

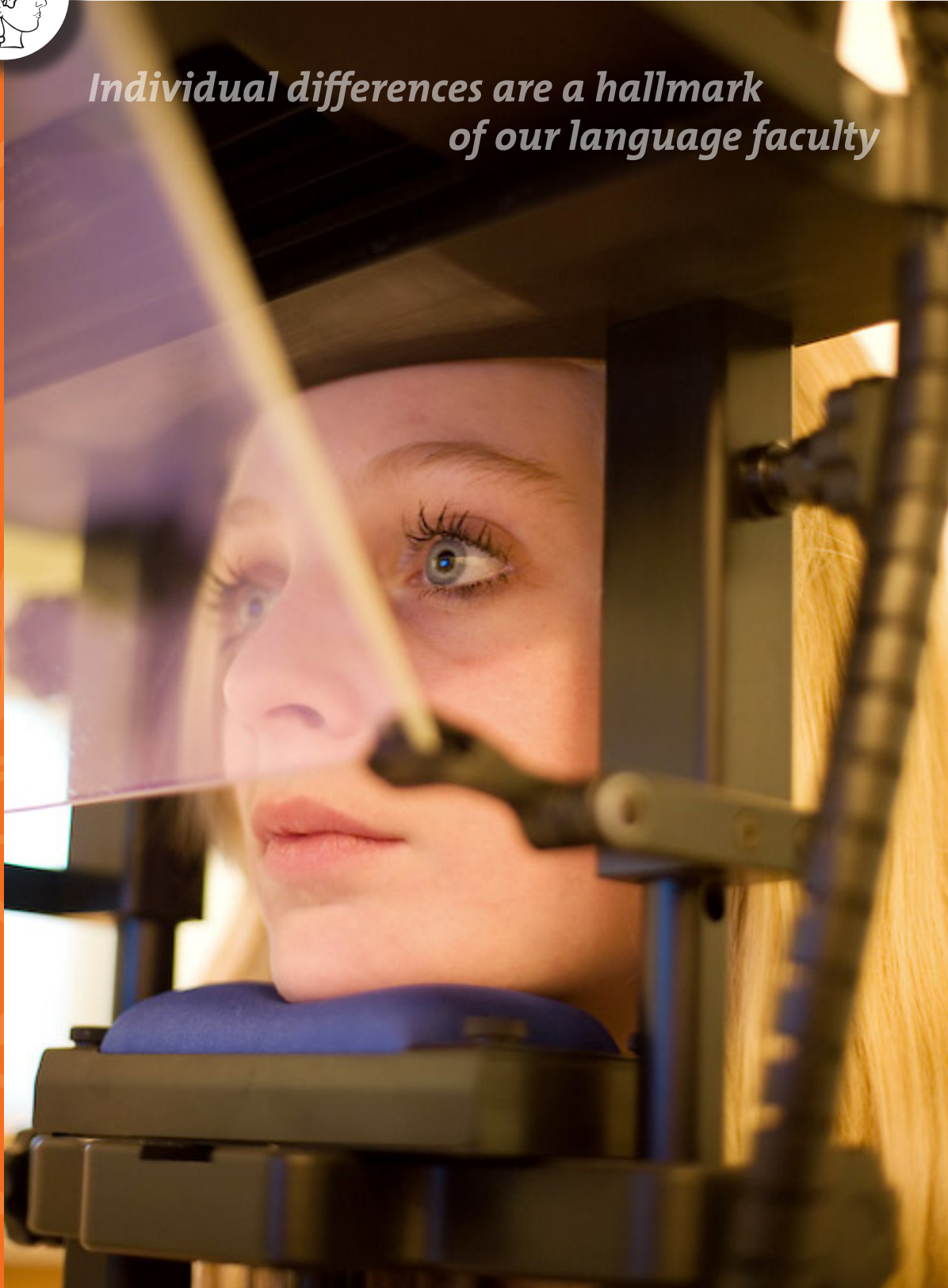
09|10

Research Report

Max Planck Institute for Psycholinguistics



*Individual differences are a hallmark
of our language faculty*





09|10

Research Report

Max Planck Institute for Psycholinguistics

Colofon

Concept Myrna Tinbergen, Intercom journalistiek & voorlichting, Nijmegen

Coordination and editing Evelyn Giering, Rachel Sheer, Myrna Tinbergen, Ad Verbunt

Design Kyah ter Haar Romeny, Nijmegen

Photography Bert Beelen Fotografie, Nijmegen; Paul Breuker, Nijmegen; MPI for Psycholinguistics

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Preface

This biennial report covers highlights of the research life at the Max Planck Institute for Psycholinguistics in 2009 and 2010. More detailed information about our research can be found on our website (www.mpi.nl).

The recent two years have seen a number of important developments. The first is the start of two new departmental groups. One department focuses on individual differences in language processing. It is headed by Antje Meyer, who previously held a position at the University of Birmingham. The second department, on language and genetics, started in Autumn 2010. Its focus is the genetic infrastructure that provides the brain with the capacity to support our language and communication skills. It is headed by Simon Fisher, who was previously appointed at the University of Oxford. With these two departments we will be able to maintain a leading position for our institute by entering new areas of research that will change the landscape of psycholinguistics.

Another important development is the strengthening of our ties with the Donders Institute for Brain, Cognition and Behaviour. This institute has defined four core research themes, one of which is 'Language and communication'. Monthly joint meetings, common research projects, collaborations with the Donders Institute and the Centre for Language Studies, and our International Max Planck Research School for Language Sciences – these are all examples of our increased efforts to join forces with our partner institutes at Radboud University Nijmegen. We thus form a combined, large-scale centre of excellence as required by trends in research funding, allowing us to maintain a leading position in our field.

In addition, the institute has attracted substantial external funding from a variety of sources, which has allowed us to extend our research portfolio beyond what is covered by the Institute Projects.

Another exciting development is that the institute has been granted the possibility to substantially extend its current premises. The new part of the building will house the wetlabs and offices of the Language and genetics department, as well as a VR lab, EEG-labs, and additional office space for the other groups.

In 2010, the institute celebrated its 30th anniversary. On this occasion Pim Levelt gave us a preview of his book on the history of psycholinguistics, showing that the history of our field goes back further than is often assumed. I am convinced that the recent and ongoing developments at the institute have created a future that is much longer than might have been anticipated at its inception.

As you will experience when reading our report, the institute is a dynamic engine of new research, fully prepared to meet the challenges, scientific and otherwise, of the second decade of the 21st century.

Peter Hagoort
Managing Director, 2011–2013



The current board of directors (f.l.t.r.): Wolfgang Klein, Simon Fisher, Antje Meyer, Stephen Levinson, Peter Hagoort, and Anne Cutler

Organisation of the institute 2009–2010



Honours and awards

Directors

Anne Cutler (*managing director*)
 Simon Fisher
 Peter Hagoort
 Wolfgang Klein
 Stephen Levinson
 Antje Meyer

Director Emeritus

Willem Levelt

Max Planck research groups

Michael Dunn (*head*)
 Daniel Haun (*head*)
 Ulf Liszkowski (*head*)
 Andrea Weber (*head*)

Max Planck Fellow

Robert Van Valin, Jr. (*Heinrich Heine U. Düsseldorf*)

External group

Asli Özyürek (*head*)

External scientific members

Manfred Bierwisch
 Pieter Muysken

Scientific council

Dan Slobin (*chair*) (*U. California, Berkeley*)
 David Birdsong (*U. Texas, Austin*)
 Herbert Clark (*Stanford U.*)
 Carol Fowler (*Yale U.*)
 Dedre Gentner (*Northwestern U.*)
 Edward de Haan (*U. Amsterdam*)
 Aafke Hulk (*NIAS*)
 Manfred Krifka (*Humboldt U. Berlin*)
 Robert Ladd (*U. Edinburgh*)
 Thomas Münte (*U. Magdeburg*)
 Eve Sweetser (*U. California, Berkeley*)

Head of Technical Group

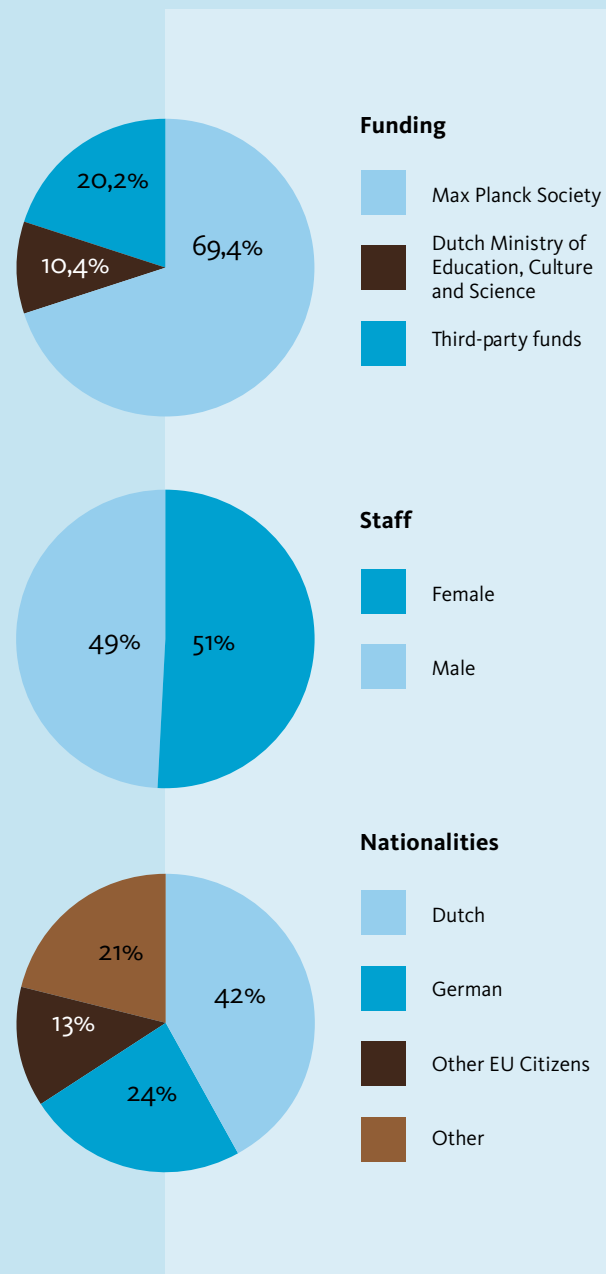
Reiner Dirksmeyer (*acting head*)
 Peter Wittenburg (*former head*)

Head of administration

Paul Lommen

Head of library

Karin Kastens



2009

Bettina Braun, Doug Davidson, James McQueen, Holger Mitterer, and the **Technical Group** each received German Research Foundation (DFG) grants.

Penelope Brown was elected a Fellow of the Wissenschaftskolleg zu Berlin (Institute for Advanced Studies) for the academic year 2009–2010.

Helen Buckler, Sarah Dolscheid, and **Kimberley Mulder** were each awarded International Max Planck Research School (IMPRS) for Language Sciences fellowships.

Anne Cutler was elected to the Academy of Social Sciences of Australia. She was also elected Fellow of the International Speech Communication Association (ISCA).

Frank Eisner received a Veni grant from the Netherlands Organisation for Scientific Research (NWO).

Nick Enfield was appointed Professor in 'Ethnolinguistics', with special reference to South-East Asia, at Radboud U. Nijmegen.

Simon Fisher won the Hertie Foundation's Eric Kandel Young Neuroscientists prize.

Peter Hagoort won the Dutch Professional Association of Psychologists (NIP) Heymans award for senior psychologists.

Peter Indefrey was appointed Professor at Heinrich-Heine U. Düsseldorf.

Alexandra Jesse received a MaxNet Research Network Cognition grant from the Max Planck Society.

Alexandra Jesse and **Eva Reinisch** received a DFG grant for the initiation and enhancement of bilateral cooperation (partnered with Lynne Nygaard, Emory U.).

Juhani Järvikivi was elected president of the Nordic Association of Linguists.

Asli Özyürek and **Nick Enfield** each received European Research Council (ERC) Starting grants.

Stephen Levinson was awarded the Ken Hale Chair at the 2009 Linguistic Institute at U. California, Berkeley.

Ulf Liszkowski received a travel award from the International Conference of Infant Studies in Vancouver.

Karl-Magnus Petersson received a grant from the Swedish Dyslexia Foundation.

James McQueen was appointed Professor in 'Learning and plasticity' at Radboud U. Nijmegen.

Meinou de Vries received a Rubicon grant from the NWO.

Claus Zinn's paper in Library Review was 'highly commended' at the Literati Network Awards for Excellence.

2010

Salomi Asaridou, Rósa Gísladóttir, and **Sho Tsuji** were each awarded IMPRS for Language Sciences fellowships.

Jos van Berkum was appointed Professor in 'Discourse, cognitie, en communicatie' at Utrecht U.

Joe Blythe, with **Gillian Wigglesworth, Rachel Nordlinger,** and **Barbara Kelly** (Melbourne U.), received an Australian Research Council (ARC) grant.

Niclas Burenhult received an ERC Starting grant.

Daniel Casasanto won the James S. McDonnell scholar award.

Aoju Chen and **Esther Janse** (*photo above*) received Vidi grants from the NWO.

Nienke Dijkstra received a Paula Menyuk travel grant.

Christine Dimroth was appointed Professor at U. Osnabrück.

Christine Fawcett and **Adriana Hanulíková** received Marie Curie Intra-European fellowships for career development.

Marianne Gullberg was appointed Professor in 'Psycholinguistics' and Director of the Humanities Lab at Lund U.

Peter Hagoort was elected a member of the International Neuropsychological Symposium.

Vishnupriya Kolipakam won 'best talk' at the 16th annual European meeting of PhD students in evolutionary biology.

Willem Levelt was nominated to the Orden pour Le Mérite für Wissenschaften und Künste.

Stephen Levinson received an ERC Advanced grant.

Asli Özyürek was appointed Professor in 'Gesture, language, and cognition' at Radboud U. Nijmegen.

Karl-Magnus Petersson received a Portuguese Science Foundation grant.

Disa Sauter received a Veni grant from the NWO.

Annemarie Verkerk's poster won 2nd prize at the Integrating Genetic and Cultural Approaches to Language symposium.

