

On Different Types of Approaches to Unaccusativity: the Purely Syntactic Approach and the Purely Semantic Approach

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1. Introduction

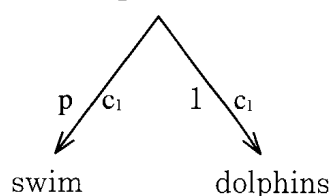
This paper deals with the main theories of unaccusativity which have been proposed in the literature. The unaccusative hypothesis was originally put forward by Perlmutter (1978) within the framework of Relational Grammar. Inspired by Perlmutter's work, many subsequent studies on unaccusativity have been carried out in a variety of different frameworks. These studies can be classified into three different types depending on the scholar's point of view in regard to this controversial issue - whether unaccusativity should be treated as a syntactic or semantic phenomenon. The three approaches are: the purely syntactic approach (Burzio 1986; Kayne 1993), the purely semantic approach (Van Valin 1990; Dowty 1991), and the interface (from both a syntactic as well as a semantic perspective) approach (Levin and Rappaport Hovav 1995; Sorace 2000). The interface approach can be further classified into two subcategories according to the scholar's view of how the interface works: the lexical-entry driven approach and the predicate-based approach. The definition of unaccusativity differs considerably among the three approaches.

The current paper reviews first two types of approaches: the purely syntactic approach and the purely semantic approach. For the sake of the space, however, the interface approach will be taken up in the following issue of the working paper. Before starting our review of the two different types of approaches, we shall briefly look at Perlmutter's work, by which many subsequent studies on unaccusativity have been inspired.

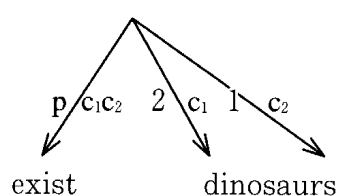
2. The Unaccusative Hypothesis

The Unaccusative Hypothesis was first proposed by Perlmutter (1978) within the framework of Relational Grammar. Relational Grammar assumes two levels of syntactic representation — the “initial stratum”, and the “final stratum”. Initial 1 indicates the subject and Initial 2 indicates the direct object. The hypothesis claims that there are certain intransitive clauses which have an Initial 2 but not an Initial 1. In other words, the hypothesis can be paraphrased as follows: there is a special type of intransitive clause having an underlying direct object but no underlying subject, distinct from the usual type of intransitive clause having an underlying subject but no underlying object. Perlmutter calls the former type “unaccusative” and the latter type “unergative”. For example, “Dolphins swim” which is an unergative phrase, and “Dinosaurs exist” which is an unaccusative phrase, can be illustrated as follows:

(1) a. Dolphins swim.



b. Dinosaurs exist.



(1a) contain a 1-arc but no 2-arc, which is defined as unergatives, while (1b) contains a 2-arc but no 1-arc, which is defined as unaccusative. Perlmutter (1978: 161) argues that “initial unergativity vs. unaccusativity is predictable from the semantics of the clause” (Perlmutter 1978:161). He also claims that the distinction is cross-linguistically uniform, though the degree varies from language to language. This claim is clearly presented as the “Universal Alignment Hypothesis” in Perlmutter and Postal (1984: 97).

(2) **Universal Alignment Hypothesis**

There exist principles of universal grammar which predict the initial relation borne by each nominal in a given clause from the meaning of the clause.

This hypothesis claims that there is an explicit and universal connection between semantic roles and grammatical relations. Preceding this hypothesis, Perlmutter had already suggested that “the necessary first step is to attempt to formulate the principle predicting initial unergativity vs. unaccusativity” (Perlmutter 1978: 161). He attempts to single out some of the fundamental properties which determine initial unergativity vs. unaccusativity. His list is shown below:

(3) **Predicates Determining Initially Unergative Clauses**

a. Predicates describing willed or volitional acts:

work, play, speak, talk, smile, grin, frown, grimace, etc.

b. Manner-of-speaking verbs:

whisper, shout, mumble, grumble, growl, bellow, etc.

c. Predicates describing sounds made by animals:

bark, neigh, whinny, quack, roar (voluntary), chirp, etc.

b. Certain involuntary bodily processes:

cough, sneeze, hiccough, belch, burp, vomit, defecate, etc.

(4) **Predicates Determining Initially Unaccusative Clauses**

a. Predicates expressed by adjectives in English:

This is a very large class, including predicates describing sizes, shapes, weights, colors, smells, states of mind, etc.

b. Predicates whose initial nuclear term is semantically a Patient:

burn, fall, drop, sink, float, slide, slip, glide, soar, flow, ooze, etc.

Inchoatives:

melt, freeze, evaporate, vaporize, solidify, crystallize, dim, brighten, etc.

c. Predicates of existing and happening:

exist, happen, transpire, occur, take place, ensure, result, show up, etc.

d. Involuntary emission of stimuli that impinge on the senses:

shine, sparkle, glitter, glisten, glow, jingle, clink, clang, snap, etc.

e. Aspectual predicates:

begin, start, stop, cease, continue, end, etc.

f. Durative:

last, remain, stay, survive, etc. (Perlmutter 1978:162-163)

Perlmutter (1978) warns that there could be some mismatches in spite of the cross-linguistic validity of his formulation. He gives the following three reasons.

