Helmholtz Retreat 2018

Proceedings of the 9th Helmholtz Retreat

Jun 27th - June 29th
Hotel Jan van Scorel, Schoorl, The Netherlands

Helmholtz Committee

Organizers Retreat

Dr. Marnix Naber

Dr. Krista Overvliet

Kayla Stone, MSc.

Prof. dr. Leon Kenemans

Prof. dr. Joke Baas

Prof. dr. Chris Dijkerman

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Welcome

Welcome to the 2018 Helmholtz retreat!

Welcome to the 9th Helmholtz retreat! The program features many of the traditional elements: a location surrounded by North Sea coast sand dunes, a mixture of scientific presentations in various sessions on different topics by PhD students, a dedicated PhD workshop, and lectures by (inter)national guest speakers (Fiona Newell, Chris Olivers, Stephen Jackson, and Angelo Maravita). The demos introduced in the last installment are repeated due to great success, with among others a driving simulator. And of course there should be sufficient time for informal chats about research or any other topic, a walk on the beach etc. As always this format will be highly stimulating and well-regarded by attendees, of which 70 have registered.

Over the past 2 years the institute has seen a nice collection of acquired research grants, including Vidi, Veni, Rubicon, and other NWO and non-NWO grants. The challenge for the next few years is to maintain this traditionally high level of Helmholtz research volume, especially by supplementing it with ERC grants. A number of very talented Helmholtz researchers have accepted this challenge and are going for sizable grants right now, appropriately facilitated by departmental resources.

The Helmholtz community continues to thrive and the Helmholtz lecture series has again featured renowned international speakers (thanks Estrella Montoya and Nathan van der Stoep, for the excellent organization over the last two years). But there is no doubt that the highlight of the Helmholtz activities calendar remains the Helmholtz retreat.

On behalf of the HH community we would like to thank Marnix Naber, Krista Overvliet, and Kayla Stone for all the effort they have put into organizing the retreat. We wish you all another highly stimulating and social retreat.

Leon Kenemans
Joke Baas
Chris Dijkerman

Program at a glance

Locations: All sessions will in the Tuinzaal, except for the poster and demo session (hall 5-6). During the breaks, coffee will be available in at the bar or, if the weather permits, in the garden. Breakfast, lunch and diner will be in the restaurant 'KanunniK'. The BBQ will be at the terrace and the garden.

Wednesday June 27th

09.15 - 10.00 Arrival PhD students
10.00 - 13.00 PhD only session
12.00 - 12.30 Arrival other guests
12.30 - 14.00 Lunch
14.00 - 14.15 Opening by Leon Kenemans
14.15 - 15.45 Session 1 - Effects of visual processing
15.45 - 16.00 Break
16.00 - 17.30 Session 2 - Eye movements 1
17.30 - 17:45 Break (with snacks!)
17.45 - 19.00 Keynote Fiona Newell
19.00 - 21.00 Diner

Thursday June 28th

07.00 - 09.15 Breakfast
09.15 - 10.45 Session 3 - Body perception & haptics
10.45 - 11.00 Break
11.00 - 12.30 Session 4 - Developmental. social, & applied psychology
12.30 - 14.00 Lunch
14.00 - 15.30 Session 5 - Imaging & Numerosity
15.30 - 16:30 Time for some fresh air!
16.30 - 17.30 Business meeting
17.30 - 17.45 Break (with snacks!)
17.45 - 19.00 Keynote Chris Olivers
19.00 - 21.00 BBQ diner

Friday June 29th

7.00 - 9.15 Breakfast
09.15 - 11.00 Session 6 - Eye movements 2
11.00 - 12.00 Posters and demos (and coffee)
12.00 - 13.30 Lunch
13.30 - 15.00 Symposium Stephen Jackson & Angelo Maravita
15.00 - 15.15 Closing

Keynote Fiona Newell

Wednesday June 27th
17.45 - 19.00,
Keynote Prof. Dr. Fiona Newell
School of Psychology and Institute of Neuroscience
Trinity College Dublin, Ireland

