

# Computational Lexical Semantics, Incrementality, and the So-called Punctuality of Events

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## Abstract

The distinction between *achievements* and *accomplishments* is known to be an empirically important but subtle one. It is argued here to depend on the *atomicity* (rather than punctuality) of events, and to be strongly related to *incrementality* (i.e., to event-object mapping functions). A computational treatment of incrementality and atomicity is discussed in the paper, and a number of related empirical problems considered, notably lexical polysemy in verb – argument relationships.

## Introduction

Ever since Vendler (1957) introduced it, the so-called punctuality of *achievements* has been the object of many theoretical contests. After having demonstrated that punctuality actually breaks up into two, distinct notions, namely *non-durativity* and *atomicity*, I will argue here for a compositional semantic account of the latter. I will show that (non-)atomicity interacts closely with the notion of *incrementality*, as formulated in Dowty (1991), and that this property of verbs should be lexically encoded, although it is subject both to semantics and pragmatics-driven variations. I will finally discuss the formal specifications an NLP system could use to make predictions about atomicity and incrementality.

### 1. On Vendler's so-called *achievements*

Vendler (1957) defined *achievements* and *accomplishments* as respectively *punctual* and *durative*. He based his claims on two main tests,

noting that *at* <time expression> adverbials combine with *achievements* but not *accomplishments*, whereas *finish* combines with *accomplishments* but not *achievements* :

- (1a) *At what time did you reach the top? At noon sharp.*
- (1b) *At what moment did you spot the plane? At 10:53 A.M.*
- (2a) *\*John finished leaving.*
- (2b) *John finished drawing the circle.*

Dowty (1986) and Moens and Steedman (1988) decisively questioned the coherence of the class of *achievement* verbs, arguing that not all of them are non-durative. As noted above, Vendler identifies punctual events through the conjunction of the (positive) *at* and (negative) *finish* tests. However, they do not always yield comparable results :

- (3a) *Karpov beat Kasparov at 10.00 P.M.*
- (3b) *\*The Allies beat Germany at 10.00 P.M.*
- (4a) *\*Karpov finished beating Kasparov*
- (4b) *The Allies finished beating Germany.*

The *at* test fails to characterize (3b) as an *achievement* because it is *durative*, whereas (3a) passes this very test because it is *non-durative*. On the contrary, the *finish* test in (4) yields an identical result for the beating of a chess player and that of a whole nation. It appears thus that the *finish* test does not indicate non-durativity, contrary to the *at* test, which refuses durative events, and that telic events such as (3b) fall outside Vendler's classification, since they fail both the *finish* test (unlike *accomplishments*) AND the *at* test (unlike *achievements*). Since it

is desirable that *achievements* should include events such as (3b), durativity should not be considered as a necessary property of *achievements*. The salient common point between (3a) and (3b) is that both events lack *proper subparts*, i.e., are *atomic*. *Atomicity* should thus be regarded as the defining property of *achievements*; it can be tested with *finish*.

## 2. Atomicity as a semantic issue

Many authors, including Verkuyl (1993) and Jackendoff (1996), have denied atomicity any semantic content, and have argued that it is a pragmatic category. I do not intend to claim here that atomicity is not subject to pragmatic constraints. The following examples identify one such constraint, i.e., the *relative size* of arguments of verbs of consumption :

- (5a) ??*John finished eating the raspberry.*  
 (5b) *The bird finished eating the raspberry.*

(5a) suggests that raspberries are so small with respect to a human 'eater' that *eat* denotes an atomic event. But the same does not hold true of birds (cf. (5b)). No attention will be paid to this kind of pragmatic constraint in this paper.

Yet I will demonstrate here that atomicity does possess a semantic content, and that therefore it can be regarded as an aspectual category. Consider the following examples<sup>1</sup> :

- (6a) \**The soldier finished crossing the border.*  
 (6b) *The soldiers finished crossing the border.*  
 (7a) \**John finished slamming the door open.*  
 (7b) *John finished slamming the doors open.*

The plural NPs *the soldiers* and *the doors* possess proper subparts, along which the crossing and slamming events in (6b) and (7b) are measured, making those events non-atomic (there are several distinct subevents of one door being slammed, and of one soldier crossing the border); compare with the atomic (6a) and (7a), where those very NPs are singular. The variation in noun quantification being a semantic one,

<sup>1</sup> Similar examples were proposed by Declerck (1979), but were discussed in terms of durativity, and not of atomicity.

atomicity should clearly receive some form of semantic content. Moreover, it should be noted that atomic events are not compatible with the *progressive perfect*, whereas non-atomic ones freely combine with it<sup>2</sup> :

- (8a) \**The soldier has been crossing the border.*  
 (OK with iterative, non-atomic reading)  
 (8b) *The soldiers have been crossing the border.*

Those facts support a semantic view of atomicity<sup>3</sup>.

