

# Talking About Language

22<sup>nd</sup> October 2010

9.30 AM to 4.30 PM

Historisches Gebäude der SUB, Vortragsraum  
(Pauliner Kirche)

A one-day Workshop to mark the launch of

**WORTSCHATZINSEL**

the new Göttingen lab investigating  
Language Acquisition and Language Processing

<http://www.uni-goettingen.de/wortschatzinsel>

Organised by the

Free-Floater Junior Research Group on Language Acquisition

<http://www.uni-goettingen.de/en/127874.html>

Please contact Nivedita Mani ([nmani@gwdg.de](mailto:nmani@gwdg.de)) by 1st October 2010  
to participate in the workshop.



# Talking About Language

Abstracts included below

## Historisches Gebäude der SUB, Vortragsraum (Pauliner Kirche)

- 9.30 AM      Welcome Address by Nivedita Mani  
Free-Floater Junior Research Group Leader, Language Acquisition  
Georg-August-Universität Göttingen
- 9.45 AM      **The Whorfian Infant and the Perceptual Load Hypothesis**  
*Kim Plunkett*  
Department of Experimental Psychology, University of Oxford
- 10.45 AM      Coffee break
- 11.00 AM      **Word Segmentation in Infancy Revisited**  
*Barbara Höhle*  
Linguistics Department, University of Potsdam
- 12.00 PM      Lunch
- 1.00 PM      **As Soon as You Find Words, You Can Start Using Language**  
*Anne Cutler*  
Max Planck Institute for Psycholinguistics, Nijmegen
- 2.00 PM      Coffee break
- 2.15 PM      **Learning One or Two Languages Shapes the Infant Brain**  
*Debra L. Mills*  
School of Psychology, Bangor University
- 3.15 PM      **Phonological Priming Across Language Borders: Passport Required?**  
*Katie Von Holzen & Nicole Altwater-Mackensen*  
Free-Floater Junior Research Group Language Acquisition  
Georg-August-Universität Göttingen
- 4.00 PM      **Lab visit: WortSchatzInsel**  
Goßlerstr. 14, 37073 Göttingen





## As Soon as You Find Words, You Can Start Using Language

Anne Cutler



The speech infants hear, in the first year of life before they themselves begin to speak, is mainly multi-word utterances, without clear pauses between the words. Thus to construct the initial vocabulary they need to begin speaking themselves, infants need to learn how to segment words from speech. Indeed, there is evidence that segmentation ability in the first year of life correlates positively with vocabulary size at two years. This evidence has come principally from studies of segmentation using the behavioral headturn-preference procedure. If infants first hear words in isolation, and then recognise these familiarised words when they occur later in sentences, they have shown that they can segment individual words out of multi-word utterances. An electrophysiological analogue to this behavioral procedure, measuring Event-Related Potentials (ERPs) was however later developed by Kooijman. This allowed, for the first time, an online assessment of infants' word segmentation. Kooijman tested seven- and ten-month-olds; the ten-month-olds showed a clear recognition response (in the form of a left negativity) for familiarised words heard later in sentences, relative to unfamiliar words. This showed that the ten-month-olds indeed had the ability to segment speech. Such segmentation behavior was not, however, consistently present in the seven-month-olds. We here report three studies relating this ERP measure of speech segmentation to later language development. First, we divided the seven-month-old infants tested by Kooijman into two sub-groups: those with an ERP effect similar to the 10-month-olds' pattern, and those without such an effect. When re-tested at three years of age, the former group displayed significantly higher language scores than the latter group. Second, we examined whether ten-month-olds can recognize words that have previously been presented just once, within an utterance. Recognition was again indicated by a left-frontal negativity, and presence and size of this response proved in later testing to be related to vocabulary size, both at 12 and at 24 months. Third, we conducted a study in which both familiarization and test phases consisted of continuous sentences. Again we observed the same recognition response in the infant brain, and the patterning of this response was once more related to later performance, this time in a test of recognition of known words at 16 months. Hence, with a variety of measures, we see that a consistently observed ERP effect of word segmentation serves as a direct predictor of the degree of later language development.

