requires that learners recognise the full nominal object as a non-subject, and mark their discourse/pragmatic choice of TOP explicitly by the proclitic pronoun unifying their features. Learners who can produce such an agreement must clearly be able to attribute SUBJ and OBJ functional roles, and manipulate their agreement and position patterns. More about this type of complex structure will be said when presenting the development of Italian syntax in § 3.2, and especially in **chapters ?, ? and ?**, when its acquisition by learners and loss in aphasic patients will be discussed with results from empirical data.

- (34) le pere le compra Geo
 the pears-PL.FEM them-OBJ.PL.FEM buy Geo
 [Geo bought **the pears**]
- (35) le pere le ha comprate Geo
 the pears-PL.FEM them-OBJ.PL.FEM have bought PL.FEM Geo
 [Geo has bought **the pears**]

Summing up this section on the development of Italian morphology, it is clear that PT has been successful in pinpointing the emergence of a particular stage on whichever structural expression happens to emerge first.⁸ Once a stage has emerged, classic PT appears to have no further business to resolve but to look at the emergence of the next stage. The reality of languages such as Italian (or Arabic and German) is that there is a lot of further ground to cover within the same stage. Yet, even so, the strength of PT is that, out of a bunch of structures that belong to the same stage, it uncovers what may turn out to be default structures in learning specific L2s. This needs further investigation (cf. ch. **??** by Di Biase), and may offer strategic advantages to learners and teachers.

3.2. *The syntactic development of Italian L2*

Because of its rich morphology, resulting in strong competitive pressure on its syntactic phrase structure, Italian appears to assign a lesser role to syntax in interpreting grammatical relations. As Bresnan (1998: 119) observes more generally, morphological forms will compete with and preempt phrases that carry no additional information. If the syntactic structure nodes do not bear additional functions that distinguish them from the morphological structures, they must be omitted. This explains why the large number of Italian word order options are used less for conveying grammatical information than for mapping pragmatic and semantic information.

⁸ Cf. Pallotti (2007) for a more cautious note on the emergence criterion.

Let us then have a look at how PT's Unmarked Alignment Hypothesis and Topic Hypothesis apply to the development of Italian syntax. We will present first the key features of Italian grammar on which the predicted developmental trajectory is based, and then the actual trajectory for Italian L2 declarative sentences, drawn from work by Di Biase and his collaborators (e.g. Di Biase 2005; Di Biase & Bettoni 2007; Bettoni, Di Biase & Ferraris 2008, Bettoni, Di Biase & Nuzzo 2009). The development of Italian content questions, including topicalised constructions, is discussed and tested with empirical data by Bettoni & Ginelli in [chapter ?](#).

Like in English, Italian canonical order is SVO, as shown in (36). This means that from a discourse-pragmatic point of view, SUBJ is the default TOP, and OBJ is the default FOC. However, since Italian – unlike English – is a non-configurational language, its canonical order can be disrupted if the speaker chooses to either focalise SUBJ or topicalise OBJ. So, when SUBJ is focal it follows the verb, as in (37). Likewise, when the theme or patient, rather than to the agent, is given prominence in topical position, it precedes the verb, as in (38).

(36) Pierino mangia gli spaghetti
SUBJ V OBJ
[Pierino eats/is eating spaghetti]

(37) sono arrivati i bambini
AUX V SUBJ
are-3RD PLUR arrived the children
[the children have arrived]

(38) il gelato lo lecca il bambino
TOP_{OBJ} Clitic-MASC.SG V SUBJ
[the icecream, the child licks it]

Notice however that in this latter case, in LFG terms, the first NP is assigned TOP function, and, as we have seen for morphology in § 3.1, the OBJ function is borne by a coreferential clitic pronoun attached to the verb. The presence of this clitic marker is crucial, because without it the listener could interpret the first topical NP as SUBJ. If the inanimate nature of the first NP in (38) would rule out semantically the possibility of the *icecream* doing the licking, when animacy is shared by both the agent and the patient, as in (39), confusion could easily arise without either the SUBJ function or OBJ function unequivocally marked.⁹ As we have just seen, between these two possibilities, Italian marks the preverbal object with a clitic, which in this case is masculine singular (*lo*), agreeing with *il bambino*. If, on the other hand, it were *the child* who does the caressing (40), and for discourse or pragmatic reasons the speaker would wish to place this NP in postverbal focal position and place *the mother* in topical position (as in 40b), then the clitic signalling all this would be feminine singular, agreeing with *mummy*.

