

Result Nominals: A Lexical-Semantic Investigation*

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Abstract

This contribution deals with semantically ambiguous event/result nominalisations and is aimed at showing and explaining why only certain classes of base verbs yield the relevant semantic ambiguity in their derived nominals, while other classes only give unambiguous event nominals. In particular, the focus of the investigation is on the lexical semantic characterisation of the base verbs and, more specifically, on the identification of those structural and conceptual semantic properties that are indispensable for yielding a result nominal. We accordingly propose a verbal taxonomy crucially based on the ontological concept of 'result', and formally represent the nominalisation process by means of the theoretical apparatus proposed by Lieber (2004). Specifically, we contend that the morpho-syntactic and semantic properties of result nominals can be derived through an accurate lexical decomposition of the base verbs and of the suffixes, and by implementing the co-indexation mechanism that drives the nominalisation process.

1. Introduction

Deverbal nominals such as *building* and *translation* are semantically ambiguous since they can refer to the action/event expressed by the base verb or to its result. *Event* and *result* nominals are not only semantically distinct, but they also differ syntactically, since, for instance, the former are accompanied by argument structure whereas the latter typically lack it (cf. Grimshaw 1990 on this and other criteria for distinguishing the two classes).¹

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¹ In this paper we will assume, without adequate discussion, some of the diagnostics Grimshaw (1990) posited for distinguishing result from complex event readings. As we will see, some of her tests are not easily applicable to Italian event nominals (complex event nouns, for instance, can be easily pluralised in Romance). In general, however, the perspective we adopt here is different from and complementary to her analysis, which is focussed on the complex-event class rather than on result nominals.

Although semantic and syntactic ambiguity is a widespread phenomenon among deverbal nominals, this correspondence is not completely systematic. There are in fact nominals that do not exhibit it, but only refer to events, such as *abandonment* or *administration*, and others expressing concrete meanings loosely connected to verb semantics, such as *shavings* or *delivery*, that are typically considered as 'fully-fledged lexical derivations which create novel lexemes' (Spencer, 1998: 36). The label 'result', in fact, is meant to cover a range of nominals whose interpretations are strictly or rather loosely related to the meaning of the base verb. Consequently, the notion of 'result' expressed by many action nominalisations seems to need a fairly broader interpretation, as often suggested in the literature on the topic.

In most cases, however, the concept of result can be interpreted in its narrow sense as the outcome of an action. In such cases, a semantic correlation between the meaning of the nominal and that of the base verb is systematically preserved.

The main goal of this paper is to determine how and why result nominals – where 'result' is intended in the relevant, narrow sense – are by-product interpretations of the corresponding event ones and to account for their non-systematic ambiguous interpretations. In particular, we will explore the possibility of predicting whether a verb can give rise to a result nominal on the basis of its lexical-conceptual representation. We believe, in fact, that a fine-grained lexical semantic analysis of the base verbs of action nominals can shed light on the intricate and neglected issue of result nouns. The present investigation concerns a relevant class of Italian deverbal nominals, but we suggest it could be successfully extended to action nominalisations in other Romance languages.²

The paper is organised as follows: section 2 shortly presents the data set, focussing on the Italian nominalising suffixes considered here. Section 3 contains an overview of the main semantic distinctions among action verbs; it further discusses the different types of nominals each verbal class gives rise to. In section 4 a theoretical approach accounting for result nominal formation is proposed, framed into a lexical semantics theory of word-formation (Lieber 2004). Section 5, finally, contains the concluding remarks.

2. The data: bases and suffixes

The present study takes into account a relevant class of Italian nominals: i.e. those derived by transitive verbs expressing dynamic events (the analysis thus excludes intransitive and state verbs) through so-called 'transpositional' suffixes, that is, suffixes whose characteristic property is that of lacking an inherent meaning (we have excluded cases of zero-affixation along with foreign-origin and non productive suffixes). The most frequently occurring suffixes of this kind are *-mento*, *-zione* and *-tura*, which can be defined as semantically 'weak' since they simply act like nominalising operators (cf. Bisetto 2007).³

² Recently, Spanish nominalisations have been analysed by García García-Serrano (2000-02) from a lexical-semantic perspective and her proposal partially confirms the analysis defended here.

³ According to Bisetto (2007), *weak* suffixes differ from *strong* ones, which have a definite meaning reproduced in the derivatives and whose characteristic property is that of imposing (semantic) restrictions on their bases (cf. also Bisetto, 1996 as for *-tore* and Booij & Lieber 2004 as for *-ee*). As a consequence, almost all the nominals derived with strong suffixes have a specific interpretation (e.g., Italian *-tore* nouns

The main characteristic of *-mento*, *-zione* and *-tura* suffixes is that of ‘sharing’ the verbal bases they merge with. The choice each suffix makes on the verbs can only be viewed as a ‘preference’, but not as a strong criterion of categorial or semantic selection.

-mento, for example, prefers: a) polysyllabic verbs (i.e. *addestramento* ‘training’), b) verbs having a ‘popular’ prefix – as in parasyntetic verbs (i.e. *incenerimento* ‘incineration’) or suffix (i.e. *gareggiamento* ‘competition’), c) simplex (underived) verbs. *-zione*, in turn, attaches to: a) verbs that can be monosyllabic (i.e. *stazione* ‘station’), b) verbs containing learned prefixes (i.e. *esacerbazione* lit. ‘exacerbate+ion’) or suffixes (i.e. *craxizzazione* lit. ‘craxi+ise+ion’), c) complex verbs, while the suffix *-tura* prefers: a) polysyllabic verbs (i.e. *mietitura* ‘reaping’), b) verbs containing non-learned prefixes (i.e. *abbronzatura* ‘bronzing’) and c) verbs derived with popular suffixes (i.e. *scopiazzatura* ‘copying’, *simboleggiatura* lit. ‘symbolise+tura’).⁴

The restrictions listed above are neither syntactic nor semantic, i.e. do not correspond to c- or s- selection restrictions, but account for suffixal choices only on morphotactic and stylistic grounds, thus showing the semantic weakness of these nominalising suffixes.

