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The acquisition of tense and aspect in a morphology-sensitive framework: Data from Italian and Austrian-German children

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Abstract: This article criticizes the wide-spread view, sometimes referred to as the “aspect first hypothesis” (initiated by Antinucci and Miller 1976 and supported by Bloom et al. 1980; Bickerton 1981; Weist et al. 1984; Shirai and Andersen 1995, among others), according to which a universal acquisition path is postulated in the tense-aspect domain, based on the leading role of actionality (or Aktionsart) and aspect. According to this view, children build their competence starting from the pervasive correlations atelic:imperfective:present vs. telic:perfective:past, before gradually learning to disentangle (i.e., freely combining) the various actional, aspectual, and temporal components. The alternative view advocated here (typologically-oriented and morphologically-sensitive) claims, instead, that children start out with no predefined strategy and extract the relevant information out of the individual language’s morphological structure. The data stem from four longitudinal corpora relating to three Italian children and one Austrian German child, showing that: (i) the strong correlation between actionality, aspect, and tense can only be supported if activity and stative verbs are lumped together within the category of atelic predicates. Once activities are separately examined, their behavior stands out as absolutely incompatible with the traditional view. (ii) In the relevant languages, there can be earlier understanding of the temporality-oriented morphology as contrasted with the aspect-related categories. (iii) The analysis does not support the so-called prototype hypothesis (Shirai and Andersen 1995), since the examined children were strongly affected

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by their linguistic input from the very beginning. (iv) The children presented (to a greater or lesser extent) a notable verb spurt that very briefly preceded the first uses of the Past tenses. In conclusion, the actual acquisition path followed by the analyzed children undermines the hypothesis of a universal acquisition pattern, supporting instead the view that acquisition depends on the specific morphological shape of the target language.

Keywords: acquisition, tense, aspect, morphology, Italian, German

1 Introduction¹

1.1 The aspect priority hypothesis

The prevalent view of the last four decades in L1 tense-aspect acquisition rests on the assumption that aspect and/or actionality (the latter also known as *Aktionsart*) trigger(s) the acquisition process, while temporality and mood play a secondary role. At the risk of oversimplification, one can arrange the main theoretical proposals as follows:

- (a) *Aspect Priority*: cf. the pioneering work by Antinucci and Miller (1976), *Aspect before tense* (Bloom et al. 1980), *Defective tense* (Weist et al. 1984);
- (b) *Actionality Priority*: cf. *Language bioprogram* (Bickerton 1981), *Basic child grammar* (Slobin 1985–1997), *Prototype account* (Shirai and Andersen 1995; Andersen and Shirai 1996; Li and Shirai 2000).

The exact separation of these two sets is a delicate matter. Some authors merge aspect and actionality, while others keep them duly separate. In any case, it makes little sense, in this connection, to carefully delimit the contribution of these two components, for they are assumed to work in a synergistic manner. The above proposals converge towards a recurring set of associations among the main semantic dimensions, as shown in the following scheme:

1 This paper makes use of the following abbreviations: ADS = adult-directed speech; ATAM = actionality-temporality-aspect-modality; CDS = child-directed speech; CS = child speech. Besides, capital initials are used to refer to the name of grammatical tenses. This makes it possible to distinguish ‘Past’ as a verbal tense from ‘past’ as a subdomain of the temporality component. Furthermore, the terms “perfective/imperfective” and “aspect” will be placed between double quotes whenever reference is made to the lexical-grammatical categories to be found in the Slavic languages.

- (1) atelic predicates ⇔ imperfective tenses ⇔ Present tenses
telic predicates ⇔ perfective tenses ⇔ Past tenses.

This legitimates the *aspectual under-extension* label proposed by Wagner (2012). It is important to observe that the above convergences are merely statistical, rather than categorical. For instance, an individual child at the early stage of acquisition may occasionally produce the Past tense of an atelic verb, although this turns out to be a largely disfavored combination.

The associations in (1) have been detected in a number of languages. In addition to the above cited works, consider at least: Li (1989) for Chinese; Tomasello (1992), Johnson and Fey (2006) for English; Meisel (1985) and Labelle et al. (2002) for French; Meisel (1985) again and Behrens (1993) for German; Berman (1983) for Hebrew; Noccetti (2002, 2003) for Italian; Rispoli (1981), Cziko and Koda (1987), and Shirai (1998) for Japanese; Stephany (1981, 1985) for Modern Greek; De Lemos (1981) for (Brazilian) Portuguese; Stoll (2001) for Russian; Aksu-Koç (1988) for Turkish.

Despite wide acceptance, this traditional view has been challenged, almost from the beginning, by alternative proposals. In particular, although temporality – as well as mood – is usually considered to play a secondary role at the initial stage of acquisition, some scholars did suggest that this component may show an early development. For instance, Bloom et al. (1980) and Gerhardt (1988), studying the behavior of American children, observed that children no doubt learn temporality (tense, in their words) relations at the same time as aspect. Behrens (1993, 2001) made a similar point about German, and in recent times the number of contributions casting doubt on the prevalent view has constantly grown. Bar-Shalom (2002) remarked that Russian children can correctly use the Past tense of both “perfective” and “imperfective” verbs before they are 2 years old (see also Wagner 2001: 679).² This is not surprising, considering that the psychological literature offers robust evidence that children show understanding of temporal relations before they acquire the ability to express them linguistically (e.g., Harner 1982; Eisenberg 1985). The role of temporality was also underlined by Spharim and Nunio (2008) about Modern Hebrew, and this might look obvious, considering that this language does not mark aspect at all. Note, however, that in terms of the aspect under-extension hypothesis, this should not make any difference: since actionality is (at least covertly) present in any language, the relevant associations in (1) should

2 As for the use of quotes with “perfective/imperfective”, see Footnote 1.

nonetheless be effective. It is worth noting, in this connection, that Pawlak et al. (2004) and Valian (2006), while confirming the early maturation of deictic time-reference in 2-year-old children, observed that relative time-reference only develops around the end of the third year, when children learn to use the time adverbs. The later emergence of time adverbs with respect to tense affixes is a point that deserves attention (see Section 5.3).

As for the mood component, although the literature seems to provide much less evidence in relation to it, there is reason to surmise that it should deserve more attention. Aksu-Koç (1988) observed that Turkish children show early activation of the modality system, notoriously well-rooted in Turkish morphology with special regard to evidentiality. This finds an easy explanation in the important role of modality in child-mother interactions, with frequent use of deontic modals and the Imperative, or of pragmatically equivalent strategies (e.g., the exhortative usage of the Present). Stephany (1986) has offered useful insights on this.

Although the present paper also addresses the issue of the supposedly minor tense-aspect components, with special emphasis on temporality, its purpose does not consist in substituting one semantic category (aspect/actionality) with another (temporality or mood), but rather in showing that the actual acquisition path is to be found elsewhere, namely in the specific morphological structure of the target language. This offers the learning child abundant hints to build her/his linguistic competence in all domains of grammar. As a consequence – due to the extreme morphological variability of natural languages – the earliest tense-aspect category activated in the acquisition process may be anyone of the four above-mentioned, depending on which one(s) receive(s) the strongest support by the target language morphology.

This paper is organized as follows. After addressing some crucial terminological matters in Section 1.2, Section 2.1 criticizes the prevalent view of L1 tense-aspect acquisition, while Section 2.2 spells out an alternative, typologically-oriented view. Section 3 profiles the structure of Italian and Austrian German, the languages used for this study. Section 4 describes the longitudinal corpora and the annotation procedure and spells out the research goals (Section 4.4). Section 5 presents the empirical evidence stemming from the behavior of four children. The evidence relates to: (i) the interaction of actionality and aspect, inspected by comparing successive developmental phases (Section 5.1); (ii) the same, by using continuous statistical modeling tools (Section 5.2); (iii) the respective acquisition time of Past- and Future-tense markers, *vis-à-vis* time-locating adverbs and the past/future-oriented use of the Present tense (Section 5.3); (iv) the respective timing of the verbal lexicon expansion and of

the verb morphology burst (Section 5.4). The discussion in Section 6 brings about further methodological comments. Section 7 concludes the paper.³

1.2 Terminological matters

The semantic domain this paper refers to involves a number of conceptual issues that must be made explicit from the beginning, due to lack of general agreement within the specialized literature. The purpose of this section is to preempt tedious misunderstandings. Since the relevant components of the domain at stake are *Actionality*, *Temporality*, *Aspect*, and *Mood*, throughout this paper the acronym ATAM – as more comprehensive than the traditional denomination *tense-aspect* or the recently introduced TAM acronym – will be used. Two points deserve special attention.

First, it is important to separate actionality from aspect: the former designates lexical-semantic categories in the Vendlerian tradition; the latter designates the sentence-level perspective under which the event is viewed as either perfective or imperfective (Comrie 1976). These two components should thus be carefully distinguished, despite their less than perfectly orthogonal separation. Since in both cases notions such as event's (in)completion are involved, it is no wonder that mutual entailments arise. For instance, telically fulfilled events necessarily entail perfectivity. Conversely, an imperfective (or, more specifically, a progressive) viewpoint either suspends the telic inclination of the given predicate or (typically in the Slavic languages) dictates the selection of the appropriate predicate, compatible with the atelic interpretation. However, the independence of these two domains is proven by the fact that perfective events may involve both telic and atelic events (e.g., *Yesterday, while mum had a nap, little Jim built a puzzle [telic]/watched TV [atelic]*).

Second, the term *temporality*, rather than *tense*, is used here. The latter term should best be confined to the morphosyntactic categories to be found in the grammar of individual languages, rather than used to refer to the semantic/cognitive component of time-reference, with its deictically-oriented subdomains of past/present/future. To justify this choice, consider for instance the Romance Imperfect: in its prototypical uses, this tense conveys the aspectual value 'imperfectivity' and the temporal value 'past'. It is thus confusing to use the

³ The goal of the present paper is limited to L1 acquisition, to the exclusion of L2 acquisition. Although these two learning processes share a number of similarities, there are major differences. L2 learners master the grammar of their native language and thus filter any new acquisition through an established competence (see Bardovi-Harlig [2012] for a recent survey). By contrast, L1 learners have no previous grammar to build upon, except for the universal predisposition to acquire language, as shared by all human beings.

word tense to indicate both a particular grammatical category (in this example, the Imperfect) and the temporality component at large. As a matter of fact, any tense conveys both aspectual and temporal information, even though one of the two (or both) may be underdetermined. The German Preterite, for instance, conveys the temporal value ‘past’, but is aspectually underdetermined as it neutralizes the (im)perfectivity value, although in most cases the language user may assign to it the relevant aspectual interpretation by exploiting the appropriate contextual cues (Bertinetto 2008).

2 Towards a realistic model

2.1 A criticism of the prevalent view on ATAM acquisition

One early criticism that has been leveled against the aspect priority hypothesis is that one can find a fairly similar behavior in the interacting adults, who also exhibit the associations in (1) (see, among others: Stephany 1981; Andersen and Shirai 1996; Li et al. 2001; Boland 2006). This has been labeled the *input problem*: if children simply do what their caretakers do, then there is nothing to bother about. To counteract this objection, one can however look for significant deviations at the initial stage between children and caretakers, subsequently followed by gradual convergence towards the adult target.⁴ This point will be addressed in Sections 5.1–5.2 with freshly acquired data. There are, however, further criticisms that can be put forth, as the remaining of this section will show.

The theoretical implications of the prevalent view of ATAM acquisition, as depicted in (1), imply indeed a debatable consequence. By selecting one particular category (aspect or actionality, or possibly a mixture of the two) as the triggering factor of the acquisition process, one implicitly assumes that the learner masters the given category in a sufficiently robust manner. This assumption is seldom overtly stated, except by the defenders of extreme nativist versions of the language acquisition process (Bickerton 1981; Weist et al. 1984⁵).

⁴ In order to corroborate this view, a further step should be taken, namely comparing the child-directed speech (CDS) with the adult-directed speech (ADS) as produced by the same individuals, in order to evaluate the extent to which they deviate from their usual linguistic behavior while interacting with children. Unfortunately, Boland (2006) and Huang (2003) are perhaps the only studies in which CDS and ADS are systematically compared. The present study cannot provide any evidence in this respect.

⁵ It is fair to observe that, in his many contributions to the field, Weist has later on substantially modified his views, giving up his initial innatistic claim.

Nevertheless, once this argument is made explicit, its dubious implications become evident. One would hardly endorse a view suggesting that a particular ATAM dimension must be mastered by the toddler, in order to build up the remaining dimensions from scratch.

We are aware of a possible objection to this reasoning. One might claim that the toddler has no actual knowledge of the relevant linguistic category/ies: rather, s/he acquires gradual knowledge of them through recurring patterns of statistically favored combinations. In other words, s/he extracts the relevant linguistic categories in a usage-based manner. Let us clarify this point. Most scholars would assume as a matter of fact the child's initial *tabula rasa* with respect to any sort of metalinguistic competence. The point is, however, that in the prevalent view the child is assumed to exploit the (initially implicit) aspectual and/or actional categories precisely in order to gradually develop her/his understanding of the ATAM matters. Thus, although her/his metalinguistic knowledge differs from the adult's one, the relevant category/ies must be sufficiently perspicuous to her/him as to act as the triggering factor(s) in the acquisition process. This is precisely the point we would like to take issue with. To anticipate: we propose that the child builds her/his linguistic competence out of the statistical associations found in the input in a language-specific way, without the help of any pre-defined strategy.

Our objections to the prevalent view are of two (strictly interdependent) sorts. First, we would like to propose that children base their learning strategy on the (typologically quite diverse) morphological evidence provided by the target language. Second, and consequently, we suggest that there is no universal acquisition path (what van Hout [2008] calls *Uniform acquisition of aspect hypothesis*), but rather an array of possibilities as made available by the diverse morphological shapes of the languages. This entails that temporality or mood (rather than aspect and/or actionality) might be the first category to develop, whenever the target language offers adequate morphological support to this effect.

Before elaborating this alternative hypothesis, it must in fairness be stated that some of the problems entailed by the prevalent model have been discussed in the literature. Two positions deserve to be mentioned: Slobin's Basic Child Grammar and Andersen-Li-Shirai's Prototype Account.

Although in later work (Slobin 1991) the former author has substantially enriched his views by acknowledging – in a sort of neo-Whorfian conception – the extreme grammatical diversity of the various languages, we would like to concentrate here on his original, highly influential position, recapitulated in Slobin (1985). The proposal is based on the cognitive notions result and process, rather than on the linguistic categories that make up actionality. Slobin's original conception might thus be considered immune from the present criticism, because he refers to a universal endowment of human beings, rather than to any specific

grammatical component. Although this is undoubtedly the case, a further problem arises: the cognitive notions alluded to by Slobin cannot be directly identified with the actional categories as commonly defined. Result and process are universal cognitive notions, whereas the actional categories may only be considered universal as semantic prototypes, while their linguistic implementation is much less uniform than usually assumed. In Bulgarian, virtually every verb is lexically specified for (a)telicity, whereas in Thai all verbs are claimed to be thoroughly underdetermined in this respect, at least in the analysis proposed by Jenny (2000). While these two languages may be regarded as the extreme poles in the typological range of variation, several intermediate cases could be described, suggesting a highly variegated picture. In fact, languages differ among themselves in at least some details, as far as the implementation of actional categories is concerned. Compare, for instance, the behavior of telic verbs in Japanese as opposed to English (McClure 1994). Consequently, unless one directly refers to the grammatically relevant notions that children need to acquire when learning a specific language, the mere appeal to universal cognitive prototypes is of little help in explaining how ATAM features are acquired.