⁹ In configurational languages such as English you can tell positionally which NP has which grammatical function: in declaratives, the one before the verb is SUBJ, and the one after the verb, if any, bears some other grammatical function.

- (39) a. la mamma accarezza il bambino
SUBJ V OBJ
[mummy caresses the child]
- b. il bambino lo accarezza la mamma
TOP_{OBJ-MASC/SG} Clitic-MASC/SG V SUBJ
[the child, mummy caresses him]
- (40) a. il bambino accarezza la mamma
SUBJ V OBJ
[the child caresses mummy]
- b. la mamma la accarezza il bambino
TOP_{OBJ-FEM/SG} Clitic-MASC/SG V SUBJ
[mummy, the child caresses her]

Besides being nonconfigurational, Italian is also a prodrop language. This means that, when pragmatic or discourse clues make the referent clear, the subject pronoun is left out, as in (41a). Should it be used, it would indicate strong emphasis or contrast, and occur most often in focal position, as in (41b), rather canonically before the verb.

- (41) a. hai sentito i ragazzi? hanno telefonato?
have-2 SG heard the boys? have-3 PL phoned?
[have you heard from the boys? have they phoned?]
- b. hai sentito tu i ragazzi? hanno telefonato loro?
have-2 SG heard you the boys? have-3 PL phoned they?
[was it you who has heard from the boys? was it them who have they phoned?]

Even from this brief – and partial – presentation of Italian word order rules it is easy to understand that learners will be able to acquire them all only gradually. Using PT's Unmarked Alignment Hypothesis and Topic Hypothesis, the syntactic sequence predicted for Italian L2 learners producing declarative sentences is shown in (42).

(42). *Developmental stages for Italian syntax based on the Topic Hypothesis – Declaratives (after Di Biase & Bettoni 2007)*

STAGE	STRUCTURE	EXAMPLE
MARKED ALIGNMENT	TOP _i Clitic _{OBJ-i} -V SUBJ (topicalisation of OBJ)	<i>i fichi li compro io</i> [the figs, (I) buy them]
	V SUBJ (focalisation of SUBJ)	<i>li compro io</i> [I buy them]
XP + UNMARKED ALIGNMENT	TOP + canonical order (topicalisation of ADJ)	<i>in Italia il sole splende</i> [in Italy the sun shines] <i>domani non vengo</i> [tomorrow (I) don't come]
UNMARKED ALIGNMENT	canonical word order = SVO (including prodrop)	<i>Piero mangia gelato</i> [Piero eats an icecream] <i>parte domani</i> [(he/she) leaves tomorrow]
LEMMA ACCESS	single words; formulas	<i>ciao</i> [hello] <i>mi chiamo Piero</i> [my name is Piero]

After the initial stage where single concepts are mapped to single words or formulas, at the next stage learners will organise words according to the order most typically and most frequently recurring in the L2 input. This is SVO for Italian, including the possibility of VO, or V, as we have seen in (5). Notice however that, at this stage, the canonical-order sentence remains underspecified regarding the grammatical functions of its core referents. That is, the Unmarked Alignment Hypothesis simplifies language processing for learners, who will analyze the preverbal NP, if present, semantically as agent or pragmatically as TOP rather than grammatically as SUBJ, thus avoiding any kind of transfer of grammatical information during language processing. Notice also that the prodrop possibility implies that formal variation on the verb according to person and/or number may begin to emerge in Italian interlanguage at this stage, that is, much earlier than in English interlanguage, as we have seen in § 3.1 when discussing morphological development. So, whereas the English –s marker on third person singular emerges when the learner is able to unify the relevant features of SUBJ-verb agreement at the interphrasal stage, there being no SUBJ for the Italian verb to agree with, a variety of morphological verbal markings may appear at this category stage. The sentences in (43)-(44) are typical of this stage

- (43) *mia famiglia. fratello sorella mangia dolce swedish*
SUBJ V OBJ
[my family, brother sister eat swedish sweet]

- (44) vado scuola
 V LOC
 [I go to school]

To move beyond unmarked alignment, PT's Topic Hypothesis predicts that learners will learn to uncouple TOP from SUBJ, and assign proper grammatical functions to sentence constituents. The first step forward in the development happens when they begin to contextualise (in time, space, etc.) the core sentence by adding some adjunct to canonical order. If for pragmatic reasons this addition is introduced as TOP occupying first position, as in (45), there will now be two preverbal constituents. This will force learners to distinguish between TOP and SUBJ, change the relationship between the c-structure and f-structure, and require additional processing procedures.