## 3. Towards a semantic account : (non-) atomicity and incrementality

The above data suggests an interesting solution to this puzzle : atomicity seems to be related to the notion of *incrementality*, as formulated in Dowty (1991) (see also *graduality* in Krifka 1992). To my knowledge, the concept of *incrementality* (originally proposed to account for the telicity of events) has never been discussed in the light of that of atomicity, although this is an obvious thing to do, both concepts being about the present or absence of subevents in the internal structure of events. I will undertake to bridge this gap here.

### 3.1 Incrementality and delimiting arguments

Dowty defines *incrementality* as a property of verbs whose development can be measured along the inner structure of one of their arguments (which he calls *incremental theme*) :

- (9) *John drank a glass of beer.*

In (9), the development of the drinking event can be measured along the subparts of the glass of beer. Each subpart of the *incremental theme* argument is mapped onto a subpart of the

<sup>2</sup> Complementary tests such as the different readings of *in* etc. will not be studied here for want of space.

<sup>3</sup> Caudal (1998) discusses at length related examples involving collection-referring nouns (e.g., *orchestra* or *regiment*), and shows that they behave similarly, cf. *The regiment finished crossing the border*.

corresponding event (a fact which Dowty (1991) and Krifka (1992) refers to as *event-object homomorphism*). Dowty (1991) rejects ostensibly the possibility to treat as incremental themes the patient arguments of so-called punctual (i.e., *achievement*) verbs, such as *slam open*. According to him, incremental themes should be able to undergo a *gradual* change of state<sup>4</sup>. Unfortunately, Dowty does not consider examples such as (7b), which exhibit an incremental behaviour although they include this very kind of patient argument. I will therefore reject Dowty's objection, and regard (7b) as incremental.

It follows naturally from the above definition that incrementality entails non-atomicity: it implies that a situation's development possesses proper subparts, and therefore that it is non-atomic. But does non-atomicity entail incrementality, conversely? I.e., are those two notions equivalent? If not, how should they be connected? In order to answer those questions in the following sections, I will make use of a rough feature-based notation: [+/-ATM] will express atomicity/non-atomicity, and [+/-INC] incrementality/non-incrementality.

### 3.2 Non-atomicity with incrementality

I will call *delimiting arguments* the arguments of a verb serving as 'measures' (or 'odometers') for the corresponding event (e.g. the internal arguments of *drink* or *slam open*). It should be noted that this term is broader than that of *incremental theme*, since it includes e.g., patient arguments of so-called punctual verbs, which Dowty refused to regard as incremental themes. For the sake of simplicity, I will focus in this paper exclusively on internal delimiting arguments:

- (10a) *John finished eating his apple.*
- (10b) *John finished eating his apples.*
- (11a) *\*John finished throwing his stone.*
- (11b) *John finished throwing his stones.*

4 Cf. Dowty (1991:568): *Many traditional Themes...are not Incremental Themes. Many achievement verbs entail a definite change of state in one of their arguments...but never in distinguishable separate stages, i.e. subevents.*

(10) shows that *eat* can be [-ATM],[+INC] both with a definite singular and plural delimiting argument, whereas (11) shows that *throw* can be [-ATM],[+INC] only with a definite plural delimiting argument. The development of *eating his apple* is measured in (10a) along the *quantity* of apple remaining to eat, whereas that of *throwing his stones* in (11b) is measured along the successive *individual* stones being thrown away. I will extend the notion of incrementality to this latter kind of event-object mapping.

