

Project overview

Below is an overview over the 24 projects that I have conducted research in between 1993 – 2012 at Lund University, including 13 projects that I have been research leader for (marked *). Apart from the listed projects, I have coordinated an interdisciplinary Advanced study group at Pufendorf institute in Lund (2012– 2013). Projects during my time in the Czech Republic and Germany (1986 - 1992) are not included.

1. EyeLearn: Using visualisations of eye movements to enhance metacognition, motivation, learning

The overall goal of this project is to implement a technological classroom of tomorrow, which can be used for studying, supporting and improving metacognitive reflection in pupils in Compulsory and Upper Secondary School. We development and implement a eyetracking-based tools in which we can also measure, quantify and improve learning behaviour.

Research leader

Kenneth Holmqvist, Humanities Lab

Researchers

Jana Holsanova, Cognitive Science

Marcus Nyström, Humanities lab

Alexander Strukelj, Humanities lab

Status: Present (2013- 2015) **Subjects:** Cognitive Science **Department:** Humanities lab, Cognitive science dept.

External funding: Marcus and Amalia Wallenberg Foundation

2. Audio description and multimodality (Syntolkning och multimodalitet) (*)

Being able to experience visual scenes, pictures, gestures and facial expressions is something that we take for granted. Visually impaired audiences, however, can miss out important things that are only visible but are not articulated by means of language or sounds. Audio description allows persons with vision impairments to have greater access to images.

Research leader

Jana Holsanova, Cognitive Science

Reseachers

Alexander Strukelj, Humanities lab

Nils Holmberg, Humanities lab

Status: Present (2012-2013) **Subjects:** Cognitive Science **Department:** Philosophy

3. How image content correlates with image perception (*)

Printed newspapers contain various images that accompany and illustrate news articles: photographs, maps, drawings, information graphics, diagrams, graphs, computer-generated graphics. However, very little is known about how readers interact with these images. Which types of images get most attention? Which image contents are attended to most by the readers?

In our interdisciplinary project, we combine theories and methods from media and communication studies and cognitive studies on visual perception in order to find out how image content correlates with image perception. We use a relational database that we have created during previous newspaper studies where we used eye tracking methodology (see project "Reading styles on a newspaper spread - semiotic analysis and eye movement analysis"). In the current project, we proceed in the following way: First, we create a coding scheme and conduct a content analysis of the images in the newspaper material. Second, we formulate hypothesis about readers interaction with these images. Third, we use collected data from newspaper reading in our database and correlate our hypotheses with readers' authentic interaction with the newspaper images.

Research leaders

Jana Holsanova, Cognitive Science

Helena Sandberg, Media and communication study

Researchers

Nils Holmberg, Media and communication study

Nelly Theobald, Master student affiliated to the Department of Communication and Media, Trier university

Status: Present (2012) **Subjects:** Cognitive Science, Media and communication study **Department:** Cognitive science dept., Media and communication study.

4. Cognition, communication and learning. Thinking in time. Linnaeus environment.

The research concerns the interplay between cognition, communication and learning. We investigate temporal processes at different levels of brain and behaviour. How do humans learn concepts? How does language and culture affect learning and attention? How do disabilities influence timing? How does the capacity of the brain to simulate actions influence the ability to plan and communicate?

Research leader

Peter Gärdenfors, Cognitive Science

Researcher

Jana Holsanova, Cognitive Science

... and about 40 other researchers, doctoral students and post docs from three faculties.

Status: Present (2009–2018) **Subjects:** Cognitive Science **Department:** Department of Philosophy

External funding

2009 – 2018: The Swedish Research Council

Project description

Jana Holsanova is responsible for two sub-projects within the Linnaeus environment:

(1) *Mental images*. Our goal is (a) to examine mental image representations, their role in human cognition and in which situations they are used and (b) to develop methods where eye-tracking is used to study these questions. Knowledge of mental image representations in the brain has very important implications for general cognitive models of our mind, as well as for domain specific models of working memory and long term memory. The results of how we use mental imagery are crucial knowledge for applied research of design, problem solving and education.

(2) *Interplay between language and visual information in communication*. The overriding goal is to investigate how speakers integrate language and pictures in communication. Do pictures contribute to a better common ground and to a "meeting of minds"? Do they activate concepts, make production/perception easier? Can partners better predict/simulate the others mind? Can we bridge the psycholinguistic tradition (visual world paradigm) and the conversation analysis tradition? The goal of the project is to both broaden the current psycholinguistic discussion (integrating neglected areas from conversational analysis) and to expand on the experimental evidence in favour of more naturalistic set-ups.