The contribution of multiple sensory information to perception: the role of task should not be overlooked

One of the greatest challenges for the human brain is to maintain a coherent perception of the world despite a bombardment of information from across the senses. As Helmholtz and others have noted, perception is a complex process going beyond the simple detection and measure of sensory stimuli. It is dependent on the integration of this sensory information and, at the same time, is subject to modulation by higher cognitive processes. Thus, the importance attributed to each sensory modality in constructing an integrated representation of the sensory world also depends on the task: for instance, vision is often the preferred sense for spatial perception but touch may serve better for texture perception, and audition for temporal perception. This talk will discuss evidence from our research that perception can be predicted not only by the nature of the sensory information itself, but also on the underlying neural system as well as contextual factors such as past experience, association, or internal goals. In particular, our research has allowed us to make important inferences on how the senses are combined for the purpose of object perception. However, despite recent advances on our understanding of multisensory perception, many important questions remain unanswered. The talk will also demonstrate how addressing these questions can help set an important context for future directions in the scientific study of human multisensory perception.

About Fiona:
Fiona Newell is a graduate in Psychology from Trinity College Dublin. She obtained her PhD from the University of Durham, UK. During her post-doctoral training she spent time in various academic institutions including the MRC Cognition and Brain Sciences Unit, Cambridge, UK, the Weizmann Institute, Israel and the Max Plank Institute for Biological Cybernetics, Germany. She returned to Trinity College Dublin in 2000 to take up a lectureship position in the School of Psychology and is currently Professor of Experimental Psychology. The broad goal of her research is to elucidate the brain and behavioural processes involved in the multisensory perception of objects, faces, bodies and scenes. Recently, this research has broadened into investigations of synaesthesia, sensory deprivation and development of multisensory processes across the lifespan.

Keynote Chris Olivers

Thursday June 28th
17.45 - 19.00,
Keynote Prof. Dr. Christian N.L. Olivers
Department of Experimental and Applied Psychology
Institute for Brain and Behaviour Amsterdam
Vrije Universiteit

Dissociating current from future templates in perceptual tasks

Visual attention is driven by top-down control processes reflecting the current goals of the observer. Working memory has been regarded as the mechanism by which such top-down control is implemented, through the activation and maintenance of task-relevant perceptual representations, which are then thought to automatically bias sensory input. However, while working memory can be used to bias the current perceptual task, it should also serve future tasks, when planning sequences of perceptual actions. Such prospective memories ought to be shielded from, rather than influence the current perceptual input. I will present behavioural, electrophysiological and neuroimaging work using paradigms in which observers perform sequences of visual search tasks that allowed us to dissociate templates serving current from those serving future goals in working memory. Behavioural and neurophysiological measures show that working memory distinguishes between what is relevant now and what is relevant in the future, with different consequences for attention and the representations it relies on.

About Chris:
Chris Olivers is Professor of Visual Cognition. His research focuses on top-down influences on visual attention, from short term goals to long term knowledge, and from sensory to multi-modal representations. His lab uses a range of approaches, notably manual and oculomotor behaviour, electroencephalographic and functional magnetic resonance measures, and computational modeling.

Symposium

Friday June 29th
13.30 - 15.00
Symposium Prof. Dr. Angelo Maravita & Prof. Dr. Stephen Jackson

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The standard Posture: preferential associations between body parts and spatial representations

Daniele Romano[1], Francesco Marini[2], Angelo Maravita[1]

[1] University of study Milano-Bicocca, department of Psychology;

[2] University of Verona, department of Neurological and Movement Sciences

The internal representation of the body in space is dynamic and constantly updated to allow the interaction with the external world. However, body representation has also more stable features that are less defined and investigated. We recently investigated whether single body parts hold a standard, preferential association with spatial concepts. Specifically, we investigated whether different fingers have preferential associations with relative spatial elevations "high" or "low". We tested for this associations in several experiments assessing different aspects of sensory processing, ranging from perceptual tactile detection tasks to more cognitive tasks such as the implicit association test (IAT) and picture categorization tasks to ERP brain responses.
We found strong and consistent preferential associations between the index finger and the high elevation posture/concept versus the thumb and low elevation.
These findings suggest that body parts and spatial labels are automatically and implicitly connected, supporting the idea that the body representation holds a standard preferential posture that would automatically affect our perception (and interaction?) with the external world.

