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AGENT and PATIENT Revisited: Children's Knowledge of Semantic Roles.

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One view of how children acquire verb argument structure is that they have an existing, abstract notion of AGENT and PATIENT. This knowledge is presumed to enable children to map information about who did what to whom onto the syntactic structure of language. This research presents a different view, one in which knowledge of semantic roles develops hand-in-hand with the knowledge of verbs.

In a series of studies, our focus is on the **emergence** of children's knowledge of AGENT and PATIENT, specifically, in simple transitive events with two participants. We use a completely novel context to examine children's understanding of the **relational similarity** across AGENTs and PATIENTs.

Our hypothesis is that children will have difficulty generalizing their knowledge in the absence of familiar cues that are associated with prototypical AGENT-PATIENT behavior. This result would argue against the view that there is a general abstract concept of AGENT and PATIENT as a pre-requisite to verb learning.

Method

We examined children's perception of the abstract similarity between AGENTs and between PATIENTs in related novel scenes with and without the benefit of language. In the first study children (range 3;10 to 5;6) watched trials consisting of two brief animated scenes presented side-by-side on a computer screen. There were two phases to the experiment; a *familiarization phase* in which scenes would depict familiar every day actions, and a *Test phase* in which scenes consisted of novel actions involving an unfamiliar AGENT and PATIENT. At the end of each trial the experimenter selected either the AGENT or the PATIENT in one scene. The child's task was to point at the corresponding object in the other scene. There were two conditions to the experiment; a *Verb* condition in which, the experimenter would describe the novel scene using a novel verb (*this one gorped that one*), and a *No-Verb* condition in which the scene was not described.

Results

Results indicate significant main effects of age and condition. In the *No-Verb* condition, only older children performed better than chance. Adding linguistic cues in the Verb condition resulted in improved performance in both groups. Also both groups were better at identifying PATIENTs vs AGENTs. The procedure of the first study was adapted to test children as young as 3 years of age (range: 2;10 to 3;7).

To reduce the complexity of the task, children were trained on one of side-by-side scenes, before being tested on the corresponding scene. All children could do the task with training and similar to the older children performed significantly better in patient-trials as compared to agent-trials.

Exploring the mechanism

Currently in a new study we are investigating which components of an action sequence are most critical for identifying AGENT–PATIENT roles. We broke down the sequences of the novel actions to the following steps:

1. AGENT approaches PATIENT
2. AGENT comes to contact with PATIENT
3. AGENT performs a novel action on PATIENT
4. State of PATIENT (size, location, shape or color) changes during the action.
5. AGENT detaches / moves away from PATIENT
6. AGENT and PATIENT retain their initial states

Based on these actions all of which were included in the *control* condition, taking one component at a time we created two more sets of actions; In the *no-state-change* set, step 4 was taken out, (the state of PATIENT doesn't change, even though the AGENT performs some action on it), in the *no-contact* set step 2 was taken out, (the AGENT doesn't get close to touch the the PATIENT, but performs the same action and PATIENT undergoes the same change). Children were randomly assigned and tested in one of these conditions. (with the novel verb always describing the scene).

Preliminary results show that children in the *no-state-change* condition perform almost as well as the *control* condition, and significantly better in mapping PATIENTs as opposed to AGENTs. Performance is worse in the *no-contact* condition; in particular, the subjects are no better at mapping PATIENTS.

Discussion

We have shown that children's knowledge of semantic roles is initially fragile and local. Despite apparent competence with the argument structure of familiar verbs, children have difficulty identifying AGENT–PATIENT roles in a novel context. This is especially true of the AGENT role. It was also shown that linguistic cues promote relational similarity across semantic roles, perhaps by highlighting regularities across different action sequences.

These results are consistent with the view that children learn about roles on a case-by-case basis. We suggest that children may initially remember the details of particular events, without generalizing over them. With the overlapping of similar events and a growing knowledge of language, children notice that roles are consistently marked between and within cases.

Finally the apparent differences in knowledge of PATIENT vs. AGENT might be due to children's sensitivity to the final states of actions, which are typically associated with the outcome of the PATIENT role.