5. Double information - more or less comprehension? Reading comprehension with and without the aid of pictures

About 5-17% of the population is estimated to suffer from dyslexia. We will measure how dyslexic readers and controls glean information from traditional multimodal documents using standard questionnaires and eye-tracking.

Research leader

Mona Holmqvist, Göteborgs Universitet

Researchers

Jana Holsanova, Cognitive Science, LU

Marcus Nyström, Humanities laboratory, LU

Eva Wennås Brante, Högskolan Kristianstad

Status: Present (2011–2013) **Subject:** Education Science **Department:** Humanities laboratory

External funding: 2011 – 2013, The Swedish Research Council

6. Methodologies for visual communication and multimodal research (*)

The edited volume “Methodologies for multimodal research”, edited by Jana Holsanova, (Visual communication, 2012: 11 (3), Sage) is focusing on novel methods and tools for the analysis of visual communication and multimodality. It comprises a set of six papers and a book review and brings together international researchers from Germany, Sweden, Denmark, United States and Singapore representing various disciplines: communication and media studies, social semiotics, cognitive science, educational psychology, health studies and visual communication. The papers cover and integrate a wide range of theoretical and methodological approaches to visual communication and multimodality and use an interdisciplinary framework and triangulation of methods. The methods include content analysis, social semiotic analysis, eye tracking measurements – in combination with think aloud protocols and retrospective interviews –, as well as iconology and psychophysiological real time measurements. The respective approaches are exemplified through detailed analyses of a variety of materials, including press photography, art, multimodal health education materials, Power Point presentations, Internet advertisements and TV media discussions.

Research leader

Jana Holsanova, Cognitive Science

Status: Completed (2011-2012) **Subjects:** Cognitive Science **Department:** Philosophy, Humanities Lab

7. The interplay between language and images in various media (*)

The texts we face today often consist of many different elements: body text, headings, pictures, captions, lists, quotes, charts, graphs. It is also more common that we get information from online sources. But we still know very little about how the reading process looks like and how readers connect information from different linguistic and pictorial sources in order to create meaning.

In the book "Myths and facts about reading. On the interaction between language and images in various media" (Norstedts 2010), assumptions and opinions on reading behaviour are confronted with the results of our new empirical research. We show how readers actually behave when they read various printed and digital documents, and we give examples of how to make it easier for readers to find and understand information and navigate in the documents. The book contains practical recommendations for the

Associate Professor Jana Holsanova, Cognitive Science Dept., Lund University

design of printed and digital documents that consist of language, images and other graphic resources. The book also gives recommendations on how to create more reader-friendly texts.

Research leader

Jana Holsanova, Cognitive Science

Status: Completed (2009-2010) **Subjects:** Cognitive Science **Department:** Philosophy

8. The existence and use of mental images

We have in previous studies shown that eye movements to a high degree do reflect spatial positions from a mental visualization of a scene or a picture. This project, therefore, uses eye-tracking to study mental image representations, their role in human cognition and in which situations they are used. Our method has proven to be very potent and many aspects of mental imagery will be investigated.

Research leader

Kenneth Holmqvist, Humanities Lab

Researcher

Jana Holsanova, Cognitive Science
Roger Johansson, Linguistics and Phonetics

Status: Completed (2009–2011) **Subjects:** Cognitive Science **Department:** Humanities Lab

External funding: 2009 – 2011, The Swedish Research Council

9. Discourse, vision and cognition (*)

In my book: Discourse, vision and cognition (Benjamins 2008), I investigate the dynamic process of picture discovery, the process of picture description and cognitive processes underlying both. What do we attend to visually when we describe something verbally? How do we construct meaningful units of a scene during the scene discovery? How do we describe a scene on different occasions for different purposes? Are there individual differences in the way we describe and visualise a scene?

The point of departure in this book are complex units in spoken language description and visual units during the process of picture viewing. Observers perceive the picture on different levels of detail, mentally group the elements in a particular way and interpret both WHAT they see and HOW the picture appears to them. All this is reflected in the stepwise process of picture viewing and picture description. The transcripts of spoken discourse – including prosody, pausing, interactional and emotional aspects – contain

Associate Professor Jana Holsanova, Cognitive Science Dept., Lund University

not only ideas about concrete objects, their shapes, qualities and spatial relations but also the describers' impressions, associations and attitudes towards them. This enables us to study the complex dynamics of thought processes going on during the observation and description of a scene.

