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Abstract   The paper proposes a semantic analysis of Italian imperfective sentences which uniformly accounts for their habitual and progressive readings. Bare imperfectives with singular indefinites in object position are considered, and the observation is made that singular indefinites systematically give rise to "same object" (SO) effects in these contexts, sometimes making the containing sentence odd on a habitual interpretation. It is further noted that SO effects are absent if a Q-adverb occurs in the sentence, showing that singular indefinites can distribute over Q-adverbs, while there is no underlying generic quantifier over which singular indefinites can distribute. These observations are taken to motivate a non-quantificational account of imperfective habituals, based on a semantic analysis of verbs in terms of plural events (Kratzer 2008) and a modal/temporal analysis of imperfective aspect as a forward-expanding operator in a branching time model (Deo 2010). On the proposed account, the repetition involved in habituals does not depend on any underlying quantifier but uniquely comes from verbal plurality.

Keywords Imperfectivity · Habituality · Event plurality · Adverbs of quantification · Indefinites · Same-object effect · Progressive · Branching Time

1.   Introduction

This paper is about the meaning of imperfective sentences in Italian. The focus is on sentences in the imperfect of indicative mood (Imperfetto), but everything I'll say about my target sentences holds of the corresponding sentences in the Italian simple present.[1] A general semantic feature of sentences in the Imperfetto is that they require a temporal anchoring: a reference time has to be given, either explicitly through a sentence-initial time adverb, or implicitly through discourse salience, in order for the sentence to be interpreted. An important property of such sentences is

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[1] The Perifrasi Progressiva, an aspectual form which is specialized for the expression of progressive readings, will not be considered in this paper.

that, in general, they can have both habitual (HAB) and progressive (PROG) readings, in correlation with whether temporal anchoring is to a large or to a small reference time (Bertinetto 1986). This is shown by (1):[2]

(1)   (In quel periodo / In quel momento) Gianni leggeva il giornale.

        In that period / In that moment Gianni read (Imp, 3sg) the newspaper

        '(During that period) Gianni used to read the newspaper.'   [HAB]

        '(At that moment) Gianni was reading the newspaper.'   [PROG]

Special attention will be paid to imperfective sentences with no adverbs of quantification or *when*-clauses (hereafter, 'bare imperfectives'), uttered with a neutral intonation, and containing a singular indefinite in object position, as in (2a,b):

(2)   a.   (In quel periodo / In quel momento) Gianni guidava un'auto sportiva.

             In that period / In that moment Gianni drive(Imp, 3sg) a car sports

             '(During that period) Gianni used to drive a sports car.'

             '(At that moment) Gianni was driving a sports car.'

        b.   (In quel periodo / In quel momento) Gianni leggeva un libro di filosofia.

             In that period / In that moment Gianni read(Imp, 3sg) a book of philosophy

             '#(During that period) Gianni used to read a philosophy book.'[3]

             '(At that moment) Gianni was reading a philosophy book.'

Sentences (2a,b) differ from one another with respect to their acceptability on the HAB reading. For (2a) HAB is as good as PROG, and the sentence is perfect on both readings. Sentence (2b), however, strongly prefers PROG; to the extent (2b) is acceptable on HAB, it implies that during the relevant past period Gianni used to read the same philosophy book over and over. The same effect is observed in (2a): on HAB, the sentence implies that Gianni used to drive the same sports car at the time considered.

This implication that (2a,b) have on their HAB reading I shall call *same-object effect* (SOE).[4] Singular indefinites trigger SOEs also when they undergo a kind-reading, as in (3):

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[2] I'll often prepose the time adverbials *in quel periodo* 'at that time' and *in quel momento* 'at that moment' in parentheses, to emphasize the need of a temporal anchor (a reference time interval of larger or smaller size) for the temporal interpretation of the imperfective sentence.
[3] The diacritic '#' is used to indicate oddness of a sentence with respect to a certain reading. For example, I prepose '#' to the first gloss of (2b) to indicate that sentence (2b) is odd on the habitual reading.

(3)   (In quel periodo) Gianni fumava un sigaro toscano (il Toscanello).

        In that period Gianni smoke(Imp, 3sg) a cigar tuscan the Toscanello

        '(During that period) Gianni used to smoke a kind of tuscan cigar (the Toscanello).'

Sentence (3) is good on a HAB interpretation, which can be paraphrased as 'Gianni used to smoke a certain *kind of* tuscan cigar'. This paraphrase makes it clear that a SOE is present in (3) as well, though it is sameness of a kind of cigar which is involved, not of an individual cigar (I'll say that [3] has a kind-level SOE).[5]

        Sentences (2a,b) will be compared on the one hand with minimally different sentences modified by adverbs of quantification (Q-adverbs), and on the other hand with minimally different sentences featuring bare plural objects. It will be observed that neither their adverbially quantified counterparts nor their bare plural counterparts exhibit SOEs, moreover such counterparts are all perfect on HAB, unlike (2b). This observation will play a crucial role in motivating a non-quantificational, plurality-based analysis of HAB readings of bare imperfectives.

        The structure of the paper is as follows. Section 2 presents a quantificational analysis of habituals which posits a covert generic quantifier **GEN** with similar properties as the Q-adverb *always*. This analysis is shown to face empirical difficulties: it cannot account for the asymmetric distribution of SOEs across bare imperfectives with singular indefinite objects and their adverbially quantified counterparts, unless one makes some stipulative assumptions concerning the scope interactions between indefinites and **GEN**. In section 3 I look at the interpretation of bare imperfectives with bare plural objects and "kind coerced" singular indefinite objects. In section 4 I present a branching time model based on Kratzerian situations. Also, I introduce an event model with plural events, along with a lattice structure for individuals, as in Krifka (1998). On the background of this mixed model, semantic analyses of verb predicates and of the imperfective feature IMPF are provided, based on the following central claims: (C1) verbs can inherently refer to pluralities of singular events (Kratzer's 2008 Lexical

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[4] The implication that I call *same-object effect* is discussed by Cabredo Hofherr in her contribution to this volume. It was previously observed by other researchers, e.g. Ferreira (2005), Spector (2003), Bosveld-de Smet (1998). As remarked by an anonimous reviewer, this kind of implication is far from being restricted to the particular contexts I examine here, i.e. habitual imperfectives, but is a more general effect that singular indefinites trigger in other constructions involving repetition of events, e.g. frequentative sentences (see van Geenhoven 2004).

[5] If the indefinite object in (3) were not coerced to a kind-reading, the sentence would be unacceptable on HAB. In this case, the sentence would have the weird implication that there was an individual cigar that Gianni repeatedly smoked.

Cumulativity Hypothesis); (C2) IMPF contributes a forward-expansion of the reference time in the branching time model (Deo 2010). Section 5 is devoted to the account of the SOEs exhibited by (2a,b) and (3). In section 6 I explain the contrast between (2a,b) and their adverbially quantified and bare plural counterparts with respect to the presence of SOEs. Finally, section 7 accounts for the different degrees of acceptability of HAB for (2a) and (2b), and for the full acceptability of HAB for their adverbially quantified and bare plural counterparts. To explain the asymmetry between (2a) and (2b), I'll make the general assumption that sentences can be odd because they have implications that conflict with common knowledge, and propose that (2b) has indeed a SOE that is not compatible with common knowledge. A result that will be achieved on the way to solving the above problems is a uniform semantic analysis of HAB and PROG readings of imperfectives, close in spirit to, but different in important details from, Deo's (2010) proposal. Section 8 presents the conclusions.

2.   The covert quantifier analysis

According to a quantificational analysis of habituals, along the lines of Krifka et al. (1995), the imperfective sentence (4a), on its habitual reading, involves a covert generic quantifier **GEN**, whose meaning and syntactic position is similar to the meaning and syntactic position of the Q-adverb *sempre* 'always' in (4b):[6]

(4)   a.   Gianni viaggia in treno.

             Gianni travel(Pres, 3sg) in train

             'Gianni (generally) travels by train.'

        b.   Gianni viaggia sempre in treno.

             Gianni travel(Pres, 3sg) always in train

             'Gianni always travels by train.'

On this analysis, (4a) can be considered a simpler stylistic variant of (4b), with basically the same truth-conditional meaning as (4b). The two sentences are mapped onto the following isomorphic Logical Forms (LFs):[7]

(5)   a. GEN_s [$\varphi(s)$] [$\exists e$ (travel-by-train(e) $\wedge$ Ag(e) = Gianni $\wedge$ Occur(e, s))]

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[6] Covert quantifier analyses of habitual sentences have been proposed for English by many – e.g. Heim (1982), Farkas & Sugioka (1983), Chierchia (1995), Pelletier & Asher (1997).
[7] I am assuming an event semantics with thematic roles such as Ag(ent) and Th(eme), as in Krifka (1998).

b. ALWAYS$_s$ [$\varphi(s)$] [$\exists e$ (travel-by-train(e) $\wedge$ Ag(e) = Gianni $\wedge$ Occur(e, s))]

LFs (5a,b) have the following structure (see Krifka et al. 1995):

(a) The operators **GEN$_s$** and **ALWAYS$_s$** are dyadic universal quantifiers which correspond to the silent generic quantifier and to the Q-adverb *always*, respectively, and they both bind a situation variable.

(b) The formula $\boldsymbol{\varphi(s)}$ provides the restriction of the dyadic quantifier, which need not correspond to overt restrictive material – it does not in the particular case of (4a,b), where it is intended to be contextually supplied.[8]

(c) The formula $\exists e$ **[Gianni-travel-by-train(e) $\wedge$ Occur(e, s)]** provides the matrix of the dyadic quantifier.

The habitual interpretation that on this analysis (4a) and (4b) are predicted to share (which is specified by either one of the LFs [5a], [5b]) could be expressed by the paraphrase 'all situations s satisfying the condition $\varphi(s)$ (e.g. the condition of being a situation in which Gianni is on travel) are such that there is an event of Gianni traveling by train which occurs at s'.

The analysis in question fares well for adverbially quantified habituals such as (4b), where the restriction for the Q-adverb is sometimes expressed by linguistic material overtly present in the sentence – typically, a restrictive *when*-clause. The latter case is exemplified by the variant of (4b) given in (6), which is then mapped onto LF (6'):

(6) Quando va a trovare i suoi parenti, Gianni viaggia sempre in treno.
     When go(Pres, 3sg) to find the his relatives, Gianni travel(Pres, 3sg) always in train
     'When he goes visit his relatives, Gianni always travels by train.'