PhD completions



The research projects of the institute



2009

Esther Aarts: 'Resisting temptation: The role of the anterior cingulate cortex in adjusting cognitive control'

Giosuè Baggio: 'Semantics and the electrophysiology of meaning: Tense, aspect, event structure'

Nina Davids: 'Neurocognitive markers of phonological processing: A clinical perspective'

Claudia Kuzla: 'Prosodic structure in speech production and perception'

Sarah Schimke: 'The acquisition of finiteness by Turkish learners of German and Turkish learners of French: Investigating knowledge of forms and functions in production and comprehension'

Josje Verhagen: 'Finiteness in Dutch as a second language'

Roel Willems: 'Neural reflections of meaning in gesture, language, and action' (*cum laude*)

2010

Susanne Brouwer: 'Processing strongly reduced forms in casual speech'

Hanneke van Dijk: 'The state of the brain: How alpha oscillations shape behavior and event related responses'

Jonathan Levy: 'In cerebro unveiling unconscious mechanisms during reading'

Laura Menenti: 'The right language: Differential hemispheric contributions to language production and comprehension in context' (*cum laude*)

Judith Pijnacker: 'Defeasible inference in autism: A behavioral and electrophysiological approach'

Eva Reinisch: 'Processing the fine temporal structure of spoken words'

Laura de Ruiter: 'Studies on intonation and information structure in child and adult German'

Tineke Snijders: 'More than words: Neural and genetic dynamics of syntactic unification' (*cum laude*)

Wieke Tabak: 'Semantics and (ir)regular inflection in morphological processing'



The expansion of the institute in the last few years has also led to increased variety in our research project organisation. Once upon a time, we had Institute Projects and a few other projects, created by external funding either to the institute (such as the NWO-funded projects that were part of our core structure from the 1970s to 2008), or to individuals (such as the Emmy Noether project of Ulrike Zeshan, housed at the institute from 2003 to 2006). Now, new funding possibilities have expanded the latter category in particular. Here is a guide to our current project categories and how they appear in the pages to follow:

1 Institute Projects

Ever since the institute's inception, its core research has been organised in broadly conceived projects, in most cases involving members of several directors' groups (and especially involving both psychological and linguistic input). This flexible, regularly renewed, integrative structure facilitates the cross-disciplinary approach that is the essence of psycholinguistics. The projects provide a focus for research efforts, and, in particular, a framework for PhD research (each PhD student works within one project). Responsibility for an Institute Project, including establishment of the project focus, rests with the participating director(s). Research content, including division into subprojects, is created by the project team as a whole. Each project has one (or two) coordinators (director or senior scientist level), who maintain an overview of the entire project, together with its subprojects. Coordinators are further responsible for managing project meetings and all project presentations (e.g., Research Report, website content, Fachbeirat). The eight Institute Projects during 2009–2010 report on pp. 10–25.

2 Individual Max Planck Projects

We currently have five of these: four Max Planck Research Groups and a Max Planck Fellow's project. These report on pp 26–30. Although the funding for these projects, as for the Institute Projects, comes entirely from the Max Planck Society, Max Planck Projects differ from the Institute Projects in that project responsibility rests with the funded individual.

3 Other projects

The institute also houses a number of other research undertakings, of which the main types are personal career development awards (e.g., ERC Advanced and ERC Starting grants; DFG individual grants; NWO Veni and Vidi awards; and EU Marie Curie research awards) and research infrastructure projects (funded chiefly by the EU and the Volkswagen Foundation). Many of these are integrated with other projects – for example, the ERC Starting grant to Nick Enfield is integrated with the Institute Project 'Interactional foundations of language', and the Veni grant to Frank Eisner is integrated with the Max Planck Research group 'Adaptive listening'. The ERC Starting grant project of Asli Özyürek presents a separate report (p. 31), however, as does the new large language data infrastructure project 'The Language Archive' (p. 39).



Project Categories across language and cognition

Project coordinators Asifa Majid and Gunter Senft

Project members Melissa Bowerman, Penelope Brown, Niclas Burenhult, Daniel Casasanto, Dan Dediu, Rebecca Defina, Mark Dingemanse, Sarah Dolscheid, Nick Enfield, Rik van Gijn, Peter Hagoort, Clair Hill, Falk Huettig, Olivier Le Guen, Stephen Levinson, Holger Mitterer, Elisabeth Norcliffe, Özge Öztürk, Webb Phillips, Lila San Roque, Disa Sauter, Shakila Shayan, Mark Sicoli, Hilario de Sousa, Sylvia Tufvesson, Connie de Vos



Goals of the project

Language has to interact with a large range of other representational systems – visual, auditory, haptic, olfactory – if we are to talk about the world. What kinds of transformations of concepts are involved in describing what we see and experience? This project is concerned with semantic categories and how they are expressed in words and grammar. It also examines how variable linguistic categories hook up to other perceptual and conceptual representation systems that are phylogenetically older, ontogenetically antecedent, and biologically ‘fixed’ to a much greater extent. Project members conduct cross-linguistic and cross-cultural comparison to examine the language-cognition interface.

The language of perception

The cognitive sciences and humanities have become ‘embodied’. This has meant a fundamental shift in focus from amodal symbols and symbol-manipulation to culturally and contextually grounded, sensualised, modal representations. It appears that language is strongly connected to our sensory experiences. Hearing or seeing a word for colour, odour, or action activates visual, anterior cingulate, or motor cortices respectively – effectively utilising the same representations that seeing a colour, sniffing an odour, or conducting an action would. It is normally assumed without investigation that language expresses inner sensations and experiences that are the same across communities because of the constraints derived from neural architecture and the physical body. Rather than make this assumption, we test it, investigating to what extent, across diverse languages, sensory experiences are equally expressible (or conversely, ‘ineffable’). To the extent that languages display similar patterns of codability for the sensorium, this informs us about universal biological

and environmental constraints; where languages differ, we learn about cultural diversity in sensory experience and coding.

Over 20 researchers have collaborated to investigate the language of perception across cultures. Data was collected from over 20 genetically, geographically, and typologically diverse languages, including three sign languages. Standardised sets of stimuli of colour patches, geometric shapes, simple sounds, tactile textures, smells, and tastes have been used to elicit descriptions from native speakers. Considerable diversity has been found in the expression of sensory events. Languages differ in how many colour terms they have (from three to twelve). Urban literate communities show more codability of abstract shapes than small-scale non-literate communities. Interestingly, sound appears to have little dedicated descriptive vocabulary. Instead, speakers appeal to a range of metaphors (subproject ‘The interface between language and cognition’).

The language Siwu, spoken in eastern Ghana, shows a refined and complex vocabulary for texture, not seen elsewhere in our sample, while Lao speakers, from Laos, show remarkable consistency in the coding of taste experiences. And the Jahai, a group of hunter-gatherer foragers in Malaysia, demonstrate exquisite elaboration in the domain of smell.

Building a complete picture of the linguistic codability of perceptual experiences also requires documenting the grammatical resources of languages. How is meaning packaged and distributed in descriptions of perception events? To what extent do grammatical resources apply differently depending on the sensory modality being described?

Using a standardised questionnaire, data from four unrelated languages – Avatime (Niger Congo), Guambiano (Barbacoan), Duna (Trans New Guinea), and Spanish – has been collected.



Results indicate more constructional resources dedicated to vision than to other sensory modalities across these diverse languages.

The interface between language and cognition

Speakers often use metaphors to talk about differences in sound. For example, English, Dutch, and German speakers describe variation in pitch with a vertical one-dimensional spatial metaphor (‘high’ vs. ‘low’ sounds), while speakers of other languages use different spatial metaphors. Farsi, Turkish, and Zapotec speakers, for example, rely on a two- or three-dimensional spatial metaphor (‘thick’ vs. ‘thin’). These different mappings suggest there may be alternative ways to make cross-modal associations of pitch and space. In a cross-linguistic similarity matching study we asked whether there is any hardwired mapping between pitch and thickness, and whether learning a language that maps pitch to thickness promotes the ability to map these dimensions non-linguistically. We explored this question developmentally and cross-linguistically, comparing child and adult speakers of Farsi and Turkish (languages with a pitch-thickness metaphor) to speakers of German (a language without the pitch-thickness metaphor).

The participants’ task was to indicate which of two choice objects was most similar to an exemplar. For thickness, the objects were a thick snake and a thin snake. For tone, the objects were a high-

pitched tone and a low-pitched tone. We considered responses ‘correct’ when the participant mapped between a high sound and a thin snake, and between a low sound and a thick snake. Adult speakers of all three languages, and Farsi- and Turkish-speaking children as young as 28 months mapped correctly in this way significantly better than chance. German-speaking children, however, mapped high tones or low tones to thick or thin snakes inconsistently and at chance. This inconsistent response indicates that mapping of pitch to thickness is not hardwired and available to all children. (For additional evidence of the cross-linguistically variable nature of pitch-to-space mappings, see the Language in action project.)

Other subprojects

- Comparative codability of emotions
- Cross-cultural development of



sensory and emotional categories

- Role of grammatical categories in object categorisation and attention
- Event categorisation in language and cognition
- Spatial cognition and spatial language across cultures

Selected publications

De Vignemont, F., Majid, A., Jola, C., & Haggard, P. (2009). Segmenting the body into parts: Evidence from biases in tactile perception. *Quarterly Journal of Experimental Psychology*, 62, 500–512.

Evans, N., & Levinson, S.C. (2009). The myth of language universals: Language diversity and its importance for cognitive science. *Behavioral and Brain Sciences*, 32, 429–492.

Levinson, S.C., & Burenhult, N. (2009). Semplates: A new concept in lexical semantics? *Language*, 85, 153–174.

Mitterer, H., Horschig, J.M., Müsseler, J., & Majid, A. (2009). The influence of memory on perception: It’s not what things look like, it’s what you call them. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 35, 1557–1562.

Senft, G. (2010). *The Trobriand Islanders’ ways of speaking*. Berlin: De Gruyter Mouton.



Project Individual differences in language processing

Project coordinator Antje Meyer

Project members Lesya Ganushchak, Falk Huettig, Esther Janse, Agnieszka Konopka, Linda Mortensen, Jana Reifegerste, Joost Rommers, Zeshu Shao, Francesca Stregapede, Alma Veenstra, Maartje van de Velde, Loan Vuong



Goals of the project

People differ in how they use their native language. There are, for instance, marked differences in speech rate and accent, word choice and utterance complexity. Some people just sound more sophisticated than others, and only very few of us are good at telling jokes. There are also striking differences in people's ability to understand spoken language. For example, among people with mild hearing loss, some are much better than others at understanding speech in noisy environments such as restaurants and train stations. The project aims to describe such differences among adult listeners and speakers, and to explain how they arise.

Approach

Although differences among adult speakers and listeners are noticeable and important in everyday life, experimental psycholinguists have so far largely ignored them, focusing instead on the average speaker/listener. Moreover, most experimental research has been carried out with university students as participants. Given that student samples are likely to be more homogeneous in their cognitive and linguistic abilities than the general population, this strategy is not ideal for studying individual differences, or, in fact, for drawing conclusions about listeners/speakers in general. We therefore test more heterogeneous samples, recruited from schools and businesses.

The theoretical work starts from established models of core aspects of listening and speaking. From such models, we derive hypotheses about causes of individual differences in specific tasks, such as recognising spoken words in noise, understanding or producing compounds, or selecting

contextually appropriate referring expressions (e.g., choosing between the proper name 'Bill', a noun 'the man', or a pronoun 'he'). These hypotheses can concern parameters of a model (e.g., for the speed of activation or decay), the listeners' or speakers' preferences for particular processing strategies, or the involvement of general cognitive processes (such as

the control of attention or working memory) in linguistic tasks. To evaluate these hypotheses, we often test the same participants in batteries of tests and experiments, and examine their performance profiles and the correlations between the scores achieved in different tasks. This allows us to establish the origins of individual differences and, equally importantly, to determine whether and how the existing, primarily student-based models of speaking and listening need to be modified to account for the behavior of broader groups of language users. A key theoretical issue is whether individual differences in linguistic performance are solely due to difference in domain-

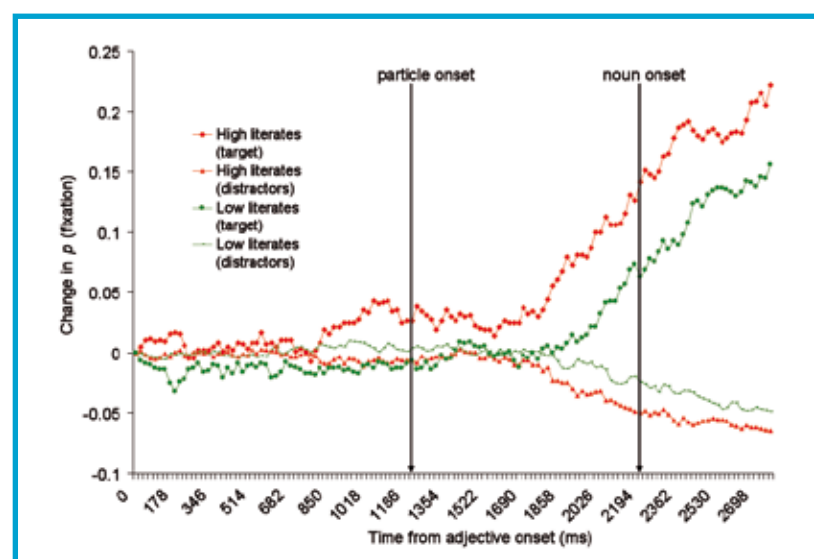


Figure 1: Time course of fixations to the target and distractors in listeners with good vs. poorer literacy skills.

general processes, or whether there are genuine linguistic differences between adult speakers of a language.

Individual differences in lexical access

One subproject concerns lexical access, the retrieval of words from the mental lexicon. This is a core component of language production and comprehension. Shao (in collaboration with Ardi Roelofs, Radboud U. Nijmegen) investigates the origins of performance differences in picture naming, a typical lexical access task. Differences in naming speed and accuracy may largely be due to domain-general cognitive factors, such as general processing speed or attentional control, or to domain-specific factors, such as the efficiency of transmitting information within the mental lexicon or selecting among competing lexical representations. Differences may, of course, also arise because of the joint effects of domain-general and domain-specific factors.

To evaluate these options, participants are tested in sets of experiments designed to tap lexical access to nouns and verbs, working memory, and the control of attention. Our current results indicate that individual differences in naming speed are, at least partly, due to differences in attentional control, including goal maintenance and inhibition.

Effects of literacy on auditory sentence comprehension

Many studies have shown that prediction plays a central role in auditory sentence comprehension. For example, listeners who look at a display and hear a sentence such as 'The girl will eat the cake' often initiate an eye movement towards the only edible object in the display as soon as they hear the verb 'eat', demonstrating the use of verb semantics to predict upcoming sentence content. Such predictions seem to be automatic and effortless. However, it is well known from studies in other areas of cognitive psychology that prediction requires relevant expertise. Huettig and colleagues investigated whether linguistic predictions depend on high levels of language expertise attained through formal literacy. Indian participants with poor and good literacy skills listened to spoken sentences containing target words that could easily be predicted from semantic and grammatical information in the preceding sentence context. Participants with good literacy skills initiated eye movements to the target object in the display well before the onset of the target word. Participants with poorer literacy skills initiated eye movements much later, usually after the onset of the target word. These findings suggest that formal literacy

supports language-mediated anticipatory mechanisms, and, more generally, that different degrees of literacy may have profound and unexpected effects on auditory sentence processing (see Figure 1).

Other subprojects

Individual differences in:

- the scope of sentence planning
- the representation of morphologically complex forms
- the acquisition of artificial grammars
- the use of pronouns
- speech processing under difficult listening conditions

Selected publications

Janse, E., & Ernestus, M. (2010).

Use of linguistic knowledge in the recognition of reduced words: Effects of age and high-frequency hearing loss [Abstract]. *Journal of the Acoustical Society of America*, 128(4), 2457.