- a. In English, homophonous verbs are used in different clause types.
- b. The lists of predicates in (3) and (4) are still incomplete.
- c. Sometimes, it is not apparent what might be the synonym in one language which is equivalent to a given verb in another language. Synonymy between verbs in different languages is not always obvious (*travel* in English and *reizen* in Dutch).

Although the initial hypothesis from Perlmutter (1978) put the emphasis on semantic roles and cross-linguistic validity, Perlmutter (1989) shows some shift in his approach, claiming that the syntactic analysis should be independent of any semantic or thematic representation, which made his account similar to that of Government and Binding Theory, but Perlmutter's initial work inspired many researchers to carry out studies within various frameworks. However, one issue which has always been

controversial is whether unaccusativity should be treated as a syntactic or a semantic phenomenon. The purely syntactic approach regards unaccusativity as a unified phenomenon — all unaccusative verbs share a common syntactic configuration, no matter what semantic class they belong to. It is denied that there are meaningful semantic generalisations which can account for the distinction between unergatives and unaccusatives. In contrast, the purely semantic approach claims that the distinction between unaccusative and unergative verbs can be explained exclusively on semantic grounds. In other words, verb meanings are crucial for characterising what is termed “split intransitivity”. Let us start with reviews of Burzio (1986), and Kayne (1993) for the purely syntactic approach.

3. The syntactic approach

In this section, Burzio’s (1986) and Kayne’s (1993) syntactic approaches to unaccusativity will be reviewed. Burzio (1986) analyses the syntactic behaviour of Italian auxiliaries, and develops the Unaccusative Hypothesis within the framework of Government and Binding Theory. Kayne (1993) analyses auxiliaries in several languages including English, Spanish, French, Italian, and some of their dialects, and he presents an integrated theory to account for auxiliary selection, both language-internally and cross-linguistically. Let us start with a review of Burzio (1986).

3.1 Burzio (1986)

Burzio (1986) adopts the Unaccusative Hypothesis to account for Italian intransitive verbs within the framework of Government and Binding Theory. By scrutinising auxiliary verbs in Italian, Burzio identifies two types of intransitive verb, which display different syntactic behaviour. He calls them “unergative” and “ergative”, the latter being

equivalent to Perlmutter's "unaccusative". Burzio presents a range of evidence to illustrate the different syntactic behaviour between unergatives and unaccusatives (ergatives). In this section, we shall concentrate on auxiliary selection and NE-cliticization. Compare the following Italian examples.

- (5) a. Giovanni arriva
 'Giovanni arrives'
 b. Giovanni è arrivato
 is arrived
 'Giovanni has arrived'
- (6) a. Giovanni telefona
 'Giovanni telephones'
 b. Giovanni ha telefonato
 has telephoned
 'Giovanni has telephoned'

(Burzio 1986: 20)

At first glance, the verbs in (5a) and (6a) look the same type of intransitive verb, but they clearly display different syntactic behaviour in auxiliary selection, as seen in (5b) and (6b). Burzio proposes that, in Italian, all unaccusative verbs systematically select the ESSERE auxiliary as in (5b), while all unergative verbs systematically select the AVERE auxiliary as in (6b). Thus, auxiliary selection in Italian is a key distinguishing criterion between the unaccusative and unergative classes of intransitive verb.

Burzio accounts for the mechanism of auxiliary selection in relation to the distribution of past participle agreement ('*pp* agreement'). He points out that the distribution of ESSERE overlaps with that of *pp* agreement. Look at the examples in (7):

- (7) a. Passive: Maria è stata accusata.
Maria is been accused (fem) (E; pp ag't)
Maria has been accused.
- b. Reflexive *si*: Maria si è accusata
Maria herself is accused (fem) (E; pp ag't)
Maria has accused herself.
- c. Ergative V: Maria e arrivata
Maria is arrived (fem) (E; pp ag't)
Maria has arrived. (Burzio 1986: 54)

Both auxiliary ESSERE and *pp* agreement are observed in these examples, and they appear closely related to each other. Burzio proposes two rules to explain the distribution of these phenomena.

- (8) a. **ESSERE ASSIGNMENT:** The auxiliary will be realized as *essere* whenever a '*binding relation*'¹ exists between the subject and a 'nominal contiguous to the verb'.
- b. **PAST PARTICIPLE AGREEMENT :** A past participle will agree (in gender and number) with an element holding a '*binding relation*' with its 'direct object'. (Burzio 1986: 55-56)

The idea behind these rules is that both ESSERE assignment and *pp* agreement are caused by a binding relationship between two NPs, which is shown in (9) and (10) respectively.

¹ The definitions of c-command and binding are as follows (Haegeman 1994:212):
(a) C-command: A c-commands B if and only if A does not dominate B and every X that dominates A also dominates B.
(b) Binding: A binds B if and only if A c-commands B and A and B are coindexed.