Re-examining Optic Ataxia: Is it really a disorder of visually-guided reaching?

Stephen Jackson[1]

[1] University of Nottingham, school of Psychology;

Optic ataxia was first described as a disorder of visually-guided reaching movements that cannot be attributed to a basicmotor or sensory deficit. The disorder was described initially by Balint as one of a triad of visuospatial symptoms that can result from bilateral damage to the occipital-parietal cortex in humans and which has since become known as Balint Holmes or Balint's syndrome. In this talk I want to re-examine this assumption by investigating how individuals presenting with OA performed on a number of behavioural tasks performed without vision. Based upon these studies I will argue the key difficulty experienced by optic ataxic patients across a range of behavioural tasks may be an inability to simultaneously and directly compare two spatial representations so as to compute the difference between them.

Session Overview

Wednesday 27th of June

14.15 - 15.45 Session 1: Effects of Visual Processing
Moderator: Eli Brenner

Does numerosity adaptation exist without duration adaptation?
Andromachi Tsouli, Susan te Pas, Serge O. Dumoulin, Maarten J. van der Smagt
Experimental Psychology, Utrecht University

Effects of aging on postural adjustments to visual perturbations during fast pointing
Yajie Zhang, Eli Brenner, Jacques Duysens, Sabine Verschueren, Jeroen Smeets
Behavioural and Movement Sciences, VU Amsterdam

Vection does not necessitate visually induced motion sickness
Ouren X. Kuiper, Jelte E. Bos, Cyriel Diels
Vrije Universiteit Amsterdam

Do visual working memory and visual salience regulate both pre-aware and post-aware processing?
Yun Ding, Chris Paffen, Marnix Naber, Stefan Van der Stigchel
Experimental Psychology, Utrecht University

16.00 - 17.30 Session 2 - Eye Movements 1 -
Moderator: Stefan van der Stigchel

Seeing is believing? The implied social presence experiment
G.A. Holleman, R.S. Hessels, I.T.C. Hooge & C. Kemner
Experimental psychology & Developmental psychology, Utrecht University

Preserving the global effect across a saccade
Kiki Arkesteijn, Mieke Donk, Jeroen Smeets & Artem Belopolsky
Behavioural and Movement Sciences, VU University

The relationship between fixation duration and saliency coding in superior colliculus during free viewing
Heeman, J., White, B.J., Van der Stigchel, S., Theeuwes, J., Itti, L., & Munoz, D. P
Vrije Universiteit; Experimental Psychology, Utrecht University

Is the eye-movement field confused about fixations and saccades? – A survey among 124 researchers
Roy S. Hessels, Diederick C. Niehorster, Marcus Nyström, Richard Andersson, & Ignace T. C. Hooge
Experimental Psychology & Developmental Psychology, Utrecht University

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Thursday 28th of June

09.15 - 10.45 Session 3 - Body Perception & Haptics
Moderator: Chris Dijkerman

Spatial representation of the workspace in blind, low vision and sighted human participants
Jacob Nelson, Irene Kuling, Monica Gori, Albert Postma, Eli Brenner, Jeroen Smeets
Department of Human Movement Sciences, Vrije Universiteit, Amsterdam

Mental rotation of feet in individuals with Body Integrity Identity Disorder
Kayla D. Stone, Anouk Keizer, Rianne M. Blom, H. Chris Dijkerman
Experimental Psychology, Utrecht University

Agency in anorexia nervosa patients
Manja Engel, Anouk Keizer, Manos Tsakiris, Chris Dijkerman
Experimental Psychology, Utrecht University

The Moving Rubber Hand Illusion: Investigating Body Perception in Eating Disorders
Mark Carey, Catherine Preston
Department of Psychology, University of York