3. Towards a semantic classification of verbs

The main aim of this contribution is to demonstrate that the interpretations derived nominals can acquire are strongly determined by the semantics of the base verbs. We assume, following Rappaport Hovav and Levin (1998) and many other scholars working on lexical semantic representation (cf., among others, Grimshaw 1993), that the meaning of a verb is composed of two types of building blocks: an ‘event structure template’, and a core meaning. The event structure template, which determines the structural aspects of verb meaning, classifies entire sets of verbs in that ‘it represents the ontological type of the event denoted by the verb’ (Levin, 1999). This is a facet of verbal meaning that is also relevant for the grammar (both syntax and morphology) as, for instance, it determines the syntactic realisation of arguments.

Rappaport Hovav and Levin (1998) identify simple event structure templates, consisting of one sub-event, and complex event structure templates, composed by two sub-events. The core meaning block, defined by Rappaport Hovav and Levin (1998) as the “constant”⁵ component, captures the idiosyncratic facets of the verb. Although constants constitute an open-ended set, they can be grouped together in a small number of fixed arrays, classified by the same types of ontological categorisation (e.g., thing, location, state, manner).⁶ On the basis of this characterisation, constants can be inserted into event structure templates and the pairing of the two blocks determines the basic verb meaning.

are mainly agentive). Weak suffixes, on the contrary, do not semantically ‘select’ their bases and, in the case of nominalising suffixes, give nominals with event interpretation.

⁴ Cf. Gaeta (2004: 328-332; 334-336) for a detailed presentation of the selectional patterns of these suffixes.

⁵ The label “constant” originates from the fact that this component is typically represented ‘as a fixed value filling an argument position in the decomposition’ (Levin 1999) of the predicate. In more recent works, however, L&RH replaced this term with ‘root’, following Pesetsky (1995).

⁶ Manner constants typically characterise activity and semelfactive verbs.

Although Levin (1999) explains that the taxonomy of event structures does not systematically correspond to the Vendler-Dowty aspectual classification, we propose, simplifying a bit, that simple structures are aspectually associated with state and activity verbs, while complex event structures are associated with accomplishments (and, more specifically, with causatives).⁷

We contend that only complex predicates – namely predicates characterised by an event structure template composed of an activity and a change of state – can form nominals which are ambiguous between an event and an outcome/result interpretation. Moreover, we suggest that predicate complexity, though being a relevant factor for yielding an outcome/result, is only a necessary but not a sufficient condition.

In particular, in order to get semantically ambiguous nominals, the base verbs, beyond having a complex event structure template, must pertain to the class of creation or (referential) change of state verbs. In Rappaport Hovav and Levin's terms, the base verb must involve constants like *thing* or *state*. This means that part of the information allowing ambiguous interpretation of nominals is not only specified in the structural meaning facet, but also in the idiosyncratic component of verb semantics.

The present analysis, in particular, identifies three classes of verbs yielding ambiguous event/result nouns:

- a. result-object verbs, denoting events that put into existence a new object/entity and where the 'effected' object corresponds to an incremental theme (cf. Dowty, 1991);
- b. resultative action verbs, denoting events that:
 - i) create a new object/entity besides/in relation with an existing one represented by the direct object of the verb;
 - ii) create a salient modification on an existing object/entity;
- c. non-resultative action verbs, denoting events that:
 - i) are aspectually classified as activity verbs,⁸ hence structurally characterised as having simple structure templates;
 - ii) do not affect or modify the object which corresponds to a holistic theme;
 - iii) either have a non-referentially affected theme or completely remove their object (consumption/destruction verbs).

The difference between classes a) and b) is to be found in the different 'action' expressed by the predicates: both result-object and resultative action verbs put into existence new entities, but while the latter create new entities related to/besides the already existing ones, the former do not have an already existing correspondent entity.

⁷ The semantic complexity of accomplishments has already been pointed out in Pustejovsky (1991), where accomplishment verbs are defined as aspectually complex, for they are composed by two sub-parts: a first sub-event of activity and a second sub-event indicating a (resulting) state, which is obtained through the achievement of the *télos*.

⁸ Verbs classified as states are automatically excluded from this classification, because they do not denote actions. Activity verbs, on the other hand, can't have an outcome/result, because, though denoting actions, do not imply any changes in their objects; besides, their event structure template does not contain the 'change of state' component.

Therefore, we maintain that result object verbs are semantically one-object predicates while resultative action verbs are two-objects predicates.

3.1. Result-object verbs

Result-object verbs are of the kind of *costruire* ‘to build’, *comporre* ‘to make up’ and *creare* ‘to create’. If verbs like these are syntactically two-argument place verbs, from the viewpoint of the situation type they are lexically specified as accomplishments and denote complex (change of state) events.⁹

These predicates have the property of expressing an action directed towards the construction of something which was non-existent before the start of the action and that comes into existence only when the action is concluded. Nominalisations obtained from the *costruire*-class can typically have both a process and a result reading. In the latter interpretation, the nominal denotes the object or entity corresponding to the internal argument of the verb.

