'Complement coercion' in Polish vs English: processing complex lexical content

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   b. The boy started the soup.
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   b. The boy started the soup.
   c. The cook started the soup.
   d. The boy drank the bottle.
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‘While theory of word meaning is often thought either not to have a subject matter or to be trivial’ (Asher, 2011), examples such as (1) call for the need to incorporate conceptual knowledge into referential semantics in some extent.

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(2) a. The boy started the fight.
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- Complement coercion is seen as a **type clash** in need of repair: the verb coerces the semantic type of the entity-denoting complement into the appropriate event-denoting type (**enriched semantic composition**) (Pustejovsky, 1995; Egg, 2003; de Swart, 2011; Asher, 2011)

- Experimental results support this: (2-b) incurs higher processing cost than (2-a).
  (McElree et al., 2001; Traxler et al., 2005; McElree et al., 2006; Pylkkänen and McElree, 2007; Frisson and McElree, 2008; Kuperberg et al., 2010).
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The girl began the queue. ((29a) in Piñango and Deo (2015))

- Considering examples like (3), Piñango and Deo (2015) argue that this phenomenon is a case of **dimension ambiguity**, e.g. **temporal, spatial, ...**: AspVs select structured individuals that instantiate functions that map the individual to axes or parts thereof (*begin a fight* is not ambiguous).

- This view has also been supported experimentally (Lai et al., 2014) showing that **only a subset of coercion verbs** engender additional processing cost. Katsika et al. (2012) show that the greater processing cost is observable only with the aspectual verbs (e.g. *begin, start*), but not with psychological verbs (e.g. *enjoy, prefer*).
Dimension ambiguity hypothesis

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Question

- Does the experimental data support a division between the different approaches to complement coercion: type clash vs ambiguity?

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- Crucially, while the Type Clash view makes clear assumptions about selectional restrictions of verbs, the Dimension Ambiguity Hypothesis talks about underspecification of the predicate.
- We provide evidence for the role of selectional restrictions.
- We conducted a self-paced reading experiment on Polish (n=36) consisting of 2 sub-experiments.
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Our predictions

- We predict that selectional restrictions will result in a **3-way distinction in the processing cost**:
  - AspV+EntityN > Non-AspV+EntityN/EventN > AspV+EventN
  - ‘begin book’ > ‘see book/fight’ > ‘begin fight’

- In contrast, an approach based on ambiguity/underspecification of AspVs (Piñango and Deo, 2015) predicts a **2-way distinction**:
  - AspV+EntityN > Non-AspV+EntityN/EventN, AspV+EventN
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Polish aspectual and non-aspectual verbs

- Aspectual verbs selecting event denoting complements: $\mbox{zacząć}$ (begin); $\mbox{rozpocząć}$ (begin); $\mbox{skończyć}$ (finish); $\mbox{ukończyć}$ (finish); $\mbox{zakończyć}$ (finish); $\mbox{przerwać}$ (pause); $\mbox{wytrzymać}$ (endure); $\mbox{oczekiwać}$ (await).

- Non-aspectual verbs taking both entity and event denoting complements: $\mbox{zobaczyć}$ (see); $\mbox{skrytykować}$ (criticize); $\mbox{przygotować}$ (prepare); $\mbox{pochwalić}$ (praise); $\mbox{zignorować}$ (ignore); $\mbox{obejrzeć}$ (watch); $\mbox{opisać}$ (describe); $\mbox{wspomnieć}$ (mention).
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Figure 1: 3-Way Distinction
In Sub-Experiment 1 we expected:

- to replicate the coercion cost using translations of the English materials in Traxler et al. (2002)
- to find the 3-way contrast shown above
In Sub-Experiment 2 we compared two types of entity-denoting nouns that are available in Polish:

- Morphologically simple nouns (\texttt{SimpleN}) denoting physical objects (e.g. \textit{kolekcja} ‘collection’)

- Morphologically complex nouns (\texttt{ComplexN}) containing a verbal root (e.g. \textit{zbiór}, ‘set’, ‘collection’, \textit{zbierać}, ‘to collect’), which are not nominalizations (cf. \textit{kolekcjonowanie}, \textit{zbieranie}).

Their dominant reading of \textit{zbiór} is the entity-reading, and they have a secondary event-reading.
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  - Their dominant reading of *zbiór* is the entity-reading, and they have a secondary event-reading.
We combine the two experiments to investigate the source of the processing cost in Sub-Experiment 1 (containing only SimpleNs).

- If ambiguity is responsible for a larger processing cost (Piñango and Deo, 2015), then in Sub-Exp 2 we should see ComplexNs having longer RTs than SimpleNs.
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Predictions for Sub-Experiment 2

Figure 2: 2-Way Distinction
In Sub-Experiment 1 there are no major effects of verb-type and noun-type. Unlike in Traxler et al. (2002), condition AspV+Non-EventN did not receive longer RTs on the object noun and the following word:
Results of Sub-Experiment 1

**Figure 3:** AspV+Non-EventN is no slower than Non-AspV+EventN and Non-AspV+Non-EventN. AspV+EventN is the fastest (on ‘today’).
Results of Sub-Experiment 1

- One-way comparison at Word Position 4 (‘today’) reveals that **AspV+EventN condition is significantly faster** ($\beta = -0.068$, $SE = 0.024$, $t = -2.809$, main effect of sentence type, $\chi^2 = 20.96$, $p < 0.001$).

- This result **partly supports the predicted 3-way contrast**, because we see a **facilitation (speed-up) when the selectional restrictions are satisfied**.

- But the 3-way contrast also involves a **slow-down** for the **AspV+Non-EventN condition**, which we do not find.
  - The absence of this effect could be due to the fact that in the same experiment participants saw a large number of event readings with aspectual verbs (AspV+ComplexN in Sub-Experiment 2).
Results of Sub-Experiment 2

Figure 4: There are no differences between the conditions.
Summary of results

- Only Sub-Experiment 1 produced statistically significant results.
- The combination of AspVs and EventNs is the easiest to process.
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Implications for theory

Behavioral evidence that:

- **AspVs are very restrictive**, because they clearly select for EventNs: **significant facilitation** when the selectional requirements match (Against Piñango and Deo (2015): ‘any analysis of aspectual verbs that assumes that they select for event-denoting complements is not tenable’)

- Non-AspVs don’t create strong expectations and are not ‘easy’ to process: possibly underspecified? A fact that has not yet received theoretical consideration.

Selectional restrictions are a good way to incorporate conceptual knowledge to compositional semantics, but they are not of the kind 0 or 1. Rather they represent a graded continuum.

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Piñango, Maria Mercedes, and Ashwini Deo. 2015. Reanalyzing the complement coercion effect through a generalized lexical semantics for aspectual verbs. *Journal of Semantics* 1–50.