(9) ESSERE ASSIGNMENT

i. NP cl - V...
 └──────────┘

ii. NP V NP...
 └──────────┘

(10) PAST PARTICIPLE AGREEMENT

i. ...cl-V NP...
 └──────────┘

ii. NP V NP...
 └──────────┘

(Burzio 1986: 56)

As explained in (8a), the ESSERE auxiliary is assigned when there is a binding relation between a clitic and the direct object as in (9i), also between the subject and the direct object as in (9ii). Based on this syntactic analysis, the examples in (7) can be explained as follows:

- (11) a. [Maria] è stata accusata t
 Maria is been accused (fem)
- b. [Maria] si è accusata [e]
 Maria herself is accused (fem)
- c. [Maria] è arrivata t
 Maria is arrived (fem)

The passive in (11a) and the unaccusative in (11c) are examples of (9ii) and (10ii). In (11b), *pp* agreement is triggered by the relation between the clitic and the empty category, whereas ESSERE assignment is triggered by the relation between the reflexive clitic and its antecedent as in (9i). Burzio's Generalisation also explains another Italian syntactic phenomenon, NE-Cliticization, whose distribution Burzio describes as follows:

(12) Ne-Cl (iticization) is possible with respect to all and only direct objects. (Burzio 1986: 26)

This is shown by the following examples:

- (13) a. Giovanni ne inviterà molti (dir. object)
Giovanni of them will invite many
Giovanni will invite many of them.
- b. *Giovanni ne parlerà a due (indir. object)
Giovanni of- them will talk to two
- c. *Molti ne arriveranno. (subject)
many of-them arrive
- d. *Molti ne telefoneranno (subject)
many of-them will telephone (Burzio 1986: 23)

As shown in (13), NE-Cliticization is allowed only with direct object, but not with an indirect object or a subject. According to Burzio, NE is a clitic pronoun, which attaches to a verb head leaving its specifier behind. Therefore, the NP which NE is extracted from must be positioned lower than V' in the D-structure² (i.e. the complement of V). This can be observed in the contrast between unaccusative and unergative verbs as in (14) and (15).

² In Government-Binding Theory, two levels of syntactic representations are posited (Haegeman 1994: 304-305):

- (i) D-structure: This level encodes the lexical properties of the constituents of the sentence. It represents the basic argument relations in the sentence. External arguments are base-generated in the subject position relative to their predicate; internal arguments are governed by the predicate in their base-position.
- (ii) S-structure: This level reflects the more superficial properties of the sentence: the actual ordering of the elements in the surface string, and their case forms.

- (14) a. Telefoneranno molti esperti.
 will telephone many experts
 “Many experts will telephone”
 b. “Ne telefoneranno molti.
 of-them will telephone many
 “Many of them will telephone”
- (15) a. Arriveranno molti esperti.
 will arrive many experts
 “Many experts will arrive”
 b. Ne arriveranno molti.
 of-them will arrive many
 “Many of them will arrive”

(Burzio 1986: 21-22)

In both (14a) and (15a), the subjects appear post-verbally, but their behaviour in NE-cliticization is different—(15b) is grammatical, while (14b) is not. This shows us that the NP in (14b) originates outside V' , while the NP in (15b) occurs in a position dominated by V' . This phenomenon supports the claim made in Burzio's Generalisation that unaccusatives take an internal argument while unergatives take an external argument.

3.2 Kayne (1993)

Kayne (1993) addresses the core question of how best to account for the difference in auxiliary selection between the languages with systematic HAVE (ex. English, Spanish), and the ones having either HAVE or BE. Kayne gets his initial insight from Benveniste (1966: sect.15), whose claim is that “(the evolution of) auxiliary HAVE and main verb (i.e. ‘possessive’) HAVE should be thought of in parallel fashion” (Kayne

1993: 3). Thus, Kayne does not assume an auxiliary selection rule, instead, he attempts to present an integrated theory which can account for any type of auxiliary selection, both language-internally and cross-linguistically.

Before starting his discussion of each type — English/Spanish, and French/Italian - Kayne summarises Szabolcsi's (1981, 1983) analysis of the Hungarian possessive construction. He believes that possessive HAVE and auxiliary HAVE can be analysed in the same way, though there is a trivial difference in the structure. Let us start looking at the first type of languages, those with systematic HAVE such as English and Spanish.

3.2.1 English and Spanish auxiliary HAVE

With respect to auxiliary selection, English and Spanish are in the same category — HAVE (HABER) is always selected by all verbs, even unaccusatives. Kayne gives the structure of the active auxiliary + past participle construction with a transitive verb as follows:

(16) ...BE [DP SPEC D/P⁰ ... [VP DP_{subj} [V DP_{obj}]]
 (Kayne 1993: 8)

Based on Kayne's account, in this construction, DP_{subj} moves twice. The first movement is from within VP to Spec of the larger DP as shown in (17).

(17) ...BE [DP DP_{subj/i} D/P⁰ ... [VP [e]_i ...]
 (Kayne 1993: 8)

The second movement is from Spec of the larger DP to Spec of BE, which happens only if D/P⁰ incorporates to BE, and Spec of DP is assimilated to an A-position. The second movement and incorporation are illustrated

below:

- (18) $DP_{\text{subj}/i}$ $D/P_e + BE$ $[DP [e]_i$ D/P^0 ... $[_{VP} [e]_i$ V $DP]$
 (Kayne 1993: 8)

As a result of the incorporation, $D/P^0 + BE$ is spelled out as HAVE. Possessive HAVE is also considered to be spelled out as a result of the incorporation of D/P^0 to BE. This is the basic account of the structure of the active auxiliary + past participle construction in English and Spanish. However, there is one crucial difference between these two languages, which is that the morphology of past participles in Spanish is more complex than that of English. Basically, the participle in Spanish can show number and gender agreement, though only in passives. Kayne treats all the agreement reflected in the morphology of the participle as a single AGR node, more precisely, as what corresponds to AGR_o in Chomsky (1991). The main point that Kayne makes about active participle agreement is that no participle agreement is shown by unaccusative sentences with the auxiliary + past participle construction in Spanish, as in (19).