Andersen-Li-Shirai's model is based on the notion of *prototype*, as summarized in (1): "Children acquire a linguistic category starting with the prototype of the category, and later expand its application to less prototypical cases" (Shirai and Andersen 1995: 758). This allows the following prediction. First, children learn to associate a cluster of prototypical actional properties with each linguistic form. For instance, they first assume that English Past forms are assigned the features [+telic, -durative, +result], while English Present Progressives are assigned the features [-telic, +durative, -result]. This stems from probabilistic tendencies. As a consequence, children tend to use the tense morphemes available to them at the initial stages with the verbs exhibiting the corresponding actional features, while later on they learn to generalize such morphemes to other verbs, more peripheral with respect to the semantic prototype. Andersen-Li-Shirai's model appears to elegantly cope with the problem raised above (as well as with the input problem mentioned at the beginning of this section), not only by suggesting that toddlers do not fully master the target morphology, but most of all by showing how they gradually develop their own competence. Upon closer inspection, however, it turns out that this model does not really answer the question raised above (i.e., Do children have an early understanding of the linguistic categories supposedly acting as triggers?). Rather, it provides an answer to another important and strictly related, but nevertheless different question: Why is there such a striking correlation, in the learner's initial production, between actional classes and tense morphemes distribution? We now know that this correlation exists because it exists in the input; children build upon it,

in a usage-based manner, by first pushing it to the extreme. The toddler's behavior is, in other words, strongly biased by the caretakers' example. Concerning the crucial question, however, Andersen-Li-Shirai are silent. They appear to imply that toddlers have an embryonic ability to exploit the essential actional information, even when dealing with languages which do not explicitly mark actional contrasts (Japanese), or do so in a less than systematic manner (English, Chinese). The same reasoning extends to aspect, which is prominently marked in Chinese, relatively consistently marked in English, and left totally unexpressed in Japanese. This, however, is far from obvious: whenever there is no overt evidence (i.e., there is no one-to-one form-meaning correspondence), one should not take for granted that the learner has an easy access to the intended linguistic category. This is true in general, and particularly so in the case of highly elusive features such as the actional ones, which (apart from prototypical examples) often seem to be hard to identify even for expert scholars, as Zarcone and Lenci (2008) have shown.

In conclusion, the proposals put forth by Slobin (in its original formulation) and Andersen-Li-Shirai do not provide a viable solution to the problem at hand, although for different reasons. Slobin's original proposal is cognitively-oriented, but rather vague in terms of linguistic implementation. In order to make it linguistically interpretable, one must translate it into the relevant grammatical (i.e., actional) categories, which is exactly where the problem lies. As for Andersen-Li-Shirai, they do refer to the linguistically relevant categories, but assume without proof that these are (or, rather, gradually become) available as such to the learner.

The next section will spell out an alternative, morphologically-oriented view. Before so doing, let us add one further criticism of the prevalent view. Upon careful consideration, the initial absence of the imperfective-past combination (as shown in [1]) might have a straightforward explanation. While the imperfective-present combination exploits the speech time as deictic anchor, the imperfective-past typically needs – in the progressive interpretation – a reference time in the past (e.g., *when X came, Y was eating*). The cognitive operation implied in the latter case is complex, for it involves two entities: the event itself and a reference time. By contrast, the perfective-past combination only requires deictic anchoring of the event on the speech time. Thus, the associations in (1) may not even prove the functional split of the category aspect (as implied by the prototypical combinations imperfective-present/perfective-past), but rather a sort of defective implementation of this category merely due to cognitive difficulties.⁶

⁶ This is reminiscent of the proposal by Weist et al. (1984) concerning the successive stages of ATAM acquisition (from speech time, to event time, to reference time systems).

2.2 A morphology-sensitive model

One may assume that, at the outset, the learner builds (based on the linguistic input) an inherently syncretic concept, in which the main ATAM semantic dimensions appear to be inextricably intertwined. The acquisition task consists in disentangling these dimensions. In so doing, learners have at their disposal – as an explicit source of information – no more than the lexical and morphological forms provided by the target language, to the extent that they exhibit the relevant contrasts. When this does not occur, i.e., when the language does not provide explicit support in terms of form-meaning correspondences, the learner's task is much harder and demands more time and effort. Instances of neutralized phonological or morphological oppositions, or of morphosyntactical \emptyset -morphemes, show a clear parallel in other domains.

The hypothesis defended here is based on the following scenario. The child is presumably endowed with the initial ability to develop the basic cognitive notions that will in turn sustain his learning task. One can for instance assume that, at some point, children understand the contrast entity vs. event, as presupposed by the predication theory. Similarly, in the ATAM domain children are supposedly able to develop an intuitive understanding of contrasts such as state vs. process, complete vs. incomplete event, now vs. not-now, and realis vs. irrealis. Although these notions should not be identified with actionality, aspect, temporality, and mood, they are obviously related to these linguistic categories as their cognitive antecedents. Since, however, the linguistic categories are not directly accessible to the toddler, s/he has to develop them on the basis of the available input. At the initial stage, children employ unanalyzed lexical materials, with no morphosyntactic specification (cf. Tomasello's [1992] *Verb-island hypothesis*). As the child's cognitive and linguistic experience develops, the initially syncretic categories begin to be further analyzed, as suggested by the Competition Model (MacWhinney and Bates 1989). This, however, does not occur at once and may go through intermediate steps, attuned to the specific features of the target language. Thus, depending on the language, the learner might first disentangle any one of the main ATAM categories, while the others would constitute a syncretic residue. For instance, with some languages temporality might be the first category to develop, while actionality, aspect, and mood would be joined into a residual category, possibly giving rise to preferred associations similar to those in (1). Any combination is in principle conceivable. The toddlers' task essentially consists in building the ATAM categories by gradually discovering how the target language deals with this semantic domain; namely, which categories are overtly expressed and which are only covertly conveyed. Learning a grammar may therefore be viewed as a process by which

the child acquires a set of constraints on how to shape the linguistic expression of her/his own experience. Whatever does not find overt expression is left to the inferring abilities of the language users, i.e., to their pragmatic competence.

It is useful, in this connection, to refer to the notion of ATAM-prominence proposed by Bhat (1999). What ultimately makes the difference, in the acquisition process, is the language's morphological shape, rather than anything related to the intrinsic nature of any specific semantic component. It is for instance plausible that, in the acquisition of Slavic languages, children develop the most prominent features of actionality (essentially, the telic vs. atelic contrast) earlier than any other ATAM feature, due to the abundant evidence available in their target. This provides a viable interpretation for the observation put forth by several scholars, to the effect that children learning Slavic languages have an early comprehension of the fundamental "aspectual" contrasts (Bar-Shalom 2002; Weist et al. 2004).⁷ This prominence-based view can be generalized to any major ATAM component. For example, one can surmise that, while acquiring a strictly mood-dominant language (i.e., a language where mood, or possibly evidentiality, is overtly expressed, while the other main ATAM dimensions are but poorly manifested), the basic modal features will be mastered before any other feature and will drive the acquisition process. The exact acquisition path is thus expected to significantly differ according to the target language.

The next section will present two cases in point: Italian and German.

3 The role of morphology

3.1 Overt vs. covert features

Languages present a variable mixture of overt and covert categories. A given language may have no overt actional marking and nonetheless convey actionality-relevant information (indeed, this is the most frequent situation); or it may have no overt temporal distinctions and yet express temporally-relevant information via contextual redundancy, temporal adverbs, and e.g. aspect-driven pragmatic inference if aspect is overtly expressed (as in Chinese). This presents a formidable challenge to the learning child, possibly harder than the one faced by L2 learners, except that children get strong support – within the crucial time

⁷ The notion 'aspect' (see Footnote 1 concerning the use of quotes) should be understood as appropriate, depending on the language considered. In most Slavic languages (most typically the Northern ones), one should best speak of a mixed actionality-aspect category (Bertinetto and Lentovskaya 2012).

frame – from their unique language acquisition capacity. L1 learners have to acquire ATAM categories from scratch, either by exploiting the available morpho-syntactic manifestations, or else by gradually expanding their own pragmatic competence, which allows them to perform the appropriate contextual inferences.⁸

The relevant parameter is explicitness. An explicit morphological structure is such that the relevant values are univocally manifested by a set of dedicated devices. If, by contrast, a given semantic opposition is neutralized, the structure is said to be (locally) opaque or underdetermined. Languages are a mixture of explicitness and opacity: the ATAM dimension is no exception, as hinted at by the notion of ATAM prominence referred to above. Van Hout's (2008) approach is on the same track, for she speaks of morphological salience and form-to-meaning correspondence, respectively equivalent to the notions of formally-based prominence and univocal formal marking.

Let us then see how this applies to Italian and German, the two languages represented in the present corpus. Due to the present paper's focus, the following description will be limited to the tenses actually produced in early adult/children interactions. For instance, no mention will be made of subjunctive tenses, which do not show up in early CS and are vanishingly rare in the corresponding CDS (although they appear in the ADS utterances occasionally present in the corpus). For ease of the reader, Table 1 recapitulates the tenses mentioned in the next two sections.

3.2 The ATAM structure of Italian, with special regard to CS and CDS

Italian presents no overt marking of actional features, which are lexically specified rather than morphologically marked. To the extent that a given verb is univocally interpretable, its interpretation rests entirely upon the speaker's lexical competence (cf. *dormire* 'sleep' activity vs. *addormentarsi* 'fall asleep' achievement; *essere fermo* 'be still' stative vs. *fermarsi* 'stop [oneself]' achievement). A great deal of verbs, however, are ambiguous, as they may receive two or more actional readings, depending on the context. Thus, actionality is not a prominent category in Italian and is in part parasitic on aspect. For instance, with verbs that

⁸ Huang (2003) observes that 3-year-old Chinese children make very little use of time adverbs and mostly rely on explicit aspect markers, while adults do the contrary. This indicates that mature Chinese speakers have learned to rely on their communicative-pragmatic competence, based on explicit and implicit contextual information, and make a rather parsimonious usage of overt aspectual marking. This is confirmed by Winskel (2007) for Thai, a typological cognate. The slow maturation of the pragmatic/communicative competence is also mentioned by Vinnitskaya and Wexler (2001) to explain the behavior of Russian children between 3;0 and 6;5.

Table 1: Tenses appearing in the child/caretakers interactions of the longitudinal corpora used for this study, as exemplified by the verbs *dormire* and *schlafen* ‘to sleep’.

Italian			
NONFINITE		Infinitive <i>dormire</i> Gerundive <i>dormendo</i>	
FINITE	ASPECTUALLY NEUTRAL	PERFECTIVE	IMPERFECTIVE
	Presente <i>dorme</i>	Passato Semplice <i>dormì</i>	Presente progressivo <i>sta dormendo</i>
	Futuro Semplice <i>dormirà</i>	Passato Composto <i>ha dormito</i>	Imperfetto <i>dormiva</i>
		Piucheperfetto <i>aveva dormito</i>	Imperfetto progressivo <i>stava dormendo</i>
		Futuro Composto <i>avrà dormito</i>	
German			
NONFINITE		Infinitive <i>schlafen</i>	
FINITE	ASPECTUALLY NEUTRAL	PERFECTIVE	
	Präsens <i>schläft</i>	Plusquamperfekt <i>hatte geschlafen</i>	
	Präteritum <i>schlief</i>	Futur II <i>wird geschlafen haben</i>	
	Perfekt <i>hat geschlafen</i>		
	Futur I <i>wird schlafen</i>		

may receive a static or a dynamic reading (such as *collegare* ‘to connect’, *separare* ‘to separate’), the most likely interpretation with a perfective tense such as the Simple Past (cf. *collegò* ‘she/he/it connected’) is dynamic (i.e., ‘to put in connection’ as opposed to ‘to keep connected’), unless the context suggests the alternative reading. With the Imperfect, on the contrary, the stative reading is more salient (cf. *collegava* ‘she/he/it connected’ imperfective). In addition, like in most languages, there is an endemic ambiguity between activities and accomplishments (cf. *leggere* vs. *leggere un libro* ‘read [a book]’).

Aspect is partly marked in Italian. In the past subdomain, the Imperfect contrasts with the Simple and Compound Pasts alongside the imperfective vs. perfective divide. In addition, the Pluperfect and the Compound Future convey the perfect aspect with respect to a past and, respectively, future reference-time. The Compound Past, by contrast, is aspectually ambiguous: it may express the meaning of a present-perfect, but is often employed in the aoristic sense, i.e., as a purely perfective past, just like the Simple Past (for the distribution of the Simple vs. Compound Past in the Italian varieties, see Bertinetto and Squartini 1996). Other tenses are even more ambiguous. The Present and the Simple Future may be used both perfectively and imperfectively, although their aspectual inclinations diverge: the Present is more often imperfective, while the reverse occurs with the Future. The aspectual value of the Present is occasionally disambiguated by means of the progressive or the habitual periphrases; however, the frequency of use of these devices is not particularly large, and they may carry a stylistic nuance rather than a true semantic value. Indeed, they may be redundantly used with the Imperfect, which may express progressivity or habituality in and by itself. Finally, there is a limited set of adverbs that may contribute to the aspectual interpretation, such as *ancora* ‘still’, usually conveying imperfective value. Their appearance, however, is sporadic.

Temporality is to a large extent overtly marked in Italian, which may be regarded, in Bhat’s (1999) conception, as a temporality-prominent language. In the default uses, the Present is present-referring; the Imperfect, the Simple and Compound Pasts, and the Pluperfect are past-referring; the Simple and Compound Futures are future-referring. In practice, however, most tenses may receive contrasting temporal interpretations. The only tenses that convey a predefined temporal reading are the Simple Past and the Pluperfect (unless the latter is used counterfactually). For instance, the epistemic use of the Simple and Compound Futures imply, respectively, present- and past-reference:

- (2) *A quest’ ora, saranno le 5.*
 at this hour be.FUT.3PL the 5
 ‘It must be 5 o’clock now.’
- (3) *A quel punto, saranno state le 5.*
 at that point be.FUT.3PL been the 5
 ‘By then, it must have been 5 o’clock.’

Although some of the non-default temporal uses hardly appear in the child’s initial input, other uses are fairly widespread. This is partly the case of the

Imperfect, which in conversation is often employed in hypothetical sentences, with modally induced temporal displacement. The Present, the most frequent tense, is the most striking example. It is often used as past- or future-referring and, in addition, it may be used in hypothetical or injunctive contexts, i.e., with strong modal coloring. Thus, although temporality is by and large the dominant category in Italian, the kind of evidence available to the child is far from univocal. If one adds the aspectual and modal dimensions, the evidence offered to the learner appears to be rather confusing.