(6') ALWAYS$_s$ [$\exists e$ (go-visit(e) $\wedge$ Ag(e) = Gianni $\wedge$ Th(e) = Gianni's parents $\wedge$ Occur(e, s))]
      [$\exists e$ (travel-by-train(e) $\wedge$ Ag(e) = Gianni $\wedge$ Occur(e, s))]
      (All relevant situations s in which an event of Gianni going to visit his parents occurs are such that an event of Gianni traveling by train also occurs in s.)

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[8] In this case, it is plausible to assume that φ is contextually determined to be a property which is true of situations in which Gianni is on travel.

A problem for the GEN analysis, however, arises as soon as we consider the interpretation of bare imperfectives featuring a singular indefinite in object position. Consider (7) (the same as [2b] above):

(7)   (In quel periodo / In quel momento) Gianni leggeva un libro di filosofia.

'#(During that period) Gianni used to read a philosophy book.'   [HAB #]

'(At that moment) Gianni was reading a philosophy book.'   [PROG √]

Sentence (7) is odd on the HAB reading. Its most natural reading is PROG: at the relevant past time, there was an on-going event of Gianni reading a philosophy book. Notice that if (7) could be accepted on HAB, the interpretation would be that Gianni used to read the same philosophy book, i.e. there would be a SO Effect whereby Gianni used to read the same book over and over. This means that the LF of the HAB reading of (7) cannot be (7'), but must be (7"):

(7') GEN_s $[\varphi(s)]$ $[\exists e \ \exists x \ (\text{philosophy-book}(x) \wedge \text{read}(e) \wedge \text{Ag}(e) = \text{Gianni} \wedge \text{Th}(e) = x \wedge$
         $\text{Occur}(e, s))]$

(7") $\exists x \ (\text{philosophy-book}(x) \wedge \text{GEN}_s \ [\varphi(s)] \ [\exists e \ (\text{read}(e) \wedge \text{Ag}(e) = \text{Gianni} \wedge \text{Th}(e) = x \wedge$
         $\text{Occur}(e, s))])$

However, if we insert a Q-adverb in (7), the resulting sentence is acceptable on a HAB interpretation, as shown by (8) (in this case, temporal anchoring must be to a large interval):

(8)   (In quel periodo) Gianni leggeva *sempre* / *spesso* un libro di filosofia.[9]

In that period Gianni read(Imp, 3sg) always / often a book of philosophy

'(During that period) Gianni would *always* / *often* read a philosophy book.'   [HAB √]

The relevant habitual reading of (8) can be paraphrased as 'for all / most appropriate situations *s* in the relevant past period, there is a philosophy book *x* in *s* such that Gianni read *x* in *s*'. This is exactly the reading that would be captured by LF (8'):

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[9] The quantificational reading of (8) that I am pointing to is one that can be easily grasped once we embed this sentence in a suitable discourse context which provides a restriction for the Q-adverb. Once a suitable restriction is contextually retrieved, we can interpret (8) as the quantificational proposition that for all / most relevant occasions during the relevant period, there was a philosophy book that Gianni read on that occasion. Without such discourse embedding, one might find it hard to obtain the reading in question (see Rimell 2004 for a similar remark concerning English).

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(8') ALWAYS$_s$ / OFTEN$_s$ [$\varphi(s)$] [$\exists e$ $\exists x$ (philosophy-book(x) $\wedge$ read(e) $\wedge$ Ag(e) = Gianni $\wedge$ Th(e) = x $\wedge$ Occur(e, s))]

The semantic contrast between (7) and (8) is unexpected on the quantificational analysis of habituals. What is unclear is why (7) cannot have the same HAB reading as we have ascribed to (8), i.e. why the indefinite cannot be in the scope of GEN in (7), given that it *can* be in the scope of the Q-adverb in (8). The proponent of the covert quantifier analysis could consider explaining this contrast by making the following assumptions:

(α)   1. Singular indefinites in object position must obligatorily scope above GEN.

         2. Singular indefinites in object position can scope below overt Q-adverbs.

Thus, by assumption (α1), the indefinite *un libro di filosofia* would have obligatorily to take scope above GEN in (7), as shown by LF (7'') above. The result would be a reading paraphrasable as 'there is a philosophy book x such that, for every appropriate situation s in the relevant period, Gianni read x in situation s'. This reading could then be claimed to be pragmatically odd, in view of the generally recognized fact that people normally do not read the same philosophy book over and over as a habit. On the other hand, by assumption (α2), the indefinite *un libro di filosofia* would have the option to take scope below the Q-adverb in (8), as shown by LF (8') above. The result would be a reading paraphrasable as 'for all / most appropriate situations s during that period, there is a philosophy book x in s such that Gianni read x in s'.[10] Thus, assumptions (α1,2) would enable us to explain the SOE of (7) and pave the way for a pragmatic explanation of the unacceptability of (7) on HAB. They would also make it possible to explain why (8) lacks a SOE.

There are two problems, however, with assuming (α1,2). The first is theoretical and has to do with the fact that, on the standard view, GEN is just a phonologically silent version of overt Q-adverbs, and should otherwise have the same syntactic properties as overt Q-adverbs, hence the asymmetric scopal behaviour hypothesized in (α1,2) is not only stipulative, but also unexpected, given the general premises of the covert quantifier approach.

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[10] On the proposal under discussion, sentence (8) would presumably also allow LF (i), in which the indefinite takes scope above the Q-adverb:

(i) $\exists x$ (philosophy-book(x) $\wedge$ OFTEN$_s$ [$\varphi(s)$] [$\exists e$ (read(e) $\wedge$ Ag(e, Gianni) $\wedge$ Th(e, x) $\wedge$ Occur(e, s))])

The interpretation corresponding to (i) would presumably be discarded as pragmatically odd in the same way as the habitual interpretation of (7) has been discarded.

The second problem with (α1,2) is one of empirical adequacy. Consider sentences (9a,b):

(9) a. Gianni fumava un sigaro toscano (il Toscanello).

Gianni smoke(Imp, 3sg) a cigar tuscan (the Toscanello)

'Gianni used to smoke a kind of tuscan cigar (the Toscanello).'

b. Gianni non fumava nessun sigaro toscano (ma ora ha una passione per il Toscanello).

Gianni *neg* smoke(Imp, 3sg) *neg*-a cigar tuscan (but now has a passion for the Tosc.)

'Gianni used to smoke no kind of tuscan cigar (but now he has a passion for the Toscanello).'

Sentence (9a) is perfect on a HAB interpretation, provided that *un sigaro toscano* 'a tuscan cigar' has the kind-reading 'a kind of tuscan cigar' – indeed, if the indefinite had the ordinary individual-reading, (9a) would be odd on HAB, as it would imply that there was an individual cigar that Gianni used to smoke. Notice that (9a) still has a SOE (a kind-level SOE): there was a particular kind of cigar such that Gianni used to smoke *that* kind of cigar. Now, the GEN approach, supplemented with (α1) *plus* a suitable analysis of kind-readings for indefinites and of event predications involving kinds, could still account for the HAB reading of (9a). The LF of (9a) would be (10a), where the condition **Th(e) = X** involving kind X would be analyzed as implying the existential quantification $\exists x$ (**Inst(x, X) $\wedge$ Th(e) = x**) over instances of X.

(10) a. $\exists X$ (kind-of-tuscan-cigar(X) $\wedge$ GEN$_s$ [$\varphi(s)$] [$\exists e$ (smoke(e) $\wedge$ Ag(e) = Gianni $\wedge$ Th(e) = $X \wedge$ Occur(e, s))])

(There is a kind X of tuscan cigar such that in all appropriate situations s an event of Gianni smoking a cigar of kind X occurred.)

Sentence (9b) too is perfect on a HAB interpretation, with the object NP *nessun sigaro toscano* 'no tuscan cigar' also obtaining the kind-reading 'no kind of tuscan cigar'. The GEN approach supplemented with (α1,2), however, cannot account for the intuitive HAB reading of (9b). Assuming that the NP *nessun sigaro toscano* is an indefinite which must be interpreted in the scope of a higher negation (Laka Mugarza 1990, Del Prete 2008), one cannot correctly capture the HAB reading of (9b) if one sticks to (α1) and accordingly takes the indefinite object to scope out of GEN in the LF of (9b). If the indefinite object does indeed scope out of GEN, then negation too has to scope out of GEN, since *nessun sigaro toscano* must be interpreted below

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negation. Thus, (α1) would constrain the LF of (9b) to be as in (10b) (notice that this is the negation of [10a]):

(10)   b.   ¬∃X (kind-of-tuscan-cigar(X) ∧ GEN$_s$ [φ(s)] [∃e (smoke(e) ∧ Ag(e) = Gianni ∧ Th(e)
            = X ∧ Occur(e, s))])
            (There is no kind X of tuscan cigar such that in all appropriate situations s an event of
            Gianni smoking a cigar of kind X occurred.)

But (10b) provides truth conditions that are intuitively too weak for (9b). According to these truth conditions, (9b) should be true in a scenario where Gianni had the habit of smoking tuscan cigars, so long as Gianni did not have the habit of smoking tuscan cigars of *a particular sub-kind* (for instance, he did not have the habit of smoking Toscanelli, he did not have the habit of smoking Mori, etc.). But (9b) would be intuitively false in this scenario, as the sentence intuitively implies that Gianni did not smoke any tuscan cigar at all.

To correctly capture (9b)'s truth conditions, the GEN analysis should allow an LF like (10'b):

(10')   b.   GEN$_s$ [φ(s)] [¬∃e ∃X (kind-of-tuscan-cigar(X) ∧ smoke(e) ∧ Ag(e) = Gianni ∧ Th(e)
            = X ∧ Occur(e, s))]
            (All appropriate situations s are such that it is not true that there is a kind X of tuscan
            cigar and an event of Gianni smoking a cigar of kind X that occurred in s.)

LF (10'b) is logically stronger than (10b) and is a better candidate for representing (9b)'s truth conditions. But in order to have (10'b) as a possible LF for (9b), the proponent of the GEN analysis has to dismiss (α1).

My conclusion is that it would be better if we had a theory that could explain the contrast between (7) and (8) without stipulating obligatory wide scope of indefinites with respect to the alleged generic operator.

3.   Bare plural objects and "kind coerced" singular indefinites

In this section I look at the interpretation of bare imperfectives with bare plural objects, and then make a comparison with corresponding sentences featuring a kind-denoting singular indefinite object.