Malpass, D., & Meyer, A.S. (2010).

The time course of name retrieval during multiple-object naming: Evidence from extrafoveal-on-foveal effects. *Journal of Experimental Psychology: Learning, Memory and Cognition*, 36, 523–537.



Project Information structure in language acquisition

Project coordinator Christine Dimroth

Project members Bettina Braun, Aoju Chen, Miriam Ellert, Juhani Järvikivi, Wolfgang Klein, Leah Roberts, Laura de Ruiter, Sarah Schimke, Giusy Turco, Josje Verhagen



Goals of the project

We investigated the linguistic realisation of information structure (IS) and its acquisition by children and adults in a variety of languages. The focus was on the development of the relationship between semantic/pragmatic functions (topic, focus, given, new, contrast) and their corresponding formal devices. Among the means that are typically used to encode information structure, priority was given to the study of word order, intonation, pronominals, and particles. A variety of methods were used in learner data from different languages, including the investigation of corpora of spontaneous production data, elicited production, reaction time, and eye-tracking techniques.

Pronoun resolution in first- and second-language learners of German

In this subproject, we compared how children and adult L2 learners interpret the German subject pronouns *er* and *der* ('he') in spoken discourse. Both pronouns are able to resolve towards a masculine, singular antecedent ('*Der Zauberer wollte den Arzt umarmen. Aber er/der...:*' 'The magician wanted to hug the doctor. But he...'), but native speakers prefer *er* to refer the syntactic subject (also the topic, *Der Zauberer*), and *der* towards the accusative-marked second referent *den Arzt*. When the word order of the antecedents was reversed (*Den Arzt...der Zauberer*), the accusative

referent was still preferred for *der*, but in this IS-marked object-subject (non-canonical) word order context, *er* became more ambiguous. Interestingly, the six-year-old German children we tested did not distinguish between the two pronouns, having an across-the-board preference for either pronoun to refer to the most recently-mentioned referent. The Finnish L2 learners of German, whose native language has a demonstrative form (*tämä*) similar to German *der*, as well as a masculine, singular subject pronoun (*hän*), had a robust preference for *der*, resolving it towards the accusative-marked referent irrespective of word order, like the German natives. For *er*, however, they had no resolution preference at all and thus they performed neither like the native speakers, nor the German children, despite the similarity between Finnish and German. Overall, the results suggest subtle differences in the properties that govern the two pronouns, which pose a learning problem for children and adult learners, with

the distribution of the pronoun *der* in general less variable than *er*, and thus, easier to learn.

Contrastive topics and polarity: Cross-linguistic influence in advanced second language discourse

This subproject dealt with the expression of contrast in spoken discourse in native and learner French, Italian, Dutch, and German. We investigated whether there were language-specific preferences for the information units used in the establishment of discourse cohesion in contexts with an atypical distribution of information (maintained information in the comment and changing information in the topic and/or the polarity of the assertion).

Results based on retellings of video clips showed significant cross-linguistic differences in the information units that were typically highlighted. In particular, when the polarity of the target utterance was different from an otherwise comparable context utterance, native speakers of Dutch and German marked this contrast much more frequently than speakers of French and Italian. They relied on a set of assertion-related particles that do not have clear equivalents in Romance languages (e.g. *doch/toch, wel, 'indeed'*) and on the option

of accenting the finite verb (or *verum focus, 'Meneer Blauw springt wel'*). Native speakers of Romance languages in contrast highlighted contrasts in the topical domain, using adverbials ('*Il signor Blu è l'unico a buttarsi*') and (strong) pronouns ('*Monsieur Bleu lui il saute*') to signal the information flow and enhance discourse cohesion.

In her ongoing PhD project, Turco investigated the use of intonation to express polarity contrasts on auxiliary verbs in Germanic and Romance languages. She found that German speakers typically marked polarity focus with a falling nuclear accent on the auxiliary, while French speakers used an accented auxiliary only in a third of the cases, mostly accenting the non-finite verb and often with a comparably restricted pitch range.

Other subprojects

- Intonation encoding of topic and focus in child Dutch
- Word order in child language
- Acquisition of givenness intonation in German
- The expression of additive and contrastive relations in L2 discourse
- The acquisition of finiteness
- The role of intonation and syntax in focus interpretation in children and adults
- The interface between word order and intonation in focus marking in child language



Selected publications

- De Ruiter, L.E.** (2009). The prosodic marking of topical referents in the German 'Vorfeld' by children and adults. *The Linguistic Review*, 26, 329–354.
- Braun, B., & Chen, A.** (2010). Intonation of 'now' in resolving scope ambiguity in English and Dutch. *Journal of Phonetics*, 38, 431–444.
- Dimroth, C., Andorno, C., Benazzo, S., & Verhagen, J.** (2010). Given claims about new topics: How Romance and Germanic speakers link changed and maintained information in narrative discourse. *Journal of Pragmatics*, 42(12), 3328–3344.
- Pyykkönen, P., Matthews, D., & Järvikivi, J.** (2010). Three-year-olds are sensitive to semantic prominence during online spoken language comprehension: A visual world study of pronoun resolution. *Language and Cognitive Processes*, 25, 115–129.
- Ellert, M., Järvikivi, J., & Roberts, L.** (in press). Information structure affects the resolution of the subject pronouns *er* and *der* in spoken German discourse. In L. Sarda, S.C. Thomas & B. Fagard (eds.). *Linguistic and psycholinguistic approaches to text structuring*. Berlin: John Benjamins.



Project Interactional foundations of language

Project coordinators Nick Enfield and Stephen Levinson

Project members Julija Baranova, Joe Blythe, Penelope Brown, Mark Dingemans, Tyko Dirksmeyer, Simeon Floyd, Sonja Gipper, Rósa Gísladóttir, Kaoru Hayano, Gertie Hoymann, Kobin Kendrick, Olivier Le Guen, Lilla Magyari, Elizabeth Manrique, Elisabeth Norcliffe, Federico Rossano, Giovanni Rossi, Lila San Roque, Connie de Vos

Affiliated project members Paul Drew (York U.), John Heritage (UCLA), Jan Peter de Ruiter (U. Bielefeld), Emanuel Schegloff (UCLA), Tanya Stivers (UCLA)



Goals of the project

This project (formerly ‘Multimodal interaction’) investigates language in face-to-face conversational interaction, the context in which language is learnt and predominantly used. We focus on the idea that there are strong constraints and special faculties underlying interactional uses of language, including principles of mutual orientation, coordination, turn-taking, information tracking, and timing. Project work is multidisciplinary, utilising linguistics, sociology, anthropology, psychology, and neuroscience. Methods include corpus analysis of natural interaction from diverse, unrelated cultures; critical case studies; controlled study of interaction in lab conditions; study of infant-caregiver interaction; experimental work, for example, with reaction time measures; and neuroimaging of prediction and goal attribution.

Questions and turn-taking

A fundamental part of the infrastructure for conversation is turn-taking, or the apportioning of who is to speak next and when. Research on English conversation shows that English speakers do not wait for pauses to begin their turn but tend to avoid gaps and overlaps, using a range of cues to project when they can start their next turn ‘on time’. We wanted to know whether this organisation varies across human cultures or is reflective of a universal system of rules for turn-taking in conversation. While the anthropological literature has featured numerous claims of cultural variability, no previous study has set out to test the robustness of a turn-taking system across cultures.

We compared extensive data from video recordings of informal natural conversation in 10 languages that vary fundamentally in type and are drawn from quite varied cultures (from urban Europe to traditional Papua New Guinea). For comparability, we took advantage of a universal

context for turn transition, namely that between questions and their responses. We restricted the comparison to polar (‘yes-no’) questions as these are the most common type in 9 of the 10 languages (making up 67% of total questions in our 10-language sample), and they are also logically the simplest type. In some 2,000 question-response sequences across the 10 languages, we measured the time between the end of a speaker’s question and the beginning of the other speaker’s response. The results provide substantial support for a universal turn-taking system hypothesis, where the distribution of response offsets in all the languages reflects a target of minimal overlap and minimal gap between turns. All the languages show a similar distribution of response offsets, with response offsets showing an overall mode of 0 ms, and an overall mean of 200 ms. See Figure 1.

In further analysis we also found that the factors which predict whether a response

will be faster or slower within each language are identical across the languages. Responses will be faster on average if they fit with the trajectory that the question is pursuing. For example, answers are delivered faster than non-answers, confirmations faster than non-confirmations. In addition, when there is some visual component to the response, such as a head nod or gesture, the answer is delivered faster across the languages. Overall, these results offer systematic cross-linguistic support for the view that turn-taking in informal conversation is universally organised so as to minimise gap and overlap, and that, consequently, there is a universal semiotics of delayed response.

Our results argue for an interactional foundation for language that is relatively stable and relatively separable from the specific languages and cultural practices that instantiate it. Understanding this will be crucial for understanding the origin of language and the foundations of social life, because it is out of primordial interaction that languages and cultures are ultimately built.

The 10-language study of timing in turn-taking was part of a larger comparative study of question-response sequences

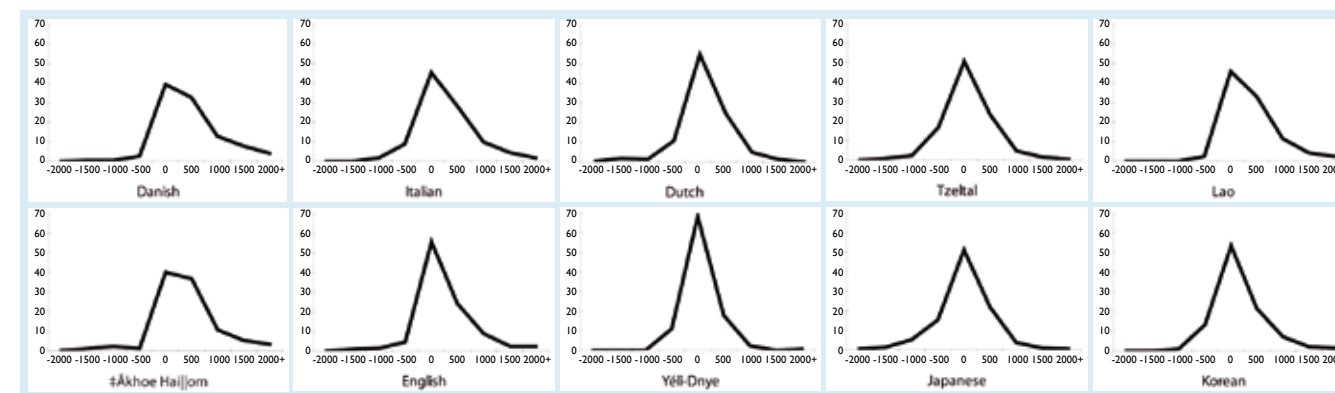


Figure 1: The distribution of turn transitions for each language in the 10 sample languages. All distributions are unimodal with the highest number of transitions occurring between 0 and 200 ms. The percentage of turn transitions is shown on the y-axis, and milliseconds of turn offset are shown on the x-axis.

that sought to determine patterns of language use. This domain has been much studied in the literature, but without reference to the kind of naturalistic data featured in our corpora. Empirical results of a systematic 10-language comparison of around 3,500 question-response sequences were presented in a special issue of *Journal of Pragmatics*.

Research group ‘Human sociality and systems of language use’

In conjunction with the project is a five-year ‘Starting independent researcher’ group (European Research Council, 2010–2014), headed by Nick Enfield. Core project members are Baranova, Blythe, Dingemans, Floyd, Manrique, and Rossi. Project work involves the collection of video-recorded everyday conversation in non-European languages and cultural settings, towards building a significant corpus for testing the diversity of social-interactional systems across human groups. Project work has begun on three subproject foci – how problems of com-

munication are ‘repaired’ online, how referential expressions to places are formulated in context, and how others are ‘recruited’ into action by means of request-like speech acts.



Selected publications

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- Rossano, F., Brown, P., & Levinson, S.C. (2009). Gaze, questioning and culture. In J. Sidnell (ed.), *Conversation analysis: Comparative perspectives* (pp. 187–249). Cambridge University Press.
- De Ruiter, J.P., Noordzij, M.L., Newman-Norlund, S., Hagoort, P., Levinson, S.C., & Toni, I. (2010). Exploring the cognitive infrastructure of communication. *Interaction studies*, 11, 51–77.
- Stivers, T., Enfield, N.J., Brown, P., Englert, C., Hayashi, M., Heinemann, T., Hoymann, G., Rossano, F., De Ruiter, J.P., Yoon, K.-E., & Levinson, S.C. (2009). Universals and cultural variation in turn-taking in conversation. *Proceedings of the National Academy of Sciences of the United States of America*, 106(26), 10587–10592.
- Stivers, T., Enfield, N.J., & Levinson, S.C. (2010). Question-response sequences in conversation across ten languages. *Journal of Pragmatics* [Special issue], 42(10), 2615–2619.



Project Language and genetics

Project coordinator Simon Fisher
Project members Dan Dediu, Clyde Francks, Lesya Ganushchak



Goals of the project

Despite the huge complexity of the task, most children learn their native languages almost effortlessly and do not need formal teaching to achieve a rich linguistic repertoire. It has long been suspected that the answers to this enigma lie buried in our genetic makeup. Using cutting-edge molecular technologies, we aim to uncover the DNA variations that ultimately affect different facets of our communicative abilities, not only in children with language-related disorders or people with exceptional linguistic skills, but also in the general population. Crucially, our work attempts to bridge the gaps between genes, brains, speech, and language, by integrating molecular findings with data from other levels of analysis, including cell biology, experimental psychology, and neuroimaging. We hope to trace the evolutionary history and worldwide diversity of the key genes, which may shed new light on language origins. These efforts are only just beginning, but a number of exciting subprojects are already underway.

Quantifying speech and language variation for genetic studies

To successfully characterise genetic contributions to speech and language it is essential to have effective ways of measuring people's performance in these domains. Such tests must be reliable, valid, and easy to administer. They should robustly index the individual variability existing in the general population, and capture those aspects that are likely to have significant genetic components. The underlying genetic architecture is predicted to be complex, involving many factors of small effect size, and pinpointing these may ultimately require the testing of very large numbers of people.

A subproject (led by Dediu) was initiated two years ago with the aim of building a comprehensive test battery to address these needs, including assessment tools that are established in the literature, as

well as novel ones designed together with expert collaborators. Such a battery should have the capability to be used in large-scale population-based studies, potentially involving thousands of sub-

jects. It should also have a modular structure, adaptable to the goals of individual experiments. Dediu and colleagues are conducting pilot studies to understand the psychometric properties of individual tests, along with the relationships between them, in various cohorts. This subproject unites a diverse array of leading researchers from groups within the MPI and elsewhere.