- (19) Maria ha llegado/*a
 “Maria has arrived” (Kayne 1993: 10)

Kayne explains that this is because the DP *Maria* does not pass through Spec of AGR_o . When it moves from within VP to the Spec of the larger DP as in (20).

- (20) ... $[_{DP} [e]_i]$ D/P^0 AGR_o^0 $[_{VP} V[e]_i]$ (Kayne 1993: 10)

3.2.2 Italian auxiliary HAVE

Except in reflexive clitic sentences, Italian transitives and

unergatives always select auxiliary HAVE, as in (21) and (22).

- (21) a. Maria ha comprato i libri.
“Maria has bought the books”
b. *Maria è comprato/a i libri.
“Maria is bought the books” (Kayne 1993: 11)

- (22) a. Maria ha dormito.
“Maria has slept”
b. *Maria è dormito/a.
“Maria is slept” (Kayne 1993: 12)

Just as in Spanish, the past participle does not show any agreement with transitive and unergatives in Italian, as follows:

- (23) a. *Maria ha comprata i libri.
b. *Maria ha dormita. (Kayne 1993: 12)

Kayne argues that the absence of agreement with transitives and unergatives in Italian can be explained in the same way as in Spanish - the DP Maria moves to Spec, DP without passing through Spec, AGR_o on the way. Here, Kayne attempts to give an account for this movement—why DP cannot move into Spec, AGR_o. With transitives, Kayne refers to Chomsky’s (1992) discussion of minimality, and explains that this can be reduced to case assignment. That is, if the subject of a transitive verb moves into Spec of AGR_o the object will be unable to get Case, because it cannot receive Case at any Spec position higher than Spec of AGR_o, due to locality conditions. However, with respect to unergatives, it seems to be hard to apply this account to them, because they do not have objects. As a solution, Kayne proposes that, in addition unergatives “must

contain a phonetically unrealised object that needs to be Case-licensed by (Spec,) AGR_o” (Kayne 1993: 12). That is, he considers unergatives as a variant of transitives, using the term “covert transitives”.

3.2.3 Italian auxiliary BE with unaccusativity

In Italian, the past participle of an unaccusative verb must agree with the subject:

- (24) Maria è arrivata/*o.
 “Maria is arrived”

This is contrary to the case with auxiliary HAVE. Following Kayne’s account, this obligatory agreement implies that DP within VP moves into Spec of AGR_o before moving into the matrix clause. This DP movement from within VP to Spec of AGR_o is not followed by D/P⁰ incorporation since D/P⁰ need not be in the structure, which means BE will be spelled out as BE. This is shown as follows:

- (25) ...BE AGR_o V... (Kayne 1993: 19)

Kayne’s claim can be summarised with the following three points:

1. The choice between HAVE and BE is dependent on whether or not incorporation of D/P⁰ to BE takes place.
2. The absence or presence of agreement depends on whether or not it passes through Spec of AGR_o.
3. In Spanish, D/P is necessary because Agr_sP and BE cannot be sisters.
 i.e. ...BE D/P⁰ AGR_s T AGR_o V...

In sum, Kayne’s approach is different in that it denies the existence of

the auxiliary rule. In its place, assumes that “BE” and “HAVE” are identified except for the difference in the incorporations of an abstract position.

3.3 Summary of the syntactic approach

Two different studies by Burzio (1986) and Kayne (1993) have been reviewed in this section. Both Burzio (1986) and Kayne (1993) examine auxiliaries in several languages such as English, French and Italian, but they differ in that Burzio (1986) considers auxiliary selection as a manifestation of unaccusativity, while Kayne does not. The syntactic approach claims that unaccusativity is a unified phenomenon, which manifests a common syntactic configuration. It explicitly denies that semantic factors are involved in the syntactic characterisation of unaccusativity.

4. The semantic approach

The semantic approaches claim that the unergative – unaccusative distinction is encoded semantically but not syntactically. Within the framework of Role and Reference Grammar, Van Valin (1990) attempts to justify that these two types of intransitive verbs can be better explained on a semantic basis, that is, this phenomenon is characterised only by semantic properties, and not by syntactic ones. Preliminary to review of the fundamental concepts in Role and Reference Grammar (RRG), let us look at Vendler’s (1967)/Dowty’s (1979) aspectual classification of verbs, which RRG is based on.

4.1 The aspectual classification of verbs—Vendler(1967)/Dowty(1979)

The notion of the telic/atelic dichotomy originates with Aristotle, but it was Vendler (1967) who first categorised verbs into four classes according to their inherent aspectual properties: States; Activities;

Accomplishments; and Achievements. In his article “Verbs and Times”, Vendler classifies verbs based on their restrictions on combining with time adverbials and tense by using two primary diagnostic tests: whether a verb can appear in the progressive form, and whether a verb can be used in a question frame like, “For how long-?”, “How long-?”. Vendler’s taxonomy and some examples are illustrated in (26).