Consider (11), the bare plural counterpart of (7) (repeated below):

(11)   (In quel periodo / In quel momento) Gianni leggeva libri di filosofia.

        '(During that period) Gianni used to read philosophy books.'   [HAB √]

        '#(At that moment) Gianni was reading philosophy books.'   [PROG #]

(7)   (In quel periodo / In quel momento) Gianni leggeva un libro di filosofia.

        '#(During that period) Gianni used to read a philosophy book.'   [HAB #]

        '(At that moment) Gianni was reading a philosophy book.'   [PROG √]

As we saw above, (7) is odd on the HAB reading, being only acceptable on PROG. For (11), we observe the reverse pattern: the sentence is perfect on HAB, but marginal on PROG – probably because it is pragmatically unlikely that a subject may be reading many different books at a given point in time.[11] Notice that (11), unlike (7), does not trigger SOEs: intuitively, the sentence is interpreted as involving a plurality of reading events in which Gianni is the agent and the theme is one philosophy book or other, but crucially events in this plurality are not constrained to have the same philosophy book as their theme – unlike what would happen on the HAB interpretation of (7).

Thus, from the point of view of the absence of SOEs, (11) patterns with (8) (repeated below), the adverbially quantified counterpart of (7).

(8)   (In quel periodo) Gianni leggeva *sempre* / *spesso* un libro di filosofia.

        '(During that period) Gianni would *always* / *often* read a philosophy book.'

It will soon become clear, however, that the underlying semantic mechanism which explains the absence of SOEs in the case of (8) is not the same as in the case of (11). To anticipate something of my analysis, only the adverbially quantified (8) has a tripartite quantificational structure with the singular indefinite scoping below the Q-adverb, while the bare plural imperfective (11) has exactly the same non-quantificational structure as the singular indefinite imperfective (7) – the difference between (11) and (7) being that only the former allows distribution of individual

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[11] I do not claim that bare imperfectives with bare plural objects are *always* awkward on the PROG reading. Sentence (i), for instance, is as good on the PROG reading as it is on the HAB reading:
(i)   Gianni mangiava ciliegie.
      '(At that moment) Gianni was eating cherries.'   [PROG √]
      '(During that period) Gianni used to eat cherries.'   [HAB √]
My sense is that general knowledge about the average temporal size of events of a given type (e.g. events of eating a cherry *versus* events of reading a philosophy book) is crucial in determining whether a certain sentence is good on the PROG or on the HAB reading.

books over the plurality of reading events introduced by the verb, whereas the latter has a unique individual book which realizes the theme argument of all reading events in that plurality.

There is a further point I want to make concerning (11). Let's compare (11) with (12):

(12)   Gianni leggeva un genere di libri di filosofia (libri di filosofia morale).

'Gianni used to read a kind of philosophy books (books of moral philosophy).'

'#Gianni was reading a kind of philosophy books (books of moral philosophy).'

Similarly to (11), sentence (12) is perfect on HAB, but unacceptable on PROG – as it is pragmatically odd to say that a subject is in the process of reading a kind of books at a given point in time. Notice that (12) displays a SOE – like bare imperfectives with singular indefinite objects in general do. The sentence, however, does not involve a same individual book, but a same *kind* of books, accordingly its reading is paraphrasable as 'for a certain kind of philosophy books X, Gianni had the habit of reading individual books instantiating X', and this reading, though exhibiting a SOE, makes perfect sense pragmatically (unlike the HAB reading of [7] considered above).

Intuitively, (11) and (12) are semantically close to each other, as they both ascribe to Gianni the habit of reading a certain kind of books: in (11), the kind involved is that of philosophy books *simpliciter*, while in (12), it is a *sub-kind* of that kind (i.e. moral philosophy books). On the Carlsonian analysis of bare plurals as kind-denoting terms, proposed in sect. 4.2, this similarity between (11) and (12) is immediately predicted. There is an intuitive difference between (11) and (12), however: (11), through the bare plural *libri di filosofia*, involves the maximal kind of philosophy books, while (12), through the singular indefinite *un genere di libri di filosofia*, involves a sub-kind of that maximal kind. Notice that the property of denoting a sub-kind, which we have ascribed to (12), is also present when a singular indefinite without the explicit noun *genere* 'kind' is coerced to a kind-reading, as in (9a) above (repeated here).

(9)   a. Gianni fumava un sigaro toscano (il Toscanello).

'Gianni used to smoke a kind of tuscan cigar (the Toscanello).'

The HAB interpretation of (9a) is indeed different from the HAB interpretation of (13), with a bare plural object in place of the "kind coerced" singular indefinite object *un sigaro toscano*:

(13)   Gianni fumava sigari toscani.

'Gianni used to smoke tuscan cigars.'

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The HAB reading of (9a) is more specific than that of (13), as (9a) asymmetrically entails (13) on the reading in question.[12] Thus, the generalization that has to be captured is twofold: a "kind coerced" singular indefinite [NP un N'] denotes a sub-kind of the maximal kind corresponding to N', whereas a bare plural [NP N'] denotes the maximal kind corresponding to N'. This generalization can be easily accounted for if we make the following semantic assumptions (see sect. 4.2 below): (a) an indefinite [NP un N'] determines existential quantification over objects in the denotation of N', (b) for a "kind coerced" indefinite [NP un N'], the coerced denotation of N' is the same as the ordinary denotation of [genere di N'] (taking N' in its non-coerced interpretation this time), and finally, (c) a bare plural [NP N'] directly refers to the maximal kind corresponding to N'.

On the basis of the previous observations, we expect that a sentence with a kind-denoting singular indefinite that could be used to express a similar reading to (11) is (14):

(14)   Gianni leggeva un certo genere di libri (i.e. libri di filosofia).

        '(During that period) Gianni used to read a certain kind of books (i.e. philosophy books).'

This expectation is intuitively satisfied.[13]   Let's now turn to the semantic analysis of the data considered above.

4.   The semantic framework

To implement a formal semantic analysis of the above data, I shall adopt a mixed model that I describe below (a formal presentation of the model is given in the appendix).

I'll propose a variant of classical Branching Time that I call *Partial Branching Time* (PBT).[14] A PBT-model is based on a domain of Kratzerian situations, the central idea being that every situation comes with a unique past but many possible futures. Formally, this means that the relation of temporal precedence $\leq_S$ over situations is not a linear order, but a partial order

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[12] The fact that (13) does not entail (9a) can be seen if we take a scenario where Gianni had the habit of smoking tuscan cigars without having an inclination for any particular sub-kind of tuscan cigars, so that each time he went to buy tuscan cigars he did not care about buying tuscan cigars of any particular sub-kind. My intuition is that, relative to such a scenario, (13) would be clearly true but (9a) would not.

[13] To be precise, (11) and (14) do not express exactly the same proposition, as correctly predicted on the analysis that I'll propose. The semantic relationship between (11) and (14) is the same one that relates a predication $[\ldots\alpha\ldots]$ to its existential generalization $\exists x\, [\ldots x\ldots]$.

[14] By *classical BT*, I refer to the conception of BT which is proposed in Prior (1967) and Thomason (1984). The reader is referred to Belnap et al. (2001) for an in-depth investigation of BT-models and a proposal of semantic analysis of natural language constructions based on such models.

generating tree structures. Given any two situations s_1, s_2, the interpretation of the relational formula $s_1 \leq_S s_2$ is that s_1 *did* occur from the perspective of s_2, while s_2 *might* occur from the perspective of s_1, the occurrence of s_2 being expected given some relevant facts in s_1 and in its past.[15] Histories are defined as maximal chains of situations. A circumstance of evaluation is defined as a situation s given along with its unique past and its possible futures – i.e. as the set of all histories passing through s (all such histories are identical up to and including s, and they diverge after s).

Further, I shall adopt event structures with plural events and a lattice structure for the domain of individuals, as in Krifka (1998).[16] The temporal trace function τ maps any object e from the domain of the event structure onto a situation $\tau(e) = s$ from the domain of the PBT-structure, s being the minimal situation at which e occurs. Thematic roles such as Ag(ent) and Th(eme) map events onto their corresponding participants: $Ag(e)$ is the agent of e, $Th(e)$ is the theme of e. As presupposed by my use of this functional notation, an event has a *unique* agent and a *unique* theme. Plural events can (but need not) have plural individuals as participants: for example, if e and e' are events of reading whose themes are two different books $Th(e) \neq Th(e')$, then the plural event of reading $e \oplus_E e'$ will have a theme identical to the plural individual $Th(e) \oplus_I Th(e')$; on the other hand, if e and e' have the same singular theme $Th(e) = Th(e')$, then the plural event $e \oplus_E e'$ will have the same singular theme as its parts e, e'.

The adoption of a model with plural events makes it possible to state the following principle (Kratzer's 2008 Lexical Cumulativity Hypothesis):

(LCH) Verbs can inherently refer to plural events.[17]

This principle is central to the non-quantificational analysis of habituality that I am going to propose. To anticipate the main idea, the habitual *(In quel periodo) Gianni giocava a tennis* '(During that period) Gianni used to play tennis' is analyzed roughly as 'there is a plural event of Gianni playing tennis whose temporal trace includes the relevant period'[18] (where a plural event of Gianni playing tennis is the sum of different singular events of Gianni playing tennis).

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[15] Here I am adapting a suggestion made by Belnap (1992).

[16] The main difference with respect to Krifka (1998) is that my event structures incorporate PBT-structures, not linear time structures (see the appendix).

[17] The idea that verb predicates can refer to pluralities of events has been exploited by a number of scholars besides Kratzer (2008), a.o. Krifka (1998), Landman (2000), Ferreira (2005), Laca (2006).

[18] I'm abstracting away from modality here.

A couple of features of this temporal model that will become relevant when I present my analysis are the following:

(a) Temporally discontinuous plural events and temporally discontinuous plural situations are allowed; in particular, whenever e is a temporally discontinuous plural event, its temporal trace $\tau(e)$ will be a temporally discontinuous plural situation.

(b) Given the possible temporal discontinuity of situation s_1, the relation of temporal inclusion $s_0 \subseteq_S s_1$ will not require that s_0 be a mereological part of s_1, but only that the left boundary of s_1 temporally precede the left boundary of s_0 and the right boundary of s_0 temporally precede the right boundary of s_1 (cf. with Ferreira's [2005: 96] definition of *i-inclusion*).[19]

Kinds, such as the kind of philosophy books or the kind of tuscan cigars, will be modeled as maximal sums of singular individuals: for instance, the kind of philosophy books is represented as the sum of all the philosophy books, i.e. the sum of all singular individuals in the denotation of the nominal expression *philosophy books* (Chierchia 1998).

