Preface

(Michiel van Elk, Universiteit van Amsterdam)

Thinking back about past events often involves a vivid memory of the people, the places and the context involved. Clear pictures of conference venues and cities that seem frozen in time come to mind when thinking about past scientific meetings. The visual nature of our memories may be taken as an example of the embodied view of language and cognition, which is the general topic of this volume. On this account, our knowledge about the world is grounded in sensory and motor concepts that were acquired through bodily experience. For instance, the concept 'to grasp' entails a motor representation of the hand action that is involved in actual grasping. In line with this suggestion, it has been found that the processing of action verbs is associated with activation in similar regions in the premotor cortex that are involved in the actual execution of the action that the verb refers to (Pulvermuller, 2013). Similarly, understanding a concept like 'grasping' when observing the action of another person has also been associated with activation in motor-related brain regions, suggesting that a process of motor simulation could support action understanding (Gallese & Lakoff, 2005).

In the last decade, we have seen an enormous interest in embodied cognition theories among scholars from a wide range of different backgrounds. Cognitive neuroscientists have primarily investigated the when and how of activation in modality-specific brain areas in response to language and concept processing (van Elk, van Schie, & Bekkering, 2014). Psychologists have experimentally determined the bidirectional relation between bodily and cognitive processing (Fischer & Zwaan, 2008). Philosophers have focused on the question whether embodied simulation processes meet the necessary and sufficient requirements to support higher-level processes such as mind reading or false belief understanding (Jacob & Jeannerod, 2005). Linguists have investigated how our everyday use of concrete and abstract language in written and spoken form is related to basic sensory and motor concepts (Gibbs, 2003).

I am convinced that this multidisciplinary approach is one of the major strengths of embodied cognition. In a time in which many scientific disciplines have become increasingly specialized, a unifying theory that spans different domains and that ranges from developmental psychology to linguistics and from philosophy to dynamical systems theory has a great potential. At the same time, the challenges faced by such a multidisciplinary approach are non-trivial as each field is characterized by specialist problems that are often defined by the use of a specific jargon. This theoretical challenge was faced directly at the Sensory-Motor-Concepts in Language and Cognition meeting, in which linguists, philosophers, psychologists and neuroscientists participated – all with a shared interest in embodied cognition. As can be seen in the contributions to this volume a wide range of topics was addressed from a variety of different perspectives and encompassing both experimental and theoretical contributions. An intriguing question is whether these different contributions are related and how they could lead to a cross-fertilization of ideas.

A possible starting point for such an integrative attempt is to acknowledge that although the topics addressed by different disciplines may be different, they all share a similar conceptual framework. At this point, an interesting parallel can be drawn with evolutionary accounts of language. Starting from the premise that language conferred an adaptive advantage in the ontogeny of our species, different disciplines have focused on more proximate or ultimate causes of language development (Arbib, 2005). For instance, anthropological accounts have investigated the fossil records to determine precursors of the human vocal tract as a necessary prerequisite for the emergence of language. Developmental psychologists typically conduct experimental studies to investigate how infants over the course of their first years acquire basic language abilities that often seem to go beyond the linguistic input that they received. Neuroscientists have elucidated the neural networks underlying language production and processing and have pointed out a striking overlap between the brain areas involved in the production of language and gestures, suggesting that gestural communication could be a precursor of a prototype of language. Thus, although differing in their topic of investigation and their experimental approach, these findings converge on the idea that language should be understood in terms of its adaptive function and its relation to other more basic forms of action and communication.

Similarly, within the framework of embodied cognition the different approaches converge on the notion that language and cognition involve the use of sensory motor concepts. This may be reflected in the use of metaphors referring to concrete sensory

motor domains, effects of concrete experiences on word reading and the activation of sensory motor brain areas in response to reading action verbs. Furthermore, each of the different domains can be characterized by similar discussions regarding the question whether an embodied cognition explanation is the only and most viable account of the extant data. For instance, embodied theories of conceptual content are often contrasted with amodal theories, according to which our thinking is based on an internal and symbolic 'language of thought' that is abstracted away from concrete experience (Mahon & Caramazza, 2008). One important argument that is often used in the debate between embodied and amodal theories of cognition is the grounding problem: it remains unclear how concepts derive meaning if they are unrelated to concrete experiences (Barsalou, 2008). The embodied account proposes an intuitive and plausible solution to this problem: the meaning of concepts is derived from the fact that concepts are by definition sensorimotor in nature. More recently, several authors have proposed a hybrid model according to which semantic processing involves both multimodal and modality-specific processing (Louwerse & Jeuniaux, 2010; Ralph, Sage, Jones, & Mayberry, 2010). These ideas may lead to a conceptual refinement of the current theoretical ideas and it would be interesting to see whether eventually theoretical integration is possible, not only within specific research domains such as neuroscience or psychology, but across different domains as well. The collection of papers in this volume provides an excellent first attempt for such an endeavor.

Last but not least, I would like to acknowledge Liane Ströbel without whom this project would not have been possible. She organized a stimulating conference and took the effort of making the proceedings of this meeting available in the form of this special issue of Düsseldorf University Press. It is my sincere hope that the discussions that were started throughout this project will be continued in the future and will lead to a further exchange of people and ideas.