Some general questions:

- How is the stage-level/individual-level distinction grammatically realized?
- What role, if any, does inner aspect play in stative predicates?
- How is quantity active in various ontological domains?

...and the basic problem: Variable behavior of stage-level/individual-level predicates (Fernald 1999; Kratzer 1995, and see Escandell-Vidal and Leonetti 2002 for a discussion of Spanish).

(1) a. Francis is occasionally blond.
   b. Suddenly, Lynn knew the answer.

(2) a. Sam goes jogging after work.
   b. Hakeem plays basketball for a living.

Overview of the talk:

- Briefly review the stage-level/individual-level distinction.
- Explore an interaction between stage-level/individual-level predicates and inner aspect.
- Discuss how quantity structures are related to scalar structure.
- Suggest a syntax to reflect the stage-level/individual-level distinction.

1 The stage-level/individual level distinction

(3) a. Firemen are altruistic.  (individual-level)
    b. Firemen are available.  (stage-level)
The examples in (3) demonstrate classic examples of stage-level and individual-level predicates (Kratzer, 1995). Two properties of focus today: Spatiotemporal Modification and Interpretation of Subject.

(4)  
   a. # Firemen are altruistic in the station/on Thursday.  
   b. Firemen are available in the station/on Thursday.

(5)  
   a. # When firemen are altruistic, they are very helpful.  
   b. When firemen are available, they are at the station.

*Spatiotemporal Modification*: Individual-level predicates cannot be modified by spatiotemporal modifiers (4) or act as the restrictor of *when*-conditional (5).

*Interpretation of Subject*: Subjects of individual-level predicates can receive generic interpretation only (3a) while subjects of stage-level predicates can receive either generic or existential interpretations (3b).

2 Interactions with inner aspect

Fernald (2000) mentions another factor, but does not explore it: inner aspect interacts with the stage-level/individual-level distinction (see also Schmitt, 1992, 2005).

(6)  
   a. John is intelligent. (individual-level stative)  
   b. John is happy. (stage-level stative)  
   c. # John is being intelligent. (individual-level eventive)  
   d. John is being happy. (stage-level eventive)

(7)  
   a. Concrete is hard. (individual-level stative)  
   b. Ponds are empty. (stage-level stative)  
   c. # Concrete hardened. (individual-level eventive)  
   d. Ponds emptied. (stage-level eventive)

Importantly, (6c) and (7c) do not have individual-level interpretations. Generalizing from (6) and (7), individual-level predicates are barred in eventive contexts, but stage-level predicates are permitted in stative contexts.

Some questions:

1. Why are individual-level predicates barred from eventive contexts?
2. Why are stage-level predicates permitted in stative contexts?

1See Dowty (1979) and many many others for a full discussion of inner aspecual classes, properties, etc.
3 Quantity and inner aspect

Among the properties used in determining telicity, a well studied part of inner aspectual interpretation, are the following (Borer, 2005a,b):

(8) a. Quantity: P is quantity iff P is not homogeneous.

b. Homogeneous: P is homogeneous iff P is cumulative and divisive.

i. Cumulative: P is cumulative iff $\forall x, y [P(x) \& P(y) \rightarrow P(x \cup y)]$

ii. Divisive: P is divisive iff $\forall x [P(x) \rightarrow \exists y [P(y) \& y < x]] \& \forall x, y [P(x) \& P(y) \& y < x \rightarrow P(x - y)]$

Telicity is then defined as the presence of quantity, and thus a failure of homogeneity. Consider the following:

(9) a. John built houses (*in three months).

b. Mary drank beer (*in three hours).

(10) a. John built the house (in three months).

b. Mary drank three beers (in three hours).

The property of quantity, coming from a composition of the verb with its (internal) argument, effect the distribution of temporal modifiers. Those predicates that can be followed with in X time are telic (10), while those that cannot are atelic (9).

A quick note on atoms. Traditional accounts of the event/state distinction have concerned themselves with atomicity (Bach 1986, but c.f. Rothstein 1999 for an alternative account).

(11) Atomic: P is atomic iff $\forall x [P(x) \rightarrow \neg \exists y [P(x) \& y < x]]$

A predicate’s atomicity effects the relevant view of divisiveness, as we are typically interested in the property divisive down to atoms in eventive predicates. Since we are dealing with statives, atomicity is not at issue, and we are interested in divisiveness without this limit.

4 Scalar representation and inner aspect


(12) a. They are widening the road. ($\Rightarrow$ They have widened the road.)

b. They are straightening the rope. ($\not\Rightarrow$ They have straightened the rope.)
Open-scaled predicates atelic (12a), whereas closed-scale predicates are telic (12b). Kennedy and Levin (2002) argue that the degree argument (here $\delta$) determines telicity. When a predicate has a maximal degree the degree argument is said to be quantized (Krifka, 1998). Adopting quantity here for quantized, (13) and (14) lay out the connection between scalar structure and telicity in eventives.

(13) $\delta$ is quantity, then P is telic.
\[ [VP \text{ lengthen the icicle by 3 centimeters}] \]
(14) $\delta$ is not quantity, then P is atelic.
\[ [VP \text{ lengthen the icicle (by some amount)}] \]

Do scalar structures involve quantity/homogeneity as in (8)? One suggestion is that closed scalar structures establish quantifiable divisions, whereas open scalar structures can not, and thus should fall out under the tests for quantity as a result.

<table>
<thead>
<tr>
<th></th>
<th>max degree</th>
<th>cumulative</th>
<th>divisive</th>
</tr>
</thead>
<tbody>
<tr>
<td>closed scale</td>
<td>*</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>open scale</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Given that closed scales have a maximum degree, they pass cumulativity but fail divisiveness as they do not have a subpart at this maximum, and are thus classified as quantity. Lacking a maximum degree, open scales pass both cumulativity and divisiveness, and are not classified as quantity (in fact, they are homogeneous).\(^3\)

Now, let’s return to a general question: What are the properties of the predicate that lead it to be interpreted as stage-level or individual-level?

(16) a. People are intelligent. generic/*existential *when-conditional
b. Puppies are wet. generic/*existential *when-conditional
c. Rocks are hard. generic/*existential *when-conditional
d. Roads are wide. generic/*existential *when-conditional

(17) a. People are happy. generic/existential when-conditional
b. Tables are dry. generic/existential when-conditional
c. Ponds are empty. generic/existential when-conditional
d. Ropes are straight. generic/existential when-conditional

\(^2\)I will focus here on maximal degree adjectives, setting aside degree of change results which often uses measure phrases and adverbals. Use of a measure phrase or adverbal should license quantity structure in the DegP, as it creates quantifiable divisions along the scale, thus requiring DegP to be quantity.

\(^3\)Given Kennedy (2001), it is not clear that atomicity plays any role in scalar structure.
When the adjective is open-scale as in (16), the predicate is interpreted (generally) as individual-level. When the adjective is closed-scale as in (17), the predicate is interpreted (again generally) as stage-level.

From (16) and (17), scalar structure plays a role in the interpretation of the stage-level/individual-level distinction. Since scalar representations have been argued to impose inner aspectual interpretation, we might consider the similar behavior of open and closed scales in stative predicates to also result from inner aspectual interpretation (contra claims that statives do not have inner aspectual structure, MacDonald (2006)).

For the case of stative predicates, (closed) scalar structure of the adjective is argued to license a quantity structure in the stative domain, to be interpreted as stage-level. The proposal comes out as follows:

(18) If P is quantity, then P is stage-level.
(19) If P is not quantity, then P is individual-level.

The statements in (18) and (19) capture stative predicates as in (16) and (17). Those predicates with quantity structures are interpreted as stage-level, those without are interpreted as individual-level.

This result appears to extend to verbal statives as well.

(20) a. People own houses. (individual-level)
b. People own the house. (stage-level)
c. The people own houses. (stage-level)
d. The people own the house. (stage-level)

In (20a), neither the external nor the internal argument is quantity, and thus individual-level interpretation arises. Otherwise, if either argument (or both) are quantity, the predicate receives a stage-level interpretation.

Certain generalizations about the stage-level/individual-level distinction have made note of the ascribed property as being temporary or permanent (Jager, 2001; Maienborn, 2004; Schmitt, 1992). However, there are “funky facts” about stage-level/individual-level predicates in which our world knowledge about temporary and permanent properties conflicts with the grammar. Consider the following.

(1) a. John was drunk (in the yard/this morning).
b. John was dead (in the yard/this morning).
c. # John was intelligent (in the yard/this morning).

While drunk can easily be thought of as a temporary property and thus stage-level, dead is not so clear and one might expect it to fall in line with intelligent as a permanent property and thus individual-level. However, note that dead is closed-scale (completely drunk/dead/*intelligent), and by its closed scalar structure, predicates which embed it are interpreted as stage-level.

Why the external argument can effect the stage-level/individual-level distinction is unclear at this point, although the syntax of aspect may again help out. Borer (2005b) argues that existential interpretation of subjects (and the mapping from predicates to events) is achieved through an event phrase (EP). If the
Note however, that eventives are now in question, as activities should be interpreted as individual-level by this definition. At present, eventives are stipulated to be interpreted as stage-level until further work can address this.

5 Quantity structures: #P, DegP, and AspP

Properties of quantity enter into inner aspectual interpretation through mapping in the syntax. A quantity structure is licensed either by merger of a morpheme to its specifier (i.e. the in the nominal domain as in (21a)), or by movement of a licensing phrase (adjectives with the semantic force to be closed scale as in (21b)).

(21) a. DP
    \[
    \text{the} \quad \text{D} \quad \text{#P} \\
    \text{#} \quad \text{the} \\
    \text{√}
    \]

   b. DegP
    \[
    \text{empty} \quad \text{Deg} \quad \text{t√}
    \]

The suggestion here is that DegP, responsible for licensing scalar structure in the modifier domain (Kennedy, 1997), functions similarly to #P, which is responsible for licensing count structure in the nominal domain (see Borer 2005a for a full discussion with respect to nominals). Both count and (closed) scalar structures are cases of quantity structure in that each establishes quantifiable divisions when licensed.

Possibly properties distinguishing eventive from statives, perhaps atomicity, preclude individual-level interpretation all together. A second possibility suggests that the presence of any inner aspectual structure (either EP (see note 5) or AspP) forces stage-level interpretation. Should this be the case, we may expect that individual-level interpretation is not referred to directly by the grammar at all, and is only established by default in the absence of inner aspectual structure. I leave these suggestions aside, again, for future work.

An additional proposal, not to be pursued here, is to have closed-scale predicates license a maximal degree either by moving the AP into Spec-DegP (allowed by the traditionally closed-scale adjectives), or by merging a morpheme such as completely into Spec-DegP. This may account for the variable behavior of predicates both in eventive (Kennedy and Levin, 2002) and stative domains. Considering this move especially for theories of Late Insertion in which structures are first constructed by the syntax and then later combined with specific lexical items, open-scale adjectives would be barred from appearing in structures like (21b) unless they could be coerced into having a closed-scale interpretation.
Another proposal: Just as a DP moves to Spec-AspP to license a quantity structure in the event domain (22a), DegP can also move to license a quantity structure in the event domain (22b). The interpretation of the quantity structure that emerges depends on the type of predicate. Atomic predicates\(^8\) as eventives, are interpreted as telic, while non-atomic predicates, as statives, are interpreted as stage-level. In either case, Asp introduces event quantity which is then licensed by a quantity structure in its specifier (a subject of quantity (Borer, 2005b)) through normal compositional procedures (Kratzer, 1996).\(^9\)

\(23\) \([\text{Asp}] = \lambda x \lambda e.\text{quantity}(e, x)\)

\(24\)

\[
\begin{aligned}
\text{TP} & \\
\text{Concrete} & \text{VP} \\
\text{T} & \text{pres} \quad \lambda e.\text{be}(e) & \& \text{s.o.s.}(e, \text{hard}) \\
& \text{V} \quad \text{hard} \\
& \text{be}
\end{aligned}
\]

\(^8\)Assuming for exposition that atomicity is the distinguishing characteristic between statives and eventives, see note \(6\) for discussion.

\(^9\)s.o.s. stands for subject-of-state.
When no quantity structure is available, AspP is not licensed to project and the stative predicate receives an individual-level interpretation by default (24). However, when a quantity structure is available, AspP projects and the stative predicate receives a stage-level interpretation (25).

6 Conclusions

The stage-level/individual-level distinction is the result of inner aspectual projection(s) in the stative domain licensed by quantity structure (be it nominal or scalar).

- The stage-level/individual-level distinction interacts with inner aspect because it makes use of inner aspectual structures for its interpretation.
  - AspP controls the culmination of the predicate, and is licensed by the presence of quantity. Atomic predicates are interpreted as telic, while non-atomic predicates are interpreted as stage-level.
  - When AspP is not licensed by a quantity structure, there is no culmination property of the predicate to interpret. By default, atomic predicates are thus interpreted as atelic, while non-atomic predicates are interpreted as individual-level.
Scalar structure, DegP, is a case of quantity structure, similar to #P (nominal quantity) and AspP (event quantity), and can license interpretations requiring quantity.

References


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