The type system contains the basic types **e** (individuals), **t** (truth values), **i** (situations), **v** (events), and **s** (circumstances of evaluation). Derived types are obtained as usual: if $\mathbf{T_1}$ and $\mathbf{T_2}$ are any semantic types, $\langle \mathbf{T_1}, \mathbf{T_2} \rangle$ is the derived semantic type of (total or partial) functions from objects of type $\mathbf{T_1}$ to objects of type $\mathbf{T_2}$. I shall use a lambda-typed language as the semantic metalanguage. As in Heim and Kratzer (1998), the lambda-term $\lambda x_\mathbf{T}\mathbf{:}\ \varphi.\ \psi$ represents a partial function f which is defined for an object of type $\mathbf{T}$ if and only if condition φ (the *domain condition*) is satisfied. If f is defined for x, then the value it assigns to x is whatever value is described by ψ. If $\lambda x\mathbf{:}\ \varphi[x].\ \psi[x]$ represents the partial function f, then the result of applying f to

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[19] The two features are illustrated by the following example. Suppose that e_0 is the event of my lighting cigarette x, and s_0 is the minimal situation in which I light cigarette x (i.e. s_0 is the temporal trace of e_0). Also, suppose that e_2 is the event of my smoking the second half of cigarette x, and s_2 is the minimal situation in which I smoke the second half of cigarette x (i.e. s_2 is the temporal trace of e_2). Then, the object $e_0 \oplus_E e_2$, that we obtain if we put e_0 and e_2 together by means of the sum operation defined over events, is also an event: it is a *plural* event made up of an event of lighting a cigarette and an event of smoking part of a cigarette, and it is temporally discontinuous. Analogously, the object $s_0 \oplus_S s_2$, that we obtain if we put s_0 and s_2 together by means of the sum operation defined over situations, is also a situation: it is a *plural* situation which is temporally discontinuous. Suppose further that s_1 is the minimal situation in which I smoke the first half of cigarette x. By the definition of temporal inclusion $\subseteq_S$ (see the appendix), we have that $s_1 \subseteq_S (s_0 \oplus_S s_2)$, but this does not imply that s_1 is a mereological part of the plural situation $s_0 \oplus_S s_2$ — actually, s_1 is *not* a mereological part of $s_0 \oplus_S s_2$, as is clear from the fact that if we sum s_1 and $s_0 \oplus_S s_2$, we obtain a plural situation $s_1 \oplus_S (s_0 \oplus_S s_2)$ which is not the same as $s_0 \oplus_S s_2$.

an object denoted by a constant *a* is described by the notation $\{\varphi[a]\}\ \psi[a]$, which means that we get $\psi[a]$ *provided that* $\varphi[a]$ is satisfied. The letters $h, h_0,\ldots, e, e_0,\ldots, s, s_0,\ldots,$ and $x, x_0,\ldots$ will be used as sorted variables ranging over histories, events, situations, and individuals, respectively. g is a two-place function which assigns a temporal value to any variable of type **i** relative to any circumstance: given variable s of type **i** and circumstance w, $g(s, w)$ is a situation belonging to (some history in) w; also, g assigns an individual to any variable of type **e**, the circumstance argument being irrelevant in this case.[20] **c** is a context of utterance, a sequence of parameter values including the situation of utterance c_t and the circumstance of utterance c_w.

The level of syntactic representation which will be relevant for semantic interpretation is LF. The rule of Quantifier Raising (QR) will obligatorily apply for the interpretation of quantificational NPs. Such NPs bear a numerical index at LF and leave a coindexed trace behind after undergoing QR. The evaluation function [[ ]] takes the LF α of a linguistic expression E onto the object α^* which is the semantic value of α relative to certain evaluation parameters. The evaluation function is always relativized to a context c, an assignment function g, and a circumstance of evaluation w.[21]

4.1 Tense and aspectual features of the Imperfetto

On my analysis, the Imperfetto is decomposed into a tense feature PAST and an aspectual feature IMPF. I assume a referential / presuppositional analysis of tense along the lines of Heim (1994). More specifically, my proposal is that the feature PAST introduces a situation variable at LF, and further presupposes that the value of this variable be past with respect to the utterance situation. This is expressed in (15), where the subscript k on PAST is the situation variable introduced by the tense feature itself.

(15) $[[\text{PAST}_k]]^{c, g, w} = \lambda P_{<i,t>}: g(k, w) <_S c_t.\ P(g(k, w))$

To model the semantic contribution of IMPF, I introduce two formal concepts: (a) an operation $f\text{-exp}(s)$ which expands a situation s forward in PBT, as represented in Fig. 4.1

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[20] Given variable x of type **e** and circumstances $w \neq w'$, $g(x, w)$ is some individual i and $g(x, w')$ is some individual j and $i = j$. Given the irrelevance of the circumstance argument for the assignment of values to variables of type **e**, I'll skip writing the circumstance argument in this case.

[21] The metalinguistic expression $[[\ \alpha\ ]]^{c, g, w}$ has to be read as 'the denotation of α relative to context c, assignment g, and circumstance w'.

below,[22] and (b) a topological operator THR (to be read 'throughout') which takes an event property P and a (possibly branching) situation s and "spreads out" P over s, in the sense defined in (16a). In definition (16a), b is a *branch* of s, i.e. a sub-situation of s which lies within a single history. Branches of s represent *expected continuations* of the initial part of s (in Fig. 4.1 below, s corresponds to the branching situation $f\text{-exp}(s_0)$, of which s_0 is the initial part, and branches b_1, b_2, and b_3 are the expected continuations of s_0). The lexical entry for IMPF is (16b).[23]

(16) a. $\text{THR}(P_{<v,t>}, s) =_{Def} \forall b\ [b \subseteq_S s \rightarrow \exists e\ [P(e) \land b \subseteq_S \tau(e)]]$

  b. $[[\text{ IMPF }]] = \lambda s.\ \lambda P_{<v,t>}.\ \text{THR}(P,\ f\text{-exp}(s))$
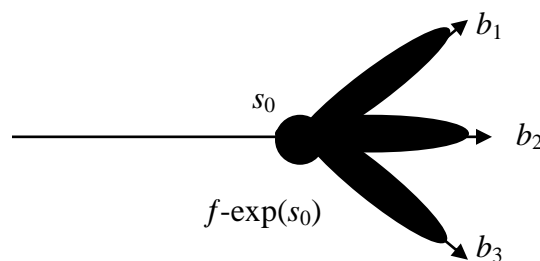
Fig. 4.1. Forward-expansion of a situation s_0 in PBT

The fact that the trace $\tau(e)$ in (16a) includes branch b of situation s and is not just coextensive with b is important to obtain the PROG reading, as we'll see in sect. 5. Notice that the formal concept $f\text{-exp}(s)$ occurring in the definition of IMPF is not a function in the mathematical sense, but is intended as the formal counterpart of an intuitive operation of stretching a situation forward in time, as represented in Fig. 4.1. In some cases, this operation can be executed more than once on the same initial situation s_0, and the result need not be the same every time the operation is executed. Also, cases of null effect are allowed, where $f\text{-exp}(s_0) = s_0$. Consider the following example:

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[22] For the idea of forward expansion of a reference time, see Condoravdi (2001, 2003).

[23] An anonimous reviewer has expressed doubt that imperfective aspect should be viewed as extending a situation into the branching future. According to the reviewer, the imperfective would spread out an event property only over the reference time, not beyond. In assuming that the imperfective stretches a reference situation forward in time, I follow Deo's (2010) proposal for an analysis of imperfective aspect. In Deo's proposal, the imperfective and the progressive differ precisely in respect to whether the reference time itself (in the case of PROG) or a forward extension of it (in the case of IMPF) is considered as included by the event time. Her differential treatment of PROG and IMPF is partly motivated by what she calls *temporal contingence puzzle* (Deo 2010: 477-478), i.e. by the observation that PROG-marked sentences, both in their habitual and progressive readings, report situations that are temporally contingent and subject to change, unlike IMPF-marked sentences (Comrie 1976, Dowty 1979).

(17)   Alle 15 Gianni era a casa, leggeva un libro.

    'At 3pm Gianni was at home, he was reading a book.'

The reference situation is intuitively the same for both sentences in (17): a salient 3pm situation in the past, $s_R <_S now$. The operation of forward-expansion is applied to s_R twice: the first time for the interpretation of the stative clause *Gianni era a casa* 'Gianni was at home', the second time for the interpretation of the activity clause *leggeva un libro* 'he was reading a book'. It is intuitively plausible that the results of these two applications are not the same: on the one hand, the first clause does not seem to predicate the state of Gianni being at home of any larger situation than s_R itself, so that $f\text{-exp}(s_R)$ is plausibly the same as s_R in this case; on the other hand, the second clause is likely to involve a non-null expansion of s_R to the future, as the reading event (unlike the being-at-home state) is naturally understood as extending over time, so that $f\text{-exp}(s_R)$ is plausibly larger than s_R in this case. Note that in those cases where $f\text{-exp}(s_0) = s_0$ and s_0 is not itself branching, $f\text{-exp}(s_0)$ will have no branches different from s_0 itself, as a result the temporal property $P_{<v,t>}$ will be spread out over s_0 itself (as in the interpretation of the stative clause *Gianni era a casa*). Actional properties of the temporal predicate that IMPF applies to are likely to play a role in determining the effect of the forward-expansion operation, but I'll not pursue the study of this interaction here.

There is a further point I want to stress here. On the view behind analysis (16a,b), IMPF is primarily not a quantificational device (unlike the determiner *every* or the Q-adverb *always*), but a device which makes a situation undergo temporal stretching and then distributes a temporal property over the stretched situation.[24] True, to describe the THR-operation, a universal quantifier over branches is used. As we'll see in the following sections, however, this universal quantifier is not the mechanism by which the plurality of events implied by HAB is accounted for. In this connection, it would be misleading to think that the universal quantifier over branches plays the same role in my analysis as GEN in the quantificational analysis of habituals: indeed, the plurality of events implied by HAB does not depend on the universal quantifier over

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[24] The introduction of the THR operator as an essential ingredient of the semantics of IMPF is an aspect of my proposal which closely corresponds to an aspect of Ducrot's (1979) characterization of the French *Imparfait*: according to Ducrot, the Imparfait requires that a temporal topic (*thème temporel*, corresponding to my reference situation) be contextually available, and its fundamental function is to characterize the temporal topic *as a whole*. Intuitively, the role of THR is to "spread out" an event property P over a reference situation s, which is achieved by requiring that there be a P-event whose temporal trace completely covers s. Taking inspiration from Ducrot, we could describe THR as an operator which provides a characterization of a reference situation as a whole.

branches in my analysis, but it uniquely depends on the existential quantifier over events being understood as a quantifier over *plural* events. It is in this sense that I claim my analysis provides a non-quantificational account of HAB, unlike previous analyses which take the imperfective to contribute universal quantification over a temporal/modal domain (Bonomi 1997, Deo 2010).