One intriguing example focuses on acquisition of non-native sounds and phonological distinctions involving Slovak consonant clusters (with Falk Huettig, Individual differences in language processing group and Adriana Hanulikova, Adaptive listening group) and Korean stops (with Mirjam Broersma and Jiyoun Choi, Language comprehension group). Other promising avenues include: aspects of working memory, attention, and vocabulary size (with Ganushchak); pitch perception (with D. Robert Ladd, U. Edinburgh); and

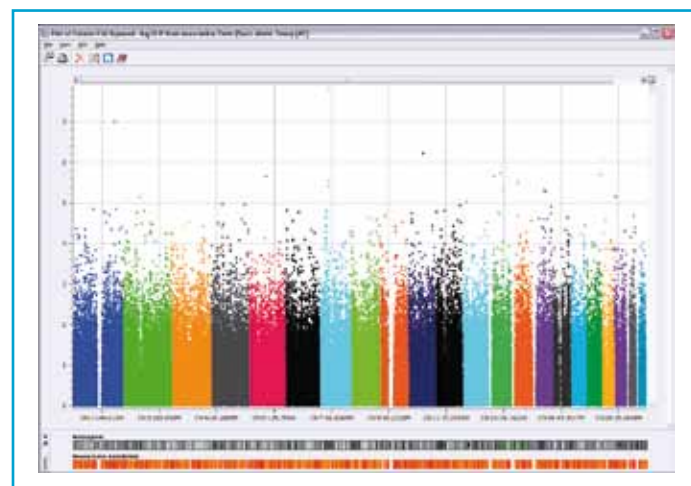


Figure 1: Example of output from a genome-wide association scan using hundreds of thousands of genetic polymorphisms.

frames of reference (with Gabriele Janzen, Donders Institute). The test battery resulting from these efforts will have impacts that go beyond the Language and genetics project, enriching existing investigations of speech and language function, and facilitating the development of completely new lines of research.

Identifying genetic risk factors in language impairment

A small but significant proportion of children have unexplained difficulties acquiring language, in absence of any obvious cause. These problems make major impacts on education, mental health, and social wellbeing. Family and twin studies indicate that a child's genetic make-up plays a major role in susceptibility to language problems. Dramatic advances in genomics make it possible to zero in on the risk genes. Such efforts were spearheaded by investigations of syndromes with a simple genetic basis, like the severe speech and language disorder caused by rare mutations of the *FOXP2* gene. Researchers now have their sights set on common forms of language impairment, which have more complex genetic explanations.

In this subproject (led by Francks) we approach language impairment as one extreme of a continuum in language ability in the general population. Making use of individual differences in language-related performance, we apply quantitative genetic methods in a similar manner

to that used to study genetics of human height or body mass index. Our first study, in collaboration with Dianne Newbury and colleagues (U. Oxford), involves over 250 families from the United Kingdom who were collected by the Specific Language Impairment Consortium (SLIC). Each family contains at least one child with poor language skills, but every available sibling has been assessed with a battery of standardised measures for receptive and expressive language, and nonsense word repetition (established as a robust heritable marker of language impairment), as well as indices of general cognition.

We are analysing all 1,000 or so members of these families (proband, siblings, and parents) with approximately 700,000 common genetic variants from different parts of the genome. In this genome-wide association screen, statistical tests establish whether inheritance of any

particular marker is significantly correlated with language-related performance. Through integration of these data with our other studies of language impairment and related disorder, coupled with those of collaborators worldwide, we aim to identify genes that influence the development of language. The functions of these genes are then analysed in relation to the structure, function, and development of neurons and brains.

Other subprojects

- Neurogenetic pathways regulated by *FOXP2*
- Next generation sequencing in severe language disorders
- Brain imaging genetics of language function
- Genetic association studies of brain asymmetries
- Epigenetics of *LRRTM1*, a gene involved in lateralisation
- Evolution of language-related genes

Selected publications

Fisher, S.E., & Scharff, C. (2009). *FOXP2* as a molecular window into speech and language. *Trends in Genetics*, 25, 166–177.

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Vernes, S., & Fisher, S.E. (2009). Unravelling neurogenetic networks implicated in developmental language disorders. *Biochemical Society Transactions* (London), 37, 1263–1269.

Roll, P., Vernes, S.C., Bruneau, N., Cillario, J., Ponsolle-Lenfant, M., Massacrier, A., Rudolf, G., Khalife, M., Hirsch, E., Fisher, S.E., & Szepetowski, P. (2010). Molecular networks implicated in speech-related disorders: *FOXP2* regulates the *SRPX2/uPAR* complex. *Human Molecular Genetics*, 19, 4848–60.

Dediu, D. (2011). A Bayesian phylogenetic approach to estimating the stability of linguistic features and the genetic biasing of tone. *Proceedings of the Royal Society of London, B-Biological Sciences*, 278(1704), 474–479.



Project Language in action

Project coordinator Peter Hagoort

Project members Jana Basnakova, Jos van Berkum, Daniel Casasanto, Sarah Dolscheid, Dieuwke de Goede, Judith Holler, Vicky Lai, Asli Özyürek, Laura Staum-Casanto

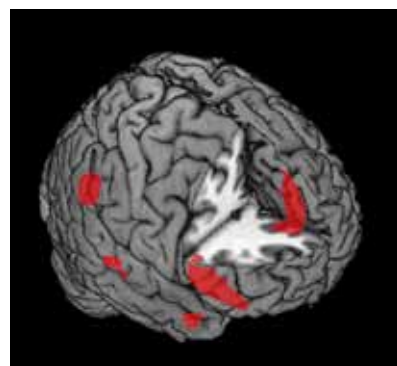


Goals of the project

Language helps people interact with their social environment. It allows us to coordinate with others to get things done or share experiences, and it supports the development and maintenance of social relationships and culture. We examine the neural and cognitive architecture of the language system when it is embedded in richer social, physical, or discourse contexts than are typically studied in the cognitive neuroscience lab. Do classic findings on linguistic coding and decoding scale up in situations where language is used for a purpose? What neural and cognitive architectures support context-dependent aspects of language use, such as inferences about the speaker and his or her state of mind? In what way does the core neural machinery studied in the Unification project interact with other brain systems, such as those involved in vision, motor behavior, attention, affective evaluation, or the pursuit of goals? Does our body matter to how we use language?

Understanding speaker meaning

A popular account of human communication is that the mirror neuron system (MNS) provides us with the neurobiological machinery to understand, via simulating, the event coded in the language input. However, this ignores the fact that natural communication is not only literal but, to a large extent, inferential. For example, if someone says, 'It is hard to give a good presentation', what she might communicate is, 'Your talk was a mess'. Listeners need to infer the speaker's hidden message; they need to infer speaker meaning from the propositional content. The central question of this subproject asks, What are the neural systems involved in deriving speaker meaning, and is the MNS recruited for this purpose? We investigated the neural correlates of pragmatic inferencing in an fMRI study involving auditorily-presented natural spoken dialogues. The final utterance of the dialogue had



different meanings depending on the dialogue context and the immediately preceding question. For example,

Direct reply:

Q: 'What is giving a good presentation like?'

A: 'It is hard to give a good presentation.'

Indirect reply:

Q: 'Did you like my presentation?'

A: 'It is hard to give a good presentation.'

Over and above the general language processing network in the frontotemporal cortex, the indirect replies resulted in activation of the Theory of Mind network, including the right temporo-parietal junction (TPJ) and dorsomedial prefrontal cortex. This network is clearly different from the MNS. These results are a very clear demonstration that speaker meaning cannot be based on motor resonance.

Language in thinking about pitch

The role of language in pitch representation was the core question of this subproject. We conducted a non-linguistic space-pitch interference experiment with speakers of two languages that use different spatial metaphors. Dutch speakers usually describe pitches as 'high' (*hoog*) and 'low' (*laag*). Farsi speakers, however, often describe high-frequency pitches as 'thin' (*naazok*) and low-frequency pitches as 'thick' (*koloft*). To find out whether Dutch and Farsi speakers represent pitch differently, we asked participants to reproduce musical pitches that they heard in the presence of irrelevant spatial information (i.e., lines that varied either in height or in thickness). For the Height Interference experiment, horizontal lines bisected a vertical reference line at one of nine different locations. For the Thickness Interference experiment, a vertical line appeared in the middle of the screen in one of nine

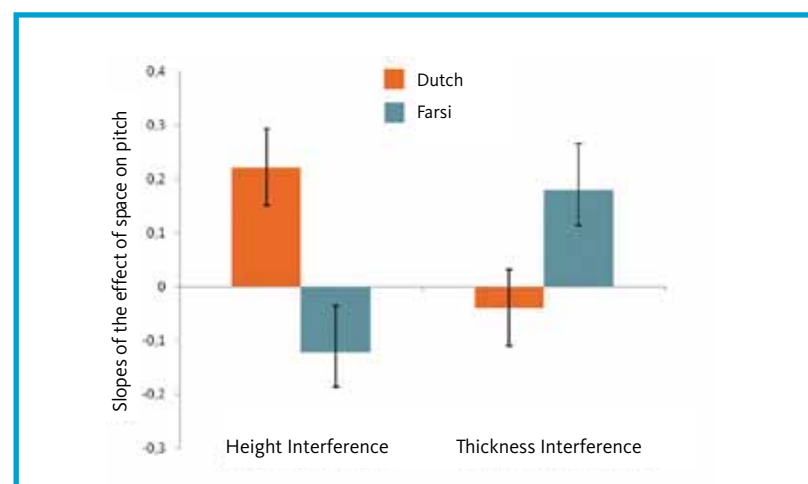


Figure 1: Comparison of Height and Thickness Interference in Dutch and Farsi speakers.

thicknesses. Differences in language were reflected in the performance on the psychophysical tasks. Dutch speakers' pitch estimates were significantly modulated by spatial height but not by thickness. Conversely, Farsi speakers' pitch estimates were modulated by spatial thickness but not by height.

In an additional training study, we investigated whether language can shape pitch representations. Native Dutch speakers either learned to use Farsi-like metaphors, describing pitch relationships in terms of thickness (e.g., a cello sounds 'thicker' than a flute) or were trained to use the familiar high-low metaphor (e.g., a cello sounds 'lower' than a flute). After 'thickness' training, Dutch speakers showed a significant effect of Thickness Interference in the non-linguistic pitch reproduction task, similar

to native Farsi speakers. These results demonstrate that people who talk differently about pitch also think about it differently, in ways that correspond to the preferred metaphors in their native

Other subprojects

- The interaction between language and emotion
- Body specificity in emotional valence and action understanding
- Space and time in language and mind
- Speaker accommodation to virtual agents
- The communicative and social valence of co-speech gestures

Selected publications

- Casanto, D.** (2009). Embodiment of abstract concepts: Good and bad in right- and left-handers. *Journal of Experimental Psychology: General*, 138, 351–367.
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- Willems, R.M., Hagoort, P., & Casasanto, D.** (2010). Body-specific representations of action verbs: Neural evidence from right- and left-handers. *Psychological Science*, 21, 67–74.
- Willems, R.M., De Boer, M., De Ruiter, J.P., Noordzij, M.L., Hagoort, P., & Toni, I.** (2010). A dissociation between linguistic and communicative abilities in the human brain. *Psychological Science*, 21, 8–14.



Project Mechanisms and representation in comprehending speech

Project coordinators Anne Cutler and Holger Mitterer

Project members Mirjam Broersma, Susanne Brouwer, Jiyoun Choi, Falk Huettig, Alexandra Jesse, Caroline Junge, James McQueen, Katja Pöllmann, Eva Reinisch, Makiko Sadakata, Matthias Sjerps, Marco van de Ven, Patrick van der Zande, Wen Cui Zhou



Goals of the project

This project, a direct successor of the prior projects ‘Phonological learning for speech perception’ and ‘Decoding continuous speech’, investigates how acoustic information in spoken utterances is mapped to stored lexical knowledge, enabling interpretation of speakers’ intentions. Listeners take into account many different types of contextual information on many different time scales, from immediate to quite distant; of primary concern to the project are the mechanisms that underlie these varying context effects. Also of central importance in the project are speech comprehension challenges, such as those presented by casually spoken utterances, speech in noise, or speech in a foreign language.

Context effects in speech comprehension across multiple time frames

It is well known that listeners adapt to the speech rate and vowel space of individual talkers. This subproject pioneered the use of eye-tracking and electrophysiological techniques to ask whether these context effects arise immediately in early perceptual processes, or whether first-pass analysis is context-insensitive. In Reinisch’s PhD (completed in 2010), eye-tracking revealed that the effect of context speech rate on consonant perception is immediate. Sjerps developed a method to investigate vowel normalisation in an event-related potential (ERP) paradigm. Having shown in behavioural studies that a given vowel is perceived, depending on the context, as /e/ or /I/, he then tested the same contexts in an active oddball-discrimination design with ERP measurement. Context effects appeared in early ERP components (N1 and MMN, Figure 1), not only in later components (e.g., P3, Figure 1). This indicates that the context is immediately brought to bear on the processing of incoming stimuli.

These two lines of research were combined in a study of the perception of the Dutch /a/-/a/ contrast (e.g., *kas* ‘green-

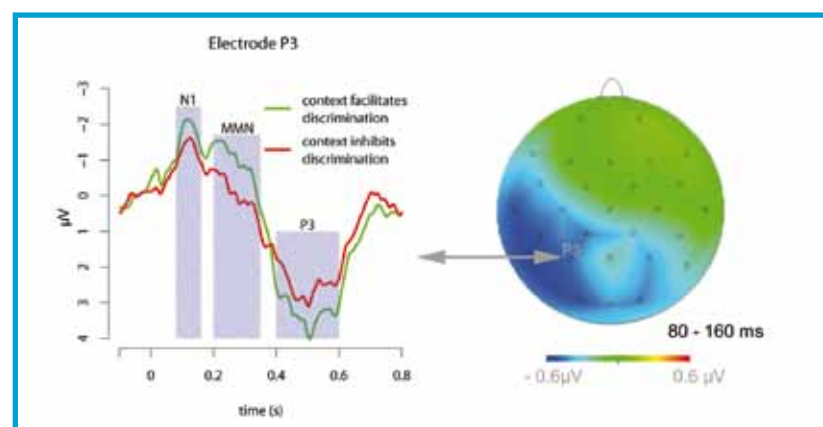


Figure 1: ERPs for vowel mismatch detection, which is either facilitated (green line) or inhibited (red line) by adjacent context. The shaded areas show the time frames of the N1 (an early response to auditory input expressed as a negativity around 100 ms from stimulus onset), the MMN (a negativity signalling response to a mismatch in the input, around 200–300 ms post-onset), and the P3 (a positivity taken to indicate decision making). When the context facilitates rather than inhibits discrimination, the negative components (N1 and MMN) and the positive P3 component are enhanced, as can be seen in the greater deflection in each of the three shaded areas.

house’; *kaas* ‘cheese’). The contrast is expressed in formant frequencies and duration, both susceptible to context effects. Sjerps and Reinisch showed that the relative timing of the onsets of the two context effects on eye movements did not differ. These experiments also suggest that a sound’s adjacent context

is immediately taken into account in perceptual processing.

