

{Content}:

- 1 Combining perception and action
- 2 Termination Functional Biology
Dinner with a message
- 3 Column
- 4 News & agenda

Combining perception and action

The training network 'Coordination for optimal decisions in dynamic environments' (CODDE) recently received funding from the European Union. The network consists of nine research groups with excellent international reputation and is led by Professor Andrew Welchman of the University of Birmingham. A participant from within the Helmholtz Institute is Dr. Eli Brenner of the faculty of Human Movement Sciences of the Vrije Universiteit in Amsterdam. Brenner gives us some background information. The aim of the project is to improve the understanding of how the brain extracts key information from the complex input of the natural world in order to support successful behaviour. For example, a handshake will only be successful if one correctly estimates the hand's orientation towards oneself as well as its position relative to the other hand. How information about such visual features is combined when guiding movement is still largely unknown. Traditionally, the processing of visual information for perception and for action have been two separate fields of study, but this may have severely limited our understanding of the sensorimotor processes that underlie everyday human decisions and actions. The CODDE network will attempt to meet the scientific challenge of studying perception, motor behaviour and neural activity in an integrated fashion with methodologies ranging from psychophysics to movement recordings and brain imaging. Fourteen PhD students will be trained, two of whom will be at Brenner's lab at the Vrije Universiteit.

Within the network, Brenner leads a project on the integration of perceptual features in the guiding of movement. Asked if he believes that feature integration is different when

guiding movement or with visual perception, Brenner smiles. Today, most introductory neuropsychology classes teach that there are two separate visual systems in the brain: one where visual information is processed for guiding action, and one where it is processed for 'conscious perception' (Milner & Goodale, 1995). However, Brenner and his colleagues at the Vrije University, Professor Jeroen Smeets and Dr. Denise de Grave, question this dichotomy. A popular argument for the 'two visual systems hypothesis' is that visual illusions do not affect actions. A disk is perceived to be smaller when it is surrounded by larger disks compared to when it is surrounded by smaller disks (see figure). However, the surrounding elements do not seem to influence grasping behaviour, as measured by peak grip aperture. According to Brenner and colleagues, however, peak grip aperture is not a valid measure of how size is processed for action. Size might not even be used to determine grip aperture: it could be sufficient to determine two positions on the object to which the fingers are moved. In fact, each task might use its own combination of spatial attributes, and illusions often do not affect all attributes. These attributes might be processed in specialised neural pathways, but this does not mean that information remains segregated - the pathways could interact. The CODDE network will try to assess the full breadth of such interactions with its multidisciplinary approach and a heavy focus on theoretical modelling.



Ebbinghaus figure where the visual perception of the central disk's size is biased away from the size of the surrounding disks.

Intended termination of Functional Neurobiology group in 2009

The Biology Department of Utrecht University intends to terminate its Functional Neurobiology group in 2009. We asked Professor Bert van den Berg of the Functional Neurobiology group and former director of the Helmholtz Institute to provide some background information.

The Utrecht Biology department is reorganising for financial reasons and intends to cut the number of positions within the department by almost one third (including both faculty and university-funded PhD students). Official reasons for terminating the Functional Neurobiology group include lack of past performance and severe competition within the neuro-domain from places such as Amsterdam and Nijmegen. Van den Berg, however, asserts his group has been performing around or above the future norm for the reorganised department in terms of publications, external funding and teaching. Furthermore, his group collaborates with some of the supposed competitors. He suggests that the present steps reveal a strategy to shift the department's focus towards plant biology and molecular biology, and away from approaches using animal models. Indeed, the other groups that will be terminated are involved in animal research as well.

(advertisement)

Looking for a new editor

Do one or more of the following apply to you?

A scientific mind

Facial hair

A scientific attitude

A lab coat

No fashion sense

A press card

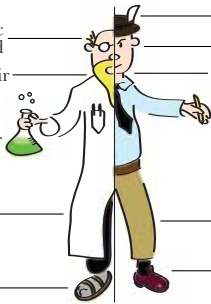
Sharp senses

No facial hair

A pencil

No lab coat

Fashion sense



...and would you like to contribute to future issues of the Helmholtz Herald? Contact us at: helmholtzherald@uu.nl.

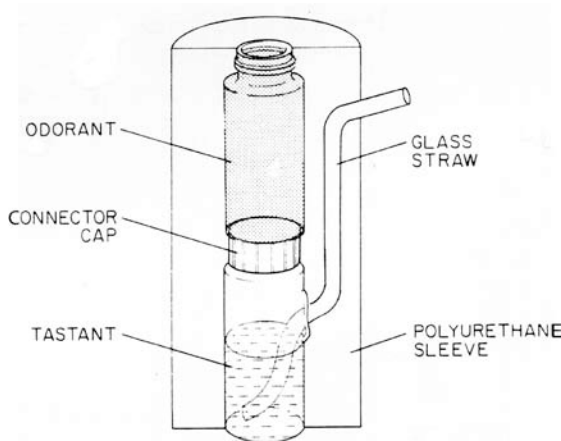
The second Helmholtz group within the department, Johan Bolhuis' Behavioural Biology group, will not be terminated, yet is supposed to shift focus and join another research institute. In terms of long-term consequences, Van den Berg is worried that the Utrecht Biology bachelor course may suffer from the loss of breadth. He anticipates a bachelor course with limited quality for students interested in animal research. There may also be repercussions for other Helmholtz members in Utrecht, for instance for the Physics of Man group which recently moved into the same building as Functional Neurobiology and Behavioural Biology to strengthen within-institute ties.

Dinner with a message

Professor Jan Kroeze of the Experimental Psychology group at Utrecht University recently hosted a dinner at 'Restaurant Zinding' in the Stadsschouwburg Utrecht. This might seem odd, as hosting dinners is not the core business of a professor. But the Stadsschouwburg has organised a series of dinners where a meal is combined with art, science, history or religion. The first edition focused on the Middle Ages and this second edition was all about smell and taste. Jan Kroeze specialises in the psychophysics of taste and smell, and was invited to give an introduction into the mechanisms that contribute to our experience of food taste.

Cooking is an art, but how we taste and smell is discovered by science. Scientific findings about sensory aspects of eating were discussed with the chef in advance, and he prepared a number of small dishes to illustrate sensory effects. These small 'experimental' dishes were served along with the main meal. For example, a very bitter wine, astringent is the scientific term, can be turned into an acceptable wine by eating a greasy olive before taking a sip. The greasy olive will create a coating on the tongue, which reduces the astringency of the wine. Another demonstration had to do with the contribution of smell to the overall impression of food. When your nose is closed with a nose clip, thereby preventing retro-nasal stimulation (i.e. stimulation of the olfactory epithelium through the mouth it is hard to tell wine apart from other liquids. If you open your nose while the wine is still in your mouth, you will suddenly experience the retro-nasal contribution of the

wine and immediately recognise it. This fusion of taste and smell is essential for enjoying, but more importantly, identifying different types of food. A scientist would like to study exactly how these taste and smell sensations interact by separating them and controlling them individually. This is possible with a 'bottle of Hornung' in which taste is perceived through a tube from one container and the smell from another container. Of course the subjects are not aware of the two containers as they are hidden inside Hornung's bottle. It turned out that fusion of taste and smell is strongly diminished when the food odour is added through sniffing. You need retro-nasal olfactory stimulation in order for fusion to take place.



Bottle of Hornung, used to separate smell and taste.

Taste receptors do not only contribute to our enjoyment of food, they also have a regulatory function. For example the lingual acid receptors serving the sour taste are also found in large amounts along the spinal cord where they monitor pH-level. And salt-receptors identical to those on the tongue are found in the kidneys and the colon where they contribute to the control of water. Although in humans olfaction is much less important as a regulatory system, it does play that role in many other mammals. For example in mating, nesting and fostering. In humans unconscious effects of odours are found as well, but human olfaction has mainly a conscious role, like in the enjoyment of food and in social behaviour. We can discriminate over 10.000 different smells and in combination with taste we can talk about food and our appreciation of it.

Arnoldus van H.

Infallibilistic disorder

Dear committee,

For the 5th edition of your diagnostic manual*, I propose to include the following disorder:

301.10 Infallibilistic disorder

Diagnostic criteria

A. For at least 2 years, the presence of numerous periods of trying to impose one's own beliefs on someone else. Note: for a religious person or scientist, the duration must at least be 1 year.

B. During these 2 years (1 year for religious person or scientist), the person has not been without the symptoms in Criterion A for more than 2 months at a time.

C. The symptoms in Criterion A are not better accounted for by Narcissism, Evangelicism, impaired intellectual capabilities, Paranoid Personality Disorder or Psychotic Disorder Not Otherwise Specified.

D. The symptoms are not due to the direct physiological effects of a substance (e.g. a drug of abuse, a medication), a general medical condition (e.g. hyperthyroidism), or a bad childhood.

E. The symptoms do not necessarily cause clinically significant distress of impairment in social, occupational, or other important areas of functioning to the sufferer but do to his or her immediate surroundings.

The disorder is to be classified under 301.00 Paranoid Personality Disorder, as a subclass of Paranoid Disorder, classified under Axis II of the current edition of your manual*. We urge you to consider the application since it is our firm belief that the disorder involves severe suffering to the immediate surroundings of the patient. Even more alarming is the fact that we quantified prevalence to be around 80% in academics, and around 50% in non-academics#. Due to its impact on society and high prevalence, we urge you to undertake swift action. Feel free to contact us if you have any questions.