4.2   Reference time adverbials

I assume that the semantic role of reference time adverbials, like *alle 15* 'at 3pm' in sentence (17) above, is to constrain the value of the situation variable introduced by the tense of the sentence they are preposed to. Formally, a reference time adverbial α has the type of a generalized quantifier over situations (type $<<i, t>, t>$): α takes a property of situations λs_i: $R_S(s, c_t)$. $P(s)$ as argument (where the property is obtained by abstracting over the temporal variable introduced by tense) and returns the truth if the property holds of the situation specified by the temporal term embedded within α. In (18a) I give the semantic interpretation of reference time adverbials of the form *in quel N* (the metalinguistic predicate N* corresponds to the temporal term *quel N*, and fixes the temporal location of the situation to whatever time is deictically referred to by *quel N*):

(18)   a. $[[\,[_{TAdv} \text{in quel N}] \,]]^{c, g, w} = \lambda P_{<i,t>}.\, \exists s\, [\text{N*}(s) \wedge P(s)]$

      b. $[[\,[_{TP1} [_{TAdv} \text{in quel N}]_k \, k[_{TP2} [_T \text{PAST}_k][_{AspP} \beta]]] \,]]^{c, g, w} =$

      $= (\lambda P_{<i,t>}.\, \exists s\, [\text{N*}(s) \wedge P(s)])(\lambda s_i: s <_S c_t.\, \beta'(s)) = \exists s\, [\text{N*}(s) \wedge \{s <_S c_t\}\beta'(s)]$

      It should be noted that, in spite of being analyzed as generalized quantifiers, reference time adverbials are not quantificational, unlike the time adverbial *ogni giorno alle 15* 'every day at 3pm' in (19):

(19)   Ogni giorno alle 15 Gianni prendeva il caffé.
      'Every day at 3pm Gianni would take coffee.'

Notice that (19) cannot be paraphrased either as 'for every day *d*, the time *t* which is at 3pm in *d* is such that Gianni had the habit of taking coffee at *t*' or as 'for every day *d*, the time *t* which is at 3pm in *d* is such that Gianni was in the process of taking coffee at *t*'. If the quantificational adverbial *ogni giorno alle 15* were a reference time adverbial, however, sentence (19) should have one of these two readings. The sentence, instead, has the meaning of a quantified habitual,

paraphrasable as 'Gianni had the habit of taking coffee every day at 3pm'. The habit expressed by (19) is still in need to be anchored via a reference time adverbial, as shown in (20):

(20)   In quel periodo, ogni giorno alle 15 Gianni prendeva il caffé.

        'During that period, every day at 3pm Gianni would take coffee.'

The interpretation of (20) makes it clear that there is a semantic difference between the initial adverbial *in quel periodo* and the adverbial *ogni giorno alle 15*: only the former provides the anchor for the habit expressed by (19), while the latter contributes a universal quantification which is intuitively part of the description of the habit.

4.3   Singular indefinites, bare plurals, and Q-adverbs

Singular indefinites of the form [$_{NP}$ un N'] are interpreted in terms of existential quantification over objects in the denotation of N'. Being quantificational, they undergo QR at LF. I assume that the morphologically singular N' in [$_{NP}$ un N'] denotes a set of singular individuals. When N' contains the head noun *genere* 'kind' (as in [12] above), or the indefinite is otherwise coerced to a kind-reading (as in [9a,b] above), N' will denote a set of kinds, accordingly the indefinite will involve existential quantification over kinds from this set. More exactly, for a "kind coerced" indefinite [$_{NP}$ un N'], I assume that the coerced denotation of N' is the same as the denotation of [(sub-)kind of N'] – where N' is taken in its ordinary, non-coerced interpretation this time. For example, for the kind coerced indefinite *a tuscan cigar*, the coerced denotation of *tuscan cigar* is identical to the ordinary denotation of *(sub-)kind of tuscan cigar*.

Bare plurals are names of kinds (Carlson 1977, Chierchia 1998): for instance, *libri di filosofia* directly refers to the kind of philosophy books. Unlike singular indefinites, bare plurals are not quantificational, hence they do not undergo QR. I'll assume that a predication having a plural event *e* and a kind x^k as arguments involves distribution of singular instances of x^k over singular sub-events of *e*, as established by the following principle:

(21)   *Distribution to Sub-Events*

        $P(e, x^k) = \forall e' [e' \subseteq_{AT} e \rightarrow \exists x (x \subseteq_{AT} x^k \wedge P(e', x))]$[25]

This principle is not a mere stipulation, but is empirically motivated by the semantic interaction between plurally interpreted verbs and kind-denoting arguments, as observed in the frequentative

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[25] The symbol $\subseteq_{AT}$ denotes the relation of being an atomic (singular) part.

sentence *Gianni ha fumato Toscanelli per vent'anni* 'Gianni smoked Toscanelli for twenty years', whose interpretation is that a series of events of Gianni's smoking lasted for twenty years and the theme of each event from this series was a cigar instantiating the kind *Toscanello*.

I'll also assume that a thematic function mapping a plural event *e* onto a singular individual *x* has to map the singular sub-events of *e* onto the same individual *x*, according to the following principle:

(SSP) *Sameness of the Singular Participant*

Let *e* be a plural event, *x* a singular individual, and Θ some thematic role:

$$[\Theta(e) = x \rightarrow \forall e'\, [e' \subseteq_{AT} e \rightarrow \Theta(e') = x]]$$

I regard (SSP) as being an obvious assumption to make. Its motivation comes from obvious observations such as that if a plural event e^* of reading a book has the singular book *x* as its patient, the atomic sub-events of e^* cannot be events of reading a book different from *x*.

Concerning the analysis of Q-adverbs like *sempre*, I make the following assumptions:

(A)   *Sempre* is raised out of its surface clause and is adjoined to its restrictive part RES so as to form a restricted universal quantifier over events [sempre RES], whose intuitive interpretation is "for every situation *s* such that *s* has the property expressed by RES, there exists an event *e* such that *e* bears a contextual temporal relation to *s* and … *e* …".

(B)   The restricted quantifier [sempre RES] combines with its matrix SCOPE (usually determined by the surface clause out of which *sempre* has been raised) so as to form a predicate of events [[sempre RES] SCOPE], whose intuitive interpretation is "to be an event e_0 such that for every situation *s* in RES there exists an event e_1 such that e_1 bears a contextual temporal relation to *s* and e_1 has the property expressed by SCOPE and e_1 is a mereological part of e_0".

(C)   *Sempre* takes scope immediately below IMPF – a consequence of this assumption is that, whenever *sempre* is overtly restricted by a *when*-clause in the Imperfetto, as in *Quando voleva meditare, Gianni leggeva sempre un libro di filosofia* 'When he wanted to meditate, Gianni would always read a philosophy book', the latter Imperfetto is a morphological manifestation of the same IMPF feature which shows up morphologically in the main clause, therefore complex sentences like the one just mentioned only involve *one* instance of IMPF at LF.

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(D)   The covert restriction of *sempre* in a sentence like *Gianni leggeva sempre un libro di filosofia* 'Gianni would always read a philosophy book' is represented by means of a contextual variable C (see the analysis of [29] below), a predicative variable of type **<i, t>**.

5.   The same-object effect

Let's turn to the following problem:

(P1)   How to account for the SOE that (2a,b) and (3) have on the HAB reading.

I'll focus on sentence (2a), repeated below as (22) (the same reasoning holds, *mutatis mutandis*, for [2b]). The LF of (22) is given in (23):[26]

(22)   (In quel periodo / In quel momento) Gianni guidava un'auto sportiva.
          '(During that period) Gianni used to drive a sports car.'
          '(At that moment) Gianni was driving a sports car.'

(23)   [$_{TP1}$ [$_{TAdv}$ in quel N]$_k$ k[$_{TP2}$ [$_T$ PAST$_k$] [$_{AspP}$ IMPF [$_{VP1}$ [$_{DP}$ un'auto sportiva]$_1$ 1[$_{VP2}$ Gianni guidare t_1]]]]]

The truth conditions of (23) are compositionally derived in (24a-g):

(24)   a.   [[[$_{VP2}$ Gianni drive t_1]]]$^{c, g, w}$ = $\lambda e.$ [drive(e) $\wedge$ Ag(e) = Gianni $\wedge$ Th(e) = $g(1)$]

          b.   [[1[$_{VP2}$ Gianni drive t_1]]]$^{c, g, w}$ =
               = $\lambda x. \lambda e.$ [drive(e) $\wedge$ Ag(e) = Gianni $\wedge$ Th(e) = $g^{[x / 1]}(1))$]^{27}

          c.   [[[$_{DP}$ a sports car]$_1$]]$^{c, g, w}$ = $\lambda P_{<e,<v,t>>}. \lambda e. \exists x$ [sports-car(x) $\wedge$ $P(x, e)$]

          d.   [[[$_{VP1}$ [$_{DP}$ a sports car]$_1$ 1[$_{VP2}$ Gianni drive t_1]]]]$^{c, g, w}$ =
               = $\lambda e. \exists x$ [sports-car(x) $\wedge$ drive(e) $\wedge$ Ag(e) = Gianni $\wedge$ Th(e) = x]

          e.   [[[$_{AspP}$ IMPF [$_{VP1}$ [$_{DP}$ un'auto sportiva]$_1$ [$_{VP2}$ Gianni guidare t_1]]]]]$^{c, g, w}$ =

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[26] Notice that I'm not assuming structurally different LFs or different semantic derivations for the PROG and for the HAB reading of (22). As will become clear from my analysis of (22), the difference between the two readings crucially depends on how narrowly restricted the reference situation is by the sortal noun in the initial time adverbial.

