Structured Argument Structure, and the Distinction between the Primary and the Secondary Unaccusativity in HPSG

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Abstract

The aim of this paper is to propose a structured argument structure (arg-st) in which the external and the internal argument(s) are defined declaratively and represented separately. Based on the structured argument structure, it proposes a basic distinction between two types of unaccusativity, the ‘primary’ and the ‘secondary’ unaccusativity within a recent framework of Head-driven Phrase Structure Grammar (HPSG).

This paper, then, tries to show that the structured argument structure is necessary and theoretically promising. In addition to the arguments presented in Ryu ((1996), (1997)), further arguments will be added, including related data from English and German such as typical unaccusative mismatches, auxiliary selection, fake reflexives, resultative predication, middle formations, etc.

1 Data and Issues

1.1 The Feature ARG-ST Revisited: Flat vs. Structured Argument Structure

In HPSG, it is commonly accepted that the value of argument structure (arg-st) is a list containing all of the arguments of a verb together (cf. Manning (1994), Manning and Sag (1995), Davis (2001)). For example, the value of the argument structure of a word is $\langle \text{spr} \oplus \text{comps} \rangle$, where $\text{spr}$ is the value for SPR and $\text{comps}$ is the value for COMPS. A simplified version of Argument Realization Principle, as described in Sag and Wasow (1999, p.151ff.), is given in (1):

\begin{equation}
\text{Argument Realization Principle (as a part of Lexical Satisfaction)}
F \text{ (of type word, satisfying } \delta \text{ of a lexical entry } < \omega, \delta > \text{) satisfies the following feature structure description:}
\begin{bmatrix}
\text{SYN} & \left[ \begin{array}{c}
\text{SPR} \\
\text{COMPS} \\
\text{GAP}
\end{array} \right] \\
\text{ARG-ST} & \langle \text{spr} \oplus \text{comps} \rangle
\end{bmatrix}
\end{equation}

The feature arg-st plays a central role – and seems to work well in its proposed form – in the analyses of some widely known phenomena such as binding, passivization, etc. (cf. Manning (1994), Manning and Sag (1999), see also Pollard and Sag (1994))

But previous works in the related field have difficulties in dealing with some other more complex cases, in which the grammatically relevant key property is not just the ordering of the arguments, but the status of each argument. These cases include, but may not be limited to, im-
personal passive formation, **Agent** nominalization, auxiliary selection, past participle formation, fake reflexives, resultative predication, middle formations, etc.¹

### 1.2 Unaccusative Phenomena and Unaccusative Mismatches

Ever since Perlmutter’s Unaccusative Hypothesis (Perlmutter (1978)), later researchers have widely accepted the view that the heterogeneous behaviors of intransitive verbs are accounted for by assuming two different classes of intransitive verbs, ‘unergative’ and ‘unaccusative’ verbs [see also Rosen (1984), Burzio (1986), Levin and Rappaport Hovav (1995), etc.].

The most frequently discussed unaccusative phenomena can be summarized as follows:

(2) Some unaccusative phenomena (in German)

<table>
<thead>
<tr>
<th>unaccusative phenomena</th>
<th>unergative verbs</th>
<th>unaccusative verbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>auxiliary selection</td>
<td><em>haben</em> (to have)</td>
<td><em>sein</em> (to be)</td>
</tr>
<tr>
<td>impersonal passive</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>prenominal attribute</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td><strong>Agent</strong> nominalization</td>
<td>yes (-<em>er/-or</em> in German)</td>
<td>no (-<em>ling</em> in German)</td>
</tr>
</tbody>
</table>

In a variety of current syntactic theories the two types of intransitive verbs are analyzed without any serious problems. For example, the subject argument of the unaccusative verbs is analyzed as an underlying object and a surface chômeur in Relational Grammar. It is assumed in PPT that the unaccusative NPs appear in object position [Belletti (1988)] or as adjoined to the VP in the same syntactic configuration as postposed unergative subjects, forming a chain with a null expletive subject [Burzio (1986)].

An alternative proposal tries to account for unaccusativity phenomena solely in terms of some semantic notions such as Aktionsarten and/or agentivity [e.g. in van Valin ((1987), (1990))], the telicity and the protagonistic control [e.g. in Zaenen ((1988))], or lexical entailments along the lines of Dowty (1991) [e.g. Zaenen (1993)]. These semantic approaches do not deny that intransitive verbs are sub-classified into unergative and unaccusative verbs, neither.