I combine eye movement protocols and verbal protocols as two windows to the mind in order to shed light on the underlying cognitive processes.

Research leader

Jana Holsanova, Cognitive Science

Status: Completed (2008) **Subjects:** Cognitive Science **Department:** Cognitive science dept.

10. Multimodal learning (*)

How do pupils integrate information from different sources? How does it influence learning? The aim of the project is to study pupils' interaction with multimodal text books design, their understanding of the material and their meaning-making based on text, pictures and graphics. In order to trace this process in detail, we combine advanced eye tracking measurements with interviews and questionnaires.

Research leader

Jana Holsanova, Cognitive Science & Humanities Lab

Researcher

Nils Holmberg, Humanities Lab

Status: Completed (2009–2011) **Subjects:** Cognitive Science **Department:** Humanities Lab

External funding

2009 – 2011: The Crafoord Foundation

11. The interaction of language and vision

Earlier research has shown a strong connection between where we direct our gaze and our processing of spoken language. It is still unclear what explains this behavior, even though it is clearly involved in disambiguating utterances. This project explores alternative and complementary explanations.

Research leader

Sven Strömqvist

Researchers

Kenneth Holmqvist
Richard Andersson
Jana Holsanova

Status: Present (2010–2012) **Subjects:** Cognitive Science **Department:** Department of Philosophy, Humanities Lab

External funding

The Swedish Research Council

Project description

This research project has a number of different branches:

- 1) Is it possible that our perception is influenced differently in different languages? We focus especially on possible differences between Romance and Germanic languages and their coding of motion events.
- 2) How is the generalizability of language and vision in complex and very information-rich settings? Does the previous research hold even under extreme circumstances?
- 3) Do we use vision in language situations to more than just disambiguate utterances? Results indicate that we also let our vision narrow or broaden our discussions, but also that this sometimes disrupts natural conversations. The aim of the project is not to deliver exhaustive answers, but rather to broaden the scientific discussion inside psycholinguistics about the interplay of language and vision.

12. Multiple Windows on the Mind and Action (*)

The aim of the project is to synchronise different streams of behaviour (verbal, visual, gestural, other non-verbal behaviour) in order to explore the natural segmentation of action into functional phases or episodes, to uncover individual strategies and to study the distribution of the underlying mental processes.

Research leader

Jana Holsanova, Cognitive Science

Status: Completed (2008–2009) **Subjects:** Cognitive Science **Department:** Department of Philosophy

Project description

The project has been conducted in co-operation between Swedish and German researchers from Lund and Bremen. The project was funded by the Institute for Advanced Study (Hanse-Wissenschaftskolleg), Delmenhorst, Germany.

13. Information Graphics and Eye Movements. Tracking reader's interaction with a multimodal document genre (*)

Information graphics is a multimodal genre that is used to explain difficult theories, discoveries, to describe steps in a process, development over time, effects and consequences of an action. To understand the graphics, the reader must connect text and images. The question is whether the reader prefers multiple entry points to find his or her own way, or if the reader instead prefers to be guided.

Research leader

Jana Holsanova, Cognitive Science

Researcher

Nils Holmberg, Humanities Lab

Kenneth Holmqvist, Humanities Lab

Status: Completed (2006) **Subjects:** Cognitive Science **Department:** Department of Philosophy

External funding

2006: Helge Ax:sson Johnsson Foundation

Project description

Information Graphics is a multimodal genre used in brochures, magazines, textbooks and scientific articles. It is often embedded in an editorial text and consists of a combination of written text (keywords, phrases, whole sentences), images (abstract or naturalistic) and graphics (arrows, enhancement techniques and the like). Information graphics explains the structure and function of objects, steps in a process, and cause and effect of actions and events. Information graphics are read carefully, because readers expect to get complex issues explained. But it is not obvious how to deal with information graphics, where to begin reading and which reading paths to choose in order to create meaning of the multimodal message. Among other things, it is difficult for readers to integrate the graphical and the textual part of the message if it is not clear how they are semantically connected, and to quickly understand graphics with a complicated structure. From a cognitive and communicative point of view, an appropriate text design can control and guide the user behaviour, affect reading flow, improve understanding and support learning.