11.00 - 12.30 Session 4 - Developmental, Social & Applied Psychology
Moderator: Chris Janssen

Signal Detection Theory in university admission
Linda van Ooijen-van der Linden, Maarten van der Smagt, Susan te Pas, Liesbeth Woertman
Experimental Psychology, Utrecht University

How humans interact with (autonomous) cars
Remo van der Heiden, Chris Janssen
Experimental Psychology, Utrecht University

The interplay between face and emotion processing: an fNIRS study with 5-month-olds
Renata Di Lorenzo, A. Blasi, C. Junge, C. van den Boomen, R.van Rooijen, C.Kemner
Departments of Experimental and Developmental Psychology, Utrecht University

Processing morally loaded language in stories: simulation, evaluation, or both?
Björn ’t Hart, Marijn Struiksma, Ton van Boxtel & Jos van Berkum
UiL OTS, dept Talen, Literatuur & Communicatie, UU

Thursday 28th of June

14.00 - 15.30 Session 5 - Imaging & Numerosity
Moderator: Ben Harvey

Evaluating linear systems theory for sub-millimetre laminar fMRI
J.A. van Dijk, A. Fracasso, N. Petridou, S.O. Dumoulin
Experimental Psychology, Utrecht University; Spinoza Centre for Neuroimaging, Amsterdam

Change blindness. Is V1 change blind?
Akhil Edadan, Wietske Zuiderbaan, Alessio Fracasso, Serge O. Dumoulin
Experimental Psychology, Utrecht University; Spinoza Centre for Neuroimaging, Amsterdam

Topographic numerosity maps dynamically adjust to the presented numerosity range
Yuxuan Cai, Jelle van Dijk, Wietske Zuiderbaan, Wietske van der Zwaag, Ben Harvey, Serge Dumoulin
Experimental and Applied Psychology, VU University Amsterdam, Amsterdam, Netherlands

Probing enumeration eye movements with saccade-terminated trials
Jacob M. Paul, Robert A. Reeve & Jason D. Forte
Experimental Psychology, Utrecht University

Friday 29th of June

09.15 - 11.00 Session 6 - Eye movements 2
Moderator: Maarten Frens

Unravelling information processing in correct and incorrect diagnosis using eye-tracking
Staal, J., Van Der Geest, J.N., Alsma, J., Frens, M., & Zwaan, L.
Department of Neuroscience, Erasmus Universiteit Rotterdam

Developmental changes in visual search are determined by changing visuospatial abilities and task repetition: a longitudinal study in adolescents
Rudolf Burggraaf, Jos N. van der Geest, Ignace T.C. Hooge and Maarten A. Frens
Dept. Neuroscience,, Erasmus MC, Rotterdam

Location memory and spatial remapping after right parietal brain damage
A.F. Ten Brink, T.C.W. Nijboer, J. Fabius, S. Van der Stigchel
Department of Experimental Psychology, Helmholtz Institute, Utrecht University, Utrecht, The Netherlands

Eye movement behaviour and silent reading; a test of cognitive correlates in a population-based study of pre-adolescents.
Suzanne Louwen, Rick van der Vliet, Hieab Adams, Simone Koenraads, Marie-Christine Franken, Vincent Jaddoe, Manon Hillegers, Jos van der Geest, Henning Tiemeier
Neuroscience/Child-Psychiatry, Erasmus MC

Eye movements in interception with delayed visual feedback
Clara Cámara, Cristina de la Malla, Joan López-Moliner, Eli Brenner
Vision and Control of Action (VISCA) Group, Universitat de Barcelona; Faculty of Behavioural and Movement Science, Vrije Universiteit Amsterdam.