Some recent approaches to unaccusative verbs in HPSG does not seem to be basically different from the previous view in that they are also based on the dichotomous distinction [cf. Davis (2001, p.183ff.) and Davis and Koenig (2000)]. One of the current proposals for the analysis of the unaccusative verbs (e.g. Davis (2001, p.178ff.)) assumes a distinguished linking type, which are constrained by the linking type *unacc-lt* (unaccusative linking type) and subsumed by *und-only-rel* (undergoer only relation).

(3) Some relevant linking constraints [Davis (2001, p.178 & p.183)]

a. The linking type *act-lt* (for unergative verbs)

```
[act-lt
 ARG-ST <NP:□, ...>
 CONTENT [act-und-rel
 □]
 □]
```

b. The linking type *unacc-lt* (for unergative verbs)

```
[unacc-lt
 ARG-ST <NP:□, ...>
 CONTENT [und-only-rel
 □]
 □]
```

Now it is safe to draw the conclusion that the foregoing accounts including those in HPSG, syntactic or semantic, are dichotomous in that they basically distinguish only two classes of intransitive verbs.

If there were only two types of intransitive verbs, however, there might not be the case in which verbs selecting *sein for the perfect formation do not allow impersonal passives. In the same vein, verbs selecting *haben for the perfect formation might basically allow impersonal passives. Both the cases, however, are not supported by empirical data. For the lack of space I will show only one set of examples here:

(4) a. Es **hat** gestern geregnet/geblüht/geblutet. (aux. selection: *haben*)
   There has yesterday rained/bloomed/bled
b. Es wurde gestern *geregnet/*geblüht/*geblutet. (imp. pass.)
   There was yesterday rained/bloomed/bled

(5) a. Der Junge **ist** im Wald/durch den Wald gelaufen. (aux. selection: *sein*)
   ‘The boy is in the forest/through the forest run
   ‘The boy has run in the forest/through the forest.’
b. Es wird im Wald/durch den Wald gelaufen. (imp. pass.)
   It is in the forest/through the forest run

I will add five more German cases where the dichotomous distinction between unergative and unaccusative verbs is not tenable. These are:

• (i) Mismatch between auxiliary selection and prenominal attribute:
  Der Junge **ist** im Wald gelaufen. (*sein (to be)) vs. *der im Wald gelaufene Junge (location),

• (ii) Mismatch between auxiliary selection and Agent nominalization:
  Hans **ist/**hat ins [acc Wohnzimmer] getanzt. (to dance to) vs. Tänzer,

• (iii) Mismatch between impersonal passive and prenominal attribute:
  Es wurde gestern *geregnet/*geblüht/*geblutet. vs. das *geregnete/*geblühte/*geblutete Kind,

• (iv) Mismatch between Impersonal Passive and Agent nominalization:
  Es wurde gestern *geregnet/*geblüht/*geblutet. vs. *Regner/*Blüher/*Bluter, and finally

• (v) Mismatch between prenominal attribute and Agent nominalization:
  *die sehr geschadete Tat vs. Schädling.

Although it is reasonable to acknowledge that Agent nominalization is subject to idiosyncratic variations to some extent, the data above show that the two distinguished groups of intransitive verbs do not exactly fall together. This means that it is definitely not the case that intransitive verbs which are not unergative are unaccusative, or vice versa. The data discussed so far can be summarized as follows:

(6) Summary of the split intransitivity (in German)

<table>
<thead>
<tr>
<th>SI phenomena</th>
<th>arbeiten/tanzen (to work/dance)</th>
<th>ankommen (to arrive)</th>
<th>laufen/tanzen+PP (to run/dance to)</th>
<th>regnen (to rain)</th>
</tr>
</thead>
<tbody>
<tr>
<td>auxiliary selection</td>
<td><em>haben</em></td>
<td><em>sein</em></td>
<td><em>sein</em></td>
<td><em>haben</em></td>
</tr>
<tr>
<td>impers. passive</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>prenom. attr.</td>
<td>no</td>
<td>yes</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>Agent nominal.</td>
<td>yes</td>
<td>no</td>
<td>yes</td>
<td>no</td>
</tr>
</tbody>
</table>

2 There are further verbs showing UMs in German, which for the lack of space I will not discuss in this paper. These verbs include aspectual verbs such as dauern (to last), enden (to end), etc. and further verbs such as *sein (to be), werden (to be), bleiben (to remain).
From the data shown above, I can, thus, draw the conclusion that the dichotomous distinction of intransitive verbs is not tenable, as far as German data is concerned. I will argue against the view that there are only two types of intransitive verbs – unergative verbs and unaccusative verbs.

1.3 Fake Reflexives, Resultative Predications, Passives, and Middles

As observed in Simpson (1983), one argument for the unergative-unaccusative distinction comes from passive data as in (7) and resultative predication data such as in (8) in English. Traditional analyses of the data in (7) and (8) are primarily based on the idea that resultative predication is only possible, if the arguments are deep objects or deep subjects of small clauses in exceptional case marking constructions (data in this subsection from Bresnan and Zaenen (1990)).

(7) a. We pounded the metal flat. (resultatives, transitive)
    b. The metal was pounded flat. (resultatives, passive)
(8) a. The river froze solid. (resultatives, unaccusative)
    b. *The dog barked hoarse. (resultatives, unergative)

Any approach based on purely semantic device or lexical type hierarchy may have difficulties with data such as ‘fake reflexives’ or ‘non-subcategorized objects’, as exemplified in (9) and (10). The reason is obvious, since the fake reflexives and non-subcategorized objects bear no thematic relation to the main verbs.

(9) a. The dog barked itself hoarse. (fake reflexives, unergative)
    b. We ran ourselves ragged. (fake reflexives, unergative)
(10) a. The dog barked us awake. (non-subcategorized objects, unergative)
     b. We ran the soles right off our shoes. (non-subcategorized objects, unergative)

On the contrary, unaccusative verbs do not allow fake reflexive predication or non-subcategorized objects of any kind, as shown in (11).

(11) a. *She flushed herself red. (fake reflexives, unaccusative)
    b. *The dog fell us awake. (non-subcategorized objects, unaccusative)

As non-thematic or non-subcategorized arguments, the fake reflexives (cf. (12)) or the non-subcategorized objects (cf. (13)) may not be promoted to the surface subject in these kinds of sentences.

(12) passives with non-subcategorized objects
    a. *We were barked awake (by the dog). (passives, unergative)
    b. *The soles were run right off our shoes (by us). (passives, unergative)
(13) middles with non-subcategorized objects
    a. *We bark awake easily. (middles, unergative)
    b. *The soles ran right off our shoes. (middles, unergative)

From the data shown in this section, we can draw the conclusion that the approaches based on the purely semantic device or the linking type hierarchy may have difficulties with the resultative data in which the so-called underlying object (und argument in Davis (2001)) is not realized in the surface subject.

These approaches may have also difficulties with the data containing fake reflexives non-subcategorized objects, since resultative predication applies also to non-thematic arguments.
These arguments do not bear any direct semantic relation to the main verb, lacking possibilities to be listed in argument structure.

In what follows, I will argue that the previous accounts based on the dichotomous distinction of intransitive verbs should be carefully re-examined, and that, in HPSG, the problems of Davis (2001) can be solved if we assume a structured version of argument structure.

2 The Structured Argument Structure

As pointed out above, the value of argument structure (ARG-ST) is a flat list containing all of the arguments of a verb together (cf. Manning (1994), Manning and Sag (1995), Davis (2001)). Under the standard assumption of HPSG, the least oblique argument in argument structure is realized as subject.

In order to analyze the related problematic phenomena in a systematic manner I propose a structured version of argument structure in this paper as shown in (14), and then try to show that the structured argument structure is theoretically promising.

\[
\begin{align*}
\text{(14) The Structured Argument Structure} \\
\text{ARG-ST} & \begin{bmatrix}
E-\text{ARG} & \begin{bmatrix}
\text{FIRST} & \text{ref} \\
\text{REST} & \text{elist}
\end{bmatrix} \\
I-\text{ARG} & \begin{bmatrix}
\text{FIRST} & \text{ref} \\
\text{REST} & \text{elist}
\end{bmatrix} \\
\text{ARG-L} & \langle \text{ref} \rangle \oplus \langle \text{index} \rangle \\
\end{bmatrix}
\end{align*}
\]

Argument structure is characterized as a collection of argument indices (note: not synsem-struc objects), one of which may be additionally classified as external (E-ARG) and one as internal (I-ARG). 3

2.1 On Deriving the Argument Status and Linking Constraints

There are two closely related components which play a crucial role in deriving the argument status: (i) the constraints on the interrelation between the thematic structure (= NECLEUS) and argument structure (= ARG-ST), and (ii) the constraints on the interrelation between ARG-ST and valence features (VAL). The former constraints will be called “pre-linking” and the latter “post-linking”.

Thematic structure is the object of the sort quantifier-free-parametrized-state-of-affairs (qfpsoa). The lexical entailments in the sense of Dowty (1991) are hierarchically structured and considered as subsorts of qfpsoa. A simplified type hierarchy with German verbs assumed in this paper is given below:

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3 Some revisions of the standard HPSG mechanism are to be pointed out: (i) Argument structure has a value of type arg-st, which requires 3 new features, E-ARG, I-ARG and ARG-L; (ii) Unlike in Sag and Wasow (1999), the value of each feature introduced above is not of type “list(synsem-struc)”, but of type “list(ref)”, “list(ref)” and “list(index)”, respectively. (iii) The lexical type predication is further elaborated in terms of thematic information, from which argument roles such as act, und, etc. are derived.
The linking of the arguments between NUCLEUS and ARG-ST is constrained by a small set of pre-linking descriptions. The following pre-linking constraint holds globally: All argument indices which occur in the qfpsoa must also occur in the list value of the feature ARG-L. The argument indices will be arranged in ARG-L according to the following hierarchy: <CAUSE, ACT, AFF, UND, SOA-ARG, NEUT>. The patterns of argument linking between ARG-ST and VALENCE are constrained by the post-linking. One of the post-linking constraints, called the “subject linking constraint”, constrains the linking of subject argument of the finite form of verbs, as formulated in (16):5

\[(\sim\text{word} \land :\text{SYNSEM LOC CAT HEAD VFORM} \sim\text{finite}) \rightarrow ( :\text{SYNSEM LOC CAT VAL SUBJ FIRST LOC CONTENT INDEX} \approx :\text{ARG-ST ARG-L FIRST})\]

The constraint (16) says: Link the \textit{index} of the least oblique argument in the list value of the ARG-L feature to the \textit{index} of the unique value in the list of the SUBJ feature of the finite verbs! Because the least oblique argument in the list of ARG-L will be realized as the subject of a finite sentence, one needs only to examine with which index the index of the first argument in the ARG-L list is token-identical.

There are a set of further descriptions that state which argument should be assigned to the external argument and which to the internal argument, respectively. The following three linking constraints are immediately relevant for the analysis of unaccusativity:

\[(\sim\text{lex-item} \land :\text{SYNSEM LOC CONTENT NUCLEUS} \sim\text{cause}) \rightarrow ( :\text{SYNSEM LOC CONTENT NUCLEUS CAUSE} \approx :\text{ARG-ST E-ARG FIRST})\]

\[\text{CAUSE by cause, ACT by act, AFF by affectedness, UND by undergoer, OBL by oblique-rel, NEUT by neutral, SOA-ARG by soa-arg.}\]

\[\text{The value of SUBJ of an infinite verb is an empty list, although the index of the corresponding argument occurs in argument structure.}\]
b. The \textit{act}-linking constraint:
\[
(\neg \text{lex-item} \land \text{SYNSEM LOC CONTENT NUCLEUS-act}) \\
\rightarrow (\text{SYNSEM LOC CONTENT NUCLEUS ACT} \approx \text{ARG-ST E-ARG FIRST})
\]

c. The \textit{aff}-linking constraint:
\[
(\neg \text{lex-item} \land \text{SYNSEM LOC CONTENT NUCLEUS-aff}) \\
\rightarrow (\text{SYNSEM LOC CONTENT NUCLEUS AFF} \approx \text{ARG-ST I-ARG FIRST})
\]

The constraint in (17a) is informally paraphrased as follows: In an object of the sort \textit{lex-item}, the value of the feature \textit{cause} must be token-identical to the first value of the feature \textit{E-ARG}.

The constraint in (17b) says that in an object of the sort \textit{lex-item}, the value of the feature \textit{act} must be token-identical to the first value of the feature \textit{E-ARG}.

3 The Primary and The Secondary Unaccusativity

3.1 Definition

There are two closely related components which play a crucial role in deriving the argument status: (i) the constraints on the interrelation between the thematic structure (= \textit{necleus}) and argument structure (= \textit{arg-st}), and (ii) the constraints on the interrelation between \textit{arg-st} and valence features (\textit{val}). The former constraints will be called “pre-linking” and the latter “post-linking”.

It should also be noted that the status of each argument will be directly induced by lexical semantic information, or equivalently, by the thematic structure.\(^6\) In all, we get a logically complete typology of the verbs as shown in (18):

\begin{align*}
\text{(18)} & \\
\text{a. Verbs of type 1} & \quad \begin{array}{c}
\text{ARG-ST} \\
\text{E-ARG} & < \square > \\
\text{I-ARG} & < \bigtriangledown > \\
\text{ARG-L} & < \square, \ldots > \\
\end{array} \\
\text{b. Verbs of type 2} & \quad \begin{array}{c}
\text{ARG-ST} \\
\text{E-ARG} & < \square > \\
\text{I-ARG} & < \bigtriangledown > \\
\text{ARG-L} & < \bigtriangledown, \ldots > \\
\end{array} \\
\text{c. Verbs of type 3} & \quad \begin{array}{c}
\text{ARG-ST} \\
\text{E-ARG} & < \square > \\
\text{I-ARG} & < \bigtriangledown > \\
\text{ARG-L} & < \bigtriangledown, \ldots > \\
\end{array} \\
\text{d. Verbs of type 4} & \quad \begin{array}{c}
\text{ARG-ST} \\
\text{E-ARG} & < \bigtriangledown > \\
\text{I-ARG} & < \bigtriangledown > \\
\text{ARG-L} & < \bigtriangledown, \ldots > \\
\end{array}
\end{align*}

The subject argument is token-identical (i) only to the value of \textit{E-ARG} in type 1, (ii) or to the value of \textit{I-ARG} in type 2; It can also be token-identical (iii) to the value of \textit{E-ARG} and \textit{I-ARG} simultaneously in type 3, or (iv) neither to the value of \textit{E-ARG} nor to the value of \textit{I-ARG} in type 4. The proposed structured argument structure is contrasted to the recent proposal for the unaccusative verbs (e.g. Davis (2001, p.183ff.)), which are constrained by the linking type \textit{unacc-llt} and sumsumed by \textit{und-only-rel}.

Based on this typology of the subject argument, I propose an explicit distinction between two kinds of unaccusativity: the primary and the secondary unaccusativity.\(^7\)

\begin{align*}
\text{(19)} & \\
\text{a. The Definition of the Primary Unaccusativity} \\
& :\neg \text{lex-item} \land (\text{ARG-ST I-ARG FIRST} \approx \text{ARG-ST ARG-L FIRST}) \\
\text{b. The Definition of the Secondary Unaccusativity} \\
& :\neg \text{lex-item} \land (\text{ARG-ST E-ARG FIRST} \approx \text{ARG-ST I-ARG FIRST} \approx \text{ARG-ST ARG-L FIRST})
\end{align*}

\(^6\) Thematic structure is the object of the sort \textit{quantifier-free-parameterized-state-of-affairs (qfpsoa)}. The lexical entailments in the sense of Dowty (1991) are hierarchically structured and considered as subsorts of \textit{qfpsoa}.

\(^7\) The following symbols are used in King’s Speciate Re-entrant Logic (\textit{srl}). The symbol : is a term which precedes a chain of attributes, indicating the root point. The symbol \sim indicates the sort assignment, and the symbol \approx indicates the sort equation.
3.2 Unaccusative Phenomena and the Nature of the Unaccusative Mismatches

The proposed approach crucially draws the distinction of the distributions of the subject argument in argument structure. The possibility of the token-identity between the external and the internal argument in the definition of the secondary unaccusativity has many promising consequences.

The first two types of argument structure in (18) roughly correspond to the configurations of the traditional dichotomous distinction of intransitive verbs: The verbs of type 1 correspond to the unergative verbs, the verbs of type 2 to the unaccusative verbs. The last two types of verbs, however, do not have any counterparts in the traditional term. Weather verbs, verbs of emission etc. do not receive any natural classification in the context of the unaccusativity in the literature. But these verbs are of type 4 in the classification above. They do not show any properties which the verbs with an external argument (i.e. agent nominalization, impersonal passives, etc.) or with an internal argument (auxiliary selection *sein/zijn* (to be) in German or Dutch, prenominal attributes, etc.) generally do. The subject argument of the verbs of type 3 is simultaneously identified with the external and the internal argument, showing unaccusative mismatches (cf. also Kathol (1992) for a different analysis).

I will now briefly suggest the analysis of unaccusative phenomena in German using the sorts and the status of the subject argument in the argument structure.

First, the auxiliary selection *sein* (to be) must selected for the formation of perfect tense if the index of the least oblique argument of a verb is token-identical to the list-internal value of the feature i-arg. According to this analysis, verbs of Type 4 such as weather verbs, verbs of emission, and verbs of natural process, etc. select *sein* (to be) for the formation of perfect tense, just as verbs of Type 1 do.

Second, the passive is, in general, only possible with verbs if the index of the least oblique argument of them is token-identical to the list-internal value of the feature e-arg. Thus, the impersonal passive is possible with verbs of Type 1 or Type 3.

Third, the past participle of a verb can be used as a prenominal attribute if the index of the least oblique argument of a verb is token-identical to the list-internal value of the feature i-arg.

Fourth, Agent nominalization of a verb is basically possible if the index of the least oblique argument of a verb is token-identical to the list-internal value of the feature e-arg.

3.3 Fake Reflexives, Resultative Predication, Double Object Constructions

Resultatives can only be predicated of the argument which is the value of i-ARG. From this follows the contrast shown in (20):

(20)   a. We pounded [*I−ARG≈COMPS the metal*] flat.
       b. [*I−ARG≈SPR The river*] froze solid.
       c. *[*E−ARG≈SPR The dog*] barked horse.

Since resultatives can only be predicated of the argument which is the value of i-ARG, the prepositional objects may not be followed by a resultative predicate:

(21)   a. *We pounded on [*COMPS≠I−ARG the metal*] flat.
       b. *Load hay into [*COMPS≠I−ARG the wagon*] full.
       c. *The solders shot at [*COMPS≠I−ARG the man*] dead.

---

8 This analysis is somewhat oversimplified. A more precise analysis will be that the auxiliary selection *sein* (to be) must be selected, if the index of the subject is token-identical to the index of the least oblique argument of a verb, the corresponding sort of which is subsumed by the sort change-of-location or affected in the sort hierarchy of qfpsoa [see Ryu (1997)].
Fake reflexives and non-subcategorized objects as illustrated in (9) and (10) above follow from the proposed assumption that they appear only when they are linked to the value of e-ARG. So, unergative verbs, but not unaccusative verbs, allow fake reflexives and non-subcategorized objects (cf. the example in (11)).

The impossibility of the formation of passives and middles in (12) and (13) follows, since neither fake reflexives nor non-subcategorized objects are arguments in the sense that they are listed in the value of ARG-L.

3.4 Theoretical Implications

It can be pointed out that my proposal has some advantages over the previous approaches. Advantages are obvious, at least in the following aspects:

First, weather verbs, verbs of emission etc. receive a more natural explanation in my approach than in the previous approaches [Type 4].

Second, unaccusative mismatches can be accounted for more systematically in my approach, since they can be attributed to the properties of Type 3 verbs.

Third, the unaccusativity changing verbs such as verbs of movement with or without a definite change of location [cf. laufen (to run) ± directional PP, tanzen (to dance) ± directional PP, etc.], which is regarded as Type 1 and Type 3 depending on their lexical entailments.

Finally, the data showing fake reflexives, non-subcategorized objects, passives and middles can be analyzed under the structured argument structure.

The proposal here is based on the lexical entailments of the verbs, thus semantically well-grounded and independently motivated. One might point out, however, that the thematic structure based on the hierarchical lexical entailments as assumed in this paper might be vague. But it is fair also to point out that this kind of vagueness is generally noted in the works on lexical semantics.

4 Conclusion

The proposed approach crucially draws the distinction of the distributions of the subject argument in argument structure. The possibility of the token-identity between the external and the internal argument in the definition of the secondary unaccusativity has many promising consequences.

The mechanism proposed in this paper has, among others, a theoretical consequence that the dichotomous distinction of intransitive verbs is not tenable, as far as German data is concerned.

The first two types of argument structure in (18) roughly correspond to the configurations of the traditional dichotomous distinction of intransitive verbs: The verbs of type 1 correspond to the unergative verbs, the verbs of type 2 to the unaccusative verbs. The last two types of verbs, however, do not have any counterparts in the traditional term. Weather verbs, verbs of emission etc. do not receive any natural classification in the context of the unaccusativity in the literature. But these verbs are of type 4 in the classification above. They do not show any properties which the verbs with an external argument (i.e. agent nominalization, impersonal passives, etc.) or with an internal argument (auxiliary selection sein/zijn (to be) in German or Dutch, prenominal attributes, etc.) generally do. The subject argument of the verbs of type 3 is simultaneously identified with the external and the internal argument, showing unaccusative mismatches (cf. also Kathol (1992) for a different analysis).

Finally, the data including fake reflexives, non-subcategorized objects, passives and middles can be analyzed under the structured argument structure.

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9 The analysis of the derivation process, whether lexical rules or post-liking constrains, is not direct concern in this paper.
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