On a larger time-scale, previous research has shown that listeners can adapt to speaker idiosyncrasies. Jesse and McQueen tested the extent to which lexically-guided learning about speaker

idiosyncrasies generalises over syllable position. Participants familiarised with a speaker producing an ambiguous sound in syllable-final position applied this knowledge to the same sound in syllable-initial position, when acoustic similarity across positions was controlled. Lexical retuning thus benefits recognition of acoustically-similar sounds wherever they appear. Lexical retuning did not occur for ambiguous sounds in word-initial position. Learning about a segment seems to require that a training signal is available as the segment is first being processed. Sounds later in the word have sufficient lexical support to induce training, but sounds at the beginning do not.

Speech comprehension under challenging conditions

Speech comprehension research is mostly conducted on young healthy adults listening to noise-free native-language recordings over headphones in a sound-proof booth. Real speech perception, however, usually occurs under far less ideal circumstances. Special challenges arise when the speech is not in the native language; though acoustic masking or disruption may impact equally upon native and non-native listeners, recovery is far harder for the non-native listeners. Even in the native language, many factors reduce speech intelligibility, among them informal speaking styles and extraneous noise. Analysing listeners’ response to such challenges sheds light on the underlying comprehension mechanisms.

Brouwer’s PhD (completed in 2010) examined how listeners recover intended meanings when words are produced in an informal style with extensive phonological reductions. In one experiment she tested the importance of discourse information for recognition of reduced versus canonical word-forms. Recognition of reduced word-forms benefited from a wider discourse context, but such discourse information was of little use for canonical word-forms, with their clear acoustic information. This reinforces the view that bottom-up information has priority in speech comprehension.

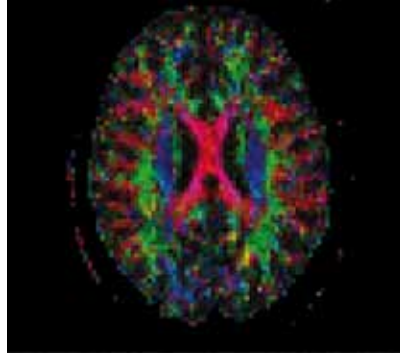
Huettig (with McQueen) showed that when participants listen to sentences with modest and transient noise masking (as in radio crackle), they can adjust the weight they assign to speech information. In experiments where looks to a display of objects were recorded, word onsets usually determined what listeners first looked at. However, in an experiment with radio crackle there were more

looks than usual to objects with a different onset (e.g., looks to a tent when the input was ‘cent’), even though the input words were themselves noise-free. This suggests that the confidence that listeners place in the same acoustic information varies across listening conditions.

Hans-Rutger Bosker’s MA thesis (U. Leiden, supervised by Mitterer and McQueen) combined elements from each of these subprojects. He measured listeners’ adaptation to individual reduction styles. Participants first heard a speaker who did or did not reduce the Dutch prefix *ver* to [f]. Participants exposed to reduced versions of *ver* could generalise this knowledge to new reduced *ver*-initial words. This suggests that abstract prelexical representations, which support such generalisation, mediate word recognition.

Selected publications

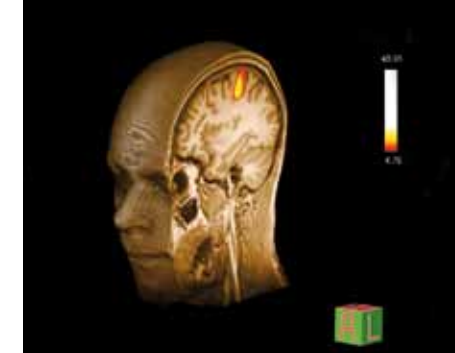
- Cutler, A., Otake, T., & McQueen, J.M. (2009). Vowel devoicing and the perception of spoken Japanese words. *Journal of the Acoustical Society of America*, 125, 1693–1703.
- McQueen, J.M., Jesse, A., & Norris, D. (2009). No lexical–prelexical feedback during speech perception or: Is it time to stop playing those Christmas tapes? *Journal of Memory and Language*, 61, 1–18.
- Mitterer, H. & McQueen, J.M. (2009). Foreign subtitles help but native-language subtitles harm foreign speech perception. *PLoS ONE*, 4, e7785.
- Brouwer, S., Mitterer, H., & Huettig, F. (2010). Shadowing reduced speech and alignment. *Journal of the Acoustical Society of America*, 128, EL32–EL37.
- Garcia Lecumberri, M.L., Cooke, M., & Cutler, A. (2010). Non-native speech perception in adverse conditions: A review. *Speech Communication*, 52, 864–886.



Project Unification

Project coordinator Peter Hagoort

Project members Dan Acheson, Petra van Alphen, Salomi Asaridou, Giosuè Baggio, Marcel Bastiaansen, Jos van Berkum, Vasiliki Folia, Gerard Kempen, Miriam Kos, Alina Lartseva, Karl-Magnus Petersson, Laura Menenti, Katrien Segaert, Irina Simanova, Tineke Snijders, Julia Uddén, Lin Wang, Meinou de Vries, Kirsten Weber, Roel Willems, Huadong Xiang



Goals of the project

The central questions of this project are: How are the different sources of information that are retrieved from memory or provided by sensory input unified into an interpretation (comprehension) or message (production) beyond the single word level? Which neural networks are recruited for these unification operations? To what degree are these shared between production and comprehension, and what is the nature of their dynamic interplay with memory components, such as the mental lexicon or episodic memory of the prior discourse?

Shared infrastructure for speaking and listening

The involvement of the brain's speech production system in speech comprehension is the topic of much debate. While research focuses on whether motor areas are involved in listening or not, overlap could occur not only for primary sensory and motor processes, but also at linguistic levels (semantic, lexical, and syntactic processes). Using an fMRI repetition suppression paradigm in speech comprehension and production, we investigated at what levels speaking and listening overlap in the brain. We found that the brain areas involved in semantic, lexical, and syntactic processing are mostly the same for speaking and

listening. Effects of primary processing load (indicative of sensory and motor processes) overlap in auditory cortex, and in left inferior frontal cortex, but not in motor cortex. Here processing load affects the response only in speaking. These results indicate that the core components of the language system are used for both speaking and listening. However, the motor system does not provide a crucial contribution to listening.

Functional connectivity in the language cortex

Resting-state fMRI provides a window onto the functional connectivity of the brain. We investigated the functional connectivity within the perisylvian language network by seeding from three

subregions of Broca's complex (pars opercularis, pars triangularis, and pars orbitalis) and their right hemisphere homologues. A clear topographical functional connectivity pattern was revealed in the left but not in the right hemisphere. Areas with known sensitivity to phonological, syntactic, and semantic information in the left frontal, parietal, and temporal areas were most strongly connected. This is the first demonstration that a functional connectivity topology can be observed in the perisylvian language network. This finding supports the assumption of the functional network division for phonology, syntax, and semantics of Broca's complex as proposed by the Memory, Unification, and Control (MUC) model.

Information structure

During communication, information structure (IS) can be used to highlight the most relevant information. It divides the information into two parts: focus and background. Focus marks the most relevant information to the interlocutors, while background is the information that is already shared between them. We investigated how IS modulates the depth of semantic processing. IS was marked by wh-question context during reading, or as pitch accent in the answers during listening. We took the N400 brain response elicited by semantic incongruity as the index of the depth of semantic processing. We found that the focused information and the accented focus produced a larger N400 effect than the conditions in which information

was not in focus. We also found that the depth of syntactic processing is influenced by IS. The depth of syntactic processing was reflected in the size of the P600 brain response to the syntactic violations. For one type of syntactic violation, we only found a P600 effect in the focus condition, but not in the non-focus condition (the Chomsky-illusion). Together, these results suggest that IS modulates both semantic and syntactic processing. In addition, the reduced N400/P600 effects in response to violations in the non-focus conditions are compatible with the idea that language is processed in a 'good-enough' manner, implying that people sometimes engage in shallow processing and achieve incomplete representations.

Artificial grammar learning

During the past decade, artificial language learning paradigms have revitalised the study of language acquisition and language evolution. Human languages are characterised by the design features of language: discreteness, arbitrariness, productivity, and the duality of patterning (i.e., elements at one level are combined to construct elements at another). These properties arise from how the human brain develops and learns in interaction with its environment. In a series of behavioural and TMS experiments, we established the qualitative equivalence between acquiring adjacent as well as non-adjacent dependencies, both context-

free and context-sensitive. Moreover, it was found that Broca's region is causally involved in artificial syntax processing, as indicated by performance modulation of TMS to this region.

Other subprojects

- A brain computer interface for speaking
- Syntactic priming and repetition suppression/enhancement
- Oscillatory brain dynamics of language processing
- Genetic modulation of the endophenotype for unification
- ERP evidence for the interface between syntactic and semantic processing
- Syntactic priming in bilingualism
- Neural mechanisms of grapheme-colour synaesthesia



Figure 2: Stimulus presentation in the studies on shared infrastructure for speaking and listening.

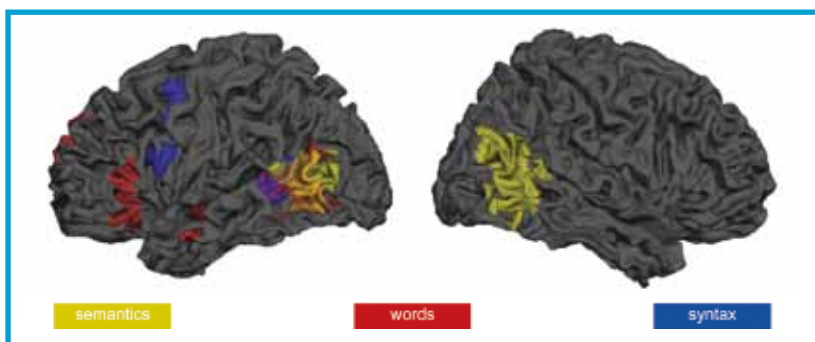


Figure 1: Shared neural infrastructure for semantic, lexical, and syntactic processes.

Selected publications

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- Hagoort, P., Baggio, G., & Willems, R.M. (2009). Semantic unification. In M.S. Gazzaniga (ed.), *The cognitive neurosciences*, 4th ed. (pp. 819–836). Cambridge, MA: MIT Press.
- Snijders, T.M., Vosse, T., Kempen, G., Van Berkum, J.J.A., Petersson, K.M., & Hagoort, P. (2009). Retrieval and unification of syntactic structure in sentence comprehension: An fMRI study using word-category ambiguity. *Cerebral Cortex*, 19, 1493–1503.
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- Xiang, H.-D., Fonteijn, H.M., Norris, D.G., & Hagoort, P. (2010). Topographical functional connectivity pattern in the perisylvian language networks. *Cerebral Cortex*, 20, 549–560.



Research group Adaptive listening

Research group Communication before language



Group coordinator Andrea Weber
Group members Neil Bardhan,
Frank Eisner, Adriana Hanulikova,
Eva Reinisch, Odette Scharenborg,
Marijt Witteman

Syntactic violations in foreign-accented speech

Hanulikova and Weber, in collaboration with Petra van Alphen (Neurobiology of language group) and Merel van Goch (Radboud U. Nijmegen), compared ERPs to gender agreement errors, which are frequently produced by second-language learners. In line with previous research, gender violations in L1 speech resulted in a P600 effect (larger P600 for violations in comparison to correct sentences), but when the same violations were produced by an L2 speaker, no P600 effect was observed. Control sentences with semantic violations elicited comparable N400 effects for both L1 and L2 speech, suggesting no general integration problem in foreign-accented speech. The findings suggest an adjustment to environmental probabilities and the direction of processing resources towards relevant (or away from irrelevant) information in L2 speech.

Short-term and long-term adaptation to foreign accents

In her PhD work, Witteman is studying the recognition of foreign-accented words by listeners with varying experience of an accent. Presentation of words spoken by a non-native speaker was followed by a visual lexical decision task (e.g., hearing Dutch *duif* ('dove') pro-

Goals of the project

Spoken language pronunciation is notoriously variable. While some variations are contextually-driven changes, others are idiosyncratic in nature. The Adaptive listening group seeks to better understand how and when listeners adapt to idiosyncratic variability, with the focus being on variability that is introduced to the speech signal by speakers with a foreign accent. The group studies the effects of foreign accents on speech perception, as well as on lexical and sentential processing. Current research questions concentrate on the prerequisites of adaptation, its time-course, and stability.

nounced with a German accent as *doif*, before responding to the printed 'duif'). While listeners with extensive experience with the German accent responded to *duif* faster after hearing *doif* (in comparison with an unrelated prime), no facilitatory priming was found for listeners with limited experience. However, when the priming study was preceded by a short exposure to the accent, listeners with limited experience learned to interpret the accented words correctly during the experiment. Interestingly, disposition to adapt was found even when no examples of the deviations were previously heard or when they had been produced by a different speaker. These results suggest that adaptation to a foreign accent can be speaker independent but also comprises aspects of speaker specificity.

Distinguishing between different types of speaker- related variation

In 2010, Eisner started his Veni project, investigating how different sources of information about a person (e.g., voice, accent, and facial identity) are represented in the brain of the listener, and how they interact in facilitating speech comprehension. These questions are

addressed using fMRI, allowing the measurement of localised brain activation while participants are passively listening to speech. The initial phase of the project examines the extent to which voices and accents are represented in shared or distinct areas of the brain of the listener. The focus is on how these representations change when listeners learn to adapt to a novel talker or accent.

Other subprojects

- Perceptual adaptation in children
- Talker-adaptation across languages
- Semantic activation by mispronunciations
- Adaptation to variation in lexical stress

Selected publications

Eisner, F., McGettigan, C., Faulkner, A., Rosen, S., & Scott, S.K. (2010). Inferior frontal gyrus activation predicts individual differences in perceptual learning of cochlear-implant simulations. *Journal of Neuroscience*, 30, 7179–7186.

Weber, A., Broersma, M., & Aoyagi, M. (2011). Spoken-word recognition in foreign-accented speech by L2 listeners. *Journal of Phonetics*. Advance online publication. doi: 10.1016/j.

Goals of the project

Human communication is premised on an understanding of others' minds and cooperative motives for acting together. How do these abilities emerge, and how do infants communicate before they have language? We investigate infants' developing social cognition and social motivation in relation to their emerging prelinguistic communication within social and cultural contexts. Our work is motivated (a) by the idea that the psychological basis of human communication develops ontogenetically prior to language and is first expressed in gestures, and (b) by the question of whether social and cultural differences in interaction influence infants' emerging prelinguistic communication.

Infant social cognition and communication

In this subproject we investigate the social-cognitive and cooperative basis of human communication before language. We investigate how infants understand others from a second-person perspective as they interact with them, and how infants understand others from a third-person perspective as they observe them interact. We found that one-year-olds use their non-verbal pointing gesture to correct and warn others in anticipation of action mistakes or mishaps, based on mental state attributions and prosocial motivation. Currently, we investigate how infants reach for objects under solitary and social conditions, and the influence of distance and mobility on infants' communicative requests. From a comprehension perspective, we further investigate how infants understand non-verbal pointing acts of displaced deictic reference, and whether infants parse and fast-map novel multimodal gesture-word representational reference. With regard to infants' third-person social understanding, we found in a novel imitation paradigm that one-year-olds attempt to reproduce a joint action when the action demonstration contained two persons with a shared

goal as opposed to parallel goals or only one person. In eye-tracking studies we further investigate infants' expectations about others' verbal and gestural interactions.

