The prominence of agents in event cognition and language processing: Reviewing the cross-linguistic evidence for a malleable preference

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Events are dynamic interactions unfolding over space and time. Events have rich internal organization, with a hierarchical scaffolding that is defined by the abstract roles agent and patient, as well as their relationship [1]. Both in language processing and in the processing of thematic relations in events, agents and patients differ in prominence: Agents can be detected rapidly [2], from early infancy on [3], and are looked at first in event pictures [4]. During sentence comprehension, role-ambiguous referents are preferentially interpreted as agents cross-linguistically [5–7], even when case marking patterns disfavor agent interpretations [8]. Based on cross-linguistic evidence from event cognition and language processing, we demonstrate that whereas agents are universally more prominent, their relative prominence can be modulated by linguistic experience.

In two eye-tracking studies, we measured visual attention to agents and patients in action pictures (e.g., a woman pushing a man) that were shown for only 300 ms. Such brief presentation requires top-down decisions for gaze allocation because it only allows for a single fixation [9]. In the first study on Dutch ($N = 41$) [10], participants uttered unrelated active or passive sentences before seeing pictures for a subsequent recognition task. Overall, participants more likely fixated agents than patients. However, Highlighting of patients in passives increased their prominence so that participants shifted their attention away from agents. Short-term linguistic experience (from a previously uttered sentence) can thus reduce agent prominence in event cognition. The second study contrasted Basque and Spanish. Basque assigns overt ergative case to agents, while Spanish leaves agents unmarked. Speakers of Basque ($N = 34$) and speakers of Spanish ($N = 36$) performed description and recognition tasks after brief exposure to event pictures. Agents were fixated more often and were described and recognized more accurately than patients. Basque speakers, in addition, gazed at agents more and described and recognized them more accurately than Spanish speakers. Basque speaker's long-term experience with ergative case thus led to an increase in agent prominence in both linguistic (description) and non-linguistic contexts (recognition).

Third, in an EEG study on sentence comprehension, we explored the influence of long-term linguistic experience on the agent preference in parsing [5–8,11]. In Äiwoo (Oceanic), patient-verb-agent sentences are grammatically unmarked and generally more frequent, although agent-verb-patient orders also occur [12,13]. Since there are no case

markers, the initial noun's role is only revealed by voice marking on the verb. When listening to initially ambiguous sentences, Äiwoo speakers (N = 22) preferentially interpreted non-humans as patients, but humans as agents (evidenced by N400 effects). This finding demonstrates that agent prominence is robust for humans, but can be modulated by broad-scale patterns of language use for other referents.

We conclude that the prominence of agents over patients is a stable feature of cognition, occurring across domains in event cognition and language processing. The relative agent-patient prominence relation can be altered, but not generally reversed. This suggests that the agent preference as a fundamental principle of human cognition, which is shaped by experience-based learning.

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