14. Reading Styles on a Newspaper Spread - semiotic analysis and eye movement analysis (*)

The main objective of the project was to investigate individual variation in newspaper reading. Methodologically, it was linked to previous research in newspaper reading, design, eye movement measurements, sociosemiotics, discourse analysis, genre theory and genre analysis. The uniqueness of our project was the multi-disciplinary combination of cognitive science, linguistics and discourse analysis.

Research leader

Jana Holsanova, Cognitive Science

Researchers

Kenneth Holmqvist, Humanities Lab
Nils Holmberg, Humanities Lab
Henrik Rahm, Scandinavian Languages

Status: Completed (2006–2007) **Subjects:** Cognitive Science **Department:** Department of Philosophy, Humanities Lab

External funding

2006 – 2007: Erik Philip-Sörensen Foundation

Project description

The results of our research shows e.g. that

- there is an individual variation in newspaper reading in form of reading styles,
- there are groups of people who read in different ways (intensive readers, selective readers, skimmers)
- these reading styles can partly be explained by the readers' personal preferences, daily reading routines, by their interests, associations and experiences,
- there are complex texts belonging to several genres that are read in various ways; this can be explained by the fact that daily press is striving to satisfy different reader groups' varied interests and needs.

The results are of interest to several scientific fields such as semiotics, genre theory, discourse analysis, media and communication studies, journalism, research, cognitive research, and design.

15. Reading during writing

Most models of the text production process include a component of reading. However there is very little research on what, when, how, and why writers read their own emerging texts and how reading influences the final text. In this project we set out to investigate this by using data collected in an earlier project that combined keystroke logging with eye tracking.

Research leader

Åsa Wengelin, Linguistics and Phonetics

Researcher

Kenneth Holmqvist, Humanities Lab
Jana Holsanova, Cognitive Science
Roger Johansson, Linguistics and Phonetics
Victoria Johansson, Linguistics and Phonetics

Status: Completed (2005–2009) **Subjects:** Linguistics **Department:** Centre for Languages and Literature

16. Language and Cognition: The Interplay between Language Production and Visual Information Gathering during Picture Descriptions (*)

The project aims to analyze the interplay between visual information retrieval (reflected in eye movement patterns) and content structuring of the production flow (reflected in the emerging picture description). The goal of this research is to highlight visual versus verbal attention, and their distribution and coordination of time.

Research leader

Jana Holsanova, Cognitive Science

Status: Completed (2003–2007) **Subjects:** Cognitive Science **Department:** Department of Philosophy

External funding

2003 – 2007: The Swedish Research Council

Project description

The main questions of the study are: (a) How information selected from a non-linguistic content domain (ie from the image), (b) how is it structured and formulated verbally, and (c) how does the scanning of the image and of the text proceed in the formulation process? The goal of this research is to elucidate the underlying cognitive processes: Visual versus verbal attention, and their distribution and coordination of time. This will offer a unique picture of what the cognitive units are, and when, and how they are processed in different modalities.

17. Diplomatic Voices and the Media (*)

The project lies in the intersection of linguistic, sociological and psychological approaches. It gives us a refined methodological tool for a systematic description of the communicative patterns and structures that conversational participants use when they position their perspectives.

Research leader

Jana Holsanova, Cognitive Science

Researcher

David Wästerfors, Sociology

Status: Completed (2002) **Subjects:** Cognitive Science **Department:** Department of Philosophy

External funding

2002: Centrum for European Studies

Project description

The project studied focus group conversations, dynamics of categorizations in conversation, polyphony of voices and intertextuality and the role of examples in argumentation. Researcher in the project was David Wästerfors (Sociology Department).

18. Readers' Interaction with Net Papers (*)

How do readers interact with net papers? The project is based on authentic empirical data and using both experimental and qualitative methods to obtain results about the general behavior, attitudes and preferences regarding the reading in this new medium.

Research leader

Jana Holsanova, Cognitive Science

Status: Completed (2001) **Subjects:** Cognitive Science **Department:** Department of Philosophy

External funding

2001: The Wahlgren Foundation

Project description

Interaction with online net papers differs significantly from reading in newspapers. Net papers are examples of network structure, characterized by the absence of a main track for navigation. The freedom to choose routes in the network is associated with danger to have problems with orientation. It is cognitively demanding to form a mental map of a site, because it is not possible to get a complete overview of the visited sites and the underlying hierarchical structure. Many readers lack search strategies, and therefore prefer visible alternatives and interaction opportunities. They select inputs which are immediately available and that they recognize. Misleading links are experienced as very confusing.