Socialisation of prelinguistic communication

In this subproject we investigate how types and frequency of social interaction influence the emergence of prelinguistic communication and social cognition. For example, in semi-natural and experimental interaction studies we found that the shared activity of joint regarding elicits more pointing than the shared activity of joint acting. We also found that infants invite an adult to join in an activity more if the adult has previously interacted with them in synchronous mimicry than when the adult has conducted different actions. To further investigate the naturally occurring differences in social interactions, we use a cross-cultural approach. We found systematic differences in the frequency of home-recorded, naturally occurring bouts of object-directed shared activity in 8- to 15-month-old infants of the Yucatec Mayans, Dutch, and Shanghai-Chinese.

Group coordinator Ulf Liszkowski
Group members Guðmundur Bjarki Þorgrímsson, Christine Fawcett, Thomas Grünloh, Birgit Knudsen, Patricia Manko, Daniel Puccini, Veronica Ramenzoni, Dorothé Salomo, Janne Willems, Rocio Silva Zunino

The differences in the frequency of shared activity predicted differences in infants' usage of deictic gestures and in the emergence of index-finger pointing. At the same time we found cross-cultural evidence from seven different cultures for a universal usage of index-finger pointing around 10- to 14-months of age, revealing a prelinguistic gestural universal of human communication. Currently, we are testing infants' social cognition and communicative biases across different cultures to determine the influence of social interactional 'input' on the emergence of infant social cognition. In longitudinal studies we further test the individual contributions of parental input and social understanding on the emergence of prelinguistic communication.

Selected publications

Puccini, D., Hassemer, M., Salomo, D., & Liszkowski, U. (2010). The type of shared activity shapes caregiver and infant communication. *Gesture*, 10(2/3), 280–297.

Fawcett, C., & Liszkowski, U. (in press). Observation and initiation of joint action in infants. *Child Development*.

Liszkowski, U. (in press). Three lines in the emergence of prelinguistic communication and social cognition. *Journal of Cognitive Education and Psychology*.



Research group Comparative cognitive anthropology

Group coordinator Daniel Haun
Group members Emma Cohen,
Yvonne Rekers, Nadja Richter,
Disa Sauter, Marie Schäfer

Dancing across cultures

There is an expectation that spatial cognition is similar across all humans, given that the physical properties of space are identical across the globe. Yet, despite this expectation, cultures vary as to how they talk and think about space. For example, the ≠Akhoe Hai||om ('Hai||om'), a semi-nomadic hunter-gatherer group in northern Namibia, rarely talk about things as occupying space to their right or left, or fore or aft (egocentric terms, often used by Europeans), but use an environment-based system with north, south, east, and west axes. The Hai||om apply this kind of language to objects in space (e.g., 'The stick is north of the pebble.'). Importantly, this system is also characteristic of how they memorise the locations of things. In this project, we aimed to find out whether the Hai||om might memorise movements of their own body, which are clearly egocentric in nature, within an environment-based system. We asked Hai||om children to reproduce a short choreographed dance from memory. After the training, we rotated them 180 degrees around their own axis for the test. When reproducing the dance from memory, most of them maintained the same compass directions they had learned in the training, and thus they moved left where we had taught them to move right (Figure 1). In contrast, German children repeated the learned right-left movements without considering which direction they were facing.

Goals of the project

The group was established in 2008 and is hosted at the MPI for Psycholinguistics and the MPI for Evolutionary Anthropology. We are an interdisciplinary team of psychologists, biologists, and anthropologists. We explore how patterns of cultural variation are related to variable cognitive function, and aim to determine the underlying set of psychological mechanisms that allow and stabilise cross-cultural variability. To achieve this, we combine cross-species, cross-cultural, and developmental experimentation.



Figure 1: Choreographed dance experiment.

Conformity to peer pressure

With little or no reflection, we adopt the ever-changing fads and fashions of those around us, sometimes even conforming to the majority opinion although we know better ourselves. Conformity to the majority opinion serves a crucial function in the transmission of human culture by promoting quick and stable in-group uniformity, which then stabilizes between-group cultural diversity over time. In this project, we sought to establish if children as young as four years of age submit to peer pressure. We found that preschool children conform to peer pressure despite better knowledge to the same extent as adults do. They did so much more if their judgments were given publicly in front of their peers than when they were given privately to the experimenter only – thus the peers did not influence children's 'real' opinion, but only their public expression of it.

Selected publications

- Haun, D.B.M., & Rapold, C.J.** (2009). Variation in memory for body movements across cultures. *Current Biology*, 19(23), R1068–R1069.
- Haun, D.B.M., Jordan, F.M., Vallortigara, G., & Clayton, N.** (2010). Origins of spatial, temporal and numerical cognition: Insights from comparative psychology. *Trends in Cognitive Sciences*, 14, 552–560.
- Sauter, D.** (2010). Are positive vocalizations perceived as communicating happiness across cultural boundaries? *Communicative & Integrative Biology*, 3(5), 440–442.
- Sauter, D.** (2010). More than happy: The need for disentangling positive emotions. *Current Directions in Psychological Science*, 19, 36–40.
- Haun, D.B.M., & Tomasello, M.** (in press). Conformity to peer pressure in preschool children. *Child Development*.

Research group Evolutionary processes in language and culture



Group coordinator Michael Dunn
Group members Fiona Jordan,
Vishnupriya Kolipakam,
Ger Reesink, Annemarie Verkerk

Goals of the project

Human variation in language, culture, and genetics is strongly influenced by history. This interdisciplinary group aims to investigate historical explanations of diversity and change in a scientific framework. We use quantitative evolutionary methods to test hypotheses about diversity. Using these approaches, we answer questions about the diffusion of people and languages, and test generalisations about processes of linguistic and cultural change both in and across families. Ultimately, this research elucidates the evolutionary processes underlying variation in domains ranging from phonology and morphosyntax, to lexical semantics and social organisation.

Population and language history

Dunn has produced new phylogenies of the Aslian (Austroasiatic) and Indo-European language families. These improved family trees shed light on the prehistory of these groups, and provide the basic model of linguistic/cultural relatedness crucial to more extensive phylogenetic comparative method investigations on features of other linguistic and cultural domains. Kolipakam has compiled an extensive database of mitochondrial, Y-chromosome, and recombinant DNA of Pacific populations. Her simulation work will discriminate between hypotheses explaining genetic diversity in the region: are patterns a result of social/structural factors, or can they be explained by stochastic forces?

Evolutionary processes

To understand patterns of diversity in the present we examine evolutionary processes that acted in the past. Members of the group are using phylogenetic comparative methods to model processes of change in language families such as correlated evolution, rates of change, modes of evolution, and ancestral state reconstruction (Figure 1). Jordan is inves-

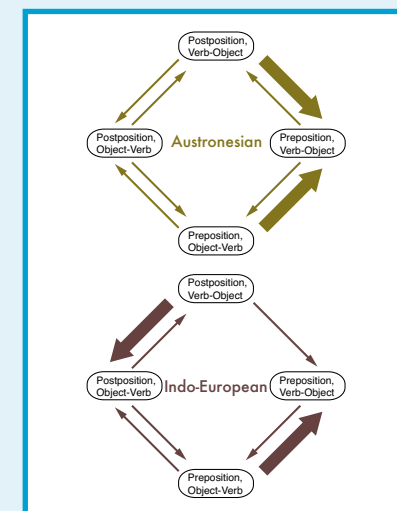


Figure 1: Bayesian methods infer different models of word order correlations in Austronesian and Indo-European languages. Approximate probability of changing between states is indicated by the weight of the arrow.

tigating change and continuity in social norms of kinship, testing predictions from evolutionary theories of parental investment. Work on the Austronesian kinship terminologies and social organisation has reconstructed ancestral kin-term meanings, and shows how we can test language-culture coevolution. Verkerk's PhD project investigates the diversity of motion event encoding in the Indo-European languages using a parallel corpus from translations of Lewis

Carroll's *Alice in Wonderland* and *Through the Looking Glass*, and Paulo Coelho's *O Alquimista*. As well as producing a rich body of comparative typological data, this project is addressing the phylogenetic and areal basis of the distribution of motion encoding systems.

Evolution of semantic systems

With Asifa Majid (Language and cognition group), Dunn and Jordan have developed a fieldwork task to elicit naming systems across cognitively important domains. Ultimately, the task will be carried out on 50 Indo-European languages, with 20 speakers each. Our understanding of semantic variation has never before been investigated in this large-scale, phylogenetically-controlled, ecologically-valid way.

Selected publications

- Dunn, M.** (2009). Contact and phylogeny in Island Melanesia. *Lingua*, 11(11), 1664–1678.
- Reesink, G., Singer, R., & Dunn, M.** (2009). Explaining the linguistic diversity of Sahul using population models. *PLoS Biology*, 7(11), e1000241.
- Dunn, M., Burenhult, N., Kruspe, N., Becker, N., & Tufvesson, S.** (in press). Aslian linguistic prehistory: A case study in computational phylogenetics. *Diachronica*.
- Jordan, F.** (in press). A phylogenetic analysis of the evolution of Austronesian sibling terminologies. *Human Biology*.



Max Planck Fellow Syntax, typology, and information structure

External group Language in our hands: Gesture and sign language



Group coordinator

Robert Van Valin, Jr.

Group members

Jeremy Hammond, Dejan Matić,
Saskia van Putten

Goals of the project

The interaction of pragmatics and grammar happens on several levels and can affect grammar in various ways, from determining word order and/or prosody, to affecting the morphological system. Since these interactions of information structure and morphosyntactic form differ from language to language, important questions arise. What are the co-occurrence patterns of these interactions? Are there constraints on the co-occurrence of these interactions? Starting from these research questions, we determine the role of information structure in explaining cross-linguistic differences in grammatical systems. The group also investigates and re-evaluates the status of the information structure primitives (topic, focus, contrast, etc.) as cross-linguistically valid categories. We combine extensive corpus analysis of the data in their respective languages with production experiments.

Current research

The members of the group are involved in describing the interaction of information structure, syntax, and semantics in understudied languages, and have all conducted extensive fieldwork in 2010.

Van Valin is investigating information structure phenomena in a strictly head-marking language, Lakhota (Siouan), a language with a rich article system sensitive to information-structural distinctions, including three types of indefinite article (specific, non-specific, focus-contrastive). The language appears to lack a presentational construction of the kind found in many other languages, and, in contrast to some of the other languages being investigated, it appears to use prosody alone to signal verb focus.

Hammond's field trip in Vanuatu was devoted to investigating the reference tracking system and its discourse properties in two Oceanic languages, Whitesands and Aniwa. He has collected a large amount of natural discourse data as well as elicited materials. The data collected is currently being analysed and will contribute towards an understanding of how texts' macro-structures influence their morphosyntactic properties.



Matić travelled to Northern Siberia and Kamchatka in order to collect further data on Tundra Yukaghir (isolate) and Even (Tungusic). He is focussing on the complex interplay of information structure and illocution as the determining factors of the Tundra Yukaghir sentence structure, and on the system of contrastive morphemes and the tag-question based focus marking in Even.

The language studied by van Putten, Avatime (Kwa, spoken in Ghana), has a rich system of syntactic and morphological means of marking information

structure, including particles that indicate different kinds of contrast, left-detachment, fronting, and tonal morphemes. Van Putten's work focuses on the fine-grained description of the semantics and pragmatics of these categories, based on a corpus of both elicited and natural data.

Selected publications

Matić, D. (2010). Discourse and syntax in linguistic change: Ratified topics in Serbian/Croatian. In G. Ferraresi & R. Lühr (eds.), *Diachronic studies on information structure: Language acquisition and change* (pp. 117–142). Berlin: Mouton de Gruyter.

Van Valin Jr., R.D. (2010). Role and Reference Grammar as a framework for linguistic analysis. In B. Heine & H. Narrog (eds.), *The Oxford handbook of linguistic analysis* (pp. 703–738). Oxford: Oxford University Press.

Goals of the project

Fundamentals of human communication reside not only in our ability to use speech but also to recruit our body movements for meaningful expression. Our group investigates how our bodily actions interact with language structure, processing, and use in communication across languages and cultures. We focus on two domains of human communicative behavior: (1) gestures that speakers use while speaking, and (2) sign languages (established or emerging) used by deaf people.

Speech and gesture processing

Gesture and speech are assumed to form an integrated system during language production. Based on this view, we investigated whether in comprehension the two modalities also interact mutually. In one experiment we presented participants with action primes (e.g., someone chopping vegetables), and with bimodal speech and gesture targets. Participants related primes to targets more quickly and accurately when they contained congruent information (speech: 'chop'; gesture: chop) than when they contained incongruent information (speech: 'chop'; gesture: twist). Moreover, the strength of the incongruence affected processing, with fewer errors for weak incongruities (speech: 'chop'; gesture: cut) than for

strong incongruities (speech: 'chop'; gesture: twist) suggesting that comprehenders take the semantic relations between the two modalities into account when processing either modality. These effects persisted in a subsequent experiment when we asked participants to focus on speech only, indicating the obligatory influence of gesture processing on speech.

Role of modality in sign language

We aim to investigate the roles that modalities (i.e., visual-spatial or oral-aural) play in shaping language structure. By comparing different signed languages and spoken languages we can broaden

Selected publications

Furman, R., Özyürek, A., & Küntay, A.C. (2010). Early language-specificity in Turkish children's caused motion event expressions in speech and gesture. In K. Franich, et al. (eds.), *Proceedings of the 34th Boston University Conference on Language Development*. Volume 1 (pp. 126–137). Somerville, MA: Cascadilla Press.

Kelly, S.D., Özyürek, A., & Maris, E. (2010). Two sides of the same coin: Speech and gesture mutually interact to enhance comprehension. *Psychological Science*, 21, 260–267.

Özyürek, A., Zwitserlood, I., & Perniss, P.M. (2010). Locative expressions in signed languages: A view from Turkish Sign Language (TID). *Linguistics*, 48(5), 1111–1145.

Group coordinator

Asli Özyürek
Group members Reyhan Furman,
Pamela Perniss, Beyza Sümer,
Inge Zwitserlood



our understanding of the range of structures used in natural language to encode spatial relations. Sign languages have been assumed to exploit affordances of the visual modality for analogue representations in spatial expressions, and to do so similarly across many sign languages. In this sense they have been considered to differ radically from spoken languages. We tested this claim by comparing two unrelated sign languages, German and Turkish Sign Languages, by eliciting locative descriptions from 12 signers from each sign language encoding 'on' (e.g., a cup on the table) and 'next to' (e.g., two cups next to each other) relations. Even though both sign languages showed general modality effects in locative expressions, we also found that both languages used language-specific and categorical as well as analogical structures in locative expressions. Thus, even in the domain of space, the affordances of visual modality seem to be constrained by linguistic structures and reveal linguistic diversity.