(26)	States	Activities	Accomplishments	Achievements
	know	run	paint a picture	recognize
	believe	walk	make a chair	spot
	have	swim	deliver a sermon	find
	desire	push a cart	draw a circle	lose
	love	drive a car	recover from illness	reach

(Dowty 1979: 54)

The examples from diagnostic tests will clearly demonstrate the characteristics of each category. First, compare the examples in the three different forms: progressive form, adverbial prepositional phrase “for-”, and “in-”.

(27) the progressive form “-ing”

- | | |
|-------------------------------|-------------------|
| a. *Tom is knowing the truth. | <States> |
| b. Tom is running. | <Activities> |
| c. Tom is making a chair. | <Accomplishments> |
| d. *Tom is recognising her. | <Achievements> |

(28) adverbial prepositional phrase “for-”

- | | |
|---------------------------------------|-------------------|
| a. Tom had a dog for ten years. | <States> |
| b. Tom swam for an hour. | <Activities> |
| c. *Tom painted a picture for a week. | <Accomplishments> |
| d. *Tom reached the summit for a day. | <Achievements> |

(29) adverbial prepositional phrase “in-“

- a. *Tom loved her in a week. <States>
- b. *Tom walked in a day. <Activities>
- c. Tom built a house in a month. <Accomplishments>
- d. Tom won the race in an hour. <Achievements>

The fundamental idea behind Vendler’s classification is “time schemata”, characterised by two main factors: telicity/atelicity, and instantaneity/continuity. According to his analysis, as for the former, Achievements and Accomplishments have a definite end-point, which allows them to take time adverbials referring to a point in time such as “in-” as in (29c) and (29d), while States and Activities do not have a definite end-point, which does not allow them to take time adverbials referring to a point in time, “in-”, as in (29a) and (29b). For the same reason, States and Activities can cooccur with time adverbials referring to the range of time such as “for-” as in (28a) and (28b), but Achievements and Accomplishments cannot as in (28c) and (28d).

With respect to the latter factor, instantaneity/continuity, the characteristics of each class are demonstrated in the examples with the progressive form. Activities and Accomplishments can take the progressive form as in (27b) and (27c), which leads to the conclusion that these two classes denote temporal, continuous events, while States and Achievements do not naturally fit in the progressive form as in (27a) and (27d). These results from the diagnostic tests and the characteristics of the four verb classes can be summarised as follows:

Table 1: The results from the diagnostic tests

	States	Activities	Accomplishments	Achievements
-ing	*	OK	OK	*
for-	OK	OK	*	*
in-	*	*	OK	OK

Table2: The four Vendler classes and the features

	telic/atelic	instantaneous/continuous	examples
States	atelic	instantaneous	know, love
Activities	atelic	continuous	laugh, stroll
Accomplishments	telic	continuous	build a house
Achievements	telic	instantaneous	win the race

However, there is some controversy about the interpretation of Achievements in the progressive form. Verkuyl (1993:36) points out that “Prog F (progressive form) has not been accepted as a solid criterion by a great many authors”, and he gives some examples which are contradictory to Vendler’s judgements.

(30) <Achievements>

- a. She is winning this game.
- b. He is dying.
- c. She was reaching the top.
- d. Look at the screen, the Challenger is exploding now.
- e. He is discovering now that he is a homosexual.
- f. Manufacturers were beginning to find it difficult to meet the dates.

(Verkuyl 1993: 36)

If Dowty’s or Verkuyl’s judgements are employed, it gets harder to distinguish between Accomplishments and Achievements. To distinguish these two classes, Dowty explores further diagnostic tests concerning whether they can occur as the complement of “stop”, “finish”, “almost”, and with the adverb “deliberately”.

(31) **stop**

- a. Tom stopped making a chair. <Accomplishments>
- b. *Tom stopped recognising her. <Achievements>

(32) finish

- a. Tom finished making a chair. <Accomplishments>
 b. *Tom finished recognising her. <Achievements>

(33) almost

- a. Tom almost painted a picture. <Accomplishments>
 b. *Tom almost reached the station. <Achievements>

(34) deliberately

- a. Tom painted a picture deliberately. <Accomplishments>
 b. *Tom reached the station deliberately. <Achievements>

Dowty (1979) gives a list of the results from all the diagnostic tests.

Table 3: Dowty's syntactic and semantic tests for verb class (Dowty 1979)

