Psychological Evidence for an Ontology of Events

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Languages are highly systematic in how they map the different semantic arguments of a verb to distinct syntactic positions. Most contemporary theories of argument realization ground this process in a structured representation of the event, which can be conceptualized as semantic structure (Jackendoff, 2002) or as part of a syntactic derivation (Hale & Keysar, 1995). These event representations break predicates into smaller conceptual pieces including abstract heads (e.g., CAUSE) and specific verbal roots (e.g., run, break). Our study explores how event concepts are organized in the mind and how this affects verb learning. Rappaport-Hovav and Levin (2010, RHL) propose that there are two types of event concepts encoded in verbal roots, MANNERS and RESULTS. These are superordinate concepts that cut across semantic fields. For example, a caused change-of-state (CoS) event can be described with a MANNER verb (*hammer* the metal) or RESULT verb (*flatten* the metal), as can an event of directed motion (*run* vs. *enter*). RHL support their theory with data on cross-linguistic patterns of argument realization, but the evidence for the psychological reality of this distinction is slim.

In three experiments, we tested RHL's hypothesis by determining whether adults construe verbs like *hammer* (COS-means) and *run* (manner-of-motion) as belonging to one category (MANNERS) and verbs like *enter* (path-of-motion) and *break* (COS-effect) as belonging to another (RESULTS). In the training phase, participants were assigned to one of four conditions and learned 8 novel verbs that encoded either COS-means, COS-effect, manner-of-motion or path-of-motion concepts. Each trial consisted of: an ambiguous scene (*blicking*=skipping+circling), a bias-test to determine the participant's initial hypothesis, training scenes (cross-situational evidence disambiguating meaning), and a final-test to assess learning. In all conditions, participants learned the verbs and quickly developed biases which they extended to new verbs. Next, participants in the COS conditions were given ambiguous motion verbs and asked to extend them, and those in the motion conditions were given ambiguous COS verbs. These trials consisted of only the ambiguous scene and the bias-test.

If there are cross-cutting concepts of MANNER and RESULT that organize verbal roots, then the bias acquired in the first phase should be transferred to the new semantic field. But if verb learning biases are narrow generalizations about the encoding a *particular* semantic field, then the bias in the second phase should be unaffected by training. In Experiment 1, we found bias transfer from motion to CoS events--folks who learned manner-of-motion verbs offered more means conjectures than those who learned path verbs (p < 0.01). However, there was no transfer from CoS to motion, which we attributed to a strong manner-of-motion bias (ceiling effect). In Experiment 2, we reduced this bias by using instrumental (*skate*) rather than agentive (*tiptoe*) manners-of-motion. In Experiment 3, we reduced it by presenting motion verbs in transitive frames. In both experiments, there was bias transfer in both directions: from COS to motion and from motion to CoS (p's<.01).

We conclude that MANNER and RESULT are conceptually salient, superordinate event concepts that transcend the boundaries of particular semantic fields. The biases developed in the context of learning verbs from one semantic class have systematic effects on the construal of unknown verbs from another semantic class.