Friday 29th of June

11:00 - 12:00 Demos and Posters

Driving Simulator
Christian P. Janssen, Remo M.A. van der Heiden, Stella F. Donker, Nico Romeijn, J. Leon Kenemans
Experimental Psychology, Utrecht University

Remote heart rate detection with a webcam
Marnix Naber & Koen van der Kooij
Experimental Psychology, Utrecht University

GazeCode: open-source software for manual mapping of mobile eye-tracking data
Jeroen S. Benjamins, Roy S. Hessels and Ignace T.C. Hooge
Experimental Psychology, Utrecht University

Measuring fear trajectories: development of a short fear conditioning task
N.A. Leen, F.E. van der Flier, P. Duits, J.M.P. Baas
Experimental Psychology, Utrecht University

Infant preferences in speech segmentation tasks: let's focus on the method
Caroline Junge , Lyan Porto , Emma Everaert , Brigitta Keij , Titia Benders , Prof. Paula Fikkert
Departments of Experimental and Developmental Psychology, Utrecht University

Induced Power and Care oppositely affect Cooperation, Punishment and Intergroup Discrimination in Economic Games
Franca Parianen-Lesemann
Experimental Psychology, Utrecht University

Abstracts

Wednesday 27th - SESSION 1: Effects of visual processing

Andromachi Tsouli, Susan te Pas, Serge O. Dumoulin, Maarten J. van der Smagt
Experimental Psychology, Utrecht University

Does numerosity adaptation exist without duration adaptation?

The theory of magnitude suggests that number and time are linked by a common metric, and their specialization develops from a single magnitude system. We investigated the presence of a common processing mechanism underlying numerical and temporal perception using adaptation. We conducted a series of experiments each using a rapid adaptation protocol and a 2AFC adaptive staircase method. We showed that duration adaptation, like numerosity adaptation, alters numerosity perception. We further examined whether a low versus high numerosity adapter is perceptually associated with a short versus long duration adapter. Subjects indicated if a numerosity stimulus was under- or overestimated after numerosity adaptation using different durations. We found that different durations affect high numerosity adaptation but not low numerosity adaptation. Since a high numerosity stimulus combined with a long duration might be a stronger adaptation stimulus, we investigated whether this effect reflects the total adaptation time or adaptation to individual stimulus durations. We suggest that individual duration "events" drive the effect of duration adaptation on numerosity discrimination, while the effect of numerosity adaptation is driven by the total adaptation time. These results show that numerosity adaptation cannot exist without duration adaptation.

Yajie Zhang, Eli Brenner, Jacques Duysens, Sabine Verschueren, Jeroen Smeets
Behavioural and Movement Sciences, VU Amsterdam

Effects of aging on postural adjustments to visual perturbations during fast pointing

People can quickly adjust their goal-directed hand movements to an unexpected visual perturbation (a target displacement or background motion). An age-related decline in the ability to make the appropriate postural adjustments might make weaker manual adjustments. A decreased resolution of vestibular and proprioceptive information might result in more reliance on vision and stronger postural responses. We examined how aging would affect early adjustments to both types of perturbations, in terms of response latencies and intensities. Young and elderly adults were instructed to hit a target as accurately and fast as possible by moving their hand on a horizontal screen while standing. In some trials, the target jumped or the background moved when the hand started to move. We found a similar pattern of manual responses for the young and the elderly, but the elderly took 11-16 ms longer to respond for both types of visual perturbations with movement time about 160 ms longer. Their finger response intensity was half smaller than the young, while head response intensity was as twice larger. These results indicate that aging can delay manual response and increase head response to background motion, and elderly adults rely more on vision than young adults.

Ouren X. Kuiper, Jelte E. Bos, Cyriel Diels
Vrije Universiteit Amsterdam

Vection does not necessitate visually induced motion sickness

Moving images presented to stationary participants can induce an illusory sense of self-motion, called vection. Vection is known to play an important role in visually induced motions sickness (VIMS), however, its precise role is unknown. Following the sensory conflict theory, constant vection, suggesting constant velocity, should not lead to a visual-vestibular conflict, whereas variability in vection would. In this study we investigated if variability in vection rather than vection primarily leads to VIMS, using a HMD to expose participants to constant optic flow. We found high levels of vection (i.e. 100% on a 0-100% scale) reported by 16 out of 18 participants at some point during the 10-minute exposure, and average vection score over the course of the experiment of 58.6%. Motion sickness symptoms were reported by 15 out of 18 participants, although only averaging 1.78 on an 11-point scale. Neither variability in vection nor mean vection strength were significantly correlated with VIMS. We argue that vection should be understood not as causing VIMS, but as a perceptual state still depending on other visual factors, e.g. those influencing frame information, before VIMS occurs. Vection by itself, even when it is experienced strongly, does not necessitate VIMS.