Criterion	States	Activities	Accomplishments	Achievements
1. meets non-stative tests	no	yes	yes	?
2. has habitual interpretation in simple present tense:	no	yes	yes	yes
3. ϕ for an hour, spend an hour ϕ ing:	ok	ok	ok	bad
4. ϕ in an hour, take an hour to ϕ :	bad	bad	ok	ok
5. ϕ for an hour entails ϕ at all times in the hour	yes	yes	no	d.n.a
6. x is ϕ ing entails x has ϕ ed	d.n.a	yes	no	d.n.a
7. complement of <i>stop</i> :	ok	ok	ok	bad
8. complement of <i>finish</i> :	bad	bad	o	bad
9. ambiguity with almost:	no	no	yes	no
10. x ϕ ed in an hour entails x was ϕ ing during that hour:	d.n.a	d.n.a	yes	no
11. occurs with <i>studiously attentively, carefully, etc.</i>	bad	ok	ok	bad

ok = the sentence is grammatical, semantically normal

bad = the sentence is ungrammatical, semantically anomalous

d.n.a = the test does not apply to verbs of this class

Dowty (1979: 71) claims that “the different aspectual properties of the various kinds of verbs can be explained by postulating a single homogeneous class of predicate — *stative predicates* — plus three or four sentential operators” — BECOME, DO, and CAUSE. According to his explanation, Statives are primitive predicates, which English stative verbs directly correspond to, while the three aspectual operators and connectives are used to construct the logical structure of other aspectual classes of verbs. That is, Vendler’s (1967) four aspectual verb classes can be described as a combination of Stative predicates and aspectual operators. The logical structures of each class of verb are represented in Table 4.

Table 4: Logical Structures of Vendler’s Verb Class (Van Valin 1990:224)

VERB CLASS	LOGICAL STRUCTURE
STATE	predicate’ (x) or (x,y)
ACHIEVEMENT	BECOME predicate’ (x) or (x,y)
ACTIVITY (=Agentive)	(DO (x)) [predicate’ (x) or (x,y)]
ACCOMPLISHMENT	Φ CAUSE ψ , where Φ is normally an activity predicate and ψ an achievement predicate.

In the next section, we shall move on to Van Valin’s (1990) theory of Role and Reference Grammar which uses Dowty’s aspectual calculus.

4.2 The linking schema of Role and Reference Grammar

Role and Reference Grammar (RRG) is also based on the theory of lexical decomposition proposed in Dowty (1979). Like other syntactic theories, RRG posits a linking rule between semantic and syntactic representation, but there is one crucial difference between RRG and a number of other theories, RRG assumes only a single level of syntactic

representation. Thus, it assumes a direct mapping from semantic representation (Logical Structure:LS) to the syntactic representation. RRG postulates two levels of semantic roles: one which is equivalent to the thematic relations of other theories, and another which has no exact corresponding notion in other theories. The first tier, thematic relations, is defined according to the position of arguments in LS, which means the difference in thematic relations is to a large extent attributed to the verb class, that is to the LS. The derivation of thematic relations for state and activity verbs is illustrated in Table 5.

Table 5: Definitions of thematic relations for state and activity verbs.

(Van Valin 1990: 226)

I. STATE VERBS		
A. Locative	be-at' (x,y)	x= locative, y= theme
B. Nonlocational		
1. State or condition	predicate' (x)	x= patient
2. Perception	see' (x,y)	x= experiencer, y= theme
3. Cognition	believe' (x,y)	x= experiencer, y= theme
4. Possession	have' (x,y)	x= locative, y= theme
5. Attrib/Identificational	be' (x,y)	x= locative, y= theme
II. ACTIVITY VERBS		
A. Uncontrolled	predicate' (x,(y))	x= effector (y= locative)
B. Controlled	DO (x,[predicate' (x,(y))])	x= agent, (y= locative)

With respect to the second tier, two crucial macroroles are posited: ACTOR and UNDERGOER. These are the two arguments of a transitive predication. Each of the macroroles subsumes the various thematic relations, and the relationship between the macroroles and the thematic roles is regulated by the Actor-Undergoer Hierarchy in Table 6.

Table 6: Dowty's syntatic and semantic tests for verb class (Dowty 1979:60)

ACTOR			UNDERGOER		
.....→			←.....		
Agent	Effector	Experiencer	Locative	Theme	Patient

[‘→’ = increasing markedness of realization of thematic relation as macrorole.]

The Hierarchy shows an accessibility cline for each macrorole. The closer to the centre the arrows goes, the less prototypical the realisation of the thematic role as a given macrorole gets. For example, the volitional transitive verb “hit” has typical ACTOR and UNDERGOER, which are “agent” and “theme”, while the verb such as “see”, “fear”, the ACTOR is Experiencer, and the UNDERGOER is Theme, which are marked cases.

The tier of ACTOR and UNDERGOER plays a role as the interface between thematic and grammatical relations. RRG has its own linking algorithm, which determines how to link the macroroles to grammatical relations. Van Valin suggests the RRG linking algorithm consists of two steps — the first step is the assignment of macrorole status and thematic relations to the argument, the second step is mapping the macrorole and the rest of the arguments onto the syntactic constructions. The first step is regulated by the General Macrorole Assignment Principles as follows:

(35) General Macrorole Assignment Principles:

- a. Number: the number of macroroles a verb takes is less than or equal to the number of arguments in its LS.
 1. If a verb has two or more arguments in its LS, it will take two macroroles.
 2. If a verb has one argument in its LS, it will take one macrorole.

- b. Nature: for verbs which take one macrorole
1. If the verb has an activity predicate in its LS, the macrorole is actor.
 2. If the verbs has no activity predicate in its LS, the macrorole is undergoer. (Van Valin 1990: 227)

The second step is governed by the Pivot Hierarchy below:

(36) **Pivot Accessibility Hierarchy = ACTOR > UNDERGOER > others**

This hierarchy shows which role is chosen as pivot in an unmarked case. In English, the transitive construction normally chooses the actor as the subject-equivalent, with the passive construction as a marked case. Based on the linking schema in RRG, Van Valin (1990) presents his own account of split intransitivity in Italian, Georgian and Acehnese. Let us briefly review his explanation for split intransitivity in terms of “the selection of auxiliary verbs” and NE-cliticization.

First, with respect to the selection of auxiliary verbs, Van Valin provides an account associated with the Dowty/Vendler classification of verbs, which is also suggested in Centineo (1986). That is, if the ESSERE/AVERE selection is considered in terms of the aspectual classes, it can be reduced to one generalisation -in Italian, all AVERE verbs are classified as activity verbs, and all ESSERE verbs as State, Achievement or Accomplishments. In the RRG framework, activity verbs are labelled class-S_A, and the latter verbs (State, or Achievement, or Accomplishment) are named class-S_O. Combining these concept with the Logical structure of each aspect class shown in Table 7, it is presented as follows:

Table 7: Logical structures of class-S_A and class-S_O intransitive verbs in Italian (based on Van Valin 1990: 233)

	VERB CLASS	LOGICAL STRUCTURE
< AVERE verbs> Class-S _A :	ACTIVITY (=Agentive)	(DO (x)) [predicate' (x) or (x,y)]
< ESSERE verbs> Class-S _O :	STATE	predicate' (x) or (x,y)
	ACHIEVEMENT	BECOME predicate' (x) or (x,y)
	ACCOMPLISHMENT	Φ CAUSE ψ , where Φ is normally an activity predicate and ψ an achievement predicate.

This logical structure clearly shows one common feature seen among ESSERE (class-S_O) verbs- each class among State, Achievement and Accomplishment entails a state predicate in its logical structure. Van Valin (1990:233) presents this fact as the rule of auxiliary selection:

(37) **AUXILIARY SELECTION WITH INTRANSITIVE VERBS:**

Select *essere* if the LS of the verb contains a state predicate.

(38) **NE-CLITICIZATION:** *NE* realizes the lowest-ranking argument on the Actor-Undergoer hierarchy in the state predicate in the LS of the predicate in the clause.

Van Valin suggests that both rules show that the existence of the state predicate is the key for ESSERE verbs. Synthesizing all his accounts, it is possible to draw a generalisation about auxiliaries in this way; AVERE verbs are classified as activity verbs, which have an actor as pivot, while ESSERE verbs are categorised as either state, or achievement, accomplishment, which have an undergoer as Pivot.

4.3 Dowty (1991)

4.3.1 Proto-roles and argument selection

Dowty (1991) claims that the traditional system of discrete thematic roles in GB theory cannot describe the characteristics of verbal arguments well, because he believes that thematic roles are not discrete entities but cluster concepts, much like the notion of “prototypes” presented by Rosch and Mervis (1975). This is a new view on thematic roles, which completely differs from the one presented in Dowty (1979). Thus he posits two prototypes of roles: Proto-Agent and Proto-Patient, each of which consists of a cluster of semantic entailments, and explains that each argument differs in the degree of the entailment which it denotes. These two prototype roles seem to be similar to the two “macroroles”, ACTOR and UNDERGOER, proposed by Foley and Van Valin (1984). Dowty, however, argues that macroroles and Proto-roles are not identical, because the former are posited as two discrete categories, while the latter are as cluster concepts, which are fuzzy. His emphasis is that each Proto-role consists of a set of semantic entailments, and “there are DEGREES of membership in the two P[Proto]-categories” (Dowty 1991:599). He gives a list of entailments which characterise the two role types as follows:

(39) Contributing properties for the Agent Proto-Role:

- a. volitional involvement in the event or state
- b. sentence (and/or perception)
- c. causing an event or change of state in another participant
- d. movement (relative to the position of another participant)
- (e. exists independently of the event named by the verb)

(40) Contributing properties for the Patient Proto-Role:

- a. undergoes change of state
- b. incremental theme

- c. causally affected by another participant
- d. stationary relative to movement of another participant
- (e. does not exist independently of the event, or not at all)

(Dowty 1991: 572)

Dowty states that each of the properties in the role is semantically independent, even though each argument in most English transitive verbs entails more than one property. Dowty argues that Proto-roles reflect higher order generalisations about lexical meanings. That is, the more entailments a verb has belonging to either Agent or Patient proto-roles, the more centrally it represents the category. His algorithm for argument selection is regulated by an Argument Selection Principle and two Corollaries as follows:

- (41) **ARGUMENT SELECTION PRINCIPLE:** In predicates with grammatical subject and object, the argument for which the predicate entails the greatest number of Proto-Agent properties will be lexicalized as the subject of the predicate; the argument having the greatest number of Proto-Patient entailments will be lexicalized as the direct object.
- (42) **COROLLARY 1:** If two arguments of a relation have (approximately) equal numbers of entailed Proto-Agent and Proto-Patient properties, then either or both may be lexicalized as the subject (and similarly for objects).
- (43) **COROLLARY 2:** With a three-place predicate, the nonsubject argument having the greater number of entailed Proto-Patient properties will be lexicalized as the direct object and the nonsubject argument having fewer entailed Proto-Patient properties will be lexicalized as an oblique or prepositional object (and if two nonsubject arguments have approximately equal numbers of entailed P-Patient properties, either or both may be lexicalised as direct object)

(44) **NONDISCRETENESS:** Proto-roles, obviously do not classify arguments exhaustively (some arguments have neither role) or uniquely (some arguments may share the same role) or discretely (some arguments could qualify partially but equally for both proto-roles)

(Dowty 1991: 576)

Dowty warns that, in spite of using the term “argument selection”, he does not mean to use the term “selection” in the sense used in the GB framework meaning “a step that occurs during the derivation of a sentence....or linking-up two different levels of representation, the syntactic level and the ‘thematic level’ (Dowty 1991:576). Rather, he uses the term “argument selection” to indicate a constraint on what sort of predicates will exist in a natural language out of the number of predicates which can be predicted.