Consider, for example, the verb *costruire*: the object obtained through the building process cannot exist before the beginning of the process itself. In this sense *costruzione* ‘construction’ – the nominal derived from *costruire* – refers to the proper result of the process, given that such an entity comes into existence gradually, throughout the building event.

Verbs implying the realisation of an entity/object all belong to the result-object class, as can be seen with another predicate, *creare* ‘to create’ and its related nominal *creazione* ‘creation’.

- (1) La creazione di quella scultura (da parte dell’artista) fu lunga e difficoltosa.
‘The creation of that sculpture (by the artist) was long and troubled.’
- (2) Questa splendida creazione rappresenta un esempio dell’architettura del XIX secolo.
‘This wonderful creation represents an example of 19th C architecture.’

The nominal in a context like (1) has an unambiguous event reading since it denotes an event with temporal duration. Syntactically, it cannot be pluralised and is accompanied by its arguments (although the phrase corresponding to the external argument is typically optional, questioning its syntactic-argument status).¹⁰ The nominalisation in (2) is a result one and refers to a concrete object. From a syntactic viewpoint, we observe that it can be pluralised, is non-argument taking and can be accompanied by a demonstrative (*questa* ‘this’).¹¹ The addition of the internal argument (expressed in

⁹ Verbs such these are traditionally classified as accomplishments shifting into activities when accompanied by bare plurals or mass nouns. However, we follow here Pustejovsky's (1991) account in assuming that verbs are lexically specified as pertaining to a default aspectual class.

¹⁰ In Italian this argument is expressed by means of a ‘*da parte di*-phrase’, corresponding to the English ‘*by*-phrase’.

¹¹ According to the diagnostics produced by Grimshaw (1990), the genitive phrase of result nominals should exhibit a possessor interpretation. However, in *La creazione di Gianni è sul tavolo* ‘Gianni’s creation is on the table’, the ‘*di*’-phrase cannot be interpreted as a possessor, but as agent-oriented. This

Italian with a *di* ‘of’-phrase) to the result nominal forces its interpretation as an event, as shown by the sentence in (3), where the predicate ‘è bella’ triggers the result reading of the nominal and thus excludes the eventive meaning forced by the expression of the internal argument.

- (3) La creazione (*della scultura) è bella.
 ‘The creation (*of the sculpture) is beautiful.’

Summing up, result nominals derived from result-object verbs entirely absorb (or semantically incorporate) the verb internal argument, since it refers to the object put into existence by the action denoted by the verb.¹²

3.2. Resultative action verbs

Verbs in the resultative action class are transitive as well, and they too, like those of the *costruire*-class, express an action directed towards the putting into existence of an entity. The difference between this and the *costruire* class of verbs is that the internal argument of resultative action verbs denotes an already existing entity. The action expressed by these verbs can have two different outputs: it can leave unmodified the entity denoted by the verbal object (when verbs are of the b-i subclass seen in § 3.) or can modify it (when verbs are of the b-ii subclass).

In the first case, the action expressed by the verbs – that we call *resultative verbs of creation* – creates a new object/entity (which is the outcome of the event) “besides” or “in relation with” the existing one. In the second case, the action expressed by the verb tangibly affects or alters (through breaking, addition or subtraction of material, for ex.) the existing object (we dub this subclass as *resultative verbs of modification*). Therefore, what counts for the identical behaviour of these two subclasses of verbs with respect to nominalisations is not whether the object is modified by the action (specifically, whether or not the action is carried out on the object), but that in both cases the action produces a result that does not correspond to the entity denoted by the verbal object.

From the situation-type viewpoint, resultative-action predicates are accomplishments (consisting of a sub-event of activity and a sub-event of state), as result-object verbs are. Thus, being result-object and resultative action verbs syntactically identical and exhibiting the same (complex) event structure template, we contend that it is the difference in the idiosyncratic meaning between the two classes (‘new creation’ vs. ‘creation besides’) that is responsible for the different kind of derived nominals they give rise to.

peculiarity seems to be a characteristic common to the creation verb class (cf. also the verbs examined in 3.2.1).

¹² However, among result nominals of this class there are differences: in fact, while in Italian *creazione* can refer to many different objects (practically, all the entities which are created can be defined *creazioni*) a nominal like *costruzione* indicates only a specific entity, viz. a building (/an edifice); a table, for example, though ‘built’, cannot be defined as *costruzione*. What this implies, then, is that in some non predictable cases, the names expressing the outcome of an event/process can acquire a specific meaning which might become lexicalised.

3.2.1. Resultative verbs of creation

Verbs pertaining to this class are of the kind of *copiare* ‘to copy’, *imitare* ‘to imitate’, *rappresentare* ‘represent’, *riscrivere* ‘re-write’, *tradurre* ‘to translate’. A *translation*, for instance, expressing an entity obtained through a translating event, is something new and different from the entity (presumably a text) syntactically expressed as the verbal object; hence, a *translation* represents a new entity in close relation with the original text.¹³

If we examine nominals obtained from this subclass of verbs, we can observe that the interpretations they admit are different and more numerous with respect to those obtained from the verbs of the *costruzione* class. Let us illustrate the point in (4), (5) and (6) with the nominal *traduzione*:

- (4) La traduzione di questo testo (da parte del filologo) è durata due mesi.
‘The translation of this text (by the philologist) lasted two months.’

The nominal in (4) is a complex event nominal and displays in fact the typical properties of event nouns: it is argument taking, has temporal duration and does not allow pluralisation. However, *traduzione* can appear in different syntactic-semantic environments and display different morpho-syntactic behaviours. Consider the example in (5):

- (5) Traduzioni frettolose possono alterare considerevolmente il significato originale del testo.
‘Rushed translations can consistently alter the original meaning of the text.’