Consider the following uses of the Present (overwhelmingly employed in CS), all directly available to the child at the early stages of linguistic experience (for comparison, most of these uses are also available to the English Simple Present):⁹

- (4) *Ora la bambola dorme.*
 now the dolly sleeps
 ‘Now the doll is sleeping.’ [present-referring; imperfective (progressive)]
- (5) *La mucca fa il latte.*
 the cow makes the milk
 ‘Cows yield milk.’ [generic/omnitemporal; imperfective (habitual)]
- (6) *Ed allora il babbo dice...*
 and then the daddy says
 ‘And then father says...’
 [past-referring (sc., in the appropriate context); perfective]

⁹ The preponderance of the Present as compared with the remaining tenses is shown by the following percentages: Camillo 65.25%, Raffaello 68.33%, Rosa 60.57%, Lena 40.82%. As for the different uses of the Present, the respective percentages are as follows:

	Camillo	Raffaello	Rosa	Lena
imperfective	60.87	63.07	55.36	84.28
perfective	26.14	17.40	26.66	5.68
exhortative	4.58	8.09	7.53	2.18
generic	7.25	4.98	5.07	0.87
hypothetical	0.38	2.88	2.02	1.31

The remarkably lower percentage of the perfective Present in Lena’s productions is to large extent due to the frequent use of the root Infinitive (as typical of Germanic languages), which was preponderantly used perfectly, and to some extent also to particles with paraverbal function (see Section 4.1).

- (7) *Dopo gioco con te.*
 after play-1SG with you
 ‘Later on I play with you.’ [future-referring; perfective]
- (8) *Ora lo fai, capito?*
 now it do-2SG understood
 ‘You do it now, right?’ [injunctive/future-referring; perfective]
- (9) *Se vieni qui...*
 if come-2SG here
 ‘If you come here...’
 [temporally displaced (hypothetical); aspectually underdetermined]

As for morphological shape, Italian – again confining the discussion to the tenses actually used in CDS – has both synthetic tenses (Infinitive, Present, Imperfect, Simple Past, Simple Future) and analytic ones (Compound Past, Pluperfect, Compound Future). The latter tenses are easier to learn, due to their fairly regular structure, exception made for the irregular Participles, which pose a challenge to the learner. However, the learning task is certainly harder with the synthetic tenses, including the Present which may exhibit synchronically opaque morphophonological changes (e.g., *le[g:]o* ‘I read’, *le[dʒ:]i* ‘you read’, but *le[g]o* ‘I tie’, *le[g]i* ‘you tie’) or sheer irregularities (e.g., *vado* ‘I go’, *vai* ‘you-SG go’, *andiamo* ‘we go’, *vanno* ‘they go’).

As for the Infinitive, it essentially appears after modal verbs, but it also shows up (homophonically) in the negative imperative (e.g., *non graffiare!* ‘do not scratch!’).¹⁰

3.3 The ATAM structure of German, with special regard to CS and CDS

German is also, and to an even larger extent than Italian, a temporality-prominent language, for it has almost no way to convey aspectual contrasts. There is no dedicated past-imperfective, while both the Simple Past (or Präteritum) and the Compound Past (or Perfekt) may interchangeably be used in perfective and

¹⁰ Diachronically, the Italian negative imperative derives from the Latin periphrasis *noli(te)* + Infinitive (lit. ‘do not want (to) + Infinitive’). Synchronically, however, and despite formal identity with the Infinitive, the negative imperative should be considered a functionally independent form.

imperfective contexts. Even the contrast between pure past-perfectivity and present-perfect is neutralized, for tense selection is governed by areal, rather than semantic criteria. In Northern German the Simple Past definitely prevails, while in the Southern dialects (like the Austrian variety at stake) it is restricted to modal and auxiliary verbs. Here again, analytic tenses are formally simpler and thus easier to learn, despite the existence of irregular Participles.

The only tenses that substantially retain their basic aspectual meaning are the Pluperfect and the Compound Future, which typically convey the meaning of, respectively, past- vs. future-perfect. However, the Pluperfect is also occasionally used in Austrian German as a mere aoristic tense (i.e., as a purely perfective past). In some spoken varieties one may even find super-compound tenses, showing the inclination to recreate the vanishing perfect series (e.g., *er hat gegessen gehabt* [lit. he has eaten had] ‘he has eaten’). Finally, although some German varieties exhibit some kind of (incompletely grammaticalized) progressive periphrasis, this feature is absent in Austrian German.

Besides its aspectual underdetermination, German presents the same sort of temporal flexibility already described for Italian, with special regard to the Present. Unlike Italian, however, the Future has an analytic rather than synthetic structure, whereby the auxiliary *werden* ‘become’ accompanies the Infinitive. This makes it potentially easier to learn than its Italian cognate. As for the Infinitive, its form (as distinct from its function) is prominently found in the input of German children for, in addition to its use in the Future tense and after modal verbs, it formally coincides with the first and third plural persons of the Present (e.g., [*wir/sie*] *essen* ‘[we/they] eat’).

Concerning actionality, German is much more explicit than Italian in signaling the contrast telic/atelic, although it does so in a far less systematic way than the Slavic languages. German provides two different types of verbal prefixes which change the verb actionality: (i) prefixes – or rather, verbal particles – which are separated from the verb root in finite forms (3sg Present *er isst es auf* ‘he is eating it up’ vs. Infinitive *aufessen* ‘eat up’); (ii) true prefixes (*be-*, *ent-*, *er-*, *ver-* and *zer-*) inseparable from the verb root (3sg Present *die Blume verblüht* ‘the flower fades’). By adding the prefix to the verb root, in most cases the verb becomes telic (*essen* ‘eat’, *aufessen* ‘eat up’; *steigen* ‘rise’, *besteigen* ‘climb (something)’, *fließen* ‘flow’, *zerfließen* ‘melt’). Separable prefixes are more frequent and, in contrast to inseparable ones, always stressed. To the extent that children receive adequate input, this can speed up the recognition of the relevant actionality features. Admittedly, the separability of some prefixes complicates the learning task. However, as repeatedly observed in the acquisition literature, at the initial stage children take advantage of this by often using the stressed, separate particles as predicative elements, as a substitute either of the

(contextually inferable) verbal predicate or, more frequently, of a verb indicating termination, disappearance, or the like. This provides an easy way to express the notion of telicity (and, concomitantly, perfectivity, given the above noted entailment [telic → perfective]).

3.4 The task of the learning child

What makes the learner's task particularly hard is the often intricate or misleading character of the available evidence, due to ambiguity and neutralization (as illustrated in Sections 3.2–3.3 with respect to Italian and German). It is therefore no wonder that many scholars proposed that the acquisition process be driven by a universally predetermined triggering factor (cf. the aspect priority hypothesis in Section 1.1 and quotations therein). Needless to say, no scholar claimed that the aspect/actionality primacy was proposed to overcome the morphological variability issue; it is, however, legitimate to infer that the very fact of proposing a universal path of acquisition, exclusively based on semantic categories, ostensibly implies neglect of such an issue. Indeed, by supporting such a universalistic approach, one implicitly suggests that learners are endowed with a sort of cognitive pre-processing of the data to pave their way. In this paper we provide instead evidence for an alternative, typologically-oriented approach, dictating that morphology is the major trigger of language acquisition. According to this view, learners exploit the overt categories to gradually acquire an understanding of the covert ones.

Important evidence in favor of the typologically-oriented (or constructivist) approach stems from results obtained within the multilingual project on the acquisition of morphology led by Wolfgang U. Dressler. The study by Xanthos et al. (2011) has shown, by measuring the cumulative mean size of paradigm, that the more morphologically rich a language is, the steeper the acquisition curve turns out to be. This confirms and expands previous results by Pizzuto and Caselli (1992, 1993). Weakly inflecting languages exhibit a slow acquisition speed, whereas strongly inflecting ones (above all, highly agglutinating languages) show a much faster speed. Similar results, obtained via computational simulation of the acquisition process, are described in Calderone et al. (2007). This suggests that grammatical complexity is no hindrance to the learning child, for she/he is able to exploit the recurring patterns in the input distribution to find out the key of its organization. This capacity is uniquely possessed by children; L2 learners are, by contrast, ostensibly slowed down by the morphological intricacies of the target language (Shirai 2009).

The following section describes the longitudinal corpus used in this study.

4 Corpus description

The empirical data stem from the recordings of three Italian children (Camillo, Raffaello, Rosa) and one Austrian child (Lena), interacting with their caretakers (usually the mother, occasionally the investigator). Each child was recorded at least once a month (with very few exceptions); Rosa and Raffaello were also video-recorded. Camillo's data were collected by one of the authors (S. Noccetti), while the data of Raffaello and Rosa belong to the Italian CHILDES corpus. These recordings had been previously transcribed in CHAT format (MacWhinney 2000). For the purpose of the present study, Camillo and Rosa have been annotated by S. Noccetti, Raffaello by P.M. Bertinetto. The two annotators regularly met to cross-check their labeling procedure: this occasionally led to extensive changes in the previously labeled materials, to ensure full inter-annotator agreement. Lena's recordings were taken care of by E. M. Freiberger, who adopted the annotation procedure spelled out in Bertinetto and Noccetti (2006) and discussed with P.M. Bertinetto any problem of interpretation.

This section is organized as follows: Section 4.1 defines criteria for morphosyntactic productivity; Section 4.2 highlights major methodological issues inspiring the annotation strategy; Section 4.3 details the actual annotation procedure; Section 4.4 presents the hypotheses to be statistically tested.

4.1 Stages of morphosyntactic maturation

Mastery of language is achieved through successive steps (provided this is understood as a gradual process, with no sharp boundaries). The phases definition depends on the criteria adopted, based on research goals and theoretical framework. According to the model developed by Wolfgang U. Dressler and co-workers, based on morphosyntactic and semantic criteria, three maturational phases are defined: premorphology, protomorphology, and modularized morphology. Full-fledged morphological productivity is only observed in the last phase, but already at the stage of protomorphology children begin to activate this capacity, by using a number of nouns, adjectives, and verbs in different inflections (Dressler and Karpf 1995; Dressler 1997; Kilani-Schoch and Dressler 2002; Bittner et al. 2003).

With regard to ATAM phenomena, the premorphology phase corresponds to the period in which the few verb forms produced turn out to be rote-learned words or CS-specific ones (e.g., prosodic reductions, reduplications, simplifications, onomatopoeia; cf. Bittner et al. 2003). In addition, one can find multifunctional words endowed with predicative function (Gillis and De Schutter 1986). Although their number decreases at later stages, they did not disappear entirely in the

present corpus within the whole observation window. In the annotation, such forms were labeled as *paraverbs*, distinguished into two types according to their function: descriptive vs. exhortative (cf. Table 2). In the Italian corpus, the former mainly consist of nouns, prepositions, adverbs, and onomatopoeia; they typically describe an object position (e.g., *sotto* ‘[to be] under’; *terra* ‘ground’ for ‘[to be/go down]’) or an ongoing/completed action (e.g., *ta* [onomatopoeia] for ‘he is hitting him’; *brum* [onomatopoeia] for ‘car’/‘the car is moving’; *pum* [onomatopoeia] for ‘it fell down’; *più* ‘more’ for ‘no longer here’ or ‘not working any more’).

Table 2: Distribution of temporal adverbs and paraverbs.

PARAVERBS and ADVERBS (% on word tokens)			Camillo	Raffaello	Rosa	Lena
PHASE I	CS	Total no. paraverbs	28 (7.10%)	107 (17.20%)	72 (8.39%)	507 (16.60%)
		Descriptive	21 (5.32%)	74 (11.9%)	38 (4.43%)	239 (7.82%)
		Exhortative	7 (1.78%)	32 (5.14%)	34 (3.96%)	210 (6.87%)
		Neutral	0 (0.00%)	1 (0.16%)	0 (0.00%)	58 (1.89%)
		Temporal adverbs	0 (0.00%)	0 (0.00%)	0 (0.00%)	37 (1.21%)
	CDS	Total no.paraverbs	6 (0.62%)	14 (0.91%)	21(1.03%)	477 (4.59%)
		Descriptive	1 (0.10%)	0 (0.00%)	0 (0.00%)	109 (1.05%)
		Exhortative	5 (0.52%)	14 (0.91%)	21(1.03%)	197(1.89%)
		Neutral	0 (0.00%)	0 (0.00%)	0 (0.00%)	171(1.64%)
		Temporal adverbs	25 (2.62%)	14 (0.91%)	17 (0.83%)	366 (3.53%)
PHASE II	CS	Total no. paraverbs	98 (6.24%)	102 (3.79%)	89 (5.47%)	40 (5.99%)
		Descriptive	54 (3.43%)	80 (2.97%)	60 (3.68%)	10 (1.49%)
		Exhortative	34 (2.16%)	12 (0.45%)	28 (1.72%)	22 (3.29%)
		Neutral	10 (0.63%)	10 (0.37%)	1 (0.06%)	8 (1.19%)
		Temporal adverbs	15 (0.95%)	14 (0.52%)	3 (0.18%)	44 (6.60%)
	CDS	Total no.paraverbs	9 (0.22%)	64 (0.91%)	79 (1.37%)	67 (4.89%)
		Descriptive	1(0.02%)	4 (0.06%)	3 (0.05%)	20 (1.45%)
		Exhortative	8(0.2%)	42 (0.60%)	76 (1.32%)	17(1.24%)
		Neutral	0 (0.00%)	18 (0.25%)	0 (0.00%)	30 (2.18%)
		Temporal adverbs	113 (2.77%)	133 (1.89%)	77 (1.34%)	73 (5.33%)
PHASE III	CS	Total no. paraverbs	229 (4.81%)	79 (1.77%)	146 (1.10%)	14 (3.32%)
		Descriptive	100 (2.10%)	39 (0.87%)	61 (0.46%)	8 (1.9%)
		Exhortative	113 (2.38%)	22 (0.50%)	85 (0.64%)	4 (0.95%)
		Neutral	16 (0.33%)	18 (0.40%)	0 (0.00%)	2 (0.47%)
		Temporal adverbs	114 (2.39%)	45 (1.01%)	291 (2.20%)	24 (5.70%)
	CDS	Total no.paraverbs	9 (0.09%)	120 (1.64%)	205 (1%)	42 (4.15%)
		Descriptive	1(0.01%)	6 (0.08%)	9 (0.04%)	10 (1.0%)
		Exhortative	8 (0.08%)	64 (0.87%)	189 (0.93%)	11 (1.08%)
		Neutral	0 (0.00%)	50 (0.68%)	7 (0.03%)	21 (2.07%)
		Temporal adverbs	279 (2.74%)	225 (3.08%)	366 (1.80%)	53 (5.24%)

Exhortative paraverbs, by contrast, express the will/hope of the child that some action be performed (e.g., *fuori* ‘out’ for ‘want to go out’; *io* ‘I’ for ‘I want to do it myself’; *giù* ‘down’ for ‘put it down’ or ‘want to go down’). In the German corpus, descriptive as well as exhortative paraverbs mainly consist of nouns (*Papa* ‘to belong to the father’; *Mikrofon* ‘using the microphone’), adverbs (*da* ‘[being] there’; *drinnen* ‘[being] inside’), onomatopoeia (*tütü* ‘the car is coming’, *wau* ‘a dog is outside’) and particles (e.g., *weg* ‘away’ for ‘go away’; *auf* ‘up’ for ‘open up’). While onomatopoeia are mainly used descriptively, particles tend to occur in the exhortative function, expressing the child’s will.

