The Semantics of Agentive Nominals in the Generative Lexicon

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Abstract

In this paper, I examine the set of agentive nominals and argue that, in spite of their heterogenous behavior, we can find generalizations by characterizing their semantic properties in terms of the *stage-level* and *individual -level* distinction. This parallel with the domain of predicates provides a useful semantic classification of the class of agentive nouns and explains a range of syntactic phenomena as well as issues of semantic interpretation.

1. Introduction

The semantic representation of a variety of nominal forms requires explicit reference to certain distinctions which have been drawn in the verbal domain. In particular, the notion of *stage-level* and *individual-level* predication appears to be crucial to provide an appropriate characterization of the semantics of agentive nominals.

Agentive nominals are taken to correspond to a set of deverbal nouns which are morphologically derived by *-er* affixation (e.g., *baker*, *winner*, *runner*), a process which is sensitive to the argument structure of underlying verbal forms (cf. Keyser and Roeper, 1984, Moortgat, 1987, Sproat, 1985, Fabb, 1984, Grimshaw, 1990). This theoretical position gives a prominent role to morphological processes which are expected to account for both a syntactic generalization, i.e. there is a category change from a verb to a noun, and a semantic generalization, i.e. the derived noun refers to an individual who performs the action denoted by the verbal stem. As observed by a number of authors (Sproat, 1985, Rappaport and Levin, 1992), these two generalizations quickly run into problems in light of derived nominals that denote instruments (e.g. *opener*, *parser*, *propeller*), and verbal forms that lack a correlated agentive noun (e.g. *dier*, *arriver*, *fearer*).

Since Chomsky's "Remarks on Nominalizations" there is a widespread assumption that the lack of systematicity and the unpredictability of the interpretation of derived nominal forms is an inescapable problem with nominalizations. In this paper, I argue that this is a fact of morphology which should be of little concern to a semantic theory, and that morphology should not constitute the unifying explanation for the behavior of agentive nouns.

The alternative solution is to view morphological operations as an instance of creative use of language, which should consistently derive new forms for which we can find independent motivation in the language. This perspective requires that we find correlations between lexically encoded base forms and morphologically derived forms. By viewing the problem from this perspective, the resulting classification changes radically in a way that displays a very close connection between the behavior of the nominal system and that of the verbal system. In the rest of this paper, I will discuss some of the cruicial semantic issues that arise with the set of agentive nominals, and then provide a solution within Generative Lexicon theory (henceforth, GL), (Pustejovsky, 1995), based on the role of events and on the quantificational properties of qualia roles.

2. The Basic Distinction

Within recent work in lexical semantics, Rappaport and Levin (1992) have observed that the set of agentive nominals splits into two classes. The sets of nouns which denote instruments, e.g. *can opener*, as well nominals that denote occupations, e.g. *teacher*, fall into a class which they terms *non-event agentive nouns*, since these nouns do not presuppose that an event of opening or teaching has occurred or will ever occur. The set of agentive nouns which presuppose the occurrence of an event are classified as *event agentive noun*, and it includes expressions such as *builder of the house*. In this paper, I show that all agentive nominals are best characterized in terms of events, irrespectively of whether or not the event which defines an individual is presupposed (cf. Chierchia, 1995, for individual-level predicates). The different interpretations emerge as the result of the quantification as well as of the event type of the action that characterizes the agentive noun.

Building on a previous distinction drawn in Pustejovsky (1995), I argue that nouns which denote participants in an event fall under two general classes according to whether or not they require the context to make reference to the defining characteristic of the individual. This is illustrated in the sentences in (1) and (2), (cf. Pustejovsky, 1996, for the use of the symbol "!" to indicate semantically odd sentences):

(1) When we bumped into the violinist$_i$ on Sunset Boulevard,

a. he$_i$ was playing a serenade on a street corner.

b. he$_i$ was selling hot-dogs on a street corner.

(2) When I saw a pedestrian$_i$ on Sunset Boulevard,

a. he$_i$ was about to get run over by a truck.

b. !he$_i$ was selling hot-dogs on a street corner.