Under this view, incrementality arises from delimiting arguments, and not only from incremental themes. However, I will distinguish *two* types of incrementality, thereby preserving a distinction between Dowty's incrementality and the extension I proposed. I will call *m-incrementality* (for *quantity of matter-incrementality*) the type of incrementality exhibited by (10a) and *i-incrementality* (for *individual-incrementality*) that exhibited by (11b). At least two classes of verbs can be distinguished in this respect: verbs like *eat* are capable of m-incrementality, i.e., incrementality with individual-referring delimiting arguments (they have an incremental theme in the sense of Dowty), whereas verbs like *throw* are only capable of i-incrementality, i.e., incrementality with collection-referring delimiting arguments (they lack an incremental theme in the sense of Dowty). Of course, non-atomicity can follow from either i or m-incrementality.

Another type of incremental non-atomic events can be found in path-movement verbs:

- (12) *Mary walked the Appalachian trail.*  
(Tenny 1994)

The development of the walking event can be measured along the explicit path argument *the Appalachian trail* in (12). It is therefore [-ATM],[+INC]. White (1994) proposed a generalized path-based incremental theme role to account for the semantic behaviour of both patient and path delimiting arguments, fairly akin to the present one, since it crucially relies on a similar individual / quantity of matter distinction. One could conclude at this point that

the present account of incrementality is sufficient to predict (non-)atomicity, and that non-atomicity and incrementality are equivalent notions. If that is right, then non-incremental events should be non-atomic. However, I will show in 3.3 that it is not the case.

### 3.3 Non-atomicity without incrementality

Some non-atomic events lack a delimiting argument, so that the type of non-atomicity involved seems unrelated to incrementality :

- (13) *John finished digesting his pudding.*
- (14) *John finished cooking the chicken.*
- (15) *John finished registering his son at the university.*

Contrary to (10) and (11b) , neither (13), (14) nor (15) are (necessarily) measured along the subparts of their patient arguments. (13) and (14) are rather measured along the *state* of the latter, which vary as time passes. In this sense, *his pudding* and *the chicken* do not behave like delimiting arguments, and those non-atomic situations are non-incremental ([-ATM],[ -INC]). Some sort of non-argumental odometer seems to be required. In the case of (13) and (14), *digest* and *cook* receive a *scalar result state*, i.e., one that varies as time passes : John's chicken becomes (as a whole) closer to being (finally) cooked as time passes in (14), and John's pudding gradually turns (as a whole, and not bit by bit) into nutrients inside his stomach in (13) (see Caudal (1999a/b) for a treatment of such data). I will refer to this kind of incremental-like reading as *scalarity*. If one considers (15), things are somewhat different, as there exists some sort of predetermined series of stages through which one should pass in order to register at the university : John's son is closer and closer to being registered at the university as his father goes through them. I will refer to this kind of data as *gradual scenarios*.

I will turn now to the computational treatment of incremental non-atomic events (section 4), before suggesting some ways of accounting for non-incremental non-atomic ones (section 5).

## 4. A formal, computational treatment of incremental non-atomic events

A formal and computational treatment of incremental non-atomic events will be formulated here, relying on model-theoretic logics and on the *Generative Lexicon* framework (GL henceforth ; see Pustejovsky (1995) for an introduction). I will first discuss a few theoretical notions related to the *internal structure* of objects and events, in order to formalize m and i-incrementality. I will leave aside the treatment of incremental path-arguments, referring the interested reader to White (1994).

### 4.1 Internal structure of objects and events : Link's *part-of* operators

Following Link (1983), I will oppose *individuals* (i.e., the denotata of nouns referring to individual entities) and *collections* (i.e., the denotata of definite plural NPs, collectives, etc. ; see Caudal (1998a)). Let A be the domain of entities (events or objects), structured as a semi-lattice. Let *individual\_part\_of* be a partial order relation on individual entities (henceforth *i-part* or  $\leq_i$ ), connecting an individual to the collection it belongs to. Let  $\sqcup_i$  be the join operation on individuals and collections,  $y$  a collection and  $x$  an individual, such that  $x$  is an *i-part* of  $y$ . The definition of the meronymic operator  $\leq_i$  was formulated by Link as follows :

$$(16) \quad \forall x,y [x \leq_i y \rightarrow x \sqcup_i y = y]$$

Following again G. Link, I will define similarly a partial order relation on non-individual parts, *m-part* (or  $\leq_m$ ), which connects an individual and its non-individual parts (e.g. a slab of stone to a rock). All those operators will apply both to events and objects in the model (events being reified). As a consequence, collection-referring NPs as well as i-incremental events are endowed with *i-parts*, whereas individual-referring NPs and m-incremental events possess *m-parts*.