Figures 1(a)–1(d) show the evolution of paraverbs. The distribution of descriptive paraverbs shows that CS makes a much more abundant usage

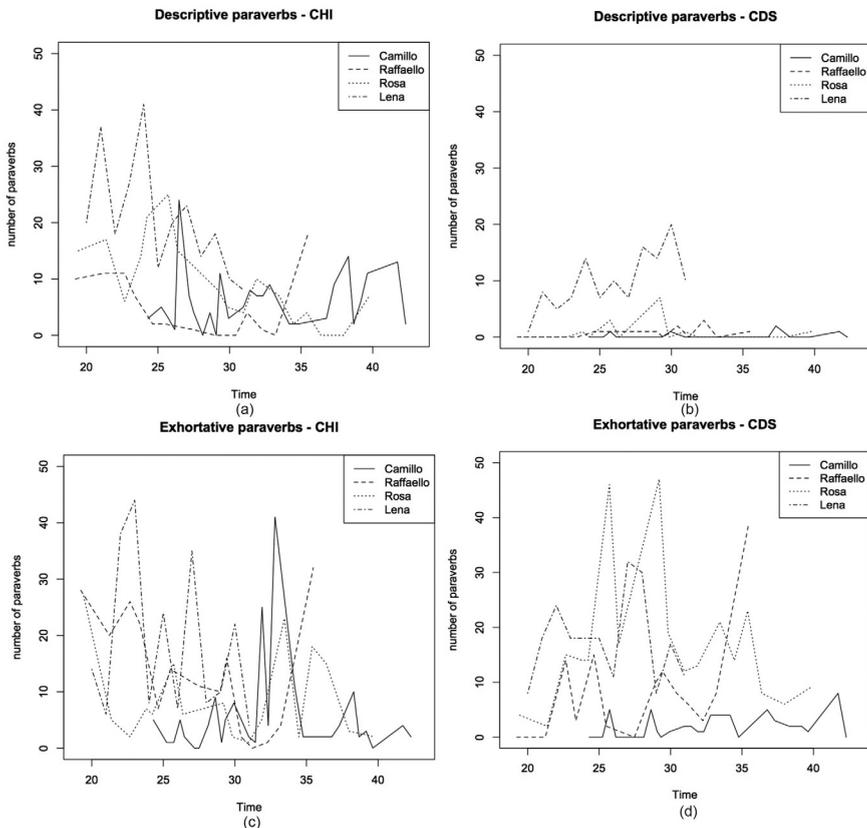


Figure 1: (a) Distribution of descriptive paraverbs in the four children. (b) Distribution of descriptive paraverbs in the CDS of the respective children. (c) Distribution of exhortative paraverbs in the four children. (d) Distribution of exhortative paraverbs in the CDS of the respective children.

of such forms as compared with CDS, particularly in the early recordings (Figures 1(a) and 1(b)). By contrast, exhortative paraverbs are also extensively used in CDS, although one should keep in mind that the figures report absolute frequencies: with respect to overall linguistic production, the density of paraverbs is much lower in the adults than in the children (Figures 1(c) and 1(d); Table 2). It is at any rate remarkable that, in general, children seem to follow a pattern very similar to that of the respective adults, despite individual differences.

The transition from pre- to protomorphology occurs, for most learners, in the proximity of a rather sharp lexical enrichment (see Section 5.4), which offers sufficient materials for experiencing the morphological patterns of the target language. With respect to ATAM acquisition, the following phenomena were observed in our corpus:

- a) the number of verb types and tokens increased;
- b) mini-paradigms emerged, where two or more forms of the same verb (persons, number, tense, mood) appeared in a single recording.

The Italian and German corpus used for this study did not reach beyond the protomorphological phase, due to the limited time window. This, however, was an intentional choice: the purpose was to analyze the initial steps of the ATAM acquisition process. Despite the restricted time window, the children's behavior could be arranged in three developmental phases (cf. Tables 3(a)–3(b)). Phase I corresponds to the premorphological stage. Phase II begins when the child uses at least two different tenses within one and the same recording. Phase III (which could be identified with the protomorphology stage) begins, instead, where the child uses at least two different tenses with one and the same verb. The criteria adopted are thus more severe than is normally the case, for two different forms of the same tense (e.g., 1sg vs. 3sg of the Present) counted as one and the same categorical entity for the sake of the classification. This periodization proved useful – following a well-established tradition – for the first unbundling of the data. However, as Section 5.2 will show, a more

Table 3a: Children studied: coarse-grained periodization.

Child	Camillo	Raffaello	Rosa	Lena
Birth Place	Pisa, Central Italy	Pisa, Central Italy	Pisa, Central Italy	Vienna, Austria
Recording age-span	2;0-3;6	1;7-2;11	1;7-3;3	1;7-2;7
Phase I	2;0-2;1	1;7-1;10	1;7-1;10	1;7-2;5
Phase II	2;2-2;6	1;11-2;5	1;11-2;1	2;6
Phase III	2;7-3;6	2;6-2;11	2;2-3;3	2;7

Table 3b: Children studied: Sample size (Discarded observations refer to contextually uninterpretable cases).

VERB TOKENS (+ discarded tokens)			Camillo	Raffaello	Rosa	Lena
PHASE I	CS	Total no. Words	394	622	858	3054
		Verb tokens	6	26	92	355
		% Verb/Words	1.52%	4.18%	10.72%	11.62%
		Discarded Verbs	0	4	4	40
		% Disc V./Verbs	0.00%	15.38%	4.35%	11.27%
	CDS	Total no. Words	954	1526	2036	10374
		Verb tokens	230	363	505	1904
		% Verb/Words	24.10%	23.78%	24.80%	18.35%
Discarded Verbs		0	1	0	48	
	% Disc V./Verbs	0.00%	0.28%	0.00%	2.52%	
PHASE II	CS	Total no. Words	1570	2689	1627	667
		Verb tokens	104	400	191	115
		% Verb/Words	6.62%	14.87%	11.73%	17.24%
		Discarded Verbs	2	6	2	4
		% Disc V./Verbs	1.92%	1.50%	1.05%	3.48%
	CDS	Total no. Words	4065	7103	5728	1370
		Verb tokens	1156	1497	1401	226
		% Verb/Words	28.43%	21.07%	24.45%	16.50%
Discarded Verbs		0	1	0	7	
	% Disc V./Verbs	0.00%	0.07%	0.00%	3.10%	
PHASE III	CS	Total no. Words	4753	4442	13169	421
		Verb tokens	689	947	2430	97
		% Verb/Words	14.49%	21.31%	18.45%	23.04%
		Discarded Verbs	0	25	26	7
		% Disc V./Verbs	0.00%	0.07%	0.00%	7.22%
	CDS	Total no. Words	10160	7305	20321	1012
		Verb tokens	2230	1604	4979	199
		% Verb/Words	21.94%	21.95%	24.50%	19.66%
Discarded Verbs		0	0	4	3	
	% Disc V./Verbs	0.00%	0.00%	0.08%	1.51%	
TOTAL	CS	Total no. Words	6717	7753	15654	4142
		Verb tokens	799	1373	2713	567
		% Verb/Words	11.90%	17.71%	17.33%	13.69%
		Discarded Verbs	2	35	32	51
		% Disc V./Verbs	0.25%	2.55%	1.18%	8.99%
	CDS	Total no. Words	16483	14436	35117	12756
		Verb tokens	3616	3464	6885	2329
		% Verb/Words	21.94%	24.00%	19.61%	18.26%
Discarded Verbs		0	2	4	58	
	% Disc V./Verbs	0.00%	0.06%	0.06%	2.49%	

sophisticated type of analysis can be exploited to gather a fine-grained picture of the acquisition process.

4.2 Methodological issues

This section highlights important issues concerning the annotation procedure. First and foremost, constant effort was made to avoid preconceptions. The specific temporal and aspectual values were checked by directly inspecting the audio/video-recordings (see also Parisse and Morgenstern 2012). For instance, the Present of an activity verb was not routinely interpreted as imperfective (although this interpretation turned out to be appropriate with all stative verbs). To illustrate with corpus examples, the Present in (10a)–(10c) received different aspectual readings, based on linguistic and extralinguistic information. In particular, in (10c) the Present is used to make a proposal, i.e., to express a future intention; hence its perfective value. Needless to say, besides temporal and aspectual values, the latter example also carries a modal meaning, duly labeled in the annotation file:

- (10) a. *perché ridete?* [imperfective, progressive]
 why laugh-2SG
 ‘Why are you laughing?’
- b. *piove, piove, metto stivali.* [imperfective, generic]
 rain-3SG rain-3SG put.on-1SG boots
 ‘When it rains, I put on my boots.’
- c. *si parla?* [perfective]
 3SG.REFL talk-3SG
 ‘Shall we talk?’ (sc.: ‘Would you agree to talk?’).

To this purpose, linguistically unbiased criteria were adopted while labeling covert aspectual values. Thus, the (im)perfective value of the Present tense of dynamic verbs was assessed by checking whether the child referred to an event actually occurring at the speech time, or at a previous/later time. This enabled the annotators to assign a contextually-sensitive interpretation in the absence of explicit morphology. For instance, while in (11a) the child is commenting on his current behavior, in (11b) he is giving instructions on how to perform a game in the imminent future:

- (11) a. *chicco co a penna.* [current event=imperfective]
 write-1SG with FILLER pen
 ‘I am writing with the pen.’

- b. *Io scappo e te mi rincorri.* [non-current event=perfective]
 I run.off-1SG and you me run.after-2SG.
 'I will run off and you will run after me.'

Referring each item's interpretation to the actual context is crucial for tracing back the acquisitional path of polyfunctional tenses. If for instance, at some early stage, a child uses the Present as a past-referring device, the appropriate context-sensitive labeling provides relevant information regarding the acquisition of the temporal dimension. Merely noting that, at a given stage, the child begins to use the Past tense would provide incomplete information. We thus constantly kept trace of both form and meaning, and this strategy was adopted for all tenses, not taking for granted that toddlers correctly use the morphologically explicit forms. Correctness of usage was assessed *a posteriori*.

The same attitude was adopted in the labeling of actionality. Consider, for instance, *fare* 'to do/make', which may be used as an activity, a stative, or a telic predicate. Only direct inspection of the recordings can solve the difficult cases. To illustrate:

- (12) a. *Da Auto fahren.* [non-directed motion=atelic]
 there car/cars drive-INF
 'A car/Cars is/are driving there.'
- b. *Nach Hause fahren!* [directed motion=telic]
 to home drive-INF
 'They are driving home!'

Whenever the communicative situation could not be unambiguously interpreted, the data were discarded from the statistical analysis. Table 3(b) shows the number of discarded data.

As for actional values, four labels were used: stative, activity, telic, and *stative. The latter label refers to stative verbs that allow a certain degree of voluntary control, such as It. *stare* 'to stay', It. *rimanere* 'to remain', and Ge. *bleiben* 'to remain' and the predicates based on them. These behave like any stative verb as far as the progressive periphrasis is concerned (cf. **Luca stava rimanendo seduto* [lit. 'Luca was remaining seated']), but unlike stative verbs, they admit the imperative (cf. It. *Rimani seduto!* Ge. *Bleib sitzen!* 'remain seated!'). Although *stative verbs are a tiny minority, they make up a fairly frequent type in child-caretakers interactions. In the corpus used, the percentage of *statives over statives was: Camillo 3.73%, Raffaello 5.55%, Rosa 4.39%, Lena 1.12%. By contrast, achievements and accomplishments were lumped together

under the label *telic*. The reason for this is twofold. First, the literature on L1 acquisition does not mention anything relevant following from this distinction; the only relevant matter concerns the contrast between the telic predicates as a whole and their atelic counterpart. Second, the exact delimitation between achievements and accomplishments turns out to be a rather delicate matter in some cases, particularly so with young children's productions.

The following section details the annotation procedure.

4.3 Annotation method

Tables 4(a)–4(e) present excerpts of the annotation sheet, each one exhibiting no more than the relevant columns, in order to focus on specific aspects of the

Table 4a: Excerpt from the annotation table, with an additional column for *meaning*.

Child	Speaker	Recording	Lemma	Type	Meaning
Camillo	CHI	11	averci	c'ho	<i>I possess</i>
Camillo	CHI	11	averci	c'hai	<i>you possess</i>
Raffaello	ADS	14	guardare	ho guardato	<i>I have looked</i>
Raffaello	OTH	10	andare	andare	<i>to go</i>
Rosa	MOT	8	aiutare	aiutami	<i>help me</i>
Rosa	CHI	20	camminare	cammina	<i>he walks</i>
Lena	CHI	20721a	weggehen	weggehen	<i>to go away</i>
Lena	MOT	10712a	schlafen	schläft	<i>sleeps</i>

Table 4b: Excerpt from the annotation table, with an additional column for *meaning*.

Corpus	Speaker	Lemma	Type	Spontan.	Fiction	Error	Correct Form	Meaning
Camillo	CHI	camminare	(cam)mina	S	NF	NE	–	<i>(he) is walking</i>
Camillo	CHI	dare	dammi	NS	NF	NE	–	<i>give it to me</i>
Camillo	CHI	trovare	è trovato	S	NF	Eaux	ha trovato	<i>has found</i>
Camillo	CHI	mangiare	mangiava	S	F	ET	mangia	<i>is eating</i>
Raffaello	CHI	rompere	rompata	S	NF	Eclass/ omis	ha rotta	<i>has broken</i>
Raffaello	CHI	mangiare	mangiata	S	NF	Eomis	ha mangiata	<i>has eaten</i>
Rosa	MOT	portare	che ti porta	S	NF	E mood	che ti porti	<i>that she brought</i>
Rosa	CHI	volere	io vole	S	NF	EP	io voglio	<i>(I) want</i>
Lena	CHI	sein	is(t)	S	F	EN	sind	<i>(they) are</i>
Lena	CHI	kaufen	gekauft	S	NF	Eomis	habe gekauft	<i>(I) have bought</i>
Lena	CHI	reingeben	hast reingeht	S	NF	Eclass	hast rein(ge) geben	<i>(you) have put in</i>

Table 4c: Excerpt from the annotation table, with an additional column for *meaning*.