[27] $g^{[x / 1]}$ is the assignment which differs from g at most for the value that it assigns to 1, and $g^{[x / 1]}(1) = x$.

$= \quad \lambda s. \ \forall b \ [b \subseteq_S f\text{-exp}(s) \rightarrow \exists e \ \exists x \ [\text{sports-car}(x) \wedge \text{drive}(e) \wedge \text{Ag}(e) = \text{Gianni} \wedge$
$\qquad \text{Th}(e) = x \wedge b \subseteq_S \tau(e)]]$

f. $[\![\ k[_{\text{TP2}} ...] \ ]\!]^{c, g, w} \ = \quad \lambda s: s <_S c_t. \ \forall b \ [b \subseteq_S f\text{-exp}(s) \rightarrow \exists e \ \exists x \ [\text{sports-car}(x) \wedge \text{drive}(e)$
$\qquad\qquad\qquad \wedge \text{Ag}(e) = \text{Gianni} \wedge \text{Th}(e) = x \wedge b \subseteq_S \tau(e)]]$

g. $[\![\ (23) \ ]\!]^{c, g, w} \ = \ 1 \quad iff$

$\quad iff \quad (\lambda P_{<i,t>}. \ \exists s \ [\text{N*}(s) \wedge P(s)])(\lambda s: s <_S c_t. \ \forall b \ [b \subseteq_S f\text{-exp}(s) \rightarrow \exists e \ \exists x \ [\text{sports-car}(x)$
$\qquad\qquad \wedge \text{drive}(e) \wedge \text{Ag}(e) = \text{Gianni} \wedge \text{Th}(e) = x \wedge b \subseteq_S \tau(e)]])$

$\quad iff \quad \exists s_R \ [\text{N*}(s_R) \wedge \{s_R <_S c_t\} \ \forall b \ [b \subseteq_S f\text{-exp}(s_R) \rightarrow \exists e \ \exists x \ [\text{sports-car}(x) \wedge \text{drive}(e) \wedge$
$\qquad \text{Ag}(e) = \text{Gianni} \wedge \text{Th}(e) = x \wedge b \subseteq_S \tau(e)]]]$

Notice that, throughout steps (24a-g) of this derivation, variable *e* can be instantiated by singular or by plural events alike, in virtue of (LCH). Variable *x*, however, corresponding to the singular indefinite *un'auto sportiva*, must be instantiated by a singular car. As a result, if *e* is a plural event of Gianni driving a car, as is the case on HAB, the *same* car is identified as the theme of all singular sub-events of *e* which are events of Gianni driving a car, by (SSP). This explains the SOE that (22) has on HAB.

I'll now show how the schematic truth conditions in (24g) account for both HAB and PROG. Consider HAB first. In this case, the situation s_R in (24g) is a large situation, as required by the adverbial *in quel periodo*, and the forward-expanded situation $f\text{-exp}(s_R)$ will *a fortiori* be large. For any branch of $f\text{-exp}(s_R)$ to be included by the temporal trace of an event *e* of Gianni driving a sports car (call it a *D-event*), *e* must be a plural event consisting of many D-events. Only in this way can we have a large enough D-event for its temporal trace to cover a branch of $f\text{-exp}(s_R)$. As a result of the obtained relation $b \subseteq_S \tau(e)$, a plurality of singular D-events is spread out over the reference situation and its expected continuations. The resulting reading is that Gianni repeatedly drove a certain sports car throughout situation s_R on the relevant period and the expected continuations of s_R.[28] This intuitively corresponds to the HAB reading of (22).

Let's now turn to PROG. In this case, the situation s_R in (24g) is a small situation, as required by the adverbial *in quel momento*. Thus, branches of $f\text{-exp}(s_R)$ may be small enough to

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[28] Notice that the analysis does not have the unintuitive side effect that the sports car may vary with each branch of $f\text{-exp}(s_R)$, since the reference situation s_R itself has to be included by the trace of the event *e* having sports car *x* as its theme, thus there must be a part of *e* which has already occurred at s_R and the sports car *x* involved in this part of *e* is the same which is driven in the continuation-branches of s_R.

be included by the temporal trace of a singular event of Gianni driving a sports car. I shall assume that the natural choice for instantiating the event quantifier, when the reference situation is small, is indeed a *singular* event, which is spread out over the reference situation and its expected continuations.[29] This correctly predicts (22)'s PROG reading.

Concerning (3), repeated below as (25), its LF is (26), and the derivation of its truth conditions is partly given in (27) (notice that [27a] gives the kind-reading of *un sigaro toscano*, and [27b] applies *Distribution to Sub-Events*):

(25)   (In quel periodo) Gianni fumava un sigaro toscano (il Toscanello).

        '(During that period) Gianni used to smoke a kind of tuscan cigar (the Toscanello).'

(26) $[_{TP1} [_{TAdv}$ in quel periodo$]_k$ $k[_{TP2} [_T$ PAST$_k] [_{AspP}$ IMPF $[_{VP1} [_{DP}$ un sigaro toscano$]_1$ $1[_{VP2}$ Gianni fumare $t_1]]]]$

(27)   a. $[[[_{DP}$ un sigaro toscano$]_1]]^{c, g, w}$ $= \lambda P_{<e,<v,t>>}.\lambda e.\exists x[\text{kind-of-tuscan-cigar}(x) \wedge P(x, e)]$

    b. $[[[_{VP1} [_{DP}$ un sigaro toscano$]_1$ $1[_{VP2}$ Gianni fumare $t_1]]]]^{c, g, w}$ $=$

        $= \lambda e. \exists x [\text{kind-of-tuscan-cigar}(x) \wedge \text{smoke}(e) \wedge \text{Ag}(e) = \text{Gianni} \wedge \text{Th}(e) = x]$ $=$

        $= \lambda e. \exists x [\text{kind-of-tuscan-cigar}(x) \wedge \forall e' [e' \subseteq_{AT} e \rightarrow \exists y (y \subseteq_{AT} x \wedge \text{smoke}(e') \wedge \text{Ag}(e')$

        $= \text{Gianni} \wedge \text{Th}(e') = x)]]$

    c. $[[(26)]]^{c, g, w}$ $= 1$ *iff*

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[29] The main reason for this assumption comes from the oddness of (i), with the bare plural object *auto sportive* 'sports cars' instead of the singular indefinite object *un'auto sportiva* 'a sports car':

(i)   ? Alle 15 Gianni guidava auto sportive.
    '? At 3pm Gianni was driving sports cars.'

Here, the time adverbial *alle 15* introduces a small reference situation s_R, while the VP *Gianni guidare auto sportive* 'Gianni drive sports cars' necessarily denotes a set of plural events in which Gianni drives different sports cars x, y, z, ... To be precise, the denotation of this VP is the set $\lambda e. [\text{drive}(e) \wedge \text{Ag}(e) = \text{Gianni} \wedge \text{Th}(e) = \text{sports-cars}^k]$ of driving events having Gianni as their agent and the kind *sports-cars^k* as their theme, which is the same as the set $\lambda e. \forall e' [e' \subseteq_{AT} e \rightarrow \exists x [x \subseteq_{AT} \text{sports-cars}^k \wedge \text{drive}(e') \wedge \text{Ag}(e') = \text{Gianni} \wedge \text{Th}(e') = x]]$ of driving events e such that for every atomic part e' of e there is an atomic car x instantiating the kind *sports-cars^k* such that Gianni is the agent and x is the theme of e'. The oddness of (i) might depend on a clash between the small size of s_R and the plurality of the VP interpretation (but note that it cannot be just VP plurality that causes troubles here: considerations concerning the average size of singular events in the VP denotation are also crucial, as shown by the fact that *Alle 15 Gianni mangiava ciliegie* 'At 3 pm Gianni was eating cherries' is perfect). I don't have an explanation for why such a clash should arise, given that the imperfective aspect in (i) only requires that s_R be included by the trace of the plural event, not that the former be coextensive with the latter – in the latter case, we might have argued that the incompatibility arose because of a misfit between the small size of s_R and the unconstrained size of the plural event. Whatever the reason for this clash, this reason motivates the crucial assumption I make in the main text.

iff $(\lambda P_{<i,t>}.\ \exists s\ [\text{on-that-period*}(s) \wedge P(s)])(\lambda s:\ s <_S c_t.\ \forall b\ [b \subseteq_S f\text{-exp}(s) \rightarrow \exists e\ \exists x$

$[\text{kind-of-tuscan-cigar}(x) \wedge \forall e'\ [e' \subseteq_{AT} e \rightarrow \exists y\ (y \subseteq_{AT} x \wedge \text{smoke}(e') \wedge \text{Ag}(e') =$

$\text{Gianni} \wedge \text{Th}(e') = x)] \wedge b \subseteq_S \tau(e)]])$

iff $\exists s\ [\text{on-that-period*}(s) \wedge \{s <_S c_t\}\ \forall b\ [b \subseteq_S f\text{-exp}(s) \rightarrow \exists e\ \exists x\ [\text{kind-of-tuscan-}$

$\text{cigar}(x) \wedge \forall e'\ [e' \subseteq_{AT} e \rightarrow \exists y\ (y \subseteq_{AT} x \wedge \text{smoke}(e') \wedge \text{Ag}(e') = \text{Gianni} \wedge \text{Th}(e') =$

$x)] \wedge b \subseteq_S \tau(e)]]]$

The analysis predicts that (25) is true if and only if every continuation branch b of the large reference situation s is covered by the trace of a plural event e of Gianni smoking a certain kind x^k of tuscan cigar, where x^k is predicted to be the same kind for every singular sub-event of e (by [SSP]).[30] Also, by *Distribution to Sub-Events*, singular instances of x^k are distributed over singular sub-events of e. Consequently, a plurality of events in each one of which Gianni smokes a tuscan cigar of kind x^k is spread out over s and its expected continuations. This corresponds intuitively to the HAB reading of (25).