In the above sentence *traduzioni*, being plural and lacking argument structure, seems to disallow a complex event interpretation. Plurality and lack of arguments, however, do not trigger a result reading. The nominal refers instead to (several/repeated) events of translation (note that a result interpretation is clearly available in a sentence like *Le numerose traduzioni degli studenti sono piene di errori ortografici* ‘the numerous translations of the students are full of orthographic mistakes’, cf. (6a)). The nominal in (5) indicates a set of (bounded) events of translation, as suggested by the adjectival modification *frettolose* expressing the manner component of the event.

We use the label “(bounded) events” to emphasise that such nominals, though displaying the typical properties of results, i.e. pluralisation and argument/satellite optionality, are names of events and exclude an ongoing reading in the above example, reading which is instead readily available for complex event nominals (see Grimshaw 1990 on this point).

The reading of *traduzione* can be yet of a different kind, as we can see in (6):

¹³ It is worth noticing that a *traduzione* process does not alter, in a physical sense, the original entity. According to Dowty (1991: 569-70), the internal objects of these verbs can be defined as Representation-Source themes, that is to say as manifestations of incremental themes, even if in an indirect way.

- (6) a. La (sua) traduzione (di questo testo) è piena di errori.
'The (/his/her) translation (of this text) is full of mistakes.'
- b. Molte traduzioni sono piene di errori.
'Many translations are full of mistakes'
- c. La traduzione è sul tavolo.
'The translation is on the table.'

In (6a,b) *traduzione* refers to the result/outcome of the action indicated by the verb *tradurre*. The nominal can be accompanied by a possessive (*sua*) and can be pluralised. The presence of the internal argument (*di questo testo*) does not force the nominal *traduzione* to acquire an event reading, contrary to what happens to nominals from result-object verbs. In (6c) another interpretation, denoting the object which *contains* the translation itself is available. It is worth observing that this interpretation of the nominal as a concrete object is due to a process that can be defined as metonymic transposition of meaning and is generally available to simple nouns expressing abstract contents (e.g., *I've put your novel on the table*).

3.2.2. Resultative verbs of modification

Resultative verbs of modification, as the label itself suggests, denote actions which affect and tangibly modify the object. Instances of this heterogeneous class are verbs like *correggere* 'to correct', *modificare* 'to modify'. A tangible modification is commonly expressed also by verbs indicating addition of material (*argentare* 'to silver-plate', *ricoprire* 'to cover') or breaking or fracturing the referent of the verbal object (*rompere* 'to break', *tagliare* 'to cut'), for instance.

To illustrate the point, let us consider the nominal *correzione* 'correction' from *correggere*. Typically, this nominal can denote both the event and the outcome of the action performed on an object; this action results in a "tangible/concrete" modification of the object itself. Nominals obtained from this subclass of verbs display the same syntactic properties of those obtained from resultative verbs of creation (cf. § 3.2.1.). This similarity depends on the fact that both kinds of verbs produce a new entity that cannot be identified with that representing the internal object (conversely, this last point is the reason why resultative action verbs behave differently from the above discussed class of result-object verbs).

However, resultative verbs of modification differ from resultative verbs of creation: the former, in fact, do not create a new object but a new state of the object manifesting a modification which, in virtue of its concrete denotation, acquires its own referentiality as a new, autonomous entity. Therefore, result nominals obtained by this subclass can only have a concrete interpretation.

The examples in (7) show that verbs in this sub-group can give rise to the same set of nominals of those of the *tradurre*-class.

- (7) a. La correzione di questo documento (da parte della segretaria) è stata lunga e laboriosa.
'The correction of this document (by the secretary) was long and troubled.'
- b. Ripetute correzioni hanno modificato il testo originale.
'Repeated corrections modified the original text.'
- c. Questa correzione è errata.
'This correction is wrong.'
- d. Le correzioni sono sul tavolo.
'Corrections are on the table.'

In (7a) the nominal *correzione* conveys the event reading and displays the syntactic behaviour of a complex event nominal; in (7b) the nominal is in the plural form, but it still has a (bounded) event reading. In (7c) *correzioni* is referential, since it indicates the outcome or proper result of the action denoted by the verb (*correggere*). Finally, the nominal in (7d) denotes concrete objects: this further meaning is achieved through a metonymic transposition. Similarly to what happens with *traduzioni* in (6b), *correzioni* might stand for objects which contain the corrections themselves, whereby the exact nature of these objects can only be contextually established.

3.2.3. Non-resultative action verbs

Under the underspecified label “non-resultative action verbs”, three sub-classes of verbs at least can be put together:

- (8) (i) activity verbs, characterised by a simple structure template (e.g., *amministrare* ‘to administrate’)
- (ii) verbs which do not affect or modify the object, which corresponds to a holistic theme (e.g., *trasferire* ‘to transfer’)
- (iii) verbs which have a non-referentially affected theme (e.g., *pulire* ‘to clean’) and which completely remove their object (e.g., *annullare* ‘to annul’)

As explained in § 3, activity verbs, though denoting actions, have a simple event structure template (they lack a change of state sub-event in their template). Ontologically, verbs in this class lexicalise events that do not yield “results”, intended either as effected objects or modifications. An activity verb and its corresponding nominal are *amministrare* and *amministrazione* ‘administration’ respectively.¹⁴ All the available interpretations are illustrated in (9).