Yun Ding, Chris Paffen, Marnix Naber, Stefan Van der Stigchel
Experimental Psychology, Utrecht University

Do visual working memory and visual salience regulate both pre-aware and post-aware processing?

We conducted several experiments to explore whether visual working memory and salience can regulate 1) the priority of access to visual awareness and 2) the visual processing in post-awareness period. With a breaking Continuous Flash Suppression (b-CFS) paradigm, we first replicated the findings that both VWM relevance and visual salience regulate the priority for access to visual awareness. More interestingly, these two effects were numerically additive which suggested that VWM and salience regulate the priority for access to visual awareness simultaneously. The race model results suggested that these two effects worked independently. In the post-awareness condition, we replicated the similar results. Our results suggest that VWM and salience can regulate our behavior in both pre-awareness and post-awareness processing. Both findings and limitation will be discussed further.

Wednesday 27th - SESSION 2: Eye movements I

G.A. Holleman, R.S. Hessels, I.T.C. Hooge & C. Kemner
Experimental psychology & Developmental psychology, Utrecht University

Seeing is believing? The implied social presence experiment

In this study, we investigated how implied social presence – the belief that one is being watched by another person – influences gaze behavior to faces. 82 subjects received one of two instructions, either that they would see a person via a live-video connection (Live instruction), or that they would see a pre-recorded clip (Pre-recorded instruction). Prior to the experiment, a confederate walked into a separate room to suggest that (s)he was taking place behind a webcam. In fact, regardless of the instructions, all subjects were presented with a pre-recorded clip of a person. Subjects' eye movements were recorded. Afterwards, subjects were asked whether the presentation was live or not, and why. 46,3% of the subjects responded: "live presentation". Analysis of eye movements revealed that subjects who received the Live instruction gazed significantly less at the eyes compared to subjects who received the Pre-recorded instruction, indicating an effect of implied social presence. Furthermore, subjective responses suggest that subjects used different cues to judge whether the person on the screen was live or not (e.g. presence of confederates, instructions, bids for interaction).

Kiki Arkesteijn, Mieke Donk, Jeroen Smeets & Artem Belopolsky
Behavioural and Movement Sciences, VU University

Preserving the global effect across a saccade

When a distractor is presented in close spatial proximity to a target, a saccade tends to land in between the two objects rather than on the target. This 'global effect' is thought to reflect unresolved competition between target and distractor. It is unclear whether the global effect persists across saccades since a saccade displaces the retinotopic representations of target and distractor. In the present study participants performed a sequence of a horizontal and a vertical saccade and the global effect was induced by presenting a distractor next to the second saccade target. This distractor was removed during the first saccade. On half of the trials, the second target also disappeared after the first saccade, resulting in a memory-guided second saccade. On these trials, the second saccade showed a global effect, despite the disappearance of the distractor after the first saccade. Without correction based on a visible target location, the global effect was stable over hundreds of milliseconds. This suggests that the biased saccade plan was remapped across the first saccade. However, when the second target remained present after the first saccade, the bias was corrected and the global effect was eliminated, even for saccades with the shortest intersaccadic intervals.

