

# NWO programme Brain and Cognition: an integrated approach

## Eindverslag van Joint Forces Network Grants

**Dossiernr:** 433-08-113

**Naam Projectleider:** prof.dr. Jan Theeuwes

**Titel:** Merging Senses in the Brain

### 1. Participants

We organized a one and a half workshop on multimodal perception on November 2 and 3. November 2 was a full day at the Royal Dutch Academy of Science in Amsterdam. November 3 was a half day at the Olympic Station in Amsterdam. The first full day focused more on fundamental research on multimodal perception; the second half day focused on applied aspects. Below is the program of these days. About half of the speakers were also mentioned in the original proposal. There were about 50 participants during each of the symposia both from academia and industry. For NWO prof.dr. W.B. Verwey attended both days.

#### **PROGRAM Monday November 2, 2009**

09:30 - 10:00 Welcome with coffee and tea  
10:00 - 10:05 Opening by Jan Theeuwes

**Session I** Chair: Erik van der Burg  
10:10 - 10:40 David Alais (University of Sydney, Australia)  
*Multisensory attentional influences on visual awareness using binocular rivalry*

10:40 - 11:10 Salvador Soto-Faraco (Universitat de Barcelona, Spain)  
*Multisensory integration and attention*

11:10 - 11:40 Durk Talsma (University of Twente, NL)  
*An attentional account of the multisensory mind*

**Session II** Chair: Adelbert Bronkhorst  
11:55 - 12:25 Jean Vroomen (Tilburg University, NL)  
*Perception of synchrony between heard and lipread speech is not special*

12:25 - 12:55 John van Opstal (Radboud University Nijmegen, NL)  
*Audiovisual integration subserving saccades in a complex environment*

12:55 - 13:45 Lunch

**Session III** Chair: Thomas Koelewijn  
13:45 - 14:15 Charles Spence (University of Oxford, UK)  
*Explaining the Colavita visual dominance effect*

14:15 - 14:45 Armin Kohlrausch (University of Technology Eindhoven, NL)  
*Influence of stimulus characteristics on audio-visual synchrony judgments*

14:45 - 15:15 Marc O. Ernst (University of Tübingen, Germany)  
*Recalibration makes sense*

15:15 - 15:45 John Foxe (City College New York, NY, USA)  
*It's a multisensory world: Sensory integration in human cortex and what happens when it breaks down*

**Session IV** Chair: Chris Olivers  
16:00 - 16:25 Erik van der Burg (Vrije Universiteit Amsterdam, NL)  
*Temporal multisensory processing and its effects on attention*

16:25 - 16:50 Thomas Koelewijn (Vrije Universiteit Amsterdam, NL)  
*Audiovisual attention in space*

## PROGRAM Tuesday November 3, 2009

09:00 - 09:30	Welcome with coffee and tea
09:30 - 09:35	Opening by Adelbert Bronkhorst
<b>Session I</b>	Chair: Thomas Koelewijn
09:35 - 10:00	Sylvain Hourlier (Thales, France) <i>Multimodal interfaces in the modern cockpit, a human factors point of view</i>
10:00 - 10:25	Eric Groen (TNO, NL) <i>Smartcard</i>
10:25 - 10:50	Janto Skowronek (Philips Research, NL) <i>Towards the development of a multimodal system to create appealing atmospheres</i>
10:50 - 11:15	Coffee break
<b>Session II</b>	Chair: Erik van der Burg
11:15 - 11:40	Charles Spence (University of Oxford, UK) <i>Driving by the seat of your pants! A multisensory approach to capturing driver attention</i>
11:40 - 12:05	Joost Festen (VUmc, NL) <i>Visual support in speech perception</i>
12:05 - 13:00	Lunch (end of symposium)

### 2. Content

The two-day symposium was very inspiring. All important national and international researchers on multi-sensory integration and attention were present. The first day there was a very lively discussion whether attention is needed for audio-visual integration to occur. The viewpoints of Talsma and Soto-Faraco claiming that integration only occurs when attention is involved clashed with view that integration is an automatic bottom-up process views advocated by Vroomen and by researchers from our own lab. This discussion is crucial and lies at the heart of what multi-sensory integration entails. The discussion regarding the automatic effects of audio-visual cueing was important since it suggests that there may be two independent supramodal attentional systems. The second day on applied aspects of multisensory integration gave important insights regarding human factors aspects of cockpit design. The talk by Hourlier of Thales and Groen of TNO basically indicated that the modern cockpit will be so adaptable that each pilot may choose his or her own settings to allow optimal performance. This is a large shift from previous concepts. The talk by Spence on multi-modal warning system in the car was very inspiring and indicated that it is possible to use tactile warning signals in the seat of driver.

### 3. Result

Even though originally we wanted to include more participants in our research proposal, the relatively small budget available made us decide to only have two main applications. Prof.dr. John van Opstal and prof.dr Jan Theeuwes wrote a research pre-proposal called 'The pip-and-pop of audiovisual integration behaviour' (dossiernummer 433-09-205). This proposal received excellent reviews from NWO. Quotes "Uw ambitieuze voorstel is naar het oordeel van de beoordelingscommissie van excellente kwaliteit, betreft een innovatieve integratie van cognitieve disciplines en kan een substantiele bijdrage leveren aan de verdere ontwikkeling van de hersenen- en cognitiewetenschappen. De commissie heeft het gebiedsbestuur MaGW positief geadviseerd over uw vooraanmelding. Het Gebiedsbestuur MaGW heeft dit advies overgenomen en adviseert u derhalve uw vooraanmelding nader uit te werken"

A full proposal was submitted last month. The proposal addresses the issue of how the primate saccadic system performs under dynamic, uncertain conditions in complex environments. The proposal specifically addresses how information from different sensory systems is integrated, in particular audio-visual, as these senses receive input from the external environment.