¹⁴ An anonymous reviewer points out that *lavoro* is a (zero-derived) nominal that is actually derived from an activity verb and, yet, can have both event and result reading. This and other few examples of this kind

- (9) a. L'amministrazione di questo podere (da parte del fattore) è stata efficiente.
'The administration of this estate (by the bailiff) was efficient.'
- b. ?Le buone amministrazioni (di un'impresa) danno sempre risultati apprezzabili.¹⁵
'Good administration (PL) (of a company) always give good results.'
- c. Questa amministrazione è composta da persone esperte.
'This administration is composed by proficient people.'
- d. L'amministrazione è al primo piano.
'The administration (=office) is at the first floor.'

As we can see in (9a-d), the only concrete interpretations are the ones determined by pragmatic or encyclopaedic knowledge factors: only pragmatics and world knowledge, in fact, can account for the meaning of *administration* as the group of persons/structure which administers something (9c) and as the place where administrative activities are carried over (9d). Note, however, that this nominal is scarcely grammatical if pluralised in the context of a bounded event reading. The scarce grammaticality of the plural form seems to be a tendency of nominalisations obtained from activity verbs: they, in fact, are likely to rule out pluralisation since they denote processes and tend to behave like mass nouns.¹⁶ This behaviour can be explained with the fact that activity verbs lack a *télos* (or a change of state component). Since processes/activities are characterised as unbounded and homogeneous, nominals denoting them might show the same property.

To the second subclass of non-resultative action verbs (8ii) belong predicates expressing events which neither modify their objects nor create new entities besides or in relation with the existing one. Consequently, they do not produce "results" in a narrow sense. Examples of such verbs are: *trasferire* 'to transfer' or *spostare* 'to move', which indicate a change of location. According to Dowty (1991), change of location verbs have holistic (non incremental) themes. As (10) and (11) show, the only possible reading is the event one, which is available both in the singular and plural form.

- (10) a. Il trasferimento di Lucia è stato inaspettato.
'Lucia's transfer was unexpected.'
- b. Continui trasferimenti hanno danneggiato il rendimento dell'ufficio.
'Continuous transfers damaged the efficiency of the office.'

show that our generalisation concerning activities might be too strong. We leave this point for further research.

¹⁵ Note that the sentence is fine if *amministrazioni* refers to the people involved in the management.

¹⁶ The use of the term "process", as distinct from that of "event", here highlights the absence of a *télos* in nominals derived from activity verbs. Further, it is worth stressing that the tendency of activity nominals of ruling out pluralisation only refers to nominals characterised by the suffixes considered throughout this investigation (concerning pluralisation, consider the different behaviour of *educa-zione*/*i 'education/*s' vs. *cammin-ata/e* 'walk/s').

The semantic property of not creating new objects (or tangible modifications) is what parallels the *amministrare* and *trasferire* classes with another class of predicates, those represented by verbs such as *asciugare* ‘to dry’ and *pulire* ‘to clean’ (8iii). If we consider the sentences in (12) exemplified with the nominal *pulitura* ‘cleaning’, we can easily see that the *pulire* class behaves like other non-resultative subclasses with respect to derived nominals.

- (12) a. La pulitura del disco solitamente dura mezz’ora.
‘Disk cleaning usually takes half an hour.’
- b. Frequenti puliture del disco giovano al computer.
‘Frequent disk cleaningPL is good for the computer.’

As we can see in (12), only an event interpretation is available to *pulitura*, which does not allow a result meaning also when plural.

However, verbs of the *pulire* subclass differ from the other two with respect to their object: while the verbs of the *amministrare* and *trasferire* classes indicate actions that do not modify the object, verbs of the *pulire* class do produce a change of state in it. This property is what parallels this subclass with the subgroup of predicates indicating removal or (total) destruction of their object (8iii). This is the case, for instance, of verbs like *annullare* ‘to cancel’, *annichilire* ‘to annihilate’, *depennare* ‘to cross out’, *revocare* ‘to revoke’, *abolire* ‘to abolish’.

Verbs of the *annullare*-class can give rise to nominals for which the following interpretations can be obtained.

- (13) a. L’annullamento del nostro appuntamento mi ha molto irritato.
‘The cancellation of our date made me angry.’
- b. I continui annullamenti hanno ritardato l’anteprima del nuovo spettacolo.
‘Repeated cancellations delayed the preview of the new show.’
- c. Gli annullamenti sono sullo scaffale di destra.
‘Cancellations are on the right-hand shelf.’

In (13a,b) *annullamento* denotes an event, both in the singular and plural form. It seems that the outcome/result interpretation is ruled out: the only possible non-event reading is obtained through a process of metonymic transposition, which has, in this case, become a ‘lexicalised’, fixed interpretation for this nominal (cf 13c). We contend that the lack of result reading follows from the semantic-conceptual meaning of this kind of predicates: since ontologically, the verb expresses an action directed towards the removal of a pre-existing object and does not create a new one, there can be neither absorption of the object (as in the case of result-object verb like *costruire*), nor creation of a new object (as in the case of resultative action verbs like *tradurre*) or a tangible modification (as in the case of resultative action verbs like *correggere*). In other words, the state resulting from the carrying out of the action implies the complete removal of the object; consequently, a result interpretation is excluded on the basis of the ontological properties of the event denoted by the relevant verb.

Finally, the nominal in (13c) displays the non argument-taking behaviour of a result noun as by-product of a semantic shift. Such a shift is due to a metonymic transposition: *annullamenti* refers to the objects (sheets or folders, for instance) which contain the files of marriage annulments.¹⁷

Concluding, all the verbs loosely dubbed here as non-resultative action verbs are characterised by the impossibility of producing a result, be it intended as a new object or as a concrete/tangible modification affecting it. We emphasise that it is exclusively this semantic property that has consequences on the interpretation of the related nominals, since, for instance, the presence of a modification performed in/on the object seems to be irrelevant.