In (1), we can felicitously refer to *violinist* without the individual being engaged in the activity of "playing the violin". Conversely, reference to a noun such as *pedestrian*, in (2), is felicitous only if the individual is walking at the time of reference, hence the oddness of (2b). Adopting the distinction drawn in Pustejovsky (1995), the behavior of these two types of nominals can be captured by viewing it as the analogue of the *individual-level* and *stage-level* distinction in the nominal domain. Nouns such as *violinist* are treated as *individual-level agentive nominals* (ILNs), and nouns such as *pedestrian* as *stage-level nominals* (SLNs).

Consistently with the behavior of *stage-level* and *individual-level* predicates, these two classes of agentive nouns are distinguished by a number of grammatical and semantic facts. As illustrated in (3), SLNs, but not ILNs, are licensed with frequency adjectives:

(3) a. a frequent passenger/patron; (*SLN*)

b. !a frequent violinist/professor; (*ILN*)

With SLNs, locative PPs uniquely modify the location of the event, as in (4a) below:

(4) a. a pedestrian on the crosswalk

b. !a pedestrian on the airplane

With ILNs, a locative PP is either polysemous, as in (5a), where it can be interpreted as modifying either the location of the individual or that of the event, or, as in (5b), it uniquely makes reference to the location of the individual:

(5) a. a skier on the glacier

b. a skier on the airplane

A semantic difference between the two nominals types is that SLNs can either make reference to the individuals involved in the events or to the events themselves, while with ILNs this option is not available. This is illustrated below:

(6) a. Twenty patrons came in today.

b. I have seen eight doctors in the last month.

In (6a), the number of patrons may be twenty or less since the same individual might have visited the business more than once. In (6b), the number of doctors is exactly eight. The distinction between SLNs and ILNs is also motivated by additional grammatical facts including their distribution with complements, coercion predicates, when-clauses, and temporal adverbials, as discussed in greater detail in Busa (1996).

In the process of recasting the question of how agentive nouns can best be characterized from the starting point of semantics rather than morphology, it is necessary to make explicit how their different properties, which are reflected in grammatical behavior and semantic interpretation, are part of lexical knowledge. The next section addresses more explicitely the question of how persistent and changeable properties of individuals can be described both in the verbal as well as in the nominal domain.

3. Persistent and Situated Properties of Individuals

Describing the temporal relation between individuals and events within simple sentences provides a useful method for approaching the problem of how persistent and changeable properties of individuals can be expressed as part of lexical knowledge. Consider the following utterances:

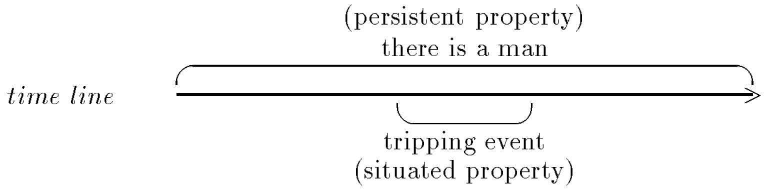
(7) a. A man tripped.

b. A man/John built a house.

c. A man/John knows Latin.

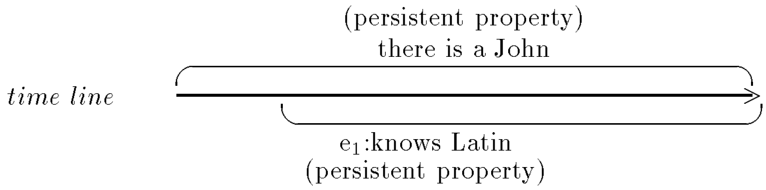
The sentence in (7a) expresses a situation in which an individual who has the persistent property of being a man is involved in a tripping event. This situation can be informally described by means of an imaginary time line along expressing the relation between a larger temporal containing the persistent property of being a man, that , at some stage, overlaps with a smaller interval containing the occurrence of a tripping event. This is illustrated in the diagram below:

(8)