*Anne Cutler is currently Director of the Language Comprehension Group at the Max Planck Institute for Psycholinguistics at Nijmegen, Professor of Comparative Psycholinguistics, University of Nijmegen, and Professor at the MARCS Auditory Laboratories, University of Western Sydney, Australia.*



## Word Segmentation in Infancy Revisited

Barbara Höhle



Segmenting words from continuous speech is not a trivial task to master as the signal itself does not contain unique phonetic markers of word boundaries. Nevertheless, infants master this task within the early phase of language acquisition typically starting their language production with utterances roughly corresponding to words of the target language. I will provide an overview on studies showing that from early on word segmentation skills are affected by the specific phonological properties of the target language. A special focus will be laid on children learning German as a stress-based and children learning Turkish considered as a syllable-based language with vowel harmony as a cue to word boundaries.

*Barbara Höhle is currently C3-Professor for Psycholinguistics: Language Acquisition at the Linguistics Department of the University of Potsdam and the Director of Universität Potsdam Babylab.*

## Learning One or Two Languages Shapes the Infant Brain

Debra L. Mills



The first two years of life are associated with dramatic advances in vocabulary development. Yet little is known about the development of neural systems underlying the attainment of new language milestones. A series of event-related potential studies are presented to explore how learning one or two languages shapes the organization of brain activity linked to increasing vocabulary size. These studies also examine how the development of domain-general cognitive processes influence changes in brain activity linked to communicative functions.

*Debbie Mills is currently a Reader at the School of Psychology, Bangor University and a Senior Research Fellow of the ESRC Centre for Research on Bilingualism in Theory & Practice and Director of the Bangor Brain and Cognitive Development Lab.*





## The Whorfian Infant and the Perceptual Load Hypothesis

Kim Plunkett



The Whorf Hypothesis assumes that the language we speak impacts the way we think. If correct, this assumption naturally leads to conclusion that language learning can also have a profound impact on mental development. I will briefly review a series of experiments that provides support for the view that labels impact the process of categorization in young infants even before they begin to produce their first words: Labels can override the perceptual dissimilarities between objects and lead infants to treat them as more similar to each other, even as members of the same category (Plunkett, Hu & Cohen, 2008). The experiments also demonstrate that young infants can compute the correlational structure of object features in the visual domain *at the same time* as they compute the relationship of that correlational structure to novel features (words) in the auditory domain. This cross-modal, computational capacity is a powerful tool for the young infant to exploit in categorising objects.

However, the nature of the underlying mechanisms that enable labels to impact infant categorisation is unclear. Some researchers have suggested that 'labels facilitate categorisation' by virtue of their capacity to 'highlight the commonalities between objects' (Waxman & Markow, 1995). An alternative explanation is that labels are merely additional features that are integrated into the processing of category information (Robinson & Sloutsky, 2008). Computational support for this featural explanation is provided by an unsupervised neural network model involving self-organising maps (Glozzi, Mayor, Hu & Plunkett, 2009). In this model, labels have the same status as the perceptual features that define visual objects. Nevertheless, the model is able to replicate the pattern of results reported by Plunkett et al. (2008). A problem remains, however, as to why labels sometimes facilitate and at other times hinder infant categorisation. The 'Perceptual Load Hypothesis' is introduced in an attempt to reconcile competing accounts of cross-modal auditory-visual processing in infancy (Plunkett, 2010). On this account, successful categorisation depends upon the perceptual load imposed on the infant during stimulus exposure. A Goldilocks-like effect operates: too little load impedes categorisation as does excessive overload. Both the visual stimuli and labelling events contribute to perceptual load, so consequently perceptual (salience and distinctiveness) and cognitive (relative novelty) characteristics of the visual and auditory stimuli can impact outcome. A final set of experiments (Mather & Plunkett, submitted) that systematically manipulates the perceptual load in a visual categorisation task is described. These experiments provide insights into the conditions under which labels do and don't impact the process of perceptual categorization in 10-month-old infants, and point to the conclusion that a featural approach can accommodate a wide range of experimental findings concerning infant categorisation.

*Kim Plunkett is currently Professor of Cognitive Neuroscience at the Department of Experimental Psychology at the University of Oxford, Director of the Oxford Babylab and Fellow of St Hugh's College, Oxford.*