Furthermore, it is worth stressing that the reason for the non-resultative character of these groups of predicates originates at different levels: the one of the semantic template as for activities and the one of the constant as for change of location, (referential) change of state and removal/annulment verbs.

3.2.4. Summary

To sum up, we have shown that the classes of transitive verbs we analysed crucially differ in their semantics, from the aspectual viewpoint, but especially in their conceptual meaning. With the exception of activity verbs like *amministrare*, which exhibit a simple event structure template, we have only examined verbs characterised by complex event structure templates, thus verbs semantically or aspectually similar. So doing, we have given evidence that other semantic distinctions are responsible for the difference in number and interpretation of the nominalisations verbs give rise to. Specifically, we have maintained that these variations are to be found in the semantic block Rappaport Hovav and Levin (1998) defined as the "constant", which captures the idiosyncratic information in event semantics and permits to differentiate verbs belonging to the same aspectual class.

Our points can be summed up as follows:

- (14) a. result-object verbs only give rise to two types of nominalisations: event and result nominals. The latter, which denote abstract or concrete effected/created objects, cannot appear in syntax accompanied by the internal argument of the base verbs without changing their interpretations from result to event (cf. 14i.).
- (i) *Le numerose creazioni di nuovi modelli da parte di quel giovane stilista.
'The numerous creations of new models by that young stylist.'

Furthermore, they cannot be pluralised and convey a (bounded) event reading. As shown in (14i), pluralisation is ruled out when the nominal is

¹⁷ In this case, the metonymic transposition is available because one of the specialised meanings of *annullare* is the one of *annullare un matrimonio* 'to annul-invalidate a marriage', where the predicate assumes the semantic-pragmatic valence of a verb of creation: such an action is indeed accompanied by a written certificate (hence related to a writing procedure) formally attesting the annulment act.

accompanied by its arguments; this implies that, if pluralised, object-result nominals can only have a result reading. Further, such nominals can acquire a specific reference to the object of the predicate, as in the case of *costruzione* = *casa*, *edificio* 'house', 'edifice'. Finally, these nominals can also have a concrete result interpretation through metonymic transposition; for instance, in *Le ultime creazioni sono sul tavolo* 'The latest creations are on the table', the nominal can also refer to metonymic objects, such as sheets, for instance, containing poems or drawings, that is to say (artistic) 'creations' in a proper sense, which are performed on them.

- b. resultative-action verbs give rise to three classes of nominalisations: event (readily accepting the plural form and argument optionality), outcome/result and metonymic result. Contrarily to what happens to the nominals derived from verbs of the preceding group, shift in interpretation is not available when satellites are present, as the following examples illustrate:

- (ii) La traduzione di questo testo è piena di errori.
'The translation of this text is full of mistakes.'
- (iii) La traduzione è piena di errori.
'The translation is full of mistakes.'

The presence of the phrase *di questo testo* does not alter the result interpretation of the nominal *traduzione*: the phrase appears to be optional as typically happens with 'modifier phrases' of result nominals (in the sense suggested in Grimshaw, 1990).

- c. non-resultative action verbs can give rise to two types of nominals: event (in the singular and in the plural) and metonymic result. The bound event reading is not always available to (or scarcely grammatical with) nominals obtained from activity verbs. The metonymic result reading is especially linked to encyclopaedic knowledge, and is not grammatically and systematically determined.

4. A theoretical proposal

In this section we attempt a formalisation of the word-formation processes yielding the deverbal nominals we have illustrated so far. To do so, we will take into account the theoretical framework put forth by Lieber (2004), who develops a powerful formal apparatus for modelling the lexical semantic properties of word-formation phenomena. However, in order to achieve a satisfying formal implementation of the nominalisation process under investigation, we will slightly modify her theoretical machinery.

4.1. Lieber's (2004) model of lexical semantics

An accurate presentation of Lieber's (2004) model of lexical semantics would clearly exceed the limits of the present contribution. We will therefore limit the presentation to the fundamentals of her theory, which also grounds the formalisation adopted for the present research.

First, Lieber's model is decompositional: lexical units are decomposed into atoms or primitives of a grain-size allowing the cross-categorial lexical-semantic description of nouns, verbs and adjectives. The author suggests that the lexical semantic representation of lexemes (and of affixes, at least to a certain extent) is composed of two parts: a semantic/grammatical *skeleton* and a semantic/pragmatic *body*. The distinction *skeleton-body* roughly parallels the one proposed in Rappaport Hovav and Levin (1998) between event structure template and constant, and it is therefore an optimal instrument for representing the lexical decomposition of verb meaning.¹⁸

Lieber's model employs distinct features, which can be used both in an equipollent and a privative way, to cross-classify ontological and semantic classes. The two features she proposes are [\pm material], defining 'substances/things/essences' and [\pm dynamic], identifying 'situations' (terms referring to nouns and verbs/adjectives, respectively).

To represent skeletons, Lieber adopts Jackendoff's (1990) machinery, consisting of hierarchically arranged functions and arguments, like the following:

- (15) a. [F₁ ([argument])]
 b. [F₂ ([argument], [F₁ ([argument])])]

Lieber assumes that verbs, nouns and adjectives are argument-taking categories and that nouns contain at least the R argument first introduced by Williams (1981) and Higginbotham (1985).

Another peculiarity of Lieber's theory is co-indexation, a mechanism which "allows us to integrate the referential properties of an affix with that of its base" (Lieber, 2004: 45) and corresponds to the integration of different parts into a single referential unit.¹⁹

4.2. A formal representation

Weak transpositional suffixes discussed above do not really select their bases (cf. § 2.): we thus propose that this kind of nominalisations are base-driven derivations (in

¹⁸ The skeleton is also comparable to Jackendoff's Lexical Conceptual Structure, while the body contains many of the elements that Pustejovsky (1995) includes in the Qualia Structure.