Speaker	Lemma	Type	Actional.	Tense	Aspect	Mood	Meaning
CHI	sentire	senti	*stative	----	Perfective	Imperative	<i>listen</i>
CHI	andare	si va	telic	Present	Pf:	Indicative	<i>(why don't we)</i>
CHI	andare	andava	activity	Imperfect	Exhortative	Indicative	<i>go</i>
CHI	rompere	rotto	telic	----	Ipf	Adject. use	<i>s/he was going broken</i>
CHI	morire	muoiono	telic	Present	Perfective	Indicative	<i>they (usually) die</i>
CHI	averci	c'ho	stative	Present	Impf: Generic	Indicative	<i>I possess</i>
CHI	camminare	mina	activity	Present	Current: Impf	Indicative	<i>s/he is walking</i>
CHI	giocare	gioco	activity	Present	Pf:	Indicative	<i>(can I) play</i>
CHI	cascare	casca	telic	Present	Hypotetical	Indicative	<i>he (has just fallen)</i>
MOT	raccontare	si racconta	activity	Present	Past referring	Indicative	<i>he (has just fallen)</i>
MOT	correre	corse	activity	Simple Past	Non-Current: Pf	Indicative	<i>shall we tell (he) ran</i>
MOT	dire	aveva detto	telic	Pluperfect	Perfective	Indicative	<i>(he) had said</i>
MOT	dormire	dormivi	activity	Imperfect	Imperfective	Indicative	<i>(you) were sleeping</i>
CHI	stossen	hast stosst	telic	Compound past	Perfective	Indicative	<i>(you) have pushed</i>
CHI	können	kann	stative	Present	Current: Impf	Indicative	<i>(I) can</i>
CHI	schwimmen	schwimmen	activity	Root Infinitive	Imperfective	Infinitive	<i>swim</i>
MOT	zeigen	zeig(e)	telic	Present	Non-Current: Pf	Indicative	<i>(I) show</i>
MOT	stechen	gestochen	telic	Past participle	Perfective	Participle	<i>stung</i>

Table 4d: Excerpt from the annotation table, with an additional column for *meaning*.

Speaker	Lemma	Type	Actionality	Mood	Pers/Num./gender	Meaning
CHI	rompere	rotto	Adject. use	Participle	ms	<i>broken</i>
CHI	tagliare	tagliata	telic	Participle	fs	<i>cut</i>
CHI	mangiare	mangia	activity	Indicative	3s	<i>eat</i>
CHI	mangiare	mangiano	activity	Indicative	3p	<i>eat</i>
CHI	bleiben	bleib	*stative	Imperative	2s	<i>stay</i>
CHI	brechen	brochen	Adject. use	Participle	---	<i>broken</i>

Table 4e: Excerpt from the annotation table, with an additional column for *meaning*.

Speaker	Lemma	Function	<i>Literal meaning</i>	<i>Meaning</i>
CHI	sotto	descriptive	<i>under</i>	<i>to be under</i>
CHI	terra	descriptive	<i>earth</i>	<i>to be down</i>
CHI	pum	descriptive	<i>onomatopoeia</i>	<i>to fall down</i>
CHI	fuori	exhortative	<i>out</i>	<i>I want to go out</i>
CHI	lo	exhortative	<i>I</i>	<i>I'll do it</i>
CHI	giù	exhortative	<i>down</i>	<i>put it down</i>
CHI	wau	descriptive	<i>onomatopoeia</i>	<i>a dog is outside</i>
CHI	drinnen	descriptive	<i>inside</i>	<i>to be inside</i>
CHI	weg	exhortative	<i>away</i>	<i>go away</i>
CHI	auf	exhortative	<i>up</i>	<i>open it</i>

labeling procedure. The last column in italics is added, in each table, for ease of the reader.

Table 4(a) shows the child's name, the speaker's identity (CHI = child, MOT = mother, BRO = brother, FAT = father, OTH = other), the progressive number of the recording session, the lemma (i.e., the dictionary entry in the infinitive), the type (i.e., the actual form uttered). Different types of the same lemma were analyzed as separate entries (see *averci* 'to possess' in Table 4(a)).

Each item was labeled according to the actual meaning in context, either by inspecting the video when available or on the basis of the researcher's annotations (in the case of one of the authors). One important distinction, as shown in Table 4(b), was between spontaneous (S) and non-spontaneous (NS, i.e., echoic) forms. We considered NS any form either repeated immediately after the adult, or uttered within the next five conversational turns. Needless to say, NS forms were excluded from the statistical computations. The labels Fiction (F) and Non-Fiction (NF) refer to the type of context. When the speaker tells a story or a tale, some tenses might occur with higher frequency (e.g., the Imperfect in Italian). Finally, correct forms were labeled as NE (=no error), while errors were coded according to the specific type involved (Eaux = auxiliary selection error; ET = tense error; Emood = mood error; EP = person error; EN = number error; Eomis = omission; Eclass = inflectional class migration or overextension). A single item can exhibit more than one error type.

Each item was labeled for actionality according to the actual contextual usage, according to the following labels (cf. Table 4(c)): telic (i.e., achievement and accomplishment), stative, activity, and *stative (as for the last category, see section 4.2). As for contextual usage, the table presents two instances of

the verb *andare* ‘go’: in one case, the form used depicts a non-directed motion, in the other case it refers to a directed, telic motion. See example (12) above for illustration. Tense and Mood in Table 4(c) are self-explaining labels. The form *rotto* ‘broken’, which can be read as either a Participle or an adjective, was labeled as adjective in the particular case reported due to the specific context of usage. As for Aspect, Past tenses presented no problem, because their contextual value was in each instance consistent with the given tense’s standard value: Imperfect = imperfective, Simple and Compound Pasts = perfective, etc. (see Footnote 13 for the characterization of the Bare Participle used as a CS substitute of the Compound Past). The different uses of the Present tense were dealt with according to the following strategy, to avoid the risk of misrepresenting its actual meaning in context. Whenever the speaker was referring to an event occurring at that very moment, it was labeled Current: Imp(er)f(ective). If, by contrast, the speaker was referring to a past or a future (mostly imminent) event, the label Non-Current: P(er)f(ective) was used. This is illustrated by example (11) above. Needless to say, the different temporal reference (past or future) was labeled accordingly (*F* = future; *P* = past).

Person (1, 2, 3) and number (*s* = singular, *p* = plural) of the verb forms were indicated as in Table 4(d). When the item was a Participle or was coded as an adjective (e.g., *rotto* ‘broken’), gender was also labeled (*m* = masculine, *f* = feminine). Finally, multifunctional (possibly holophrastic) items with an ostensible predicative function (cf. Gillis and De Schutter 1986) were assigned to one of two categories according to their function: descriptive vs. exhortative (cf. Table 4(e)). See the discussion on paraverbs in Section 4.1.

4.4 Hypotheses and tests

According to the aspect priority hypothesis, the associations in (1), repeated here,

- (1) atelic predicates ⇔ imperfective tenses ⇔ Present tenses
telic predicates ⇔ perfective tenses ⇔ Past tenses.

justify the traditional assumption that the acquisition of ATAM features is guided by the implicit knowledge that children gradually acquire of the categories of actionality and aspect. Once this developmental path is completed, the child acquires mature competence of the remaining categories (temporality and mood).

This hypothesis can be disproved in a number of ways, and specifically:

- (i) By observing misalignments between the categorial values involved; for instance, by showing that, from very early on, not all atelic predicates (statives, *statives, and activities) are massively used in imperfective contexts. This undermines the alleged triggering role of aspect/actionality in the acquisition process.
- (ii) By finding out that children make early use of their temporal and/or modal competence, either by exploiting the adequate tense contrasts, or by simply using multifunctional tenses in the appropriate way (i.e., similar to the adults' usage). This undermines the precedence of aspect/actionality in the acquisition process.

A further hypothesis worth testing is whether children show evidence of a lexical spurt, with special reference to verbs, temporally correlated with the acquisition of a relatively well-articulated tense morphology. This would prove that the learner has entered a phase of morphological productivity. Next, one should check how such a spurt phase correlates with the acquisition process. The relevant criteria are:

- (a) Precocity, suggesting that learners can from early on exploit the actual grammatical information contained in the input.
- (b) Overtness. Early development of explicit morphology (as opposed to under-determined tense usage) proves that children do not need to compensate their imperfect mastery of the morphological exponents by means of multifunctional tenses (e.g., the past-referring Present instead of a fully-fledged Past tense).

5 Analysis of the data

This section will present evidence supporting the above described morphologically-oriented hypothesis. Four types of evidence will be successively addressed:

- (i) The actionality/aspect relationship (Section 5.1).
- (ii) The fine-grained evolution of the children's behavior, as analyzed by means of continuous modeling tools (Section 5.2).
- (iii) The compared acquisition timing of Past and Future tense markers vis-à-vis: (a) time-locating adverbs, (b) the past- and future-referring uses of the Present (Section 5.3).
- (iv) The timing of the verbal lexicon expansion as compared with the morphology burst, with specific regard to the acquisition of Past tense markers (Section 5.4).

5.1 Actionality and aspect

As repeatedly observed, at the early stages of L1-acquisition telic vs. atelic verbs tend to be used in a very polarized way. Later on, children depart from this pattern and converge towards the adults' usage, where this sort of correlation becomes less pervasive. The corpus data show indeed that, with respect to the actionality/aspect interaction, stative and telic verbs behaved as predicted by the traditional view. Activity predicates, however, make up a special case, as shown in Figures 2(a)–2(d). Due to their atelic character, they should converge with stative verbs, but in fact the children's behavior is surprisingly varied, as evidenced by the χ^2 test performed on activities, comparing two different phases for the same speaker (child *or* CDS) or different speakers (child *and* CDS) for the same phase.¹¹ Camillo conforms to the received view, because only at phase 3, when perfectivity eventually prevails, the correlation with the caretakers' behavior finally emerges. Rosa and Lena, by contrast, always correlate with their caretakers, and – again contrary to expectations – perfectivity numerically wins even at the earliest stages. Finally, Raffaello correlates with his caretakers at phase 2, but diverges again at phase 3 precisely where, surprisingly, imperfectivity prevails in the adults' speech. Thus, two out of the three Italian children, plus the Austrian child, do not show with activity verbs the alleged pervasiveness of the actionality/aspect interaction. In particular: (i) perfective uses may be remarkably large from the beginning (indeed, with Rosa and Lena they prevail); (ii) the input effect is evident throughout, instead of the predicted gradual convergence of CS towards the adults' model.

One objection that might be raised against this conclusion is the following. Should one collapse activity and stative verbs, as is routinely done, then the expected prediction would be fulfilled even in the present case. This is undoubtedly true, and precisely for the reason mentioned above, namely due to the sharply polarized behavior of stative as opposed to telic verbs. However, if (a)telicity were the feature responsible for this divergence, activity verbs should behave in the predicted way. As shown above, however, this is ostensibly not the case in the present corpus, and there is reason to surmise that the same might be observed in other cases as well if the appropriate analyses were carried out. There is thus no reason to assign the actionality component a leading role in ATAM-acquisition, at least as far as the languages under scrutiny are considered. As for the strong polarization of stative and telic verbs, this should best

¹¹ Except for Lena, the computations involving phase 1 were not reliable, for some CS cells had less than 5 observations. Thus, for the Italian children the statistical reasoning is only based on the distributions to be found in the last two phases.

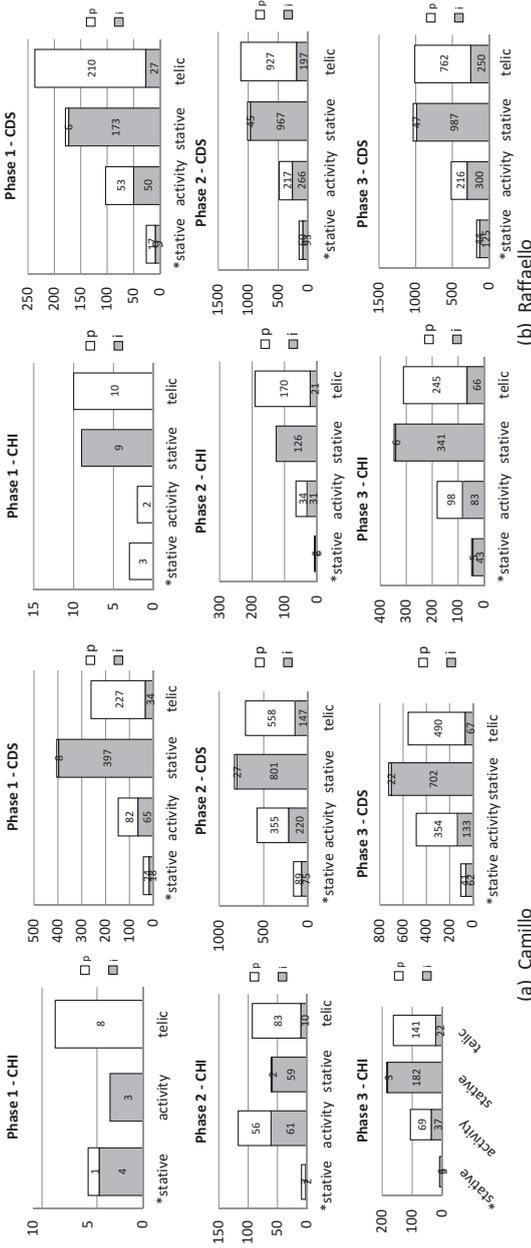


Figure 2: CS vs. CDS distribution of actional classes with respect to the perfective/imperfective opposition (p/i) in three developmental phases. Each frame has a different scale, due to the different number of observations; however, the relevant datum is the relative distribution of perfective vs. imperfective uses. In the case of Lena the comparison is between child and mother (rather than with CDS), since the mother virtually was the only interacting adult.