- (45) mezz'ora dopo mio padre prende il treno
 TOP_{ADJ} SUBJ V
 [half an hour later my father catches the train]

With the addition of ADJ as TOP, learners can now attribute grammatical functions correctly to the sentence constituents. However, as the first argument is a noncore argument, the SVO structure nudges intact to the right. Further in their development, learners will also learn to disrupt canonical order, but once again this will happen gradually. Namely, they will first do so when verbs require lexically only one argument. This single argument being perforce SUBJ, the structure produced will be V SUBJ, as in (46). Only finally, if required for pragmatic or discourse reasons – as we have seen above in (39b) and (40b) when discussing morphological development –, learners will be able to disrupt canonical order also with two-argument verbs, and thus assign TOP function to a core argument other than SUBJ, typically to OBJ, as in (47).

- (46) poi viene un polsiotto
 TOP_{ADJ} V SUBJ
 [then a policeman comes]
- (47) hindi lo sanno tutti
 TOP_{OBJ-MASC.SG} Clitic-MASC.SG V SUBJ
 [Hindi, all know it]

Data to support the Italian trajectory presented here come from several corpora, gathered in Australia and in Italy, and analysed in several papers (e.g. Di Biase & Bettoni 2007; Bettoni, Di Biase & Ferraris 2008; Bettoni, Di Biase Nuzzo 2009). Further data and analyses with applications to pedagogic issues, aphasic patients, and methodological problems are presented by Bettoni & Nuzzo in [chapter ?](#), Bettoni, Favilla & Ferroni in [chapter ?](#), and Ferrari, Ginelli & Nuzzo in [chapter ?](#) respectively. The development of Italian content questions is discussed by Bettoni & Ginelli in [chapter ?](#).

Let us now move on in (48) to the Italian developmental schedule based on the Lexical Mapping Hypothesis, which we have already proposed universally in (39)-(40) in chapter 1, and for English in (21) here.

(48). *Developmental stages for Italian syntax based on the Lexical Mapping Hypothesis – Declaratives (after Bettoni & Di Biase 2008a; Bettoni, Di Biase & Nuzzo 2009)*

STAGE	STRUCTURE	EXAMPLE
NONDEFAULT MAPPING	passives, causatives, etc.	<i>il pesce blu è mangiato dal pesce verde</i> [the blue fish is eaten by the green fish] <i>il papà lascia guidare la macchina a Pierino</i> [daddy lets Pierino drive the car]
LEXICALLY NONDEFAULT MAPPING	exceptional verbs unaccusative verbs, etc.	<i>a Piera piace la cioccolata</i> [to Piera chocolate is pleasing] <i>è arrivato l'ambasciatore</i> [the ambassador has arrived]
DEFAULT MAPPING	e.g., agent-event-patient; experiencer-event-theme & canonical word order	<i>il pesce verde mangia il pesce blu</i> [the green fish eats the blue fish]
LEMMA ACCESS	single words; formulas	<i>ciao</i> [hello] <i>mi chiamo Piero</i> [my name is Piero]

Rather than for passive verbs, which in Italian are used less often than English,¹⁰ or for causative verbs, which are less complex formally than in Japanese (cf. § 4.2)¹¹, Italian is interesting for its many – and often quite common – unaccusative and unergative¹², and exceptional verbs, exemplified respectively in (49)-(51). These are all verbs which include the requirement for nondefault mapping intrinsically among their lemma features, rather than having it assigned for discourse-pragmatic reasons.

