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EVENTS AND OBJECTS IN PERCEPTION,
LANGUAGE, AND COMMUNICATION

1. INTRODUCTION

A recent paper by Núñez and colleagues argues that cognitive science – the interdisciplinary study of cognition – has failed (Núñez et al. 2019). Whereas in the 1960s and 70s it looked like researchers in philosophy, artificial intelligence, linguistics, anthropology, psychology, neuroscience were coalescing into a new field, this paper argues that each discipline has retreated from the common cognitive science project to its home turf. Núñez and colleagues note that the journal *Cognitive Science* and the meeting of the same name are now dominated by psychology, with little representation from the other disciplines. This assessment has been challenged (see Gray 2019 and the accompanying articles), but the authors’ scientometric data are bare facts that cannot be denied.

I imprinted as a cognitive scientist, and so to read of these developments – and not for the first time! (see Gentner 2010) – was discouraging. It was therefore heartening to think back to the 13th Annual Symposium of Language, Logic, and Communication, which was held in Riga on December 8-9, 2018, on the topic of “Events and Objects in Perception, Language, and Communication.” The presentations ran

the gamut from psychology to computational modeling to linguistics to philosophy. There was even a bit of neuroscience and cross-cultural comparison. More important, many of the talks bridged two or more of these disciplines, and even the most discipline-based presentations spoke to the larger topic of events and objects.

The three articles that make up this volume are a study in miniature of how the interdisciplinary strategy of cognitive science can pay off. Of the three, Riccardo Baratella's *Objects, Events, and Property-Instances* (Baratella 2019) is the most strongly rooted in a discipline – in this case, philosophy. Nonetheless, he addresses a problem that is a core concern to psychologists, linguists, and anthropologists as well: What is an event? As his title implies, philosophical tradition has approached this problem by comparing events to objects. This approach has had a sustained impact on theorizing in linguistics (Sinha & Gärdenfors 2014) and psychology (Zacks & Tversky 2001). Here, Baratella asks whether we can reconcile two views of events, one which defines an event to be an instance of some property by some object at some time, and the other of which defines an event to be a piece of the temporal history of an object. The first notion of event is captured by talk like, “I had a temperature of 40° last Tuesday.” The object is me, the property is having a temperature of 40°, and the time is last Tuesday. The second notion is captured by an example of Quine's that Baratella quotes in the paper: If a man whistled a song while walking to the bus stop, beginning his whistling exactly when he began his walk and also ending the whistling and walking at the same time, there would be one event that corresponded to both the whistling and walking. On most theories, these two views are incompatible, but Baratella suggests that we can reconcile them by thinking of an instance of a property as being a temporal slice of an object – the slice during which the object has the property. This is potentially important for cognitive theories, because theories of planning and memory tend to look more like the first view of events, focusing on the features that constitute events, whereas theories of perception tend to look more like the second, focusing on the spatiotemporal boundaries and trajectories. If we can bring these two approaches together it could help to unify accounts of perception and of cognition about events.

In proposing a theory of the interface between visual object per-

ception and nouns in language, Francesco-Alessio Ursini and Paolo Acquaviva (Ursini & Acquaviva 2019) adopt an explicitly interdisciplinary approach that combines psychology and linguistics, with a dash of philosophy thrown in for good measure. From the cognitive psychology of vision they adopt the theory of object files (Kahneman et al. 1992). Object files are representations that bind together visual object features into a coherent structure that can be indexed across time. The evidence for object files comes mostly from studies of visual attention, which suggest that such representations are necessary to keep objects' features indexed correctly. For example, an observer viewing a scene containing a blue chair and a gray desk would need to establish object files for each object to be able to answer which object was blue, or to detect if the objects switched colors during a brief visual disturbance. Starting with this representation of visual objects, Ursini and Acquaviva build a formal structure for characterizing the relationship between individual objects and object types. Then, from the linguistics of lexical categories they adopt a semantic theory that describes the relationship between words and utterances that use those words to pick out particular objects. With these tools in hand, they are able to construct a novel account of how the mind relates the visual experience of objects to the formation of utterances that refer to objects and to the comprehension of such utterances.

Events and Processes in Language and Mind, by Alexis Wellwood, Angela Xiaoxue He, and Haley Farkas, is thoroughly interdisciplinary, employing methods from psychology and linguistics in a framework informed by philosophy. Like Ursini and Acquaviva, Wellwood and colleagues explore the interface between language and perception – however, here the focus is on events and verbs rather than objects and nouns. In particular, they are interested in the linguistic distinction between telic verbs such as “bounce” and “throw,” and atelic verbs such as “move” and “comprehend.” Telic verbs include information about boundaries and are compatible with counting, as in “bounce twice,” whereas atelic verbs do not include boundary information and are compatible with specifying duration, as in “move for an hour.” Wellwood and colleagues report the results of an experiment in which people watched animations of a square moving back and forth on a computer screen, described “what happened,” and then answered “how many

times?” At the points where the square reversed direction, its path could include pauses or changes in speed. They found that pauses made it more likely that viewers would describe the animation using the atelic verb “move,” and less likely that they would use the telic verb “bounce.” Pauses also made it more likely that viewers would count each back-and-forth across the screen when answering “how many,” rather than counting each back and each forth separately. Changes in motion speed also increased the likelihood of counting back-and-forths but did not affect their choice of verbs. The fact that verb choice did not always track how the components of the activity were enumerated suggests particular forms of abstraction in how we represent events in language.

In responding to the Núñez et al. (2019) paper, Rob Goldstone – one of the speakers at the Riga symposium – suggests that one productive way to view cognitive science is as a “network community” characterized by dense location connections between diverse researchers. He argues that an advantage of this approach is that “multiple, partially overlapping communities can be identified” (Goldstone 2019). One way the cognitive science vision can be realized is by instantiating focal communities that bring converging resources to bear on a topic such as “events and objects.” These three papers illustrate how bringing multiple disciplinary lenses to bear on a problem can lead to clearer vision.

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