I will argue that incrementality depends both on *lexical information* and *structural composition*. Whether events will receive (or not) an incremental reading is determined at the structural level, depending on the interaction of

a verb with its delimiting arguments (*modulo* pragmatic constraints). I will now describe the lexical component of this compositional procedure.

## 4.2 Encoding incrementality within the Generative Lexicon framework

I will propose here to encode lexically whether verbs are capable of m-incrementality or i-incrementality. It should be noted that although the ability to exhibit m-incrementality seems to be a constant lexical property, any potentially incremental verb can receive an i-incremental reading (but recall that not *all* verbs can be read incrementally). In the spirit of Krifka's *object-event mapping functions* (see Krifka 1992), I will assume an *i-inc* aspectual semantic role function that relates the *i-parts* of an argument to the development of an event (causing it to become *i-incremental* with an appropriate delimiting argument), and a *m-inc* function that relates the *m-parts* of an argument to the development of an event (causing it to become *m-incremental* with an appropriate delimiting argument). The following event/object mapping predicate MAP-I (applying only to i-inc aspectual roles) can be derived from Krifka's MAP-O/E (mapping to objects/events) predicates (see Krifka 1992:39) by replacing his standard partial order operator with  $\leq_i$  :

- (17) MAP-I :
- $$\begin{aligned} &\forall R[\text{MAP-I}(R) \leftrightarrow \text{MAP-E}_i(R) \wedge \text{MAP-O}_i(R)] \\ &\forall R[\text{MAP-E}_i(R) \leftrightarrow \forall e,x,x' [R(e,x) \wedge x' \leq_i x \rightarrow \\ &\quad \exists e' [e' \leq_i e \wedge R(e',x')]]] \\ &\forall R[\text{MAP-O}_i(R) \leftrightarrow \forall e,e',x [R(e,x) \wedge e' \leq_i e \rightarrow \\ &\quad \exists x' [x' \leq_i x \wedge R(e',x')]]] \end{aligned}$$

A similar formulation can be given for m-incrementality ; replace  $\leq_i$  with  $\leq_m$  in (17). Thus, by combining Link's *part-of* operators with Krifka's event-object mapping functions, atomicity construal functions can be formulated. Finally, GL will provide us with the proper computational lexical machinery in which to insert those functions : I will propose to encode those aspectual roles within the argument structure (ARGSTR) feature in GL, by making them bear directly on the relevant argument position. The following entries for *eat* and *throw* illustrate such an encoding for internal

arguments (again, external arguments are left aside for the sake of simplicity) :

<b>throw</b>	ARGSTR =	ARG1 = $x$ :ind ARG2 = $y$ :ind, <i>i-inc</i> ( $y, e_1$ )
	EVENTSTR =	E1 = $e_1$ : <b>throw_act</b> E2 = $e_2$ : <b>Binary_RStage</b>
	QUALIA =	AGENTIVE = <b>throw_act</b> ( $e_1, x, y$ )
<b>eat</b>	ARGSTR =	ARG1 = $x$ :ind ARG2 = $y$ :ind, <i>m-inc</i> ( $y, e_1$ )
	EVENTSTR =	E1 = $e_1$ : <b>eat_act</b> E2 = $e_2$ : <b>binary-RStage</b>
	QUALIA =	AGENTIVE = <b>eat_act</b> ( $e_1, x, y$ )

*m/i-inc*( $x, e$ ) indicates that the internal structures of subevent  $e$  and argument  $x$  are related by an homomorphic mapping. If  $x$  possesses proper subparts, then  $e$  will be incremental ; the whole point remains that incrementality is *lexically licensed* but *structurally construed*. The **Binary\_RStage** subevent refers to the complex result state (*Result Stage* ; cf. Caudal 1999b) attached to a transition such as *eat*. Its binary structure expresses a change-of-state. I will now consider some difficulties related to lexical polysemy and verb-argument relationships.

## 4.3 Lexical polysemy and incrementality

I assume here that the incrementality functions *i-inc* / *m-inc* are lexically specified. Yet the full story is a lot more complicated. Much data suggests that those functions can be modified or determined (when they are lexically underspecified) in context. An overview of a number of problems and a tentative treatment within GL will be proposed here.