- (49) *è arrivato l'ambasciatore*
V SUBJ
[the ambassador has arrived]
- (50) *ha telefonato il presidente*
V SUBJ
[the president has telephoned]
- (51) *al ministro mancano i fondi*
OBJ θ V SUBJ
[the minister is lacking the funds]

Because, besides noncanonicity between a-structure and f-structure, their lexical entries specify also marked alignment between c-structure and f-structure in

¹⁰ The reason why Italian uses passive verbs less often than English is that, rather than promote as SUBJ in first position thematic roles other than the default agent, it prefers to topicalise constituents other than the default SUBJ.

¹¹ Causative verbs can of course be quite complex formally also in Italian, if full referential NPs are pronominalised. This is because nouns are not marked for case, whereas pronouns are.

¹² For a brief treatment of Italian unaccusatives and unergatives in LFG, cf. Bresnan (2001: 379-383).

pragmatically neuter contexts, their grammatical encoding is acquired quite late. Bettoni, Di Biase & Nuzzo (2009) deal with these constructions from the point of view of the acquisition of postverbal subjects, and propose that within the stage of ‘lexically nondefault mapping’, unaccusative and unergative verbs will be acquired before exceptional verbs. Let us see why. Assuming with Van Valin (2005: 75) that, within the core of the clause, in Italian declaratives, the discursive function FOC is restricted to postverbal position (just as the discursive function TOP to preverbal position), it follows that, in the case of unaccusatives and unergatives – which (a) require a focus lexically and (b) subcategorise a single argument – the single thematic role in postverbal position cannot be but SUBJ. On the other hand, exceptional verbs, typically among them psychological verbs such as *piacere*, *sembrare* or *interessare*, are intransitive verbs subcategorising two arguments, with the Experiencer (the highest role available) mapped onto the indirect object – cf., e.g., *al ministro* in (51). Thus, whereas with unaccusatives and unergatives only FOC needs to be disentangled from OBJ, with exceptional verbs also TOP needs to be disentangled from SUBJ.

4. The development of Japanese L2

Japanese has an important role to play for testing and developing PT’s hypotheses because of its typological characteristics.¹³ With regard to the configurationality spectrum which has languages like English and Warlpiri at its two ends (cf. § 2.2, ch. 1), Japanese is located far from configurational English towards nonconfigurational Warlpiri. Morphologically, Japanese is rich in verbal inflections but, unlike Italian its morphological organisation is agglutinating rather than fusional, and also unlike Italian its grammatical relations are marked in nominal constituents rather than on the verb, which means that Japanese is a more dependent-marking language (cf. § 5, ch. 1). Syntactically, Japanese is an SOV, head-last language which allows great freedom in the ordering of nominal constituents, as long as V is sentence-final. The PT-derived acquisitional stages of Japanese L2 (verbal) morphology are identified and tested in Di Biase & Kawaguchi (2002); those of syntax in Kawaguchi (2005). We provide here a brief summary of the development of Japanese preceded by a sketch of its main typological characteristics.

4.1. The morphological development of Japanese L2

Japanese verbal morphology is rather complex, distinguishing tense, aspect, mood, politeness, and polarity. On the other hand, it does not mark person or number of either subject or object, and hence agreement phenomena are unknown in Japanese. Furthermore, although Japanese morphology is agglutinating – and therefore relatively easier to disentangle for the learner than the Italian fusional one – it involves complex morphophonological processes in word formation. For example, the phonology of Japanese verbal affixes varies according to whether the stem ends in a consonant or a

¹³ For a description of Japanese grammar, cf. Kuno (1973), Shibatani (1990).

vowel, but, since these processes lie outside the current scope of PT, we will not discuss them further here. With regard to nominal morphology, just as Japanese verbs do not distinguish the subject's information regarding number, so nouns do not mark number or gender distinctions either.¹⁴ On the other hand, case marking is well developed: it is marked by postpositional particles such as *-ga* (nominative) and *-o* (accusative), which is consistent with the characteristics of head-last languages. Likewise, topic marking is also well represented in the nominal morphology of Japanese, as we shall see later. The developmental hypotheses for Japanese morphology is shown schematically in (52).