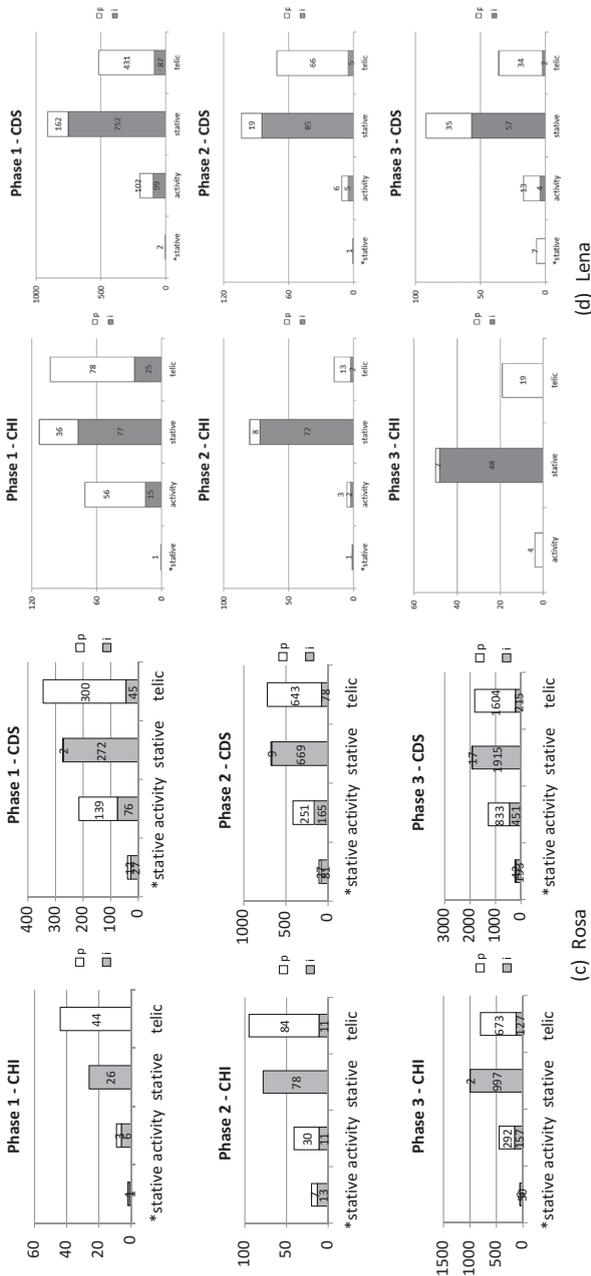


Figure 2: (continued)

be considered intrinsic to the very nature of these predicates, especially in the communicatively impoverished situations captured by child/adults interactions. Indeed, this polarization is also present in CDS.

5.2 Continuous modeling analysis

The traditional method of analysis, as described in the previous section, presents an obvious drawback, consisting in the fact that several recordings are lumped together into phases. As Stoll and Gries (2009) point out, however, this has two disadvantages: first, it severely misrepresents the data, by smoothing the actual child's behavior; second, it dramatically reduces the statistical information, by compressing it into very few data points. To circumvent this problem, Cramer's V was used to measure the association between the ATAM variables in each recording, thus allowing a continuous view of the child's development. Cramer's V stems from the χ^2 statistics according to the formula in (13), where n stands for the total number of observations, and k for the smallest among the number of rows and the number of columns in a contingency table. Its value spans from 0 to 1, respectively corresponding to the minimum and maximum association between the variables considered. Since the output is independent from sample size, this fits well with longitudinal recordings:

$$(13) \text{ Cramer's } V = \sqrt{\frac{\chi^2}{n(k-1)}}$$

As a first step, Cramer's V was used to measure the correlation between actionality and tense. For Italian, a 3-by-4 contingency table was build, with 3 actional values (stative, activity, and telic)¹² and 4 tense values (Imperative, Present, Imperfect, and Past-perfective [the last one merging Simple Past, Compound Past, Pluperfect, and the Bare Past Participle]).¹³ For German, a 3-by-3 contingency table was used, with the same 3 actional values as above and 3 tense values (Imperative, Present, and Past-perfective [merging Preterite, Perfekt, and

¹² The fourth category (*stative) had to be neglected due to scarcity of data in some cells.

¹³ The Bare Participle, often used by Italian children at the early stages of language acquisition, can be interpreted as an elliptic form, i.e., as the Compound Past with auxiliary deletion. One might object that it is not a fully-fledged grammatical device. However, its appearance does not normally antedate the first occurrences of the Compound Past; the two forms should thus be considered alternative realizations of the same tense, whose choice possibly depends on independent constraints, such as number of words in the utterance. Additional evidence stems from the variable realization, at the early stages, of the auxiliary also in nominal and adjectival predicates, ranging between: \emptyset , indistinct schwa, fully-fledged item.

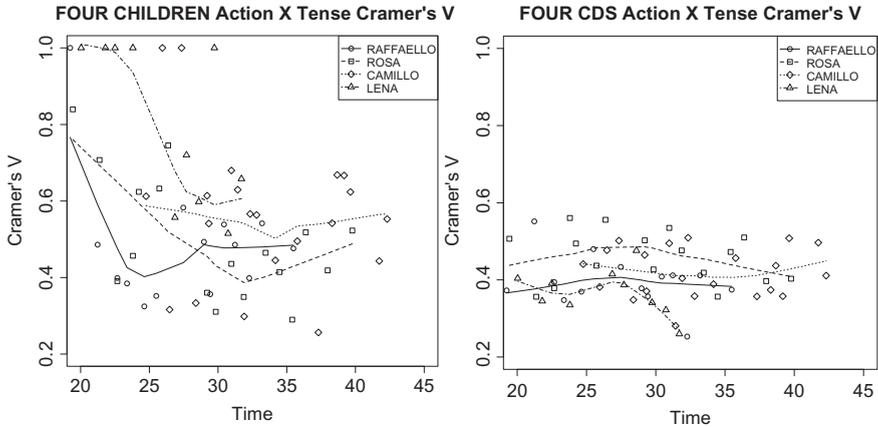


Figure 3: Association between actionality and tense as measured with Cramer's V in children (left) and adults (right).

Pluperfect]). For each child and the respective adults, the scatterplots in Figure 3 were generated, with recording time on the horizontal axis (with each data-point corresponding to a recording). The graphs also contain locally weighted linear regression lines, more suitable than standard linear regression to highlight developmental phases and changes. Three children – Raffaello, Rosa, and Lena – reveal markedly similar U-shaped curves, consisting of a first phase of strong correlation between actionality and tense, which then rapidly declines to grow again slightly at a later stage. Camillo shows instead a smoother progression, characterized by a weaker association between actional types and tense from the very beginning. These differences notwithstanding, the end phase of all children is strikingly similar, with correlation values approximating the adults' ones, which remain substantially stable throughout the recordings.

The correlation between actionality and aspect was also measured by means of Cramer's V . In this case, for both Italian and German a 3-by-2 contingency table was used, with the same 3 actional values and 2 aspectual values (perfective vs. imperfective). The association between these two variables is represented in Figure 4, with the children on the left and the adults on the right. Starting from the latter, we can again notice that actionality is stably associated with aspect, and much strongly than with tense. This is consistent with the well-known fact that perfective aspect is the prototypical viewpoint for telic events, just like imperfective aspect is for atelic events. As with tense, actionality-aspect associations in children mostly show a kind of U-shape. Cramer's V is higher at the beginning and then approaches the adults' behavior, albeit maintaining higher

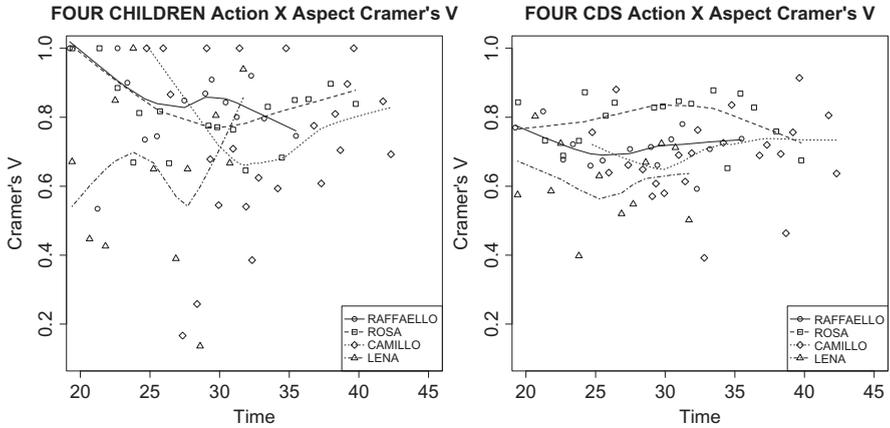


Figure 4: Association between actionality and aspect as measured with Cramer's V in children (left) and adults (right).

values. In this case, Lena is the outlier. Her association values are much lower at the outset and present a less smooth development. However, Lena's CDS also differ from the Italian caretakers, with lower correlations between actionality and aspect. This difference is likely related with the absence of overt aspectual marking in German, which weakens the aspect/actionality association, consistent with the claim that covert categories are more difficult to learn.

As already pointed out, the crucial datum of the traditional view relies on the assumption that atelic verbs strongly associate with imperfective situations, and telic verbs with perfective situations. However, Section 5.1 has provided reasons to call this into doubt. In order to obtain a continuous perspective of the evolution of the actionality/aspect association, one needs a more refined tool than Cramer's V , which cannot be applied in this case due to the binary nature of the aspect variable. If one wanted to examine, e.g., the behavior of stative verbs in perfective vs. imperfective contexts, Cramer's V would yield the same result in both cases. A viable alternative is offered by the *Pointwise Mutual Information* formula (PMI), commonly used to measure the association strength between words (Evert 2008). PMI indicates to what extent the observed joint frequency of two statistical events e_1 and e_2 departs from independence, as shown below:

$$(14) \quad PMI(e_1, e_2) = \log_2 \frac{p(e_1, e_2)}{p(e_1)p(e_2)}$$

PMI is computed as the logarithm of the ratio between the probability of observing the two events together, and the probability of observing one occurring

independently of the other. Positive PMI values indicate positive correlations between actional and aspectual categories, while negative PMI values indicate negative correlations, with \emptyset marking the lack of association. PMI can thus be used to measure the association strengths of the individual actional types with aspect.¹⁴

Figures 5(a) and 5(b) report the values for the children and the respective caretakers along the time axis. The continuous and dashed lines represent the child's locally weighted linear regressions, expressing the association between a given actionality type and, respectively, the imperfective (i) and perfective (p) aspect. The remaining two regression lines relate to the CDS. Shorter lines mean that a particular actional-aspectual pair was only attested in a subset of the recordings.

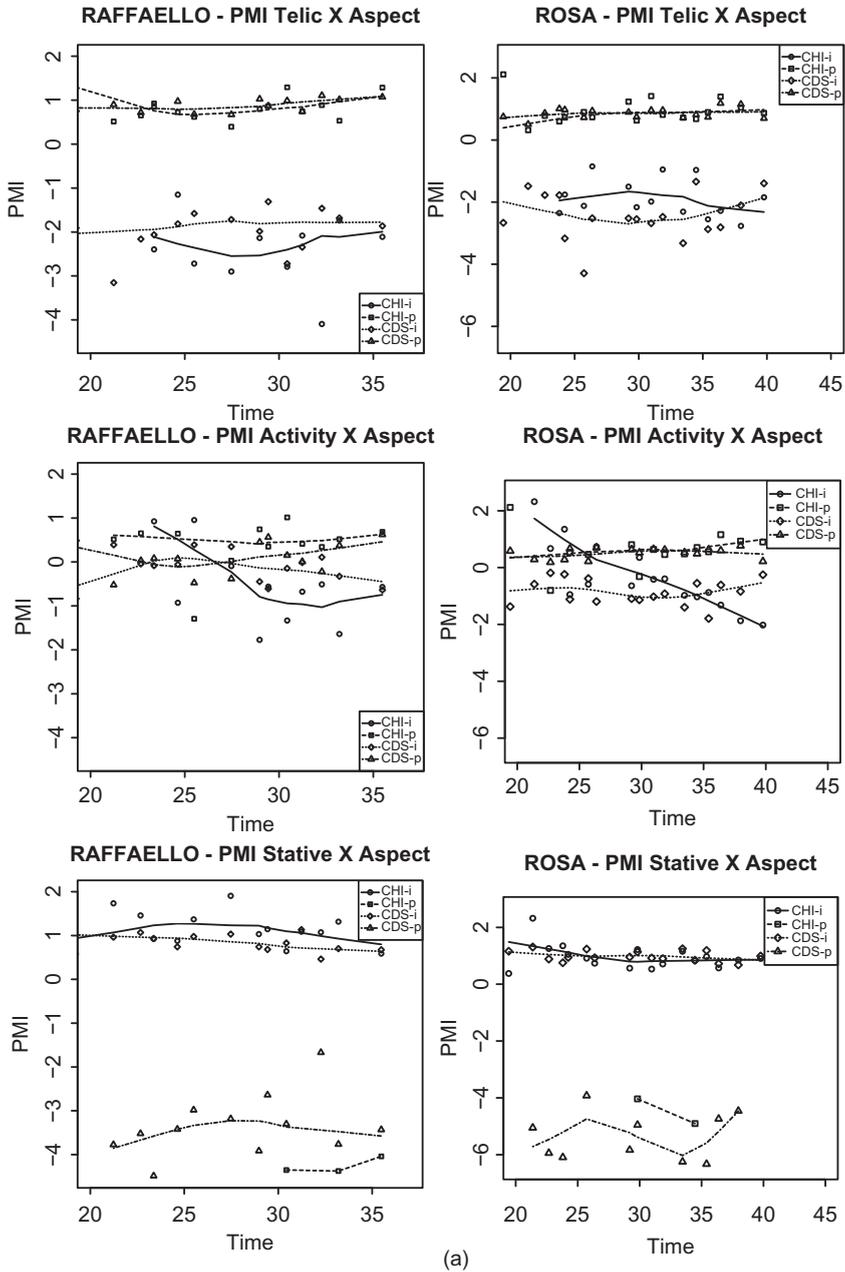
As expected, stative verbs present strongly polarized association scores overall, i.e., positive PMI with imperfective aspect, negative PMI with perfective aspect. The situation for telic verbs is symmetric: positive PMI with perfective aspect, negative PMI with imperfective aspect. Individual variation concerns the magnitude of such polarization, with Raffaello and Rosa showing more extreme values than the other two children with respect to stative verbs. The behavior of telic and stative verbs confirms therefore the prototypical associations reported in the literature. Activities present, however, a more complex and (as seen from the traditional view) unexpected picture: with all children, the PMI data for perfective and imperfective aspect do not show any polarization at all, with values close to 0 indicating a situation of substantial ambivalence.

One can thus conclude that the activity verbs behavior does not conform to the actionality/aspect associations traditionally assumed as triggers of ATAM-acquisition. If atelicity were the key feature initially associated with imperfectivity, activities should behave like statives. Another striking fact in the PMI plots is the strong correlation between children and adults: all tendencies described above for the learners closely mimic those observed in CDS.

5.3 Tense markers and temporal adverbs

The issue addressed in this section can be summarized as follows: What is the relative timing of cognitive maturation and morphology acquisition? There are three conceivable answers: (A) Cognitive maturation comes first; (B) Morphological maturation accompanies cognitive maturation; (C) Either (A) or (B), depending on

¹⁴ The association actionality/tense was not computed because of data sparseness with some tenses.



(a)

Figure 5(a): Actuality x aspect PMI values in Raffaello (left) and Rosa (right). From top to bottom: telic verbs, activities, statives.

