

Introduction: special section on interfaces between cognition and language development*

All approaches to language acquisition have long acknowledged that language development and cognitive development influence each other to some extent. The controversy has tended to focus on defining the extent of cognitive influence rather than questioning its existence. In a nutshell, emergentist approaches assume that cognitive development and language development go hand in hand, with language exploiting domain-general cognitive processes, while modular approaches traditionally posit a more restrictive role for cognition, with some language processes relatively immune to the influence of cognition.

In recent years, a number of cognitive and social functions and abilities have gained an increasing amount of attention among language development researchers, such as shared attention, theory of mind, executive functions, and information processing. Recognizing the importance of these cognitive aspects is leading to a more interdisciplinary approach to the study of language development and calls for a new light to be shone on old questions.

This special issue takes a broad view of cognition, spanning processing, conceptual development, social cognition, and executive functions. The contributions focus on reciprocal relationships between language and cognition, considering not only cognitive precursors for language, but also how language drives aspects of cognitive development.

Graham, San Juan, and Khu's contribution summarizes an extensive research programme into the emergence of children's sensitivity to others' visual perspective and emotional prosody and the development of their ability to integrate these cues with language processing. It also explores cognitive abilities which interact with (and might underpin) these abilities, i.e., theory of mind and executive functions. Children's apprehension of visual and emotional cues is shown to be initially implicit. This understanding becomes gradually more explicit as they learn to integrate visual perspective and emotional cues into robust representations, and to recruit that knowledge to inform their actions and their referential choices.

Ferguson & Waxman review an important programme of research on the emergence of the link between language and categorization. The range of cues infants can be made to rely on for object categorization are investigated in a series of experiments on children from 3 months to 24 months of age. This reveals an incremental developmental process in which the role of

[*] Address for correspondence: Cecile De Cat e-mail: c.decat@leeds.ac.uk

language evolves from attention-engaging to communicative before becoming truly representational. This enables the child to gradually build up their ability to categorize objects and hence forge concepts. Three competing hypotheses as to what underlies the link between language cognition are considered: (i) the link is explained by perception and processing (i.e., words are one of several perceptual features associated with objects, and are easy to process due to high familiarization with that signal); (ii) language does not have a privileged link with cognition (compared with other communicative signals), and its pedagogical/ostensive use is what promotes categorization; and (iii) language is initially perceived as essentially communicative by the child, and this is what subsequently enables the child to understand its referential status (through categorization). The authors present ample experimental evidence supporting the last hypothesis.

Based on cross-cultural and developmental evidence gleaned from the literature and from a vast collaborative programme of research, Barner proposes a new account of the acquisition of counting. The role of innate knowledge, perceptual constraints, and inductive inference is critically appraised. It is argued that small-magnitude numbers (1, 2, 3) are acquired independently of and prior to counting, based on domain-general semantic resources which also underlie the acquisition of quantifiers and plurality in natural language. The acquisition of small-magnitude numbers consists of a label-mapping process, which can occur at different speeds in the two languages of bilingual children, and is partly informed by linguistic cues. Learning large-magnitude numbers requires mastering the cardinality principle and the successor principle, and this is argued to be a protracted process (initially a blind procedure) based on induction.

D'Souza, D'Souza, and Karmiloff-Smith draw attention to a range of environmental, cognitive, and physical factors that influence the early stages of language acquisition, focusing on typical and atypical development in infants and toddlers. The main claim of the paper is that complex social interactions affect language development, and that delay may be caused by cascading effects of early impairments in non-linguistic domains. Several hypotheses are put forward: (i) language specialization is protracted in atypical development because of synaptic dysfunction (lengthening a (normal) stage of diffuse neural responses to speech input); (ii) the language environment of children developing atypically is likely to be less rich and less explored; and (iii) atypical development of the relevant habituation mechanisms is negatively correlated with particular aspects of language development. The overarching proposal is that language development can be better understood if considered in the context of complex social interactions.

Sadly, Annette Karmiloff-Smith passed away during the preparation of her co-authored manuscript. We dedicate this special issue to her memory,

INTRODUCTION

in grateful recognition of her exceptional contribution to research on language and cognition, and their intertwined development.

CECILE DE CAT

University of Leeds, UK

AND

JOHANNE PARADIS

University of Alberta, Canada