Sincerely,

Dr. A. van H. & Dr. J. Biggus-Dickus

*American Psychiatric Association (2000). *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.). Washington DC.

#Van H, A. & Biggus-Dickus, J. (2007). Infallibilistic disorder in Dutch society. *Journal of Quite Severe Mental Disorders*, 12, 435-535.

News & agenda.

Helmholtz lectures

- February 6, 2009. Roberta Klatzky (Carnegie Mellon University, USA) Perceptually guided action versus cognitively guided action.
- March 6, 2009. Brian Wandell (Stanford University, USA) Maps, plasticity, and reading: three analyses of visual cortex.
- March 27, 2009. Richard Mooney (Duke University, USA) Learning to communicate: neural mechanisms for learned birdsongs.
- April 24, 2009. Jos Eggermont (University of Calgary, Canada) Abnormal acoustic environments cause plastic changes in adult auditory cortex.
- June 19, 2009. Christof Koch (California Institute of Technology, USA) From attention in visual cortex to sparse coding in the medial temporal lobe.

Symposia

- Februari 18, 2009. Symposium 'New perspectives on the development of spatial cognition' by Albert Postma. Universiteit Utrecht, Zaal Groen, Heidelberglaan 2. Time: 9.00 am.

PhD defenses

- December 5, 2008. Bram Sanders (Physics of Man, Universiteit Utrecht) Investigations into haptic space and perception of shape for active touch.
- February 13, 2009. Maartje de Goede (Experimental Psychology, Universiteit Utrecht) Gender differences in spatial cognition.
- February 18, 2009. Jessie Bullens (Experimental Psychology, Universiteit Utrecht) How children learn to deal with space: developmental studies on spatial memory.

New people

- Dimitrios Voudouris, PhD student (Human Movement Science, VU Amsterdam) Project: 'The role of obstacles in grasping.'
- Rita Sousa, PhD student (Human Movement Science, VU Amsterdam) Project: 'Judging distance in a dynamic environment with many sources of information.'
- Nienke Debats, PhD student (Human Movement Science, VU Amsterdam) Project: 'Is dynamic touch based on an optimal combination of invariants?'

- Alexander Logeman, PhD student (Experimental Psychology, Universiteit Utrecht) Project: 'Pharmacology of selective attention.'
- Rick van Dijk, PhD student (Experimental Psychology, Universiteit Utrecht) Project: 'Cognition and deafness.'
- Alyanne de Haan, research assistant with Chris Dijkerman (Experimental Psychology, Universiteit Utrecht).

Grants and awards

- Jeroen Smeets (Human Movement Sciences, VU Amsterdam) received an NWO Vici grant for a project entitled 'Making movements: optimal and thus inconsistent?' Four PhD students and two post-doctoral researchers will be assigned on the project.
- Tanja Nijboer (Experimental Psychology, Universiteit Utrecht) received a Rubicon grant for a research project entitled 'Emotion and consciousness: implicit social learning' at Hull University, England.
- Myrthe Plaisier (Physics of Man, Universiteit Utrecht) received a grant from the IEEE Technical Committee on Haptics for a research project at the Max Planck Institute in Tuebingen, Germany.
- Jan Brascamp (Physics of Man, Universiteit Utrecht) received a grant from the British Council Partnership Programme in Science for a research project at the University College London in London, England.
- Jessie Bullens (Experimental Psychology, Universiteit Utrecht) received a 'Schakelbudget' from the faculty of Social Science on a project entitled 'Children's ability to integrate spatial information'.
- Frans Verstraten (Experimental Psychology, Universiteit Utrecht) was awarded 'Teacher of the year' by Utrecht University.

Other news

- The Physics of Man group at Utrecht University moved. They are now in the Kruijt building on 8 Padualaan.

Colofon:

© Helmholtz Institute 2009
P.O. Box 80125
3508 TC Utrecht
The Netherlands
Phone: +31 30 253 4270/
4281
Fax: +31 30 253 451
Email: helmholtz@fss.uu.nl
www.phys.uu.nl/~wwwfm/

Editors:

Jan Brascamp
(j.w.bascamp@bio.uu.nl)
Katinka van der Kooij
(k.vanderkooij@uu.nl)
Marijn Struiksma
(m.struiksma@uu.nl)

Copy editor:

Jonathan Flintham

DTP:

Tobias Borra
Ignace Hooge
Chris Paffen

Print:

Zuidam&Uithof

Suggestions, ideas & contributions:
helmholtzherald@uu.nl