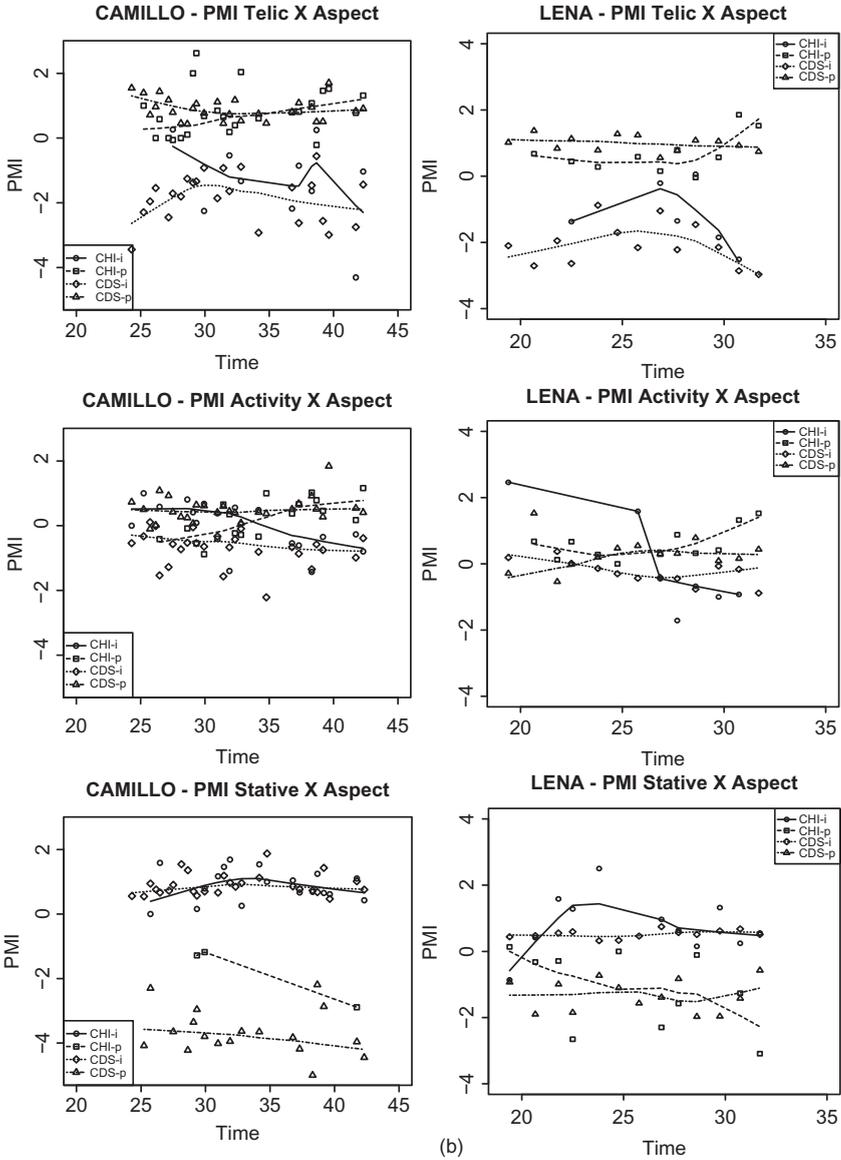


Figure 5(b): Actuality x aspect PMI values in Camillo (left) and Lena (right). From top to bottom: telic verbs, activities, statives.

the specific ATAM component. Needless to say, cognitive maturation might be manifested in non-linguistic ways. However, as far as temporality is concerned, a hint in favor of hypothesis (A) might derive from assessing an initial stage in which children only exploit temporal adverbs in order to localize the events in time, or possibly the past- and future-oriented uses of the Present as a substitute for the poorly mastered tense affixes.

The behavior of the four children was analytically described in Bertinetto et al. (2008) and Freiberger (2008), and summarized in Bertinetto (2012). Tables 5(a)–5(b) recapitulate the data. The first white cell in each column indicates the time of first consistent appearance of the given marker. Some columns have light-grey areas indicating that, according to a more generous criterion, the time of appearance could be anticipated. For instance, Raffaello's first future-referring adverb emerged at 2;1 (cf. Table 5(a)). However, since this child did not use any other such adverb until 2;7, one may wonder whether the first absolute occurrence should be taken at face value. Table 2 reports the number of temporal adverbs in the successive recordings, showing a remarkable discrepancy between Italian and German speakers, due to frequent use of *da* in CS and CDS.

Considering temporality, past-referring adverbs lack completely in Raffaello and Lena, while they appear relatively late in Camillo and Rosa. The past-oriented use of the Present preceded the appearance of the Past-perfective only with Rosa (by 3 months) and Lena (by 6 months) (in Lena's case, past-oriented Infinitive); with Raffaello and Camillo the two devices emerged at the same time. It is worth observing that the Compound Past (or the Bare Participle, see Footnote 13) was virtually the only Past-perfective used by the three Italian children, excepting two Simple Pasts produced in a narrative context by Camillo at 3;2. Explicit morphological contrasts in the temporality domain appeared early in the Italian children – with the emergence of the first Present vs. Past opposition – a bit later in Lena's productions. Thus, as far as the past subdomain is concerned, there is little or no evidence – contrary to hypothesis (A) – that cognitive maturation antedates morphosyntactic competence. Indeed, past-referring adverbs definitely followed the emergence of the first Past tenses, while the past-oriented use of the Present preceded the first Past tense occurrences in only two children and by a short time-span. Most importantly, the latter use belonged to the caretakers' behavior as well, and therefore cannot be regarded as an exclusive feature of the child's emerging grammar. As for Lena, the first Simple and Compound Past appeared at age 2;6. One month later, the first Pluperfect was observed. Until that time, Lena sporadically employed root Infinitives in past-referring contexts, although she mostly used them, from very early on, in both present- and future-referring contexts.

Table 5a: Acquisition time of lexical and morphological devices for past- and future-time-reference.

Age	past-referring adverbs	fut.-referring adverbs	past-oriented Present	fut.-oriented Present	Compound Past (past-perfective)	Imperfect (past-imperfective)	2-member tense mini-paradigms
Camillo							
2;1							
2;2				+			
2;3			+		+		(+)
2;4							
2;5		+					
2;6							
2;7	+						+
2;8						+	
2;9							
2;10							
2;11							
3;0							
3;1							
Raffaello							
1;7							
1;9							
1;10				+			
1;11			+		+		+
2;0						+	
2;1		(+)					
2;2							
2;3							
2;4							
2;5							
2;6							
2;7		+					
Rosa							
1;7			+				
1;9							
1;10				+	+		(+)
1;11							+
2;0							
2;1							
2;2		+					
2;3							
2;4							
2;5							
2;6							
2;7						+	
2;8							
2;9							
2;10	+						

Table 5b: Acquisition time of lexical and morphological devices for past- and future-time-reference.

Age	past-referring adverbs	fut.-referring adverbs	fut.-oriented Present	past-oriented Infinitive	fut.-oriented Infinitive	Compound Past	Simple Past	Plu-perfect	2-member tense mini-paradigms
Lena									
1;7									
1;8									
1;9									
1;10									
1;11					(+)				
2;0									
2;1			(+)						
2;2		+							
2;3			+						
2;4									
2;5									
2;6						+	+		
2;7								+	+

Reference to future definitely preceded the appearance of the Future tenses, which were never used by the four children within the recording period. The future-oriented use of the Present emerged very early with Raffaello and Rosa, slightly less so with Camillo and Lena. As for future-referring adverbs, they appeared after the future-oriented Present: one month later with Lena, three with Camillo, four with Rosa, nine with Raffaello. Thus, they were in most cases acquired relatively early. The divergence of the future- and past-subdomains raises an interesting problem. To understand this difference, one should best consider the distribution of Past and Future tenses in the CDS of the Italian children, as shown in Table 6. As it happens, the input offered to the children

Table 6: Past- and Future-tenses in the CDS of the four children.

Tense	Camillo	Raffaello	Rosa	Lena
Compound Past	562	468	861	92
Imperfect	239	514	183	–
Simple Past (Präteritum)	22	0	0	57
(Simple) Future	50	45	8	25
Compound Future	2	4	1	–
% of Future vis-à-vis Past	6.3%	5%	0.9%	14.4%

contains very few examples of Futures in comparison to Pasts. It is no wonder, then, that the children were so slow in learning this morphosyntactic device. Note however that, rather than suggesting a universal cognitive constraint, this merely depends on the languages considered. In Hebrew, L1 learners are very fast in acquiring the Future (Spharim and Nunio 2008), since this tense is used in negative imperative sentences, which form a large portion of CDS. But apart from the peculiarities of Hebrew, it has been pointed out that even American English and Polish children begin to use the Future tense from very early on (Weist et al. 2004; Valian 2006). Unpublished data stemming from the acquisition of Mòoré (a Gur language mostly spoken in Burkina Faso) confirm that the Future may appear very early, due to its morphologically simple structure.¹⁵

As for aspect, the following observations are in order (Lena does not count here, for German has no overt perfective vs. imperfective opposition). First, the imperfective vs. perfective uses of the Present are not overtly distinguishable. The appearance of the Present Progressive would offer explicit evidence, but this morphological tool is seldom used in Italian. Raffaello was the only child to produce some occurrences of this construction, starting at 2;6. Second, the first occurrences of the Past-perfective emerged simultaneously (Rosa: 1;10) or one month later (Raffaello: 1;11; Camillo: 2;3) than the future-oriented – implicitly perfective – usage of the Present. This suggests that the notion of aspect might have been latently possessed at that stage, at least as far as perfectivity is concerned. However, the final evidence that aspect was mastered at the morphosyntactic level stems from the appearance of the Imperfect, which yields an explicit contrast with Past-perfective tenses. This emerged very early with Raffaello (2;0); with Rosa and Camillo, by contrast, the Imperfect appeared much later (respectively, 2;6 and 2;8). Hence, contrary to the aspect priority view, there is ground to conclude that, in a substantially temporality-prominent language like Italian, temporality is mastered at the same time as aspect (Raffaello) or even at an earlier stage (Camillo and Rosa). This confirms the results of the previous two sections.¹⁶

¹⁵ The data on Mòoré acquisition stem from a recently defended PhD dissertation, and will soon be the topic of a contribution by Clémentine Pacmogda, Pier Marco Bertinetto, and Alessandro Lenci.

¹⁶ According to van Hout (2008), Italian children apparently have a reduced capacity, as compared with Dutch and Polish children, to understand the meaning of the Past-perfective combination. However, her study suffers from an obvious methodological flaw (pointed out by the author herself, p. 1757), since the Italian subjects were tested with a completely different experimental procedure. Besides, the procedure used with the Dutch and Polish children produced implausible results in the supposedly imperfective contexts. Thus, although the theoretical position proposed in the present paper shares some affinity with van Hout's approach, the empirical results presented by her appear to be of little use.

With reference to the alternatives put forth at the beginning in the present section, hypothesis (A) – claiming that cognitive maturation precedes the emergence of morphosyntactic competence – must be rejected. Since the available data do not support the choice between hypotheses (B) and (C), the latter will be provisionally retained due to its cautious formulation.

5.4 Lexical and morphological spurt

This section addresses the relative timing of the lexical and morphological spurt. Not all authors endorse the existence of the former event, and indeed things vary from child to child. To the extent that this occurs, the claim often put forth – supported by connectionist simulations – is that grammatical capacities undergo rapid acceleration as soon as the dimension of the lexicon reaches a given threshold. Marchman and Bates (1994) detected a clear correlation, for a group of English children, between the respective points of non-linear expansion of the verbal lexicon and of Past tense morphology. Similar observations were put forth by Bassano et al. (2004) for French and Austrian German children.

The issue will be considered here in relation to the acquisition of the Past tenses. The measure adopted is the *Verb expansion rate* (V-Rate), expressed – at any observation time – by the formula in (15), where V_{t_i} and N_{t_i} are, respectively, the number of verb- and noun-types cumulatively produced by the child in the recordings from t_1 to t_i , while $V_{t_{i+1}} - V_{t_i}$ and $N_{t_{i+1}} - N_{t_i}$ indicate the number of new verb- and noun-types produced by the child in recording t_{i+1} :

$$(15) \frac{V_{t_{i+1}} - V_{t_i}}{N_{t_{i+1}} - N_{t_i}}$$

This formula, which compares the incremental rate of verbs with respect to nouns throughout the observation period, has the advantage of neutralizing the recording size problem, thus avoiding undesirable distortions. Although the values are constantly lower than 1 – indicating that the child is learning, as a whole, more nouns than verbs – one can spot periods of sudden expansion of the verb lexemes, as shown by a rising slope.

The four children present individual differences in V-rate evolution, but also a common tendency (cf. Figures 6(a)–6(d)). This consists in the presence of a phase of V-spurt, mostly followed by a more stationary phase. The individual differences concern the exact time location of the spurt phase, which varies from child to child, as well as the abruptness of the verb-growth acceleration, which appears to be rather weak in Rosa. However, even in Rosa's case there is a notable acceleration in the cumulative verb vocabulary growth, for – precisely in

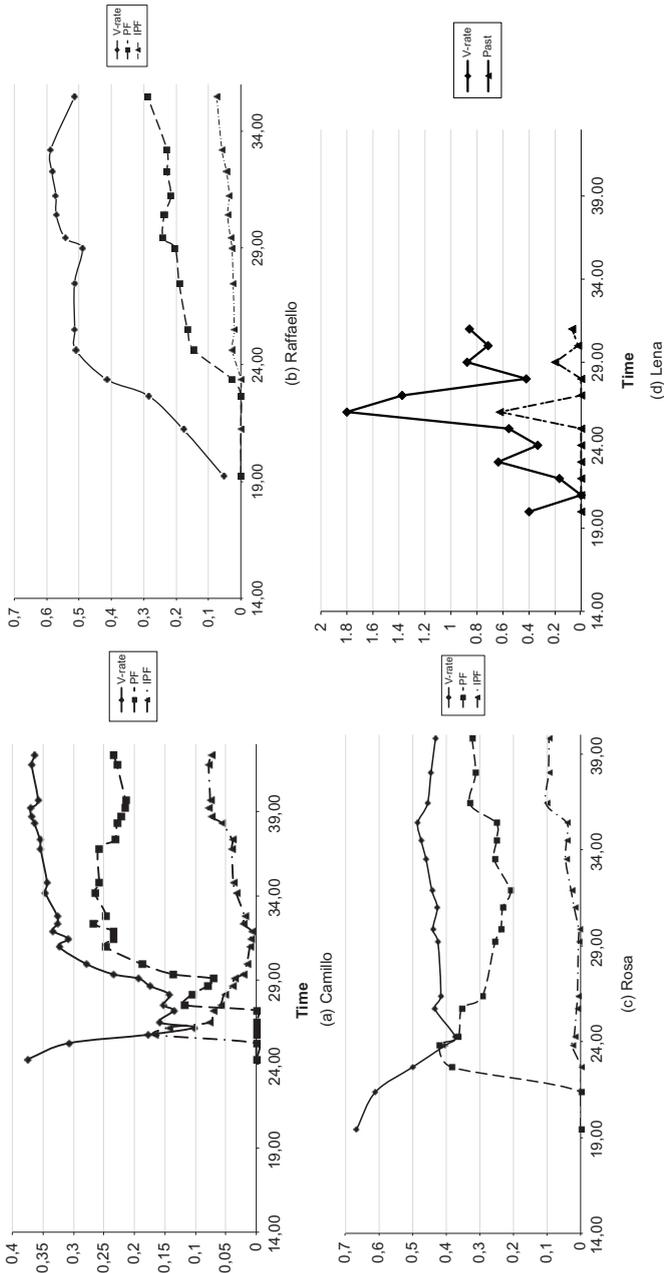


Figure 6: V-rate and Past tense expansion (PF = Past-perfective, i.e., Compound Past plus Bare Past Participle; IPF = Past-imperfective, i.e., Imperfect). In the case of Lena, no aspectual distinction is attached to the Past tense.

coincidence with this admittedly mild V-spurt – she jumps from 21 verbs towards the end of her 23rd month to 70 verbs at the beginning of the 29th month. For comparison, in the critical period Camillo jumps from 14 to 64 and Raffaello from 16 to 71. Since our verb-expansion measure is based on the V/N ratio, it follows that within that same period Rosa is also learning many new Ns, which yields a smoothed V-spurt curve. The aim of the present discussion, at any rate, is not to claim that the V-spurt phenomenon has universal validity, but rather to highlight the temporal correlation, in the four children at stake, between the observed V-spurt and the emergence of grammatical competence. The latter can be measured by the use of Past tenses, demonstrating the acquisition of a productive morphological contrast within the temporality component (Past vs. Present). The crucial observation is that the V-spurt is followed, at a very short delay, by a noticeable increase in Past tense usage, showing that attainment of a critical mass of lexical items is a precondition to the productive use of grammatical exponents. In the Italian children, this is best observed (cf. Figures 6(a)–6(c)) with the Past-perfective curve (Compound Past and Bare Participle), because the number of Imperfects is relatively small, even in the case of a precocious learner such as Raffaello.