Other subprojects

- Neurocognition of gesture
- Sign/gesture development

Events and activities



2009

Syntactic Priming and Repetition Suppression / Enhancement informal workshop

Organised by Peter Hagoort. Workshop on theoretical and methodological issues around syntactic priming and repetition suppression/enhancement. Participants included MPI presenters Katrien Segaert, with Kathryn Bock (U. Illinois, Urbana-Champaign), Rob Hartsuiker (Ghent U.), Laura Menenti and Kristen Weber (Donders Institute), Utta Noppeney (MPI Biologische Kybernetik), and Christophe Pallier (INSERM-CEA). At MPI, February 11.

CLARIN WS/WF workshop

Organised by Marc Kemps-Snijders, with Núria Bel (U. Pompeu Fabra). Workshop on the requirements of web services and workflow for CLARIN. Participants included the CLARIN WP2.6 and 2.7 working groups. At U. Oxford, February 26–27.

CLARIN Technical Infrastructure workshop

Organised by Daan Broeder, Dieter van Uytvanck, and Peter Wittenburg, with Martin Wynne (U. Oxford). Workshop on the technical requirements for participants in the CLARIN research infrastructure. Participants included Antti Arpe (U. Helsinki), Núria Bel and Santiago Bel (U. Pompeu Fabra), Volker Böhlke (U. Leipzig), Elina Despiri (ILSP), Jörg Didakowski (BBAW), Gerhard Heyer (U. Leipzig), Radu Ion (RACAI), Iris Vogel (U. Helsinki), and Kai Zimmer (BBAW). At U. Oxford, February 26–27.

Universals of Sound-Symbolism workshop

Organised by Mark Dingemans, Asifa Majid, and Sylvia Tufvesson. Workshop on the regularities in form-meaning mappings, particularly with respect to expressives/mimetics/ideophones. Participants included MPI presenters Dan Dediu, Mark Dingemans, Nick Enfield, Olivier Le Guen, Hilario de Sousa, and Sylvia Tufvesson, with Mutsumi Imai and Naburo Saji (Keio U.), and Katerina Kantartzis and Sotaro Kita (U. Birmingham). At MPI, February 26–27.

MaxNet Cognition Genetics and Cognition workshop

Organised by Peter Hagoort, with Guillén Fernández (Donders Institute). Workshop on how different Max Planck Institutes and their partner institutions can join in a collaborative effort to understand the genetic basis of human cognition, especially in the domains of memory, language, and decision making. Participants included MPI presenter Peter Hagoort, with Han Brunner (Radboud U. Nijmegen), Guillén Fernández and Mark Rijpkema (Donders Institute), Ulman Lindenberger (MPI Human Development), Andreas Papassotiropoulos (U. Basel), and Arno Villringer (MPI Human Cognitive and Brain Sciences). At Berlin, March 10–11.

LEXUS and VICOS workshop

Organised by Jacquelin Ringersma and Claus Zinn. Workshop on the introduction of two LAT tools: LEXUS and VICOS. Participants included MPI presenters Marc Kemps-Snijders, Jacquelin Ringersma, and Claus Zinn, with Gaby Cablitz, (U. Kiel), Carolina Pasamonik (U. Cologne), and Shenghui Wang (VU Amsterdam). At MPI, April 2.

Time in Space workshop

Organised by Asifa Majid, with Lera Boroditsky (U. Stanford) and Alice Gaby (U. California, Berkeley). Workshop to explore the way that people from different cultures use space to represent time. Participants included MPI presenters Penelope Brown, Olivier Le Guen, Stephen Levinson, Mark Sicoli, Hilario de Sousa, and Connie de Vos, with Lera Boroditsky (U. Stanford), Sebastian Fedden (U. Surrey), and Alice Gaby (U. California, Berkeley). At MPI, April 14–15.

Social Action and Interaction workshop

Organised by Nick Enfield and Tanya Stivers. Participants included MPI presenters Penelope Brown, Kaoru Hayano, and Stephen Levinson, with Elizabeth Couper-Kuhlen (U. Potsdam), Paul Drew (U. York), and Mardi Kidwell (U. New Hampshire). At MPI, 23–24 April.

Knowledge, Responsibility, and Affiliation in Interaction workshop.

Organised by Tanya Stivers. Participants included Birte Asmuss and Jakob Steensig (U. Aarhus), Trine Heinemann (U. Southern Denmark), John Heritage (UCLA), Lello Keevallik, Anna Lindström (U. Örebro), Tomoko Matsui (U. Kyoto), Lorenza Mondada (U. Lyon), Jack Sidnell (U. Toronto), and Marja-Lena Sorjonen (U. Helsinki). At MPI, May 11–13.

CLARIN Metadata Infrastructure Developers (CMDI) workshop

Organised by Daan Broeder and Dieter van Uytvanck. Workshop on the development effort of the new CMDI. Participants included the MPI developers group and external developers. At MPI, May 14–15.

Language Archiving Technology (OAI-PMH) workshop

Organised by Mariano Gardellini and Peter Wood. Workshop on the use of the OAI-PMH protocol for metadata harvesting in large digital repositories. Participants included MPI and CLARIN members. At MPI, May 27.

DOBES training workshops

Organised by Paul Trilsbeek. Workshops on technical aspects of language documentation. At MPI, June 2–5 and October 12–15.

Language Interactions in Bilingual Comprehension symposium

Organised by Peter Indefrey and Ian FitzPatrick. Symposium on language interactions in bilingual comprehension at the 8th Dutch Endo-Neuro-Psycho meeting. Participants included MPI presenters Ian FitzPatrick and Marijt Witteman, with Walter van Heuven (U. Nottingham), Clara Martin (U. Barcelona), and Rinus Verdonshot (Leiden U.). At Doorwerth, June 5.

Visual World Eye-Tracking workshop

Organised by Adriana Hanulikova, with Dale Barr (U. Glasgow). Workshop on analysing visual world eye-tracking data. Participants included MPI and Radboud U. Nijmegen members. At MPI, August 24–25.

CLARIN NL Metadata Project Launch workshop

Organised by Daan Broeder. Workshop to launch the Dutch CLARIN metadata project. Participants included MPI and CLARIN members. At Meertens Institute, Amsterdam, August 31.

The Earliest Stages of Language Learning: 3rd A. Guiora Roundtable Conference on the Cognitive Neuroscience of Language

Organised by Marianne Gullberg, Peter Indefrey, and Wolfgang Klein. Conference on the earliest stages of natural and artificial language learning. Participants included MPI presenters Christine Dimroth, Marianne Gullberg, Peter Indefrey, Karl-Magnus Petersson, and Leah Roberts, with Doug Davidson (Basque Center on Cognition, Brain and Language), Ruth de Diego-Balaguer (U. Barcelona), Nick Ellis (U. Bangor), Gareth Gaskell (U. York), Matti Laine (Åbo Akademi U.), Shane Lindsay (U. York), Diana Lopez-Barroso (U. Barcelona), Judith McLaughlin (U. Washington), Rebekah Rast (American U. Paris), Peter Robinson (U. Aoyama Gakuin), Nuria Sagarra (Pennsylvania State U.), Riita Salmelin (U. Aalto), Kim Veroude (Vrije U. Amsterdam), and John Williams (U. Cambridge). At MPI, October 8–9.

DOBES workshop

Organised by Paul Trilsbeek, with the DOBES steering board. Workshop on language documentation and its role in linguistics, anthropology, and language maintenance. Participants included DOBES project members. At MPI, October 15–16.

DOBES advanced training course

Organised by Paul Trilsbeek. At MPI, October 14.

Cross-Cultural Infancy Research workshop

Organised by Ulf Liszkowski and Dorothe Salomo. Workshop on converging research findings on infant socialisation in different social-cultural settings obtained by the Keller group at U. Osnabrück and MPI. Participants included MPI presenters Penelope Brown, Ulf Liszkowski, and Dorothe Salomo, with Monika Abels and Heidi Keller (U. Osnabrück), and Joscha Kärtner (NIFBE). At MPI, December 10–11.

2010

Relation Registry workshop

Organised by Marc Kemps-Snijders. Workshop on clarifying the requirements for the relation registry, which has been proposed as an extension to the 12620 DCR (ISOcat). Participants included MPI members, with Alastair Burt (DFKI), Tomasello Caselli (ILC), Thierry DeClerk and Mateij Durco (U. Vienna), Jan Odijk (Utrecht U.), Inneke Schuurman (KU. Leuven), and Sue Ellen Wright (Kent State U.). At MPI, January 8.

Language-Valence Interactions workshop

Organised by Jos van Berkum, Daniel Casasanto, and Peter Hagoort. Workshop on the interface between language and the valence system, reviewing the current state of research and setting out an agenda for the future. Participants included MPI presenter Disa Sauter, with Didier Grandjean (U. Geneva), Ray Jackendoff and Gina Kuperberg (Tufts U.), Jesse Prinz (UNC Chapel Hill), and Gün Semin (Utrecht U.). At MPI, February 5–6.

Events and activities



Entertaining Interacting Minds workshop

Organised by Ulf Liszkowski and Terry Eskenazi (Donders Institute). Participants included MPI presenters Laura Cassasanto, Birgit Knudsen, Ulf Liszkowski, Asli Özyürek and external presenters Harold Bekkering, Natalie Sebanz, Hein van Schie (Radboud U. Nijmegen), Stephen Butterfill (Warwick), Agnes Kovac (Hungarian Academy of Sciences) and Ivan Toni. (Donders Institute). Discussants were Uta & Chris Frith (UCL). At MPI, February 10

Information Structure in Language Acquisition workshop

Organised by Christine Dimroth and Barbara Höhle (U. Potsdam) during the 32nd Annual Conference of the Deutsche Gesellschaft für Sprachwissenschaft (DGfS). Humboldt-U. Berlin, February 23–26.

CLARIN-NL ISOcat tutorial

Organised by Marc Kemps-Snijders and Menzo Windhouwer. Participants included MPI presenters Marc Kemps-Snijders, Dieter van Uytvanck, and Menzo Windhouwer. At Utrecht U., March 25.

Learner Varieties workshop

Organised by Christine Dimroth and Wolfgang Klein. Workshop on discourse construction and information structure in untutored second-language acquisition. Participants included MPI presenters Aoju Chen, Christine Dimroth, and Wolfgang Klein, with Bernt Ahrenholz (U. Jena), Sandra Benazzo (U. Lille 3), Giuliano Bernini (U. Bergamo), Marina Chini (U. Pavia), Rainer Dietrich, (Humboldt-U. Berlin), Patrizia Giuliano (U. Napoli), Peter Jordens (VU Amsterdam), Colette Noyau (U. Paris 3), Urszula Paprocka (U. Lublin), Christiane von Stutterheim (U. Heidelberg), Daniel Veronique (U. de Provence), and Marzena Watorek (U. Paris 8). At MPI, March 26–27.

Future of Linguistics workshop

Organised by the International Max Planck Research School for Language Sciences. Workshop on the future of linguistics that explored the implication for linguistic studies of a number of partly related paradigm shifts summarised under the label 'usage based patterns and language structure'. Participants included MPI presenters Nick Enfield and Stephen Levinson, with Louis ten Bosch, Mirjam Ernestus, Helen de Hoop, and Pieter Muysken (Radboud U. Nijmegen). At MPI, April 1.

Language Evolution in our Hands: 2nd Nijmegen Gesture Center (NGC) Spring workshop

Organised by Asli Özyürek and Connie de Vos. Workshop on the role of gesture and sign in language evolution, examining the human language capacity from a new perspective. Participants included MPI presenter Asli Özyürek, with Marie Coppola (U. Connecticut), Naja Ferjan (U. California, San Diego), Adam Kendon (U. Pennsylvania), Sotaro Kita (U. Birmingham), Pamela Perniss and Inge Zwislerlood (Radboud U. Nijmegen), Ann Senghas (Barnard College, NY), and Rachel Mayberry (U. California, San Diego). At MPI, April 19.

Introduction to R workshop

Organised by Dan Dediu, Adriana Hanulikova, and Francisco Torreira. Workshop on basic techniques in R. Participants included MPI presenters Dan Dediu and Adriana Hanulikova. At MPI, April 21, 27, and 29.

Information Structure and Complex Syntax 1 workshop

Organised by Dejan Matic together with the members of the Syntax, Typology, and Information Structure group. Workshops included the members of the group and external guests. At MPI Nijmegen, April 29.

Multi-Level Techniques with R workshop

Organised by members Dan Dediu and Adriana Hanulikova. Workshop on multi-level techniques and more advanced use of R. Participants included presenter Dale Barr (U. Glasgow). At MPI, May 10–13.

Marta and Friends symposium

Organised by Peter Hagoort. Symposium in honour of Professor Marta Kutas, who received a honorary degree from Radboud U. Nijmegen. Participants included MPI presenters Jos van Berkum and Peter Hagoort, with Mireille Besson (CNRS-CRNS), Phil Holcomb (Tufts U.), Bernadette Jansma (U. Maastricht), Bas Kortmann (Radboud U. Nijmegen), Marta Kutas (U. California, San Diego), Thomas Münte (U. Magdeburg), and Tamara Swaab (U. California, Davis). At MPI, May 19–20.

Hunter-Gatherers and Semantic Categories workshop

Organised by Asifa Majid and Thomas Widlok. Workshop on theory, method and documentation. At Neuwied, May 30–June 6.

DOBES Training workshops

Organised by Paul Trilsbeek. Workshops on technical aspects of language documentation. At MPI, June 7–10 and October 11–14.

Neurobiology of Syntax symposium

Organised by Karl-Magnus Petersson. Symposium at the Federation of European Neuroscience Societies (FENS) Forum of European Neuroscience. At Amsterdam, July 3–7.

1st Summer School of the International Society for Gesture Studies (ISGS)

Organised by Judith Holler, with Mandana Seyfeddinipur (SOAS) and Lorenza Mondada (U. Lyon). Summer school on 'Handling gesture: Theory and method in gesture studies'. At Frankfurt a.d. Oder, July 19–24.

RELISH workshop

Organised by Marc Kemps-Snijders and Jacquelyn Ringersma. Workshop on rendering endangered languages lexicons interoperable through standards harmonisation. The RELISH project is funded by the DFG/NEH bilateral Digital Humanities programme. At MPI, August 4–5.

CLARIN-NL ISOcat workshop

Organised by Marc Kemps-Snijders and Menzo Windhouwer, with Sue Ellen Wright (Kent State U.). Workshop on standardising data categories in ISOcat, implementing group work for thematic domains, at the 2010 Terminology and Knowledge Engineering (TKE) conference. At Dublin, August 14.

Comparative Pragmatics workshop

Organised by Nick Enfield. Workshop on comparative pragmatics. Participants included MPI presenters Gertie Hoymann, Gunter Senft, and Thomas Widlok, with Keiko Abe, Yoko Fuji, Sachiko Ide, Kuni Kataoka, Yasuhiro Katagiri, and Sugawara Kazuyoshi (U. Tokyo), and Ad Foolen (Radboud U. Nijmegen). At MPI, September 6.