19. PARADYS project: Images of Self and Others in Decision Making Processes (*)

The objective of this project was to study the different procedures applied in the European Union with regard to citizen's participation in the regulation of deliberate release of living modified organisms. The method of conversation analysis was used to analyse the communication process in these participatory procedures.

Research leader

Jana Holsanova, Cognitive Science

Status: Completed (2001–2004) **Subjects:** Nordiska språk **Department:** Centre for Languages and Literature

External funding

2001 – 2004: European Commission

Project description

The project has an interdisciplinary character bringing in a new perspective to the investigation of permitting procedures in the administrative regulation of plant biotechnology. In particular, we have been studying the dynamics of social positionings in various debates. Seven countries participated in the research: Germany, Hungary, The Netherlands, Ireland, Italy, Sweden, and United Kingdom. The Swedish interdisciplinary team consisted of Jana Holsanova, Henrik Rahm, Mattias Baier and Håkan Hydén.

20. Dynamics of Perception and Production in Text Writing

The aim of the project is to study the dynamic relationships between production and perception in reading and writing. Researchers from the Department of Linguistics and Cognitive Science have combined two methodologies - ScriptLog and eye-tracking - to study these processes in detail.

Research leader

Kenneth Holmqvist, Humanities Lab

Researcher

Jana Holsanova, Cognitive Science

Victoria Johansson, Linguistics and Phonetics

Sven Strömquist, Linguistics and Phonetics

Åsa Wengelin, Linguistics and Phonetics

Status: Completed (2000–2004) **Subjects:** Linguistics, Cognitive Science **Department:** Centre for Languages and Literature, Department of Philosophy

External funding

2000 – 2004: Swedish Council for Research in the Humanities and Social Sciences, HSFR / The Swedish Research Council

21. "Us" and "Them": Treating Social and Ethnic Categories in Discourse

The project aims to conduct a qualitative analysis of what interlocutors do when they talk about ethnic and social groups: examine communication strategies used by the participants, exemplify the linguistic means used for these strategies, and identify the contents of ethnic and social images that come up in conversations or lie behind the formulations.

Researchers

The project was conducted jointly by Assoc. Prof. Nils Jorgensen (project leader), Nordic Language Dept., and Jana Holsanova (researcher), Cognitive Science & Nordic Language Dept.

Status: Completed (1995–1998) **Subjects:** Nordic Language Dept. **Department:** Centre for Languages and Literature

External funding

1995 – 1998: Swedish Council for Research in the Humanities and Social Sciences, HSFR
/ The Swedish Research Council

22. Vision and discourse (*)

The project addresses one of the key issues in cognitive research: How does the interplay between conceptual and linguistic representations work? How do conceptual structures of visual events map into linguistic representations when recounting what we have seen?

Research leader

Jana Holsanova, Cognitive Science

Status: Completed (1995–2000) **Subjects:** Cognitive Science **Department:** Department of Philosophy

External funding

1995 – 2000: Swedish Council for Research in the Humanities and Social Sciences, HSFR
/ The Swedish Research Council

Project description

The project studied oral presentation of visual events (image descriptions).

23. Det egna och det främmande (Us and Them)

The overall aim of this project is to examine – in a contrastive Czech-Swedish study - which strategies speakers use to justify stereotypical opinions, argue for them or modify them in the discussion with their interlocutors.

Researchers

The project was conducted in collaboration between dr. Kenneth Holmqvist (Project

Associate Professor Jana Holsanova, Cognitive Science Dept., Lund University

leader) , Cognitive Science, and Jana Holsanova (researcher), Cognitive Science.

Status: Completed (1994) **Subjects:** Cognitive Science **Department:** Department of Philosophy

External funding

1994: The Erik Philip-Sörensen Foundation

24. Conceptual Engineering: Implementation of Cognitive Semantics

The project is conducted as exploratory computer implementations of the language understanding process, after a theory built on the modern cognitive semantics. Its main components consist of an effective modeling of a number of semantic processes that are of great importance to the understanding of natural language.

Research leader

Kenneth Holmqvist, Cognitive Science

Researcher

Jana Holsanova, Cognitive Science

Status: Completed (1993–1996) **Subjects:** Cognitive Science **Department:** Department of Philosophy

External funding

1993 – 1996: Swedish Council for Research in the Humanities and Social Sciences, HSFR
/The Swedish Research Council