¹⁹ Lieber Principle of Co-indexation (2004: 61) works as follows:

"In a configuration in which semantic skeletons are composed, co-index the highest nonhead argument with the highest (preferably unindexed) head argument. Indexing must be consistent with semantic conditions on the head argument, if any." We propose, however, a different implementation of co-indexation in the case of base-driven derivation, which we believe is the case of event/result nominals (see § 4.2.).

accordance with Giegerich 1999 and Plag 1999), namely that it is the base verb which demands a specific suffix and not the reverse.

To formalise the nominalisation process, we adopt part of the machinery proposed by Lieber. In particular, we make use of her semantic features defining categories, her system of representation *à la* Jackendoff (cf. 15), and, with her, we assume that nouns and nominal affixes are characterised by an R argument.

Therefore, a noun like *table* (corresponding to Lieber's conceptual category of SUBSTANCES / THINGS / ESSENCES), for instance, has the following lexical semantic representation, where the function corresponds to the diacritic [+material] and the R argument over which it ranges is formally represented by the blank space between square brackets:

(16) *table* [+material ([])]

The present proposal, however, diverges from Lieber's in the following points:

- a. Verbs (situations), like nouns, contain a semantic function role (cf. Spencer 1999), namely an *E* (event) role (first introduced by Davidson 1967). We suggest that this *E* role is somehow represented in the skeleton of all types of situation, in accordance with Higginbotham (2000) who extends this *E* position also to states.
- b. Again with Higginbotham (2000), we assume that accomplishment predicates (associated with complex event structure templates) have a double event position: *E*₁ for the process and *E*₂ for the change of state components. This assumption allows us to emphasise a difference inside the heterogeneous class of verbs which are classified as simple activity situations in Lieber's system. In fact, a double event position is what distinguishes accomplishments such as *costruire* or *tradurre* from pure activities (characterised by a single event position) like *amministrare*.

For [+material] substances/things/essences and [+dynamic] situations we thus propose skeletal representations like the following:

- (17) a. *tavolo* 'table' [+material ([]_R)]
 b. *amministrare* [+dynamic ([x , y]_E)]

In (17), R and E are not exponents of syntactic or semantic arguments, but are simply labels/reminders of the ontological categories defined by the semantic features.²⁰ Syntactic and semantic arguments are represented with variables (e.g. *x*, *y*, etc.).

The situations analysed in this work are all defined as [+dynamic] (they denote events, in a narrow sense, while states have been excluded from the data set here considered). However, as already explained, a first difference among these predicates

²⁰ With the label "semantic argument" we refer to those arguments that instantiate *lcs* participants: the syntactic realisation of these arguments is non-compulsory, exactly as it happens with Pustejovsky's (1995) *default* and *shadow* arguments, which are also semantic arguments in our terminology.

lies in their semantic structure, and, more specifically in the complexity of the event structure templates they exhibit.

In this contribution, we express the information concerning the event structure template of verbs with Lieber's skeletal representation system, proposing that activities have a single sub-event (cf. 17b.) while accomplishments have two sub-events (cf. 18).

- (18) *costruire*
 [+dyn ([x]_{E1}, [y]_{E2})]

Although the syntactic-semantic participants are two (a subject-'agent' and an object-'patient/theme') in both skeletons, we observe that they are "contained" in the single sub-event in the case of *amministrare* while they belong to two different sub-events in the case of *costruire* (where *y* is the incremental theme and the effected object).

Skeleton complexity is what parallels result object verbs with resultative action verbs; however, the semantic difference between the two classes – originating from the idiosyncratic properties of the verb (call it *constant* or *body*) – is also reflected on their skeletal representations. As explained in section 3, this difference is tied to the resultative character implied by resultative action verbs. We suggest that the outcome/result (be it a new entity or a tangible modification) is represented as a new semantic argument – corresponding to an "incremental result", which we label as *z* – and associated with the second sub-event (cf. 19).

- (19) *tradurre/correggere*
 [+dyn ([x , y]_{E1}, [z]_{E2})]

z is not syntactically represented, while the *y* argument, corresponding to the syntactic object, is a Representation Source Theme, hence incremental only in an indirect way, as maintained in Dowty (1991).

Furthermore, we propose that nominalising suffixes have a double representation, as follows:

- (20) a. *-zione/-mento/-tura*₁ [-mat, dyn ([]_R)]
 b. *-zione/-mento/-tura*₂ [± mat ([]_R)]

The skeleton in (20a), given in accordance with Lieber, represents the value of suffixes which attach to verbs converting them into argumental event nouns.²¹ The skeleton in

²¹ We think that the nominalisations obtained through the suffixes represented as in (20a) can denote any type of situations, according to the base they attach to, be it a state, an activity (=process) or an accomplishment (=complex event). This interpretation as 'situation' is suggested by the presence of the feature *dynamic* in the suffix. If used in privative way, in fact, this feature simply signals what Lieber calls the 'processual flavour' of nouns making substances resemble situations. However, we will not discuss this issue here; see Spencer (1998b) and Meinschaefer (2005), among others for proposals on this topic.

(20b) represents, instead, the value of suffixes adding to verbs and implying a result, be it concrete [+material] or abstract [-material].²²

Co-indexation, in base-driven word formation, seems to work differently from what proposed by Lieber for an affix-driven derivation; since suffixes are weak and do not semantically select their bases, we propose that also co-indexation is base-driven.