### 4.3.1 Co-composition and incrementality

The machinery proposed above is not sufficient to account for subtle cases of lexical polysemy originating in the interaction between the verb and its arguments. Some data would be best treated in terms of *co-composition* within GL<sup>5</sup> :

<sup>5</sup> Roughly, co-composition refers to cases of lexical polysemy in which a lexical item receives a 'new'

- (18a) \**Le moteur acheva de produire un bruit étrange.*  
*The engine finished emitting a strange noise.*
- (18b) *Yannig acheva de produire son article.*  
*Yannig finished writing his paper.*

The French verb *produire* yields an i-incremental reading in (18a), vs. a m-incremental reading in (18b). Arguably, *produire* means ‘to cause to come into existence’, and therefore makes use of the content of the AGENTIVE qualia role (i.e., the qualia role indicating how a type is brought into existence) of its internal argument to determine the corresponding ‘creation’ event. The AGENTIVE roles of *bruit* and *article* can be represented as follows :

- (19) 
$$\left[ \begin{array}{l} \mathbf{bruit} \\ \text{ARGSTR} = \text{ARG1} = \mathbf{x} : \mathbf{sound} \\ \text{QUALIA} = \text{AGENTIVE} = \\ \quad \mathbf{emit\_sound(e,y,x)} \end{array} \right]$$

- (20) 
$$\left[ \begin{array}{l} \mathbf{article} \\ \text{ARGSTR} = \text{ARG1} = \mathbf{x} : \mathbf{info} \\ \text{QUALIA} = \text{AGENTIVE} = \mathbf{write(e,y,x)} \end{array} \right]$$

By virtue of the co-composition operation involving events specified in the AGENTIVE of *bruit* and *article*, *produire* interacts differently with its internal argument, and receives different event structures. The *emit\_sound(e,y,x)* event in (19) comes along an *i-inc* function mapping the internal argument *x* onto *e*, while the *write(e,y,x)* event in (20) comes along an *m-inc* function mapping *x* onto *e*. In fact, the whole event structure of those AGENTIVE roles together with their incrementality functions override those lexically specified by default for *produire*.

Another limit of GL until recent work (cf. Asher and Pustejovsky 1999) was its inability to construe more versatile qualia role information. Consider the following case of co-composition :

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sense (i.e., one not considered to be lexicalized) through the contribution of another lexical item with which it combines. See Pustejovsky (1995).

- (21a) *Yannig finished hiding the bike.*  
 (21b) \**Yannig finished hiding the truth.*

*Hide x* arguably means ‘to remove *x* from accessibility’, and obviously the notion of ‘accessibility’ diverges when *x* is a physical object (21a) or a proposition (21b). This kind of phenomenological information might be encoded in the FORMAL role for the corresponding super-types and triggered in this context, but a detailed implementation still has to be worked out. See Asher and Pustejovsky (1999) for a discussion of such issues.

#### 4.3.2 Other cases of polysemy

Last but not least, many cases of apparent polysemy in the incrementality functions actually arise from the coercion of affected arguments :

- (22a) *Yannig a fini de ranger sa chambre.*  
*Yannig finished tidying up his room.*
- (22b) \**Yannig a fini de ranger son livre.*  
 (gradual scenarios being left aside)  
*Yannig finished putting away his book.*

*Ranger* receives an incremental reading with *chambre* in (22a), and no incremental reading in (22b), so that it seems to be properly neither i-incremental nor m-incremental. The way out of this puzzle is the following : *ranger* is lexically encoded as capable of i-incrementality but not of m-incrementality, and the aspectual polysemy of *ranger sa chambre* originates in the polysemy of *chambre*. Although there is no question that *chambre* normally refers to an individual, its meaning is coerced into a collective one in (22a). More precisely, *chambre* is coerced from an individual real estate sense (*immovable\_phys\_obj*) to a collection sense involving the individual objects possibly enclosed within a room (*movable\_phys\_obj*), since only the latter is compatible with *ranger*. One way of accounting for such coercions within GL would be to associate with the CONST qualia role of *chambre* such a collection of instances of the *movable\_phys\_obj* type, the CONST role describing the meronymic constitution of a type.