I'll make two remarks concerning my analysis of HAB. First, there are no cardinality constraints that the analysis imposes on the number of singular sub-events of the plural events. What the analysis uniquely requires is that any branch of $f\text{-exp}(s_R)$ be covered by the trace of some (singular or plural) event. In the case of the HAB reading of (22), for instance, from the large size of such branches and some natural facts concerning events of driving a sports car (e.g. the fact that people do not normally engage in single continuous events of driving a sports car which are protracted over large periods of time), the inference can be drawn that a plural event is needed in order to obtain the required relation. Notice that a plural D-event consisting of just two D-events e_1 and e_2 would suffice for this, as long as e_1 and e_2 were far enough from each other that the trace $\tau(e_1 \oplus_E e_2)$ would temporally include a branch. If the "only two D-events" scenario is ruled out in most cases, this can only depend on what kind of historical continuations are expected as normal continuations at the reference situation s_R: it could be that, on the basis of evidence about Gianni's behaviour accessible at s_R, only such continuations were expected in which D-events would occur quite frequently. The second remark is that there are no constraints

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[30] This is the kind-level SOE of (25). Notice that my analysis does not have the effect of letting the kind of tuscan cigar x^k vary with each branch of $f\text{-exp}(s_R)$. As noted in footnote 28, the reference situation s_R itself has to be included by the trace of the plural event e having kind x^k as its theme, thus there must be a part of e which has already occurred at s_R, and the kind x^k involved in this part of e is the same one whose individual instances are smoked in the continuation-branches of s_R.

that the analysis imposes on the plural events with regard to the temporal distribution of their singular sub-events. In particular, there is no semantic requirement that the plural events should contain a *regular* temporal distribution of singular sub-events, in the sense that the singular sub-events would regularly occur at intervals of the same measure. This is a point with respect to which the present analysis differs from Deo's (2010) account of imperfective habituals.

I think it is empirically adequate to not impose either a lower bound on the number of singular sub-events, or a condition of regular distribution for such sub-events. My intuition is that imperfective habituals can be accepted as true in scenarios in which there is only evidence of few events of the relevant type having occurred, and no past evidence or expectation of a regular distribution of such events in time. I shall not pursue this issue any longer here.

6.   The same-object effect, Q-adverbs and bare plurals

The second problem that we have to address is the following:

(P2)   How to explain the contrast between (2a,b) and their adverbially quantified and bare plural counterparts with respect to the presence of an SO Effect.

I'll focus on the contrast between (2b) (repeated below as [28]) on the one hand, and (8), (11) (repeated below as [29], [30], respectively) on the other.

(28)   (In quel periodo) Gianni leggeva un libro di filosofia.
'#(During that period) Gianni used to read a philosophy book.'

(29)   (In quel periodo) Gianni leggeva sempre un libro di filosofia.
'(During that period) Gianni would always read a philosophy book.'

(30)   (In quel periodo) Gianni leggeva libri di filosofia.
'(During that period) Gianni used to read philosophy books.'

I shall not go through the analysis of (28) to show how the SOE is predicted for this sentence, as the account is the same as was given for (22) in sect. 5.

Concerning (29), my proposal is that the Q-adverb triggers the construction of a tripartite quantificational structure at LF, as proposed in sect. 4.2. Even though *sempre* is not overtly

restricted by a *when*-clause in (29),[31] still a restriction has to be accommodated at LF for the sentence to be interpretable. The LF for (29) is (29'), and its truth conditions are derived in (29"):

(29') $[_{TP1} [_{TAdv}$ in quel periodo$]_k$ $k[_{TP2} [_T PAST_k] [_{AspP}$ IMPF [sempre C] $[_{VP1} [_{DP}$ un libro di filosofia$]_1$ $1[_{VP2}$ Gianni leggere $t_1]]]]]$

(29") a. $[[[_{VP1} [_{DP}$ un libro di filosofia$]_1$ $1[_{VP2}$ Gianni leggere $t_1]]]]$ =

   = $\lambda e. \exists x$ [philosophy-book$(x) \wedge$ read$(e) \wedge$ Ag$(e) =$ Gianni $\wedge$ Th$(e) = x]$

 b. $[[$ [sempre C] $]]$ =

   = $\lambda P_{<v,t>}. \lambda e_0. \forall s_1 [C(s_1) \rightarrow \exists e_1 [P(e_1) \wedge \Re(e_1, s_1) \wedge e_1 \subseteq_E e_0]]$

 b. $[[$ [sempre C] $[_{VP1} [_{DP}$ un libro di filosofia$]_1$ $1[_{VP2}$ Gianni leggere $t_1]]]]$ =

   = $\lambda e_0. \forall s_1 [C(s_1) \rightarrow \exists e_1 \exists x$ [philosophy-book$(x) \wedge$ read$(e) \wedge$ Ag$(e) =$ Gianni $\wedge$ Th$(e) = x \wedge \Re(e_1, s_1) \wedge e_1 \subseteq_E e_0]]$

 d. $[[[_{AspP}$ IMPF [sempre C] $[_{VP1} [_{DP}$ un libro di filosofia$]_1$ $1[_{VP2}$ Gianni leggere $t_1]]]]]$ =

   = $\lambda s_0.$ THR$(\lambda e_0. \forall s_1 [C(s_1) \rightarrow \exists e_1 \exists x$ [philosophy-book$(x) \wedge$ read$(e) \wedge$ Ag$(e) =$ Gianni $\wedge$ Th$(e) = x \wedge \Re(e_1, s_1) \wedge e_1 \subseteq_E e_0]], f$-exp$(s_0))$ =

   = $\lambda s_0. \forall b [b \subseteq_S f$-exp$(s_0) \rightarrow \exists e_0 [\forall s_1 [C(s_1) \rightarrow \exists e_1 \exists x$ [philosophy-book$(x) \wedge$ read$(e) \wedge$ Ag$(e) =$ Gianni $\wedge$ Th$(e) = x \wedge \Re(e_1, s_1) \wedge e_1 \subseteq_E e_0]] \wedge b \subseteq_S \tau(e_0)]]$

 e. $[[(29)]]^{c, g, w} = 1$ *iff*

   iff $(\lambda P_{<i,t>}. \exists s$ [on-that-period*$(s) \wedge P(s)])(\lambda s: s <_S c_t. \forall b [b \subseteq_S f$-exp$(s) \rightarrow \exists e_0 [\forall s_1 [C(s_1) \rightarrow \exists e_1 \exists x$ [philosophy-book$(x) \wedge$ read$(e_1) \wedge$ Ag$(e_1) =$ Gianni $\wedge$ Th$(e_1) = x \wedge \Re(e_1, s_1) \wedge e_1 \subseteq_E e_0]] \wedge b \subseteq_S \tau(e_0)]])$

   iff $\exists s$ [on-that-period*$(s) \wedge \{s <_S c_t\} \forall b [b \subseteq_S f$-exp$(s) \rightarrow \exists e_0 [\forall s_1 [C(s_1) \rightarrow \exists e_1 \exists x$ [philosophy-book$(x) \wedge$ read$(e_1) \wedge$ Ag$(e_1) =$ Gianni $\wedge$ Th$(e_1) = x \wedge \Re(e_1, s_1) \wedge e_1 \subseteq_E e_0]] \wedge b \subseteq_S \tau(e_0)]]]$

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[31] Recall that the restriction of Q-adverbs is typically realized by *when*-clauses at the surface, as in the following variant of (29):

(i) Quando voleva meditare, Gianni leggeva sempre un libro di filosofia.
    when want(Imp, 3sg) meditate(Inf) Gianni read(Imp, 3sg) always a book of philo
    'When he wanted to meditate, Gianni would always read a philosophy book.'

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The analysis predicts that sentence (29) is true if and only if the following condition obtains (I describe it procedurally to make it easier to grasp its content):

(a)   Take any continuation branch b of the past reference situation s_R.

(b)   Then, you must be able to correspondingly find an "all inclusive" event e_0 with the following properties:

(i) for every situation s_1 having the contextually relevant property C (e.g. s_1 is a situation in which Gianni wants to meditate), there is an event e_1 of Gianni reading a philosophy book which bears some relevant temporal relation to s_1 (plausibly, the trace of e_1 overlaps with s_1) and which is part of the "all inclusive" event e_0; (ii) the branch b is temporally included by the trace of e_0.

Assuming that there are many situations s_1 with the property C (e.g. situations where Gianni wanted to meditate) within the relevant temporal region including the reference situation, this requires that there be many events of Gianni reading a philosophy book throughout the expected continuations, which seems to be intuitively correct.[32] Thus, no SOE arises in this case, as each event of reading a philosophy book has its own book as theme.

Concerning (30), on my analysis this sentence has LF (30'), and its truth conditions are derived in (30"):

(30') $[_{TP1} [_{TAdv}$ in quel periodo$]_k$ $k[_{TP2} [_T$ PAST$_k] [_{AspP}$ IMPF $[_{VP}$ Gianni leggere libri di filosofia$]]]]$

(30")   a. $[[[_{VP}$ Gianni leggere libri di filosofia$]]]$ =

$=$ $\lambda e.$ [read$(e) \wedge$ Ag$(e) =$ Gianni $\wedge$ Th$(e) = $ *philosophy-books*^{k}]

b. $[[[_{AspP}$ IMPF $[_{VP}$ Gianni leggere libri di filosofia$]]]]$ =

$=$ $\lambda s.$ $\forall b$ $[b \subseteq_S f$-exp$(s) \rightarrow \exists e$ [read$(e) \wedge$ Ag$(e) =$ Gianni $\wedge$ Th$(e) = $ *philosophy-books*$^k \wedge b \subseteq_S \tau(e)]]$

c. $[[(30)]]^{c, g, w}$ $= 1$ *iff*

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[32] Notice that, in case there were no situations with property C in the relevant period, the analysis would not require there to be any events of Gianni reading a philosophy book occurring in the expected continuations. If one were not happy with this result, one would just have to accommodate the presupposition that the C-domain for *sempre* be non-empty.

iff $\{g(k, w) <_S now \land$ on-that-period$(g(k, w))\}$ $\forall b$ $[b \subseteq_S$ f-exp$(g(k, w)) \rightarrow \exists e$

  $[read(e) \land Ag(e) = Gianni \land Th(e) = philosophy\text{-}books^k \land b \subseteq_S \tau(e)]]$

iff $\{g(k, w) <_S now \land$ on-that-period$(g(k, w))\}$ $\forall b$ $[b \subseteq_S$ f-exp$(g(k, w)) \rightarrow \exists e$ $[\forall e_1$

  $[e_1 \subseteq_{AT} e \rightarrow \exists x$ $[x \subseteq_{AT} philosophy\text{-}books^k \land read(e_1) \land Ag(e_1) = Gianni \land Th(e_1)$

  $= x \land b \subseteq_S \tau(e)]]$

The analysis predicts that (30) is true if and only if every continuation branch of the large reference situation is covered by the trace of a plural event e such that every atomic part of e is an event of Gianni reading a philosophy book. Thus, (30) too is predicted to not have SOEs,[33] as individual instances of the kind *philosophy-books^k* are distributed over atomic sub-events of the plural event, in virtue of *Distribution to Sub-Events*.