First, let us illustrate how co-indexation works with result-object verbs and resultative verbs of creation:

- (21) *costruzione*
 a. [-mat, dyn ([]_R , [+dyn ([x]_{E1}, [y]_{E2}))] / -zione₁ / *costruire*
 b. [± mat ([i]_R , [+dyn ([x]_{E1}, [y_i]_{E2}))] / -zione₂ / *costruire*
- (22) *traduzione / correzione*
 a. [-mat, dyn ([]_R , [+dyn ([x , y]_{E1}, [z]_{E2}))] / -zione₁ / *tradurre / correggere*
 b. [± mat ([i]_R , [+dyn ([x , y]_{E1}, [z_i]_{E2}))] / -zione₂ / *tradurre / correggere*

Here, co-indexation works parallel to what proposed by Lieber for suffix-driven derivation in that co-indexed arguments must be semantically compatible. This explains why co-indexation does not take place in the (a) cases where there are no semantically compatible arguments; hence, the two skeletons are simply subordinated and the referentiality of the event noun is given by the semantic argument introduced by the suffix (cf. Asher 1993, for a proposal along these lines).²³

Yet, as examples (b) show, co-indexation does take place with result nominals: we suggest that what determines the linking between the two skeletons is one of the semantic arguments of the base, namely the incremental theme/result. Specifically, in (21b) the result-object nature of the verb imposes that co-indexation links together the y argument (corresponding to the syntactic object, i.e. an incremental theme from the semantic viewpoint) and the R argument of the suffix. In (22b) the resultative property of the verb demands that co-indexation is between the z argument (corresponding to the incremental result) and the R argument of the suffix. On the basis of its concrete or abstract semantic specification, the incremental theme/result will be associated with the [+material] or [-material] feature of the suffix.

A co-indexation mechanism working in this way allows us to account for the different syntactic behaviour of these classes of nominals. Where co-indexation links the internal argument of the verb, only the external one can be discharged in syntax (cf.

²² The use of the diacritic [±material], instead of [+material] and [-material], is only intended to simplify the representation. The *-zione*, *-mento*, and *-tura* suffixes, in fact, can form concrete results such as *costruzione* and abstract ones such as *interpretazione* 'interpretation'.

²³ An alternative account would be that the base verb comes with an inherent event variable (along the lines of Davidson 1967 and Parsons 1990), which would get co-indexed with the R variable introduced by the suffix. Since the focus of the present contribution is on the class of result nouns we will not explore the pattern of co-indexation in event nominals here, and we leave the issue to future research.

result-object verbs). Conversely, where co-indexation does not link any syntactic argument but only a semantic one, both of them are available for syntactic discharge (cf. resultative action verbs).

Let us now see what happens with non resultative action verbs. As we saw above (cf. 3.2.3.), different groups of verbs belong to this class. With verbs of the *amministrare* subclass (cf. 18), co-indexation does not take place because such verbs have a simple event structure template; hence they simply lack an incremental theme or result. A similar situation arises in the case of change of location verbs, such as *trasferire*: though associated with complex event structure templates, these verbs do not have incremental but holistic themes. Hence, their *y* arguments do not co-index with the R argument of the suffix.

Verbs like *asciugare* or *pulire* and verbs like *annullare* can be represented with a zero (empty) result argument: although the action denoted by these predicates does produce a change of state in the respective objects (which in the case of *annullare* corresponds to a complete removal/destruction of the object) this change does not yield a new entity or semantic participant. To illustrate the peculiar property of these verbs, we introduce a semantically empty result argument associated with the second subevent as in (23):

- (23) [+dynamic ([x , y]_{E1}, [∅]_{E2})]
pulire/annullare

Since co-indexation is a mechanism based on the fusion of the referential properties of the *R* argument of the affix with one of the base arguments, in these derivations co-indexation is blocked because of the null reference of the relevant argument of the base.

5. Conclusion

Cases such as *annullamento* and *amministrazione* show that the result interpretation of a nominal is not systematically correlated with an event one; namely, an event nominalisation has not always a sister result correlate. We have therefore shown that a classification of the base verbs based on their semantic-conceptual properties can shed light on the formation of semantically ambiguous event/result nominals.

The possibility of forming a result nominalisation, in fact, mainly depends on the meaning of the base verb. The analysis of a group of Italian verbs, syntactically transitive and semantically eventive/dynamic, allowed us to propose that only verbs with specific (structural and conceptual) semantic properties can give rise to result nominalisations. Namely, only verbs indicating actions putting into existence an entity (also intended as a modification) can be considered as result-forming verbs. The behaviour of such verbs can be formally accounted for: a) by taking into consideration the event structure template and what is called the idiosyncratic constant or body characterizing predicates, and b) by framing the representation into a lexical semantics model of word formation.

The representation of verb semantics by means of event structure templates allows for the decomposition of meaning into sub-events and, consequently, for the individuation of the "incremental theme/result" linked to the result nominal. Since with verbs of annulment, removal and non-resultative modification the second subevent is

associated with an empty incremental theme/result, we have tried to formally account for the impossibility of such verbs to form result nominals. Further, while exploring the sortal readings of these nominals, we have emphasised that result nominals, intended as names expressing the outcomes of the situations denoted by the base verbs, must be distinguished from both bounded event nominals (which are syntactically similar to results but are events, from a semantic viewpoint), on the one hand, and metonymic objects, on the other.

Lieber's morphological model of lexical semantics has in turn offered us an optimal formal apparatus for representing in lexical-semantic terms the skeletal representation of word constituents, on the one hand, and the implementation of the nominalisation process, on the other.

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