In fact, the ability to trigger this very kind of coercion seems to be a general property of verbs addressing their arguments through their FORMAL role (i.e., requiring natural types – centrally defined through their CONST and FORMAL – and not functional types – centrally defined through their AGENTIVE and TELIC ; see Pustejovsky 1999). Such verbs are usually able to access their arguments' semantics as individuals through their FORMAL role, and as collections of individuals through their CONST role, if the FORMAL individual does not meet the selectional restrictions imposed by the verb, or other semantic constraints. See Caudal (1998) for detailed evidence of this, and for a tentative solution within GL to the problems raised by the polysemy of *collective nouns* (e.g., *regiment*, *police* and *forest*), which exhibit a similar behaviour, i.e., can either refer to individuals or to collections. Finally, it should be noted that *homeomonymic nouns* (i.e., whose parts and whole refer to the same lexical type, e.g. *estate* or *property* seen as land surfaces, or quantity of matter nouns, such as *gold* or *milk* ; see Winston *et al.* (1987)) offer other interesting properties w.r.t. to incrementality/atomicity. I will not discuss them here for want of space.

To put it in a nutshell, even *prima facie* individual-referring nouns such as *chambre* can behave like collection-referring ones under certain circumstances, making i-incremental readings of normally atomic events possible. Let us move now to some concluding remarks about non-incremental non-atomic events.

### 5. On the formal treatment of non-incremental non-atomic events

I have shown above that the notion of incrementality fell short of explaining the non-atomicity of (13), (14), and (15). I will suggest here a solution based on an extended conception of *result states*.

The non-incremental, non-atomic events discussed in 3.3 seem to fall into at least two distinct subclasses : scalar events (cf. (13)/(14)) vs. "gradual scenario" events (cf. (15)). I will focus on the former class, the latter class

originating clearly in a pragmatic phenomenon<sup>6</sup>. It should be noted that many *resultative constructions* (e.g., *pound the metal flat* ; see Levin and Rappaport 1995) also receive scalar readings, making the phenomenon a fairly widespread one.

It is a fact that the notions of *affectedness* and *incrementality / event-object mapping* do not apply to scalar events. *Affectedness* indicates that an argument undergoes an incremental (cf. *eat*) or a definite change of state (cf. *throw*), and not a gradual but total one, as in the case of scalar verbs (their delimiting arguments are gradually changing as a whole, and not bit by bit). (14) is telic and non-atomic because the chicken goes through successive states of 'cookedness' (i.e., result states) before reaching a *final* state, and not because of some event-object mapping function in the spirit of Krifka (1992). Therefore, the telicity of scalar events can only be explained by reference to this scalar change of state, which entails itself a scalar result state. Encoding a richer information about result states in the lexical entries of such verbs, as proposed in Caudal (1999a/b), would allow us to account elegantly for this kind of non-atomic, non-incremental, telic readings of events.

This new conception of result states provide us with a unified account<sup>7</sup> of (non)-atomicity, incrementality and telicity – a result which generalized paths cannot achieve for reasons exposed above, and others not discussed here. Indeed, even the non-incremental, non-atomic events studied in 3.3 (except (15), but then again this is a pragmatic issue) can also be accounted for in this manner, and path-argument verbs can also be analysed in terms of result states if *changes of location* undergone by arguments are treated as *changes-of-state*.

<sup>6</sup> Note that contrary to scalar events and incremental events, "gradual scenarios" do not combine with the progressive perfect, cf. \*John has been registering his son at the university. This fact suggests that they should be set apart from other non-atomic events, and possibly receive subevents of a different kind.

<sup>7</sup> See Caudal (1999b), where *incremental vs. scalar RStages* are introduced.

## Conclusion

It has been demonstrated in this paper that the so-called punctuality of *achievements* should be reduced to the notion of *atomicity*. Formal means to calculate it within an NLP system have been discussed; see White (1994) for a computational implementation of related interest, in a similar spirit. The machinery exposed above can be used to predict whether an event should be considered as an *accomplishment* (non-atomic event; possesses subevents) or an *achievement* (atomic event; lacks any subevent).

The above developments revealed that (non-)atomicity is at least partly amenable to a compositional semantic procedure, and does not fall altogether under the scope of pragmatics. It has been shown to be directly related to incrementality in many cases, though not in all cases. In order to construe incremental non-atomic events, I proposed to encode m-incrementality vs. i-incrementality in the lexicon, before discussing the *accessibility* of the internal structure of delimiting argument NPs; I suggested a solution to the problems raised by the polysemous internal structure of certain nouns. Finally, a tentative result-state based account of non-incremental non-atomic events has been proposed. I even claimed that it can explain all types of non-atomicity and even incrementality in a unified way, and therefore might surpass all the existing accounts of event structure.

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