Humanities of the Lesser-Known workshop

Organised by Niclas Burenhult, with Arthur Holmer, Anastasia Karlsson, Hakan Lundström, and Jan-Olof Svantesson (Lund U.). Workshop on new directions in the description, documentation, and typology of endangered languages and music. Participants included MPI presenters Mark Dingemanse, Jeremy Hammond, Asifa Majid, Hilario de Sousa, Sylvia Tufvesson, and Peter Withers. At Lund U., September 10–11.

Action Ascription in Social Interaction workshop

Organised by Tanya Stivers. Participants included MPI presenters Nick Enfield, Kobin Kendrick, Stephen Levinson, and Giovanni Rossi, with Alessandro Duranti, Kaoru Hayano, Elinor Ochs, and John Schumann (UCLA). At UCLA, October 6–11.

'Taal op School' symposium

Organised by Nienke Dijkstra, with Lizet van Ewijk and Rob Zwislerlood (U. Utrecht), Evelien Krikhaar (Expertisecentrum Nederlands), and Judith Rispen and Marga van Schalwijk (U. Amsterdam). At Amsterdam, October 8.

DOBES workshop

Organised by Paul Trilsbeek, with the DOBES Steering Board. Workshop on advances in documentary linguistics. Participants included DOBES project members. At MPI, October 15–16.

AVATECH expert workshop

Organised by Eric Auer, Przemyslaw Lenkiewicz, Han Sloetjes, and Peter Wittenburg. Participants included Rolf Bardeli, Daniel Schneider and Sebastian Tschöpel (Fraunhofer IAIS), Lou Boves (Radboud U. Nijmegen), and Stefano Masneri and Oliver Schreer (Fraunhofer HHI). At MPI, November 16–17.

AGL and FLT workshop

Organised by Peter Hagoort, with Tecumseh Fitch (U. Vienna). Workshop on AGL and FLT. Participants included MPI presenters Willem Levelt, Karl-Magnus Petersson, and Meinou de Vries, with Jörg Bahlmann, Angela Friederici, and Michiru Makuuchi (MPI Human Cognitive and Brain Sciences), Carel ten Cate (IBL), Tecumseh Fitch (U. Vienna), Timothy Gentner (UCSD), Gerhard Jäger (U. Tübingen), Kazuo Okanoya (U. Chiba), Christopher Petkov and Jennifer Sturm (U. Newcastle), Fenna Poletiek (U. Leiden), and James Rogers (Earlham College Richmond). At MPI, November 23–24.

Information Structure and Complex Syntax 2 workshop

Organised by Dejan Matic together with the members of the Syntax, Typology, and Information Structure group. Workshops included the members of the group and external guests. At MPI Nijmegen, December 16.

Lectures and colloquia

2009

Nijmegen Lectures

December 7–9, | **Morten H. Christiansen**, Cornell U. and Santa Fe Institute

Understanding language across multiple time-scales: Evolution, acquisition, and processing

The series included three morning lectures: 'Language as shaped by the brain', 'Language acquisition as multiple-cue integration', and 'Language processing as a usage-based skill'. Discussants in the afternoon seminars were Nick Enfield, and Karl-Magnus Petersson (MPI Psycholinguistics); Fernanda Ferreira (U. Edinburgh); Simon Garrod (U. Glasgow), Elena Lieven (MPI Evolutionary Anthropology), Fermin Moscoso del Prado (U. Aix-Marseille), Sharon Peperkamp (U. Paris 8), Andy Smith (U. Edinburgh), and Pienie Zwitserlood (U. Münster). The lectures were organised in collaboration with Radboud U. Nijmegen by Nanjo Bogdanowicz, Dan Dediu, Sabine Hunnius, and Dorothé Salomo.

Donders Lectures

March 20 | **Doug Crawford**, York U.

Neural mechanisms for Donders' law in 3-D gaze shifts

May 4 | **Eric Mick**, Harvard U.

Examining the genetic basis of ADHD and its associated impairments

May 29 | **Nancy Bonini**, U. Pennsylvania

Human neurodegenerative disease: Insights from Drosophila genetics

July 3 | **Bob Knight**, U. California, Berkeley

Cortical function in humans: Insights from neurosurgical patients

September 25 | **Nicky Clayton**, U. Cambridge

The evolution and development of mental time travel

November 27 | **Wolfgang Maass**, Graz U. of Technology

Understanding neural computation from the perspective of the brain as a learning machine

MPI Colloquium series

January 27 | **Geoffrey Pullum**, U. Edinburgh

What is this thing called systematicity?

February 17 | **Kathryn Bock**, U. Illinois

Between number sense and number syntax

March 17 | **Gergely Csibra**, Central European U. Budapest

Natural Pedagogy: Infants are prepared to learn from others

April 21 | **Kenny Smith**, Northumbria U.

Language change and language evolution in the laboratory

May 12 | **Irit Meir**, U. Haifa and **Mark Aronoff**, Stony Brook U.

How the body shapes languages

June 30 | **Paul Smolensky**, Johns Hopkins U.

Relating competence and performance in phonological encoding through neural network computation

September 22 | **Debbie Mills**, U. Bangor

The effects of experience on early brain and language development

October 20 | **Riitta Salmelin**, Helsinki U. of Technology

Neural processes of reading

November 24 | **Simon Kirby**, U. Edinburgh

The instinct to acquire an art: How Darwinian are recent approaches to the cultural evolution of language?



2010

Nijmegen Lectures

December 6–8 | **Aniruddh D. Patel**, The Neurosciences Institute

Music, language, and the brain

The series included three morning lectures: 'Rhythm and melody', 'Syntax and meaning', and 'Evolution'. Discussants in the afternoon seminars were Eckart Altenmüller (Institute of Music Physiology and Musicians' Medicine), Holly Branigan (U. Edinburgh), Eric Clarke (U. Oxford), Michael Dunn (MPI Psycholinguistics), Usha Goswami (U. Cambridge), Henkjan Honing (U. Amsterdam), Lawrence Parsons (U. Sheffield), Barbara Tillmann (CNRS-UMR 5020 Lyon). The lectures were organised in collaboration with Radboud U. Nijmegen by Nanjo Bogdanowicz, Daniel Casasanto, Agnieszka Konopka, Makiko Sadakata, and Kirsten Weber.

Donders Lectures

February 4 | **Ray Jackendoff**, Tufts U. and Santa Fe Institute

The cognitive structure of value, fairness, and reciprocity

February 4 | **Charles Schroeder**, Nathan S. Kline Institute for Psychiatric Research

Description active sensing, neuronal oscillations, and perceptual selection

June 3 | **Eleanor Maguire**, U. College London

Decoding memories in the human hippocampus

September 2 | **John Gabrieli**, Massachusetts Institute of Technology

Development of perception, memory, and language in the human brain

October 7 | **Matthew Rushworth**, U. Oxford

The role of the prefrontal cortex in changing behaviour

December 2 | **Tobias Bonhoeffer**, MPI Neurobiology

How experience changes the circuitry of the brain

MPI Colloquium series

January 26 | **Jonas Obleser**, MPI Human Cognitive and Brain Sciences

From sound to meaning: Mapping auditory comprehension in the human brain

February 16 | **Uta Frith**, U. College London

Why we need cognitive explanations of autism?

March 23 | **Jonathan Harrington**, U. Munich

Is sound change a natural consequence of the relationship between language and speech?

April 13 | **Elena Lieven**, MPI Evolutionary Anthropology; U. Manchester

How does what the child hears affect how grammar develops?

May 11 | **Dale Barr**, U. Glasgow

On the distributed nature of mutual understanding

June 14 | **Karalyn Patterson**, U. Cambridge

How independent of semantics are phonology and syntax? Evidence from semantic dementia

September 21 | **Julia Simner**, U. Edinburgh

Yellow-tasting sounds? The cross-sensory world of synaesthesia

October 19 | **Manuel Carreiras**, Basque Center on Cognition, Brain and Language

Mechanisms of agreement

November 23 | **Usha Goswami**, U. Cambridge

Developmental Dyslexia: A temporal sampling framework



Infrastructure Technical Group

Infrastructure The Language Archive



Group coordinator

Reiner Dirksmeyer (acting head)

Group members Herbert Baumann, Dik van den Born, Alex Dukers, Ronald Fischer, Gerd Klaas, John Nagengast, Albert Russel, Kees van der Veer, Ad Verbunt, Rick van Viersen, Johan Weustink

Goals of the group

The Technical Group (TG) has two major goals: (1) to provide the infrastructure of labs, servers, and field equipment for the day-to-day running of the institute, and (2) to develop new experiment systems and software that enable new scientific developments within the institute.



Figure 1: Supermarket experiment in VR lab.

normally not be possible. In order to enhance the reality of the participants' experience, the lab is equipped with a 3D sound system and a floor that can shake to simulate motion. There are video cameras and microphones to record participants' behaviour during an experiment. The very precise motion capture equipment in the lab makes it possible to record detailed information of gestures and other movements made by participants. First tests with simultaneous EEG measurement were successful so that experiments with the combination of EEG and virtual reality can be done in the future.

The main neuroimaging facility, including infant EEG and eye-tracking labs, is housed in the Donders Centre for Cogni-

tive Neuroimaging, where 1.5t and 3t fMRI, MEG, and EEG labs are maintained by a separate technical group in close coordination. During the last year, the experimental systems have been harmonised between the two facilities.

Field expeditions

The institute makes use of over 20 field-sites around the world which allow cross-linguistic comparison and experiment. During the period of review, 34 field trips were fully equipped with everything from solar panels to portable eye-trackers. Much specialised equipment has to be acquired, tested, and adapted. First steps have been taken to switch over to semi-professional high definition cameras for fieldwork.

Goals of the group

The Language Archive (TLA) is a new unit at the institute that was established (1) to maintain and extend the existing digital archive of language material, and (2) to continue the development of advanced software tools for the creation, archiving, access, and federation of language resources. To achieve this goal it will continue to collaborate in national, European, and international projects.

Language archive

TLA maintains one of the largest online accessible digital archives, with language data currently covering about 74 terabytes and documenting about 200 languages. This includes the archive on endangered languages created in the DOBES (Documentation of endangered languages) programme of the Volkswagen Foundation. In addition, the language archive includes a large variety of material about, for example, language acquisition, second-language acquisition, sign language, gesture studies, and multilingualism studies. All resources are described by metadata that is open to everyone, however, access to many resources is restricted to collaborations due to IPR considerations. Most of the archived resources are stored according to international standards (XML, MPEG, linear PCM, etc.). Recently, TLA started supporting the creation and storing of uncompressed video according to the MJPEGz000 Standard.

Language archiving technology

TLA's team created the Language Archiving Technology software suite over the last two decades – a unique set of tools that cover the life cycle of

language resources. The ELAN annotation tool and the LEXUS lexicon tool allow users to create and analyse language resources. The IMDI Editor and ARBIL allow users to create metadata and LAMUS allows uploading metadata and data into the archive, checking for consistency. ANNEX, IMEX, and LEXUS allow users to access and analyse the resources via the web. VICOS is a tool allowing users to create relations and to navigate in conceptual spaces.

We are participating in a number of projects, in particular the CLARIN project, which aims to establish a research infrastructure fostering the integration and interoperability of language

Group coordinators

Wolfgang Klein and Peter Wittenburg

Group members Eric Auer, Hugo Garcia Blanco, Daan Broeder, Hennie Brugman, Paul van Caspel, Patrick Duin, Willem Elbers, Binyam Gebrekidan Gebre, Mariano Gardellini, Rob Klein Hofmeijer, Alexander Koenig, Thomas Koller, Lari Lampen, Przemek Lenkiewicz, Andre Moreira, Jacquelijjn Ringersma, Guilherme Silva, Han Sloetjes, Aarthy Somasundaram, Paul Trilsbeek, Dieter van Uytvanck, Tobias Valkenhoef, Lucas Vergeest, Huib Verwey, Menzo Windhouwer, Peter Withers, Florian Wittenburg, Nick Wood

resources and services offered by most European centres. Another project, AVATECH, is devoted to creating robust audio/video recognisers that do automatic annotation to overcome the manual annotation bottleneck. Also, the CLARA project, an EC-funded Marie Curie programme, allowed us to add one postdoctoral and two PhD student positions to the AVATECH work.





International Max Planck Research School for Language Sciences

Spokesperson Stephen Levinson
Coordinator Els den Os
Assistant Rachel Sheer

Launched in September 2009, the International Max Planck Research School (IMPRS) for Language Sciences is a joint initiative of the Max Planck Institute for Psycholinguistics and two partner institutes based at Radboud U. Nijmegen, the Donders Institute for Brain, Cognition and Behaviour and the Centre for Language Studies.

Students

Each year, the research school offers three funded PhD fellowships, and recruits the rest of its excellent students from existing PhD positions within the partner institutes. There are 36 PhD students in the 2009 and 2010 IMPRS for Language Sciences year groups, representing 14 different countries of origin.

The students are supervised by nearly 40 researchers, and they are encouraged to make additional collaborative connections within all three of the partner institutes. The research school helps to build these bridges between institute groups and the students' diverse PhD projects.

Training programme

The Nijmegen campus is rich in expertise across the language sciences. These resources are brought together for IMPRS for Language Sciences students through a unique training and enrichment programme. Students have access to the Research Masters courses at Radboud U. Nijmegen, such as offerings in cognitive neuroscience, behavioural sciences, and language and communication. Many choose to attend the summer/winter schools of the Landelijke Onderzoekschool Taalwetenschap (LOT). The IMPRS for Language Sciences also presents special courses based on student need – for example, in Spring 2010



IMPRS for Language Sciences fellowship students Rósa Gísladóttir (right) and Sarah Dolscheid.

a course on programming in PERL and PRAAT was offered through the research school by Holger Mitterer (Language comprehension group). In addition, students develop essential 'soft' skills, from giving effective presentations to improving their academic writing.

The IMPRS for Language Sciences will continue to develop a structured curriculum that provides its students with the foundation knowledge for multidisciplinary research careers.

Activities

All of the IMPRS for Language Sciences students also participate in core activities. These include presentations of their own work as well as high-profile guest lectures, 'meet the speaker' lunches, and themed workshops.

Organised events in 2009 and 2010 featured an open lecture by John Searle (U. California, Berkeley) in celebration of the official opening of the research school, an open lecture by Tecumseh Fitch (U. Vienna), and a multidisciplinary workshop on the future of linguistics that brought together perspectives from across the partner institutes. The research school arranged a preparatory session prior to the Nijmegen Lectures 2010, and interested students had the opportunity to meet both Aniruddh Patel and the discussants.

Research projects

The students' research projects span the breadth of the language sciences. Below is a representative selection of some of their topics:

- Salomi Asaridou (Donders, 2010): 'Functional and structural effects of early bilingualism'
- Sarah Dolscheid (MPI, 2009): 'Soft sounds and thick voices: The role of language in cross-modal metaphors'
- Alma Veenstra (MPI, 2010): 'The constraints on the specificity of referring expressions'
- Christina Bergmann, Maarten Versteegh (both CLS, 2009): 'A computational model of language acquisition'