Heeman, J., White, B.J., Van der Stigchel, S., Theeuwes, J., Itti, L., & Munoz, D. P
Vrije Universiteit; Experimental Psychology, Utrecht University

The relationship between fixation duration and saliency coding in superior colliculus during free viewing

We examined processes that influence where to look next using a computational saliency model to interpret complex visual input while monkeys (Macaca mulatta) freely viewed videos. Simultaneously, neuronal activation in the superficial and intermediate layers of the superior colliculus (SCs and SCi), a midbrain area associated with gaze and saliency coding, and eye movements were recorded. We examined three questions. First, is saliency at the saccade goal a predictor of fixation duration? Second, is the neural correlate of saliency correlated with fixation duration? Third, how is concurrent processing reflected in the SC? We used fixation duration as a proxy for the available time to process visual input similar to saccade latency. We report four findings. 1) Short fixation durations were associated with higher pre-saccadic saliency in the receptive field. 2) Saccades following short fixation durations were mostly driven by motion, flicker and edge information. 3) Short fixation durations were associated with higher pre-saccadic SC activity similar to pre-visual activation associated with express saccades. 4) Only SCs neurons showed higher post-fixation activity when the current fixation was preceded by a short fixation than a long fixation. This suggests concurrent visual processing is encoded in the SCs but not in the SCi.

Roy S. Hessels, Diederick C. Niehorster, Marcus Nyström, Richard Andersson, & Ignace T. C. Hooge
Experimental Psychology & Developmental Psychology, Utrecht University

Is the eye-movement field confused about fixations and saccades? – A survey among 124 researchers

Eye movements have been extensively studied in a wide range of research fields. While new methods such as mobile eye tracking and eye tracking in virtual or augmented realities are emerging quickly, the eye-movement terminology has been revised only scarcely. Has this caused confusion about at least two of the main concepts: fixations and saccades?
In this study, we assessed the definitions of fixations and saccades held in the eye-movement field, by surveying 124 eye-movement researchers. These eye-movement researchers held a variety of definitions of fixations and saccades, of which the breadth seemed even wider than what is reported in the literature. Moreover, these definitions did not seem to be related to researcher background or experience.
We urge researchers to make their definitions more explicit by specifying all the relevant components of the eye movement under investigation: (1) the oculomotor component: e.g. whether the eye moves slow or fast; (2) the functional component: what purposes does the eye movement (or lack thereof) serve; (3) the coordinate system used: relative to what does the eye move; and (4) the computational definition: how is the event represented in the eye-tracker signal. This should enable eye-movement researchers from different fields to have a discussion without misunderstandings.

Thursday 28th - SESSION 3: Body Perception & Haptics

Jacob Nelson, Irene Kuling, Monica Gori, Albert Postma, Eli Brenner, Jeroen Smeets
Department of Human Movement Sciences, Vrije Universiteit, Amsterdam

Spatial representation of the workspace in blind, low vision and sighted human participants

It has been proposed that haptic spatial perception depends on one's visual abilities. We tested spatial perception in the workspace using a combination of haptic matching and line drawing tasks. There were 132 participants with varying degrees of visual ability ranging from congenitally blind to normally sighted. Each participant was blindfolded and asked to match a haptic target position felt under a table with their non-dominant hand using a pen in their dominant hand. Once the pen was in position on the tabletop, they had to draw a line of equal length to a previously felt reference object by moving the pen laterally. We used targets at three different locations in order to evaluate whether different starting positions relative to the body give rise to different matching errors, drawn line lengths, or drawn line angles. We found no influence of visual ability on matching error, drawn line length or line angle, but we found that early-blind participants are slightly less consistent in their matching errors across space. We conclude that the elementary haptic abilities tested in these tasks do not depend on visual experience.

Kayla D. Stone, Anouk Keizer, Rianne M. Blom, H. Chris Dijkerman
Experimental Psychology, Utrecht University

Mental rotation of feet in individuals with Body Integrity Identity Disorder

Body Integrity Identity Disorder (BIID) is a rare condition wherein individuals experience a mismatch between the mental and physical boundaries of the body and thus desire amputation or paralysis of a healthy limb (usually the leg(s)). Behavioural and neuroimaging studies about BIID suggest an impaired (sensorimotor) representation of the lower limbs. One way to investigate this stored representation of the body is via a body-part mental rotation task. In this task, a participant judges the laterality of a pictured body part by making an imagined spatial transformation of his/her body part to match the pictured posture. If the representation of the lower limb(s) is disturbed in BIID, then BIID participants might be slower and less accