**The complexity of events: The empirical side of the event-state distinction**

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Since Vendler (1957) an overwhelming amount of theoretical work on the categorization of situations concerning their lexical aspect has emerged within linguistics and philosophy. Telicity, change of state, and punctuality vs. durativity are the main features used to distinguish between events and states.

Surprisingly, the empirical studies concerning this topic can be counted on one hand. The two leading questions of these few studies are the following: How does the representation of an event differ from the representation of a state? And how is this difference reflected in processing times? Gennari & Poeppel (2003), for example, report longer reaction times (RTs) to event sentences than to state sentences and, therefore, suggest that the processing of state sentences is easier. The longer processing times after reading event sentences arise from the higher level of complexity in the decompositional semantic structure of the eventive verbs. In contrast to a stative verb like *love*, the semantic structure of an eventive verb like *build* contains the operators BECOME and CAUSE, denoting a change of state and a causal relation.

A closer look at these studies, however, reveals that in nearly all of them different verbs were compared: As mentioned above, Gennari & Poeppel (2003) used eventive verbs like *build* and stative verbs like *love*. To avoid this problem, in the present self-paced reading studies German ambiguous verbs were used: Depending on the context, verbs like *bedecken* (to cover), *schmücken* (to decorate), and *füllen* (to fill) lead to an eventive or a stative reading.

In the first experiment, with these verbs sentence pairs were created, consisting of an eventive (1) and a stative sentence (2). The two sentences of one pair differed only in their grammatical subject, but contained the same verb and direct object:

(1) *Der Gärtner / bedeckt / das Beet / […].*
The gardener / covers / the flowerbed / […].

(2) *Die Plane / bedeckt / das Beet / […].*
The tarp / covers / the flowerbed / […].

A preceding questionnaire production study and a corpus analysis revealed that these verbs indeed occur in the eventive as well as in the stative reading, although there are differences concerning the verbs' main tendency towards one of these readings.

Note that in the event sentences all referents described by the grammatical subjects were animate, whereas in the state sentences all subjects were inanimate. Therefore, a main effect of animacy was expected on the subject position. Since this effect could influence the potential event-state effect measured on the verb position as a spillover effect, control items containing the same subjects but non-ambiguous verbs like *liegen* (to lie) were added:

(3) *Der Gärtner / liegt / auf der Wiese / […].*
The gardener / lies / on the meadow / […].

(4) *Die Plane / liegt / auf der Wiese / […].*
The tarp / lies / on the meadow / […].

The results confirmed this assumption: Mean RT measured on the subject position was significantly shorter for the animate than for the inanimate referents, $F(1, 56) = 9.65$, $p = .003$ (587 vs. 602 ms). Within the control items, this animacy effect influenced the RTs on the verb position: After animate subjects RTs of the (non-ambiguous) verbs were shorter than after inanimate subjects (502 vs. 515 ms), revealing a slight spillover effect.

However, within the target items mean RT measured on the position of the (ambiguous) verb showed the opposite pattern: After animate subjects RTs of the verb were significantly *longer* than after inanimate subjects, $F(1, 56) = 4.12$, $p = .047$ (534 vs. 520 ms). Here no spillover effect emerged, but a main effect which can be attributed to the different lexical aspect of the two situation types.

Like in Gennari & Poeppel (2003), the longer processing times for the event sentences are explained by the higher level of semantic complexity in the mental representation of eventive situations. An interesting alternative or parallel explanation is provided by the simulation account (e.g., Barsalou, 2008): Imagine what is mentally simulated during the processing of a state like *the tarp covers the flowerbed*: The simulation contains a tarp and a flowerbed, but nothing more. In contrast, the simulation of an event like *the gardener covers the flowerbed* not only requires additional participants like the gardener, but also action, movement, change and a relevant time course. Under the assumption that a simulation constitutes at least a part of the mental representation of a situation, it seems comprehensible that the complexity of such a simulation has an influence on its processing and that the higher degree of complexity in the simulation of events leads to longer RTs.

To find more evidence for the hypothesis that a higher degree of semantic complexity has an influence on processing time, a second experiment will be conducted: This self-paced reading study uses a paradigm introduced by Kelter et al. (2004), who examined how the difference between long and short situation duration is reflected in reading times. Methodically the authors used anaphor resolution in short discourses and they found evidence for the hypothesis that it takes longer to resolve an anaphor if an event with a long duration is introduced between the anaphor and its referent.

The second experiment is motivated by the similar assumption that anaphor resolution times are longer if there is "more" between the anaphor and its referent, i.e. more semantic content like it is suggested for event sentences. Again, ambiguous verbs are used in the target sentences, which differ only in the temporal adverbial specifying the situation type: The target sentence *Die Blumen verschönern die ganze Kirche* (The flowers decorate the whole church) in (5) gets an eventive reading in combination with the temporal adverbial *in kurzer Zeit* (in a little while), and a stative reading in combination with *für kurze Zeit* (for a short time). In contrast to the first experiment, this stimulus material has the advantage for keeping the grammatical subjects in the two conditions identical.

(5) *Context:* Sonja works as a florist and has to decorate a church for a wedding ceremony.
Antecedent sentence: *Die kleinen Rosensträußchen befestigt sie mit weißen Bändern*.
She attaches the small bunches of roses with white ribbons.
Event sentence: *In kurzer Zeit verschönern die Blumen die ganze Kirche.*
In a little while the flowers decorate the whole church.
State sentence: *Für kurze Zeit verschönern die Blumen die ganze Kirche.*
For a short time the flowers decorate the whole church.
Anaphor sentence: *[…] Sonja sammelt die Gestecke ein und löst die weißen Bänder.*
[…] Sonja collects the bouquets and unties the white ribbons.

If semantic complexity has the same influence on anaphor resolution like situation duration, longer RT for the anaphor sentence following an event sentence than following a state sentence are expected.

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