The sentence in (7b) can be described in a similar way, with the additional fact that, as the result of the building event, there is an individual with persistent properties, namely a house. Finally, the sentence in (7c) describes two persistent properties of an individual that hold simultaneously:

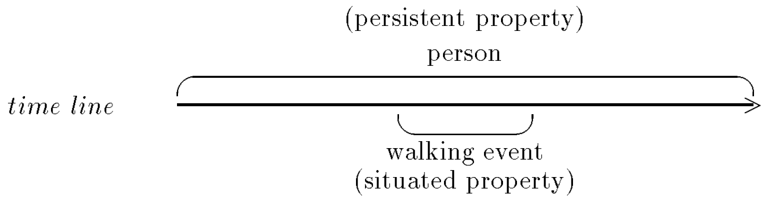
(9)



The semantics of an agentive noun, which denotes an individual involved in an event or sets of events, can be described in a similar way. Consider, for instance, the SLN *pedestrian*, which refers to a person (i.e. persistent property) who walks on the street at the time of reference (i.e. situated property). The conjunction of these two properties is described in the diagram below:

(10) a. pedestrian;

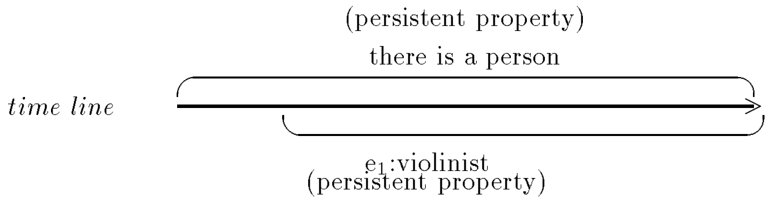
b.



The ILNs *violinist*, *professor*, *smoker*, instead, can be viewed as a conjunction of persistent properties of an individual, as illustrated below:

(11) a. violinist;

b.



This informal description elucidates quite clearly the role of events in the representation of agentive nominals, and hints at the fact that in an event-based theory, the persistency of objects can be expressed by means of a state predicate (cf. Parson, 1990, Pustejovsky, 1996). Without introducing the formal machinery that expresses the persistency of individuals (cf. Pustejovsky, 1996, for details), I will keep the discussion largely informal, and focus on how persistent and changeable properties can be encoded as part of lexical knowledge. This is the topic of the next section.

4. Elements of Lexical Representation

GL theory provides the appropriate framework for making explicit the relations between individuals and events as the result of how qualia roles are interpreted. In a GL lexical entry, events are encoded in the TELIC and the AGENTIVE roles. More specifically, the TELIC role encodes the characterizing function of an individual, while the AGENTIVE expresses the mode of coming into being of the entity being defined. In other words, different qualia roles induce a different interpretation on the event that they encode. By viewing qualia roles as introducing different forms of quantification (cf. Pustejovsky, 1996), we can exploit their properties to account for the interpretation of the two classes of agentive nouns. (cf. Busa, 1996). As an example, consider a nominal such as *knife*, whose TELIC role expresses the persistent property that this object is for cutting. This linguistic knowledge does not entail that every knife cuts or that a particular knife will be cutting in any given circumstance. Thus, the TELIC role induces a modal interpretation of the event that it encodes, such that, for an individual for which the TELIC is defined, we interpret that event as a definitional property which is true irrespectively of actual situations. Given this model of lexical representation, the individual level properties of agentive nouns can be straightforwardly expressed in the qualia structure of the noun. The representation of nominals such as *violinist* or *smoker* is given below:

(12) a.
$$\begin{bmatrix} \textbf{violinist} \\ \text{FORMAL} = \textbf{``person''} \\ \text{TELIC} = \textbf{``play violin''} \end{bmatrix}$$

b.
$$\begin{bmatrix} \textbf{smoker} \\ \text{FORMAL} = \textbf{``person''} \\ \text{TELIC} = \textbf{``smoke''} \end{bmatrix}$$

The interpretation of the AGENTIVE, which for each individual denotes the unique event of bringing about and preceeds the existence of that individual, is given in terms of existential quantification. The representation of nouns such as *pedestrian* and *passenger* is given below:

(13) a.
$$\begin{bmatrix} \textbf{pedestrian} \\ \text{FORMAL} = \textbf{``person''} \\ \text{AGENTIVE} = \textbf{``walk on the street''} \end{bmatrix}$$

b.
$$\begin{bmatrix} \textbf{passenger} \\ \text{FORMAL} = \textbf{``person''} \\ \text{AGENTIVE} = \textbf{``travel on vehicle''} \end{bmatrix}$$

5. Refining the Representations

Above, I have argued that ILNs do not require the event that defines the individual to occur at the time of reference, hence the property of being a *violinist* or a *smoker* holds irrespective of any specific situation of playing the violin or smoking. The class of ILNs, however, is not fully homogenous since *smoker* and *violinist* differ in important ways. Whereas a *smoker* refers to an individual who has the habit or the inclination to smoke with some of regularity, a *violinist* can be minimally characterized as an individual who has the ability of playing the violin. The difference between the variety of ILNs can be captured by refining the distinction in terms of different modes of "coming into being" of an individual, namely the AGENTIVE role. In other words, the defining event is dependent on a stative predicate, which in the case of *violinist* is the modal *ability*, and in the case of *smoker* is the partly extensional predicate *habit*. The resulting qualia structure representations for the two nominals are given below:

(14) $\begin{bmatrix} \textbf{violinist} \\ \text{FORMAL} = \textbf{"person"} \\ \text{TELIC} = \textbf{"play violin"} \\ \text{AGENTIVE} = \textbf{"ability to play violin"} \end{bmatrix}$

(15) $\begin{bmatrix} \textbf{smoker} \\ \text{FORMAL} = \textbf{"person"} \\ \text{TELIC} = \textbf{"smoke"} \\ \text{AGENTIVE} = \textbf{"habit to smoke"} \end{bmatrix}$

I will not detail the range of stative predicates which are found with ILNs or the formal semantics of *habit* and *ability*, (cf. Busa, 1996, for details). Keeping this discussion largely informal, suffice it to say that *ability* and *habit* differ in a crucial ways. In particular, an event which is interpreted relative to an ability is fully intensional in that it may or may not occur. Conversely, when we interpret an event relative to *habit*, an extensional component is introduced. More specifically, the events that constitute the past occurrences up to the present are extensional (e.g. AGENTIVE), while there is intensional component comprised of possible events that are likely to occur in the future (e.g. TELIC).

The characterization of the semantics of ILNs in terms of a stative predicate on which the defining event is modally dependent accounts for the individual-level properties of this class of nouns, and explains a number of grammatical and semantic facts. Consider, for instance, the constrasts below:

(16) a. John is a violinist but doesn't play violin anymore.

b. John is an alcoholic but doesn't drink anymore.

(17) a. !!John is a smoker but doesn't smoke anymore.

b. !!John is a drinker but doesn't drink anymore.

The contradictory statements in (17) are explained as the result of the extensional component introduced by interpreting the defining event in terms of a *habit*. The same reason accounts for the different entailments of *violinist* and *smoker* in composition with the adjective *former*:

(18) John is a former violinist/musician/professor. ($sense_1$)
$\Rightarrow$ John is a violinist/musician/professor. ($sense_2$)

(19) John is a former smoker/drinker.
$\not\Rightarrow$ John is smoker/drinker.

In addition, adjectives that make reference to an ability, such as *natural* or *talented* are ruled out with *smoker* and *drinker*:

(20) a. !!a natural smoker/drinker

b. !!a talented smoker/drinker

Conversely, adjectives that make reference to the occurrence of a habit are licensed with *smoker* but not with *violinist*:

(21) a. habitual/frequent/moderate drinker/smoker

b. !!habitual/frequent/moderate violinist/alcoholic

In (21b), a frequency adjective is not licensed since it could only modify the state denoted by *ability*. In (21a), instead, given the extensionalized events associated with the semantics of *habit*, frequency adjectives are licensed.

