Author's Reply - Analogy Adapts to the Structure of the World

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Author's Reply to 'Analogy Is an Implicit Universal Semantic Map' by Michael Cysouw (2010b)

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Michael Cysouw's thoughtful commentary confirms, in my opinion, that the fields of language typology and artificial language evolution can mutually benefit from each other. In this response, I will illustrate this claim by answering to Cysouw's main criticism, namely that "analogical reasoning" provides the agents of my experiments with an implicit universal semantic map.

As Cysouw himself writes, our disagreement over what we are willing to call 'semantic map' is primarily of a terminological nature. In order to clarify my position: I claim that the structure between meanings/functions (or a 'semantic map') is not innate, but the result of dynamic processes such as analogy. In the approach suggested by Cysouw (2010a), these processes are themselves semantic maps because they provide a way to show the relations between meanings or functions.

First of all, I would like to highlight the points on which we agree. In my work, I am decidedly concerned with "grounded language use", i.e. language that is used by embodied agents in a real-world environment. In the experiments I reported in this volume, agents are embodied through cameras that help them to recognize dynamic real-world events. The "meanings" that have to be expressed by the agents are directly rooted in the event structures they observe, which in this case are patterns of "visual primitives" such as 'moving' or 'touching'. As these patterns are taken directly from the contexts in which the agents interact with each other, this is highly compatible with Cysouw's proposal that meanings can be operationalized as sampled contexts. We also agree on the fact that the "traditional" semantic map is not a given, but rather a side effect of some (or more) metric(s) that relate(s) points in what Cysouw calls "conceptual space" to each other in a structured way. Various such metrics are possible, e.g. based on similarity, distance or analogy, and both Cysouw and I agree that we need language-specific metrics.

I am reluctant, however, to call these metrics or processes 'semantic maps' for several reasons. The main reason is that processes such as analogy indeed provide a way to detect structures, but that these structures are not inherent to the process or metric itself, but to the complex interplay of properties of the world and the specific linguistic background of a language user. As is demonstrated very convincingly by Smith (2003) and Wellens, Loetzsch and Steels (2008), structure arises only if there are recurrent patterns to be found in the environment. In other words: analogy adapts itself to the structure of the world. A second reason is that I feel that the term 'semantic map' does not sufficiently highlight the evolutionary and dynamic nature of these processes. Rather than investigating particular language structures, my work attempts to demonstrate how such structures can emerge and evolve.

Yet, as already said, Cysouw and I do not fundamentally disagree with each other. In fact, it is very promising to see how Cysouw's operationalization of semantic maps fits our approach, and thus how the two fields can exchange their findings with each other. Indeed, the research strategy proposed by Cysouw in his commentary (i.e. using typological data for falsifying

computational models) is being increasingly implemented in the field of artificial language evolution (see e.g. the ALEAR project – www.alear.eu), which will certainly spark future collaborations between typologists and computational linguists.

References

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