With these notions of Proto-Agent and Proto-Patient, Dowty gives an account of the distinction between unaccusatives and unergatives. His claim is summarised into the following two points:

- (a) The unaccusative-unergative distinction can be characterised with two categories of arguments: Proto-Agents and Proto-Patients.
- (b) The unaccusative-unergative distinction across languages can be explained by the Argument Selection Principle as shown in (41).

As referred to in (b), Dowty attempts to give a proper account of the variation in the unaccusativity-unergative distinction across languages. More concretely, he explains how unaccusativity is defined in terms of the Proto-role hypothesis as follows:

....in any language which manifests unaccusativity, predicates that are ‘high’ in agentivity AND ‘low’ in patient properties are

invariably unergative, while those low in agent properties and high in patient properties are invariably unaccusative; only those high in both kinds of entailments, or low in both, should be unstable.

(Dowty 1991: 608)

Dowty's use of cluster concept seem to succeed in giving a solution for unaccusative mismatches, but in fact, there are some scholars who have identified problems with it. We shall briefly look at them.

4.4 Summary of the semantic approach

In this section, studies by Van Valin (1990) and Dowty (1991) in the purely semantic approach have been reviewed. Although these studies were developed with insight from each other's previous work and have a lot of similarities, there are great differences in some respects (ex. the concept of thematic roles). The purely semantic approach claims that the two classes of intransitive verbs can be distinctively characterised in semantic terms. It completely denies and excludes any manifestation of split intransitivity in syntactic representation.

5. Summary and discussion of the three different approaches

Two different types of approaches to unaccusativity have been examined in this paper: the purely syntactic approach and the purely semantic approach. To summarise each claim, the purely syntactic approach treats unaccusativity as a unified phenomenon, which represents a particular common configuration. It never acknowledges the usefulness of semantic generalisations to account for the distinction between unergatives and unaccusatives. In contrast, the purely semantic approach denies that unaccusativity is syntactically encoded, and claims that the distinction between the two classes of intransitive verbs is better

explained in semantic terms. Having observed the claims of each approach, it would be appropriate to raise some problems which these two different types of approaches have. Firstly, the main problem with the purely syntactic approach is that it cannot really account for the variations within unaccusativity, so-called “unaccusative mismatches” within a language and cross-linguistically, because it strictly defines unaccusativity as a unified phenomenon, therefore once it faces inconsistency or variation of syntactic behaviour, it loses explanatory power, and cannot provide a plausible account. Also, the account of unaccusativity using only syntactic configuration is not sufficient, because in fact, many of the constructions are constrained by semantic factors.

Secondly, the problem with the purely semantic approach is that it is not possible to define the distinction between unaccusativity and unergativity exclusively by means of semantic factors. As Levin and Rappaport Hovav (1995:14) point out that “the semantic properties of the verb may be a necessary, but not a sufficient, condition for passing an unaccusative diagnostic”, it is the case that even though a verb possesses a semantic property which is relevant to unaccusatives, it may not pass an unaccusative diagnostic. For example, telicity is considered to be one of the semantic components which is relevant to auxiliary selection of *zijn* (be) in Dutch. However, this is not a sufficient condition to select *zijn* (be), and a syntactic condition (that the verb phrase is intransitive) should be fulfilled (see Levin and Rappaport Hovav 1995:15).

Levin and Rappaport Hovav (1995) also evaluate Dowty’s Proto-role theory acknowledging that the idea of Proto-roles as cluster concepts is valid. However, at the same time they point out that there is still some vagueness in the definition of the entities. The idea of two cluster concepts is difficult to substantiate empirically as Sorace (2000:16) argues in the following ways:

- (a) Which verbs would be characterised by a high, or by a low, number of both agent and patient entailments?
- (b) Are there verbs with two maximally agent-like, or two maximally patient-like properties?

In addition, Juffs (1996:45) raises another question about Dowty's approach, which is that Dowty implies that the entailments are stored, but does not make clear "in what form are these entailments stored". Grimshaw (1990:31) warns that "it is undesirable to posit a probabilistic theory such as Dowty's because some of the restrictions are absolute and can never be overridden". She also adds that there is a reason why Dowty's approach succeeds in providing an account of argument realisation-only properties which are thematically the most prominent arguments and the ones which are aspectually the most prominent arguments are included in his lists.

Taking all the problems mentioned above into consideration, it seems to be crucial for the account of unaccusativity to integrate the domain of both syntax and semantics. This position is taken up by the interface approach, which will be reviewed in the following issue.

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