(52). *Developmental stages for Japanese morphology (after Di Biase & Kawaguchi 2002)*

PROCEDURE	MORPHOLOGICAL OUTCOME/STAGE	STRUCTURE	EXAMPLE
S-BAR PROCEDURE	INTERCLAUSAL MORPHOLOGY	particles <i>ga/wa</i> distinction in sub. clause & main clause	<i>Yoko-ga uti-ni kaetta toki Kenji-wa terebi-o mite-imasita</i> [when Yodo returned home, Kenji was watching TV]
		genitive case marking on SUBJ in sub. clause	<i>Kumiko-no sotugyosita daigaku-ga Setagay-ni arimasu</i> [the university Kumiko graduated from is in Setagaya]
S-PROCEDURE	INTERPHRASAL MORPHOLOGY	noncanonical case marking in constructions such as passive, causative and benefactive	<i>sakana-ga neko-ni taberare masita</i> [the fish was eaten by the cat]
PHRASAL PROCEDURE	PHRASAL MORPHOLOGY	<i>Vte-V</i> <i>Vte-PROG</i>	<i>hanasi-te mimasu</i> [I try speaking (to them)] <i>mi-te imasu</i> [I am watching]
CATEGORY PROCEDURE	LEXICAL MORPHOLOGY	past marking on Verb: <i>Vstem-POL-PRES</i> vs <i>Vstem-POL-PAST</i>	<i>tabe-masu</i> vs <i>tabe-masita</i> [eat vs. ate]
LEMMA ACCESS	INVARIANT FORMS	single words; formulas	<i>oishii</i> [delicious] <i>arigatoo</i> [thank you]

At the very beginning, like learners of any other language, also those of Japanese cannot activate any language-specific procedure, and can thus produce only invariant words such as *oishii* ('delicious'), or fixed expressions such as *arigatoo* ('thank you').

¹⁴ As a matter of fact, there are the plural noun suffixes *-tachi* and *-ra*, as in *kodomo-tachi* (child-PL "children") and *boku-ra* (I-PL "we"), but these are not productively used and can be attached to limited lexical items.

As soon as learners are able to activate the category procedure, lexical variation results in some verbal inflection. In Japanese L2, the most common alternation is between present tense and past tense in verbs, as in (53). As noted above, Japanese verbs do not inflect for person or number of their subject. However, even at this early stage, other Vstem–affixes combinations can indicate the acquisition of lexical operations. Among them, we find Vstem-NEG, as in (54).

- (53) a. tabe-masu
 eat-POL.PRES
 ‘(I/you/he/she, etc.) eat’
- b. tabe-masita
 eat-POL.PAST
 ‘(I/you/he/she, etc.) ate’
- (54) iki-masen
 Go-POL.NEG
 [(I/you/he/she, etc.) do/does not go]

Phrasal morphology emerges at the next stage. The *V-te V* (Vstem-complementiser V) construction, exemplified in (55), is one of the ways two verbs can combine in Japanese for adding extra meaning to the main verb, such as progressive aspect (*V-te imasu* “be V-ing”), request (*V-te kudasai* “please V”), and trial (*V-te mimasu* “try V-ing”). This is an example of phrasal procedure because information exchange is required between two verbs in terms of the ‘combinatoric TYPE’ feature whereby the main lexical verb (head element in the verb phrase) takes gerundive form in order to combine with the auxiliary verb (Sells 1995, 1999). Sells explains that the lexical feature TYPE holds crucial information for verbal projection (i.e., phrasal syntax). In *V-te V* construction, TYPE of *V-te* is *V-sis(ter)*. This means that *V-te* has to take another *V* as its sister. Thus, the construction *V-te V* requires information unification between two Vs in terms of TYPE, which means that the production of *V-te V* requires phrasal procedure.

- (55) hasit-te imasita
 run-COMP PROG-POL.PAST
 [(I/you/he/she etc) was running]

At the next stage, Japanese requires interphrasal procedure (or S-procedure) for marking grammatical functions of NPs in sentences involving nondefault mapping such as passive and causative. Production of these structures is morpho-syntactic in nature, so they will be discussed further in § 4.2 below.

Interclausal procedure (or S-bar procedure) in Japanese morphology has not been tested empirically. However, PT hypothesizes the following two operations belonging to this stage. The first is the distinction between subject and topic, which is indicated by the particles *-ga* (NOM) and *-wa* (TOP) in subordinate clause and main clause respectively, as shown in (56). In Japanese, only the subject in the main clause, but not in the sub-clause, can be the sentential topic.

- (56) Yoko-ga uti-ni kaet-ta toki Kenji-wa terebi-o mite-imasita
 Yoko-NOM home-LOC return-PAST when Kenji-TOP TV-ACC watch-PROG-PAST.POL
 [When Yoko returned home Kenji was watching TV]

The second hypothesized structure requiring an interclausal operation is the marking of the genitive case on the subject in the relative clause. Subject in Japanese is usually marked as NOM; however, in the relative clause it can be marked either as NOM or GEN, as exemplified in (57). This requires interclausal processing, that is, the learner's ability to distinguish between the subordinate clause and main clause.

- (57) Kumiko-no sotugyosita daigaku-ga Setagaya-ni arimasu
 Kumiko-GEN graduate-PAST university-NOM Setagaya-LOC exist-POL
 [The university Kumiko graduated from is in Setagaya]

4.2. *The syntactic development of Japanese L2*

This section presents the developmental stages for Japanese declarative sentences: first the stage based on the Unmarked Alignment Hypothesis, then the stages based on the Topic Hypothesis, and finally those based on the Lexical Mapping Hypothesis.

After the very first stage of single words and formulas, as we have sketched out universally in § 4.2 in chapter 1, and illustrated specifically for English L2 and Italian L2 respectively in §§ 2.2 and 3.2 in this chapter, PT proposes the Unmarked Alignment Hypothesis. This predicts that the learner can produce only canonical word order, which cognitively speaking represents the most harmonious linking between both a- to f-structures, and c- to f-structures (cf. 2.2, ch.1). In Japanese, canonical word order yields the sequence agent-patient-event, corresponding to SOV, as in (58).

- (58) sensei-ga kohii-o nomimasu
 teacher-NOM coffee-ACC drink-POL
 [teacher drinks coffee]

Higher up in the learner's path, the Topic Hypothesis and Lexical Mapping Hypothesis (LMH) predict further syntactic development. Let us illustrate them in turn.

Before commenting on the outcome of the Topic Hypothesis in Japanese, shown schematically in (60), we should mention that topic marking is a key aspect of Japanese grammar, and that this very characteristic has contributed substantially to the formulation of this hypothesis by Pienemann, Di Biase & Kawaguchi (2005). Because, unlike Italian or English, Japanese encodes the topic morphologically, it offers the opportunity to observe the constituent identified as topic by the speaker, and unambiguously interpret developmental patterns in the learner's interlanguage. Japanese is a nominative-accusative language, where the nominative case marker *-ga* and the accusative marker *-o* are attached to NP postpositionally, and usually mark grammatical subject and object respectively, as in (58). The topic marker is *-wa*, and it too is added after core argument NPs (that is, SUBJ or OBJ) as a postpositional particle. When SUBJ or OBJ is TOP, *-wa* replaces nominative and accusative markers. In all other cases, such as semantically marked noncore functions and adjuncts, *-wa* is simply added after NP (i.e., N + postpositional particles). Thus, not only NP_{SUBJ} or NP_{OBJ} but also any

emphatic constituent NP, including time or location, can be topicalised in a sentence, usually occupying sentence-initial position.

In LFG terms, SUBJ, the only argument function which is also a discourse function, is a default topic (Bresnan 2001: 98). So, it is not surprising that, at the beginning of syntactic acquisition, learners of Japanese will not differentiate between SUBJ and other discourse functions such as TOP. In fact the only instance in which early learners use the topic marker *-wa* is to mark subject-like NPs. The initial alignment is unmarked and rigid, regardless of whether the initial constituent adds *-wa*, as in (59), or *-ga*, as in (58).

- (59) S → SOV
 sensei-wa kohii-o nomimasu
 teacher-TOP coffee-ACC drink
 [teacher drinks coffee]

(60). *Developmental stages for Japanese syntax based on the Topic Hypothesis – Declaratives (after Kawaguchi 2005)*

STAGE	STRUCTURE	EXAMPLE
MARKED ALIGNMENT	OBJ topicalisation	<i>Kono tegami-wa Tanaka-san-ga kaita</i> [this letter, Mr Tanaka wrote]
XP + UNMARKED ALIGNMENT	TOP + canonical order (TOP=ADJ)	<i>Kinoo-wa Tanaka-san-ga kono tegami-o kaita</i> [yesterday, Mr Tanaka wrote this letter]
UNMARKED ALIGNMENT	canonical order (TOP=SUBJ) (including prodrop)	<i>Kaori-wa skaato-o kaimasita</i> [Kaori bought a skirt]
LEMMA ACCESS	single words; formulas	<i>oishii</i> [delicious] <i>arigatoo</i> [thank you]

The next stage of syntactic acquisition is characterized by the learner's ability to place adjuncts in sentence-initial position without disturbing subsequent canonical order so as to express contextual information (time, place of the event, etc.). This operation triggers a disengagement of SUBJ from its canonical position, and at the same time disentangles the marker *-wa* from its exclusive association with SUBJ. So, beside adding a constituent to canonical order, the learner can now assign to it the topic function by marking it with the marker *-wa*, and place it in initial position before the canonical string. The learner's construction, at this point, can be described informally as in (61.a), where XP represents a range of nominal phrasal choices, and exemplified as in (61.b).

- (61) a. $S \rightarrow XP_{TOP} + SOV$
 b. $S \rightarrow ADJ_{TOP} SOV$
 kyoo-wa Sensei-ga kohii-o nomimasu
 teacher-TOP coffee-ACC drink
 [teacher drinks coffee]

At the next stage, learners can topicalise also constituents internal to SOV such as OBJ, as in (62). In order to achieve this construction they need to disentangle the canonical association between the position of OBJ and its semantic role on the one hand, and between the nominal morphology and its semantic role on the other. In other words, OBJ topicalisation requires that a separate grammatical function be assigned to each of the canonical constituents. So, whereas in the previous stage learners learn to differentiate TOP from SUBJ, now they can differentiate also OBJ as a separate constituent of canonical order. Functional assignment is therefore necessary for object topicalization to be operational.

- (62) $S \rightarrow OBJ_{TOP} SUBJ V$
kono kekii-wa haha-ga tukuri-masita
 this cake-TOP my mother-NOM make-POL.PAST
 [this cake, my mother made]

The Japanese syntactic hierarchy based on the Lexical Mapping Hypothesis is illustrated in (63). As we have already seen above with the Unmarked Alignment Hypothesis, learners initially map, canonically, the most prominent role available onto SUBJ, which is the most prominent grammatical function. Having thus learned to express propositional content canonically, they then gradually respond also to pragmatic motivations requiring noncanonical choices. In Japanese, default mapping associates the agent-patient-event sequence at a-structure level with SOV at c-structure level. Once this default association is in place, the L2 learner gradually learns how to attribute prominence to a particular thematic role, as well as to de-focus or suppress a thematic role.

(63). *Developmental stages for Japanese syntax based on the Lexical Mapping Hypothesis – Declaratives (after Kawaguchi 2005)*

STAGE	STRUCTURE	EXAMPLE
LEXICALLY & DISCOURSE-PRAGMATICALLY NONCANONICAL MAPPING	passives, causatives, benefactives	<i>watasi-wa haha-ni sika-rare-masita</i> [I was scolded by my mother] <i>sensei-wa gakusei-ni takusan repooto-o kakase-masu</i> [teacher makes students write lots of reports]
LEXICALLY NONCANONICAL MAPPING	exceptional verbs	<i>Yamada-san-ga tomodati-ni hon-o moraimasita</i> [Mr Yamada received a book from his friend]
DEFAULT MAPPING	e.g., agent-patient-event	<i>sensei-ga kohii-o nomimasu</i>

	& canonical word order	<i>[teacher drinks coffee]</i>
LEMMA ACCESS	single words; formulas	<i>oishii [delicious]</i> <i>arigatoo [thank you]</i>

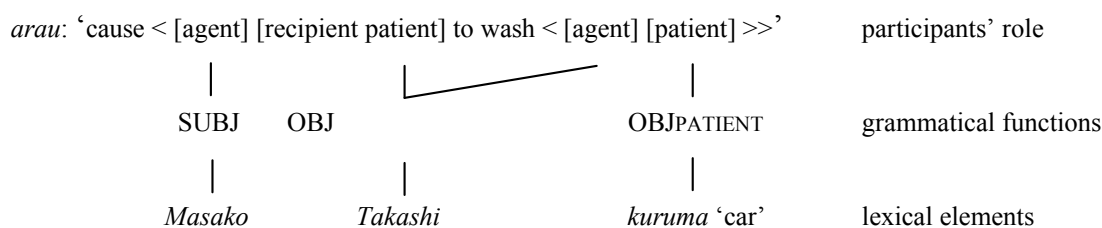
Prominence to a thematic roles other than the agent can be required lexically by the lemma itself. So, also in acquiring Japanese, as well as English and Italian (cf. respectively §§ 2.2 and 3.2.) learners will begin to understand and produce correctly some of the so-called exceptional verbs as *tomodati* (“receive”) or *xxxxx* (“xxxx”) at the stage immediately above that of default mapping.

Later on, learners also acquire the possibility of promoting the patient role to SUBJ by ignoring or suppressing the agent role, thus producing a range of pragmatically motivated choices, such as passives, causatives and benefactives – all of which, in Japanese, involve nondefault mapping (see Kawaguchi 2005, 2007, 2009). The noncanonical nature of passives comes from the promotion of the patient role mapped onto SUBJ. Since this mapping mechanism is already explained in § 4.2 in chapter 1 universally, and § 2.2 here for English, we illustrate briefly a different source of noncanonicity in Japanese, namely that involved in causatives.

Causative constructions display a complex form-meaning relationship, whereby the form expresses the meaning of ‘causing X to do something or to be in some state’ (Shibatani 1990: 307; cf. also Noda, Sakota, Shibuya and Kobayashi, *Nihongo gakushūsha*). This construction involves nondefault mapping because one participant actually receives two thematic roles, as shown in (64). Here *Takashi* plays a double role in the eventuality described in the sentence: he is patient of the causative verb (‘Masako made Takashi...’) and, at the same time, agent of the lexical verb *arau* (‘...Takashi wash the car’), as more formally shown in (65).

- (64) Masako-ga Takashi-ni kuruma-o araw-ase-masita
 Masako-NOM Takashi-DAT car-ACC wash-CAUSE-POL.PAST
 [Masako made Takashi wash the car]

(65). *Mapping of a-structure onto f-structure for the transitive causative sentence*
 Masako-ga Takashi-ni kuruma-o araw-ase-masita (after Kawaguchi 2009)



Teachers of Japanese L2 consider causative constructions some of the most difficult to acquire. Empirical evidence for their acquisition is provided by Kawaguchi (2009). This study unequivocally shows that in order to produce causatives in a target-

like fashion both functional assignment and S-procedure must be in place. This explains why they emerge at the later stages of L2 development.

5. Conclusion

With the examples of English, Italian and Japanese, this chapter has shown how three typologically diverse languages can interpret the universality of PT's developmental schedules that we had partly reformulated in a new way in chapter 1. This, of course, is not the full story, as we have left out important areas such as gender in morphology, and questions (except for English) in syntax. Nevertheless, our brief sketch of the three languages highlights the advantages of reconceptualising the 1998 and 2005 PT achievements in accordance to recent progress in its two feeder disciplines dealing with language production and linguistic knowledge.

With any L2, the main task for the learner is the acquisition of its lexicon, which is by far the greatest source of diversity, not only linguistically but also culturally. This entails learning for every new word the full bundle of its features, including, at the lemma level, all the information needed to encode it grammatically. If the sentence in which words are placed is declarative, simple, active, affirmative, minimally presuppositional, and pragmatically neuter, the speaker's choices are limited, and encoding operations and their structural outcomes mostly obligatory.

But in order to enhance expressiveness, speakers can make marked choices at the discourse-pragmatic level. A second source of great diversity is in the ways in which different languages can handle – or prefer to handle – the consequences of these choices, and the means they use to do so. Here, of crucial importance in order to develop PT further in this direction is our understanding of the role discourse functions play in learners' development. As Bresnan (2001) and others classify them within LFG, discourse functions are different from nondiscourse functions. If so, they are relatively independent, and will be learned separately from the others. Hence they are best treated separately.

For these reasons, in sum, we have kept separate, on the one hand, syntactically motivated morphology from discourse-pragmatically motivated syntax; and on the other, declarative, simple, active, affirmative, minimally presuppositional, and pragmatically neuter (i.e., unmarked) sentences from other types of sentences such as question sentences, where discourse pragmatic motivations play a key role in the framing of the structure.