One objection could be raised against this conclusion. Since the verb-spurt leads to a sharp increase in Past tense usage, one might surmise that most new verbs entering the lexicon in the spurt-phase are assigned Past inflection, thus suggesting rote-learning rather than morphological competence. To shed light on this issue, one can inspect the emergence of tense mini-paradigms based on individual verbs within a single recording. Such mini-paradigms do not only consist of the contrast Present vs. Past: early mini-paradigms may contain, besides the Present, the Imperative, and the Infinitive (see also Footnote 10 on negative Imperative). As Tables 5(a)–5(b) show, with Raffaello there is tight coincidence of the first appearance of Past-perfective forms and of 2-member mini-paradigms. With Lena and Rosa the emergence of mini-paradigms is delayed by one month. The only child showing a sizeable delay (four months) is Camillo. Thus, altogether, the Past-tense-spurt is fairly good evidence of the first manifestations of morphological productivity. This claim is further strengthened if one conceives of mini-paradigms in a larger sense, namely as composed not only of different tenses, but of different forms in general (as distinguished by person and number, in addition to tense). Indeed, producing different person/number forms is antagonist to rote-learning. The behavior of the three Italian children is revealing: with Rosa, the first person/number mini-paradigms emerged simultaneously with the first instances of Past-perfectives; with Raffaello and (most importantly) Camillo they emerged one month earlier. With Lena, the first person-number mini-paradigm emerged together with the first Imperatives. Thus, the conclusion

suggested above, concerning morphological maturation, is definitely supported: the first evidence of tense and person productive usage emerged together.

The above data confirm the existence of a correlation between lexical and morphological spurt. Apparently, the learning child needs to accumulate a sufficiently large amount of lexemes for the morphological component to gain momentum. Most importantly, the ATAM morphological spurt seems to occur fairly early, showing that children are soon able to detect, and take advantage of, the most salient morphological contrasts available in the input.

6 Discussion

6.1 Summary of the results

This section will present a short summary of the results, with special reference to the following topics: (i) actionality-aspect association; (ii) proper interpretation of the aspect-tense relationship; (iii) lexical spurt issue.

As for the alleged association between actionality and aspect, two main conclusions suggest themselves. First, the traditional view, claiming a strong correlation between telicity and perfectivity on the one side, and atelicity and imperfectivity on the other side, can only be supported if activities and statives are lumped together within the category of atelic predicates. This, however, is merely due to the strong polarization of stative verbs, which parallels the symmetric polarization of telic verbs. Thus, it does not depend on the telicity feature as such, for otherwise statives and activities should behave in the same way. Second, our data do not support the strong version of the prototype hypothesis, according to which children start up with a sharply divergent behavior with respect to the adults' target. In most cases, we found that our children were strongly affected by the input they were exposed to, which also accounted for most of their individual differences. Altogether, our results are perfectly compatible with a typologically-oriented view, whereby the morphological shape of the target language plays a major role.

With regard to the aspect-tense relation, the analysis proposed here assumed no preconceived association. Taking for granted that some tenses are aspectually ambiguous, we analyzed each form according to the actual context. The alternative would have been to ignore all tenses that do not convey an unambiguous aspectual meaning, such as the Present in both Italian and German. This, however, would have depleted our source of data of much of its content, considering the pervasive use of this tense not only by children, but

also by their caretakers. Indeed, the aspectual ambivalence of the Present is a pervasive feature of most languages. It is worth noting that the proper assessment of the aspect-tense relationship has an obvious impact on the actionality-aspect relation itself, since aspect takes part in both. Should one assign pre-determined aspectual values to all tenses, the actionality-aspect relation would turn out to collapse with the actionality-tense one, which hardly makes sense, for tense and aspect are distinct categories.

Concerning the lexical spurt issue, the data in Section 5.4 indicate that children can present a notable V-spurt at an early stage of their linguistic development. Interestingly, the lexical spurt preceded by a very short delay the first uses of the Past tenses, thus showing that the availability of a sufficiently large vocabulary is a precondition for the first manifestations of the morphological productivity. Actually, the study of Finnish acquisition by Stolt et al. (2009) has pointed out a sharp difference between the acquisition of nominal vs. verbal inflections as a function of lexicon growth. Case inflections had a sudden growth with a lexicon size of roughly 50 to 250 words, whereas verb inflectional types were steadily acquired right from the beginning. As the authors (2009: 796) claim, “the growth of the case form types occurred in a more non-linear manner than verb inflectional types, which were clearly acquired linearly”. This suggests, once again, that different morphological structures may yield significant differences in the learning strategy used by children. As it happens, the nominal morphology of Finnish, with its many cases (up to 15 according to certain grammatical accounts) and the various inflectional classes, poses a harder challenge to the learner than the comparatively simpler verbal endings. By contrast, in Italian the situation is reversed, with more morphological complexity in the verbal than in the nominal compartment. This might suggest that the morphological subcomponent which best synchronizes with the lexical growth is the one that presents the highest degree of complexity. Possibly, children – as opposed to adult L2 learners – are positively activated by this factor.

Serrat et al. (2012) have examined the lexical spurt issue in relation to the maturation of some relevant syntactic indicators. They observed that Spanish and Catalan children learn the productive use of negation before the burst of verb morphology productivity. This follows a preliminary phase in which learners do not master the negation related word order. With this in mind, the behavior of the four children used for the present study was inspected in relation to the following parameters: (i) appearance of syntactic negation; (ii) learning of the correct word order. The Italian children data show that, after a period in which the negative adverb *no* was used as either adverbial *no* ‘no’ or syntactic *non* ‘not’, the syntactic negation *non* began to appear sentence-internally in pre-

verbal position, with no word order errors. This occurred simultaneously or shortly after the verb spurt and the emergence of the first two-member paradigms: at 1;11 with Raffaello and Rosa, at 2;5 with Camillo. In Lena's speech, syntactic negation appeared at the age of 1;11. However, until 2;6 the negation particle *nicht* 'not' was used in the wrong word order. From 2;7 onwards, when she began to exhibit tense mini-paradigms, Lena mastered the negation-related word order. Thus, with all children the productive use of negation began almost simultaneously with the first evidence of verb morphology productivity.

6.2 Degrees of formal complexity

The data in Section 5 show that the verbal paradigm of any language does not only consist of semantic category contrasts, but of a morphological substance whose structuring has a heavy impact on the learning process. Conjugations may be regular or (more or less) irregular. Besides, the conjugation pattern of a given tense may be more or less complex depending on various formal details: e.g., analytic tenses usually follow a more transparent formal pattern than synthetic ones and are thus easier to learn. This section will discuss the topic of morphological complexity with respect to the specific language varieties offered as target.

The three Italian children were recorded in the area of Pisa, in central Italy. The Pisa variety is close to what is traditionally called Standard Italian, in which the Simple Past competes with the Compound Past, although the respective delimitation is a matter of probabilistic, rather than deterministic choice (Bertinetto and Squartini 1996). However, in the CS of the present corpus the proportion of Compound vs. Simple Past is definitely skewed towards the former (Camillo: 60/2; Raffaello: 72/0; Rosa: 86/0) and this is also to be found in the CDS data: Camillo 336/22, Raffaello 398/0, Rosa 631/0. This might in part be due to the adults' effort to facilitate the learning task by using a less complex form, but it most probably depends on the specific type of verbal interaction, mostly focused on the personal/deictic sphere of experience, which is a fairly robust predictor of Compound Past usage in Standard Italian. Thus, although the three children were offered some amount of Simple Pasts in the input (which must have been the case even for Raffaello and Rosa, over and above the actual recorded input), they refrained from using this tense due to: (i) lack of statistical salience, (ii) higher inflectional complexity. Admittedly, the Perfective Participle used in the compound tenses (cf. Table 1) may also be irregular, particularly so with high-frequency verbs (e.g., *mettere* 'to put', *messo* 'put-PTCP'; *leggere* 'to read', *letto* 'read'-PTCP). In addition, the Participle often has to agree in gender and number

with either the subject or the object, just as adjectives agree with the noun head. In fact, some Participles are even homophonous with the corresponding adjective (e.g., *rompere* ‘to break’, *rotto* ‘broken-PTCP/ADJ’). However, the inflectional complexity of the Simple Past – as contrasted with the Compound Past – is definitely higher, considering that: (i) each person/number has different inflectional endings; (ii) the latter depend on the conjugational paradigm; (iii) irregular verbs typically present an unpredictable shape, which often extends to the inflectional endings themselves. It is thus obvious that children find the Compound Past much easier to learn, since – apart from the shape of the Participle and the gender/number agreement rule – they only have to learn the inflectional paradigm of the two auxiliaries (*essere* ‘to be’ and *avere* ‘to have’).

No doubt, the person inflection paradigm is a stumble stone in the acquisition of Italian finite tenses, including the Present or the Imperative, which belong to the very early child repertoire. As a matter of fact, all children produced errors with sub-regular verbs during the whole observation period, due to the morpho-phonological intricacies involved: e.g., *le[dʒ:]o* instead of *le[g:]o* ‘I read’, on the analogy with *le[dʒ:]i* ‘you read’ (see Dressler and Laaha 2012 on analogical hypercorrections). However, as far as person affixes are concerned, the three Italian children started to contrast them within two-member verb paradigms from fairly early on. The first oppositions concerned 1SG vs. 2/3SG of the Present tense and expanded later on to three- and four-member paradigms as soon as the number of verb lemmas and tokens had significantly increased. It was in this period that a few person and number errors appeared in the data.¹⁷ There were three person errors in Camillo and one in Rosa. Camillo used 3SG instead of 1SG of the auxiliary *essere* ‘to be’ of a Compound Past, while Rosa used 1SG instead of 3SG in the Present tense of *cascare* ‘fall down’. From then onward, all children mastered the person category, as witnessed by the emergence of personal pronouns and the augmented number of person paradigms. As for number, the three children only made one type of error, i.e., 3SG for 3PL in both Present and Past tenses. While Camillo and Raffaello only made one such error and seemed to master the number category very soon, Rosa (sporadically) persisted until the end of the observation period. Considering the overall limited number of person/number mistakes, one can claim that the reason why the Italian children avoided the Simple Past does not depend on this inflectional category as such, but rather on the very difficulty of the Simple Past’s inflectional paradigm. The Compound Past, abundantly provided in the input and much easier to learn, offered itself as an easy alternative. Besides, at the initial stage Italian children have at their

¹⁷ Minor phonetic errors in the root were neglected, provided the morphological endings were clearly identifiable.

disposal a further facilitating strategy, consisting in suppressing the auxiliary. This elliptical form does not belong to the repertoire of adult speakers, but may be considered an early substitute of the Compound Past. Indeed, both elliptical and fully-fledged Compound Pasts appeared at essentially the same time in the three children.

To sum up, the three Italian children were presumably driven by a least effort strategy in the choice of the Past-perfective form. This choice was corroborated by the higher input frequency of the Compound Past as contrasted with the Simple Past. The three children were nevertheless able to acquire a relatively early competence of the person/number inflectional category.

The Austrian German variety learned by Lena is the colloquial Viennese standard, close to Standard Austrian German. With respect to actionality, one might assume that particle verbs might complicate the acquisition, due to the prefix separability in finite forms. However, from the first recording on (age: 1;7), Lena used verbal particles as substitutes for telic verbs. This behavior has been repeatedly observed in German-learning children. The first particle verb appeared at 2;1. One month later, a particle verb was used both alone and together with the particle in the same recording and even in the same context, suggesting that the child was aware of the semantic contribution of the particle. Two months later, particle verbs steeply increased. Why do particles occur so early in German CS? One reason is that they are overt means to mark telicity. But most of all, they are frequent in the input, always stressed, and tend to occur in utterance-final position. Their prosodic and positional salience makes them an easy target.

7 Concluding remarks

This paper presented new data on ATAM acquisition, stemming from Italian and Austrian German children. Instead of assuming a universally-valid acquisition path, based on the alleged aspect priority, the present model is based on a typologically-oriented and morphology-sensitive approach, whereby the triggering role may be played by any of the major ATAM components, depending of the individual language structure. According to this view, temporality-prominent languages like Italian and German – i.e., languages which first and foremost provide overt marking of the past/present/future contrast – offer temporality contrasts as the most solid support to the category-disentangling task to be performed by learners. In addition, Italian also offers the learning child some explicit evidence of the perfective vs. imperfective aspectual contrast, although limited to the past-domain. Once the acquisition process is completed, all major

categories are active in the speaker's competence, despite their varying degrees of explicitness. Thus, for the mature speaker some categories might be fully developed (possibly up to the most detailed and typologically rare degree of specification), due to the morphological explicitness of the language. The latent categories, by contrast, are predicted to take longer in the learning process and often establish a parasitic relationship with the explicit categories.

This hypothesis needs to be checked against a wide range of languages with the most diverse characteristics: temporality-dominant, aspect-dominant etc. (including various combinations of these ideal types). Regrettably, the presently available literature does not offer any study of the acquisition of a radically mood-prominent language. Hopefully, converging results will stem from future work. In particular, data from Mòoré (Gur, Niger-Congo) and Croatian will be presented by some of the present authors and further collaborators in a work in preparation. The latter languages provide an interesting test for the present theory, inasmuch as they are, respectively, aspect-prominent (Mòoré) and actionality-prominent (Croatian). This allows the formulation of specifically targeted predictions concerning the acquisition strategy, obviously taking into account the degree of formal complexity presented by the verbal paradigm of each language.

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