The behavior of agentive nouns in composition with frequency adjectives points to the observation that also the set of SLNs is itself not fully homogenous:

(22) a. frequent passenger/pedestrian

b. frequent winner/author

c. !frequent widow/escapee

d. !frequent believer/connoisseur

The different judgements in (22) illustrate that SLNs differ in their interpretation. This also emerges in the constraints that different nominals impose on the interpretation of the matrix predicate. In (23) below, for instance, the matrix predicate is interpreted as temporally overlapping with the event that characterizes a *pedestrian*:

(23) a. That pedestrian is limping.

b. John hit a pedestrian yesterday.

c. Pedestrians on that crosswalk will be in danger.

With nominals such as *widow* or *murderer*, however, the defining event is interpreted as preceeding the matrix predicate, as shown below:

(24) a. John's widow is getting married next week.

b. !John married his future widow (Asher, p.c.)

(25) a. John's murderer was caught.

b. !John$_i$'s murderer will kill him$_i$ tomorrow.

Finally, there are other nominals for which the defining event will occur in the future, e.g. *confirmee*, *candidate*, and so on.

A desirable solution for characterizing the requirement that the context makes reference to the event defining the individual is to have a unique generalization and have the different temporal relations emerge as the result of the event type encoded by the nominal. In other words, rather than specifying, for each nominal, whether the defining event occurs before or after the event denoted by matrix verb, we should maintain the generalization that the matrix predicate is intepreted to occur within the temporal interval in which the defining event occurs, as discussed for *pedestrian*. This solution is not only theoretically more elegant, but it is necessary to properly account for the data, since for a *widow* the state that results from having lost the husband holds at the time of reference. Similarly, a *fugitive* denotes an individual who has escaped in the past and for which the state of being free holds at the time of reference. Our generalization can be maintained by adopting a decompositional view of the event structure representation, which treats events as complex objects.

In GL theory, different types of transitions are distinguished minimally by the notion of head (cf. Pustejovsky, 1996), which is the most prominent event in an event structure representation and is motivated by a number of grammatical facts (e.g. modifier scope, adjuncts, grammatical alternations, and so on). In particular, the set of nominals associated with achievements, namely *escapee* and *fugitive*, versus *winner* and *discoverer* are interpreted differently. Nominals for which the defining event is a right-headed transition, i.e. *escape*, require that the matrix predicate is interpreted to overlap with the final state. If we assumed an analysis that establishes a precedence relation between an event of escaping and the state of being in prison, then (26b) would be predicted to be fully semantical:

(26) a. The fugitive/escapee has not yet been found.

b. !The fugitive is in jail.
(c.f. The fugitive is now in jail.)

Similarly, a simple precedence relation would not explain the contrast in (27) below:

(27) a. The winner of the Boston marathon$_i$ had crossed the finish line when it started to rain.

b. !The winner of the Boston marathon$_i$ had crossed the finish line when it$_i$ was called off.

If the event that defines an SLNs is a right-headed transition (e.g. unaccusatives), as in (26), the event denoted by the matrix verb is interpreted to occur within the temporal interval in which the resulting state of the individual holds. Conversely, if the characterizing event is a left-headed transition (e.g. a causative), as in (27), then the defining event has a perfect reading that contributes a state making reference to the agent having completed that action (cf. Parson, 1990, for this view of the perfect). In this case the matrix predicate is related to that state asserting the completion of the event.

6. Conclusion

Adopting the well known distinction between *stage-level* and *individual-level* predicates in the domain of nominals allows us find predictable patterns of behavior within the class of agentive nominals. The lexical semantic framework provided by GL theory provides an expressive model to encode the properties of agentive nouns as the result of the quantificational properties of qualia structure. In addition, focussing on the role of events to account for the interpretation of agentive nouns constitues a promising are a reseach into the semantics of productive affixes. In particular, the set of -*ee*-nominals appears to be often associated with right-headed transitions, and the set of -*er* nominals with left-headed transitions, processes, and states. It follows that not only certain nominal types display a parallel with the aspectual system, but certain phenomena can be captured in terms of an analogy with alternation classes of verbal predicate, such as the causative/unaccusative alternation.

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