I've shown how my analysis copes with (P2). Lack of SOEs in adverbially quantified imperfectives has been explained by means of the narrow scope that the existential quantifier introduced by the singular indefinite takes with respect to the Q-adverb. Lack of SOEs in bare plural imperfectives has been explained by means of the claim that bare plurals denote kinds *plus* the assumption that there is distribution of individual instances of the kind over atomic sub-events of the plural event (*Distribution to Sub-Events*).

7.   The oddness explained

We can now move on to the last problem:

(P3)   How to explain the asymmetric availability of the habitual reading for (2a) and (2b),[34] and the symmetric availability of this reading for their adverbially quantified and bare plural counterparts.

The semantic analysis and the pragmatic theory given above jointly explain why (2b) is odd on the habitual reading. The semantic analysis is relevant here insofar as it can explain the SOE that (2a,b) have. We saw that the SOE is determined as an entailment on my analysis. Now we let pragmatics step in, through the following principle:[35]

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[33] Sentence (30), of course, is correctly predicted to have a *kind-level* SOE, which I disregard here as my focus is on lack of individual-level SOEs.

[34] Recall that the HAB reading is perfectly acceptable with (2a), but odd with (2b).

[35] See Magri (2009) for a similar principle.

(O)   If a sentence S has implications that conflict with common knowledge, then S is perceived as odd.

We can run the following reasoning: the proposition that Gianni habitually read the same philosophy book x – proposition which is predicted to be entailed by (2b) on my analysis – conflicts with common knowledge, as people who are used to read philosophy books normally read books which differ across different events of reading a philosophy book, and it would be a weird habit for anyone to habitually read a particular book, always the same one. This explains why (2b) sounds odd on the habitual reading.

On the other hand, the proposition that Gianni habitually drove the same sports car x – proposition which is predicted to be entailed by (2a) on my analysis – does not conflict with any piece of common knowledge. Quite to the contrary: a scenario in which a person owns one single sports car and habitually drives it over a large period of time looks completely plausible, and there is no assumption in this case that people who are used to drive sports cars normally drive sports cars which differ across different driving events. This is coherent with the fact that (2a) is good on the habitual reading.

As to the last part of (P3), namely the question about the symmetric availability of the HAB reading for the bare plural and adverbially quantified counterparts of (2a,b), not much needs to be said. I have already shown how my analysis explains the lack of SOE in (8) and (11). Further, I have proposed that the oddness of (2b) on HAB depends on a conflict between its SOE and common knowledge, while (2a) is fine on HAB since that there is no conflict between its SOE and common knowledge. Given this, the solution to the last part of (P3) is clear: HAB is symmetrically available for (8) and (11) because these sentences lack SOEs, and it was precisely this effect that was responsible for the asymmetric availability of HAB for (2a) and (2b).

8.   Conclusion

I have provided a non-quantificational analysis of imperfective habituals in Italian in which event plurality plays a central role. The imperfective feature of the Imperfetto has been analyzed as involving a modal operation of spreading out a temporal property over a branching structure f-$exp(s_R)$ which consists of the expected continuations of a reference situation s_R. The same LF analysis that I have proposed for bare imperfectives also accounts for their progressive readings. On my analysis, the difference between habitual and progressive readings relates to the

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distinction between singular and plural events (as in Ferreira 2005), in interaction with a distinction between "large size" and "small size" reference situations. My analysis explains why a bare imperfective with a singular indefinite embedded in its VP implies that the referent of the indefinite is the same across different episodes. It has been shown that this effect would be difficult to explain on a theory relying on a covert generic quantifier. The oddness of the habitual reading of imperfective sentences like (2b) has been explained on the basis of a mismatch between their SO Effects and common knowledge. The analysis that I have proposed for imperfective aspect should be distinguished from previous analyses which rely on the idea that the imperfective introduces a universal quantification over a temporal/modal domain (Bonomi 1997, Deo 2010). In my account, the domain of $\forall$ is not a set of relevant sub-intervals of the reference time (Bonomi 1997), nor a regular partition defined over the reference time (Deo 2010), but the set of continuation branches of the reference situation. If we think of such branches as modal alternatives, my account is rather close in spirit to Dowty's 1979 classical analysis of the English progressive operator PROG. The classical thorny issue of defining the relevant domain for $\forall$ does not arise on my proposal: to account for the repeated occurrences of events that characterize HAB readings, the analysis does not exploit a universal quantifier, but the event plurality contributed by the verb. Given that plural P-events are not required to contain a regular temporal distribution of singular P-events, the present analysis (unlike Deo's) does not impose any condition of regular distribution on habitual readings, which seems empirically adequate.

Appendix

Partial Branching Time

A PBT-structure is an 8-tuple $S = \langle U_S, \oplus_S, Inst_S, LB_S, RB_S, \leq_S, \subseteq_S, \infty_S \rangle$ such that:

(a) U_S is a non-empty set of entities called *situations*

(b) $\oplus_S$, the *sum operation,* is a function from $U_S \times U_S$ to U_S that is idempotent, commutative, and associative, that is:

$\forall x \in U_S [x \oplus_S x = x]$ [idempotence]

$\forall x, y \in U_S [x \oplus_S y = y \oplus_S x]$ [commutativity]

$\forall x, y, z \in U_S [x \oplus_S (y \oplus_S z) = (x \oplus_S y) \oplus_S z]$ [associativity]

(c) $Inst_S$ is a one-place predicate which is true of $x \in US$ just in case x is an instantaneous situation

(d) LB_S and RB_S are functions from US to US that are idempotent, and whose interpretations are as follows: $LB_S(x)$ is the instantaneous situation which is the left boundary of x and $RB_S(x)$ is the instantaneous situation which is the right boundary of x

$\forall x \in U_S [LB_S(LB_S(x)) = LB_S(x)]$ [idempotence]

$\forall x \in U_S [RB_S(RB_S(x)) = RB_S(x)]$ [idempotence]

(e) $\leq_S$ is a partial order[36] over U_S whose restriction to instantaneous situations is tree-like, and whose interpretation is temporal precedence:

$\forall x, y, z \in U_S [[x \leq_S z \wedge y \leq_S z \wedge Inst_S(x) \wedge Inst_S(y)] \rightarrow [x \leq_S y \vee y \leq_S x]]$

(f) $\subseteq_S$ is a partial order over U_S whose interpretation is temporal inclusion:

$\forall x, y \in US [x \subseteq_S y \leftrightarrow [LB_S(y) \leq_S LB_S(x) \wedge RB_S(x) \leq_S RB_S(y)]]$

(g) ∞S is a reflexive and symmetric relation over US whose interpretation is temporal overlap:

$\forall x, y \in U_S [x \infty_S y \leftrightarrow \exists z \in U_S [z \subseteq_S x \wedge z \subseteq_S y]]$

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[36] A two-place relation R is said to be *partial* (or a *partial order*) if it satisfies the following conditions (Landman 1991):

(c1) $\forall x R(x, x)$ [reflexivity]
(c2) $\forall x \forall y [[R(x, y) \wedge x \neq y] \rightarrow \neg R(y, x)]$ [antisymmetry]
(c3) $\forall x \forall y \forall z [[R(x, y) \wedge R(y, z)] \rightarrow R(x, z)]$ [transitivity]

Histories (maximal chains of situations)

A subset $X \subseteq U_S$ is a history in U_S if and only if X jointly satisfies the following conditions:

(i) $\forall x, y \in X \ [x \leq_S y \lor y \leq_S x \lor x \infty_S \ y]$ (*temporal connectedness*)

(ii) $\forall Y \subseteq U_S \ [[\forall x, y \in Y \ [x \leq_S y \lor y \leq_S x \lor x \infty_S \ y] \land X \subseteq Y] \to X = Y]$ (*maximality*)

Circumstances of evaluation (worlds)

A circumstance of evaluation is the cluster of all histories passing through some situation *s* (all such histories are identical up to and including *s*, and they diverge after *s*).

Some further formulas valid in PBT-structures:

(α) $\forall x, y, z \in U_S \ [[x \subseteq_S y \land y \leq_S z] \to x \leq_S z]$

(β) $\forall x, y \in U_S \ [x \subseteq_S y \to LB_S(x) \subseteq_S y]$

(γ) $\forall x, y \in U_S \ [x \subseteq_S y \to RB_S(x) \subseteq_S y]$

(δ) $\forall x, y \in U_S \ [x \subseteq_S y \leftrightarrow [LB_S(x) \subseteq_S y \land RB_S(x) \subseteq_S y]]$

(ε) $\forall x, y \in U_S \ [[x \leq_S y \land x \neq y] \to \neg[x \infty_S y]]$

Event Structures with PBT

An event structure is a 7-uple $E = \langle U_E, \oplus_E, \leq_E, \subseteq_E, \infty_E, S, \tau_E \rangle$ such that:

(a) U_E is a non-empty set of entities called *events*

(b) $\oplus_E$, the *sum operation,* is a function from $U_E \times U_E$ to U_E that is idempotent, commutative, and associative, that is:

$\forall x, y, z \in U_E \ [x \oplus_E x = x \land x \oplus_E y = y \oplus_E x \land x \oplus_E (y \oplus_E z) = (x \oplus_E y) \oplus_E z]$

(c) $\leq_E$ is a partial order over U_E whose restriction to instantaneous events is tree-like, and whose intuitive interpretation is temporal precedence

(d) $\subseteq_E$, the *part relation*, is defined as follows:

$\forall x, y \in U_E \ [x \subseteq_E y \leftrightarrow x \oplus_E y = y]$

(e) ∞_E, the *overlap* relation, is defined as follows:

$\forall x, y \in U_E \ [x \infty_E y \leftrightarrow \exists z \in U_E \ [z \subseteq_E x \land z \subseteq_E y]]$

(f)   S is a PBT-structure

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(g) τ_E, the *temporal trace* function, is a function from U_E to U_S such that $\tau_E(x)$ is the *minimal* situation $y \in U_S$ such that the event x occurs at y, and it satisfies the following axioms:

$\forall x, y \in U_E \ [\tau_E(x \oplus_E y) = \tau_E(x) \oplus_S \tau_E(y)]$

$\forall x, y \in U_E \ [x \leq_E y \leftrightarrow \tau_E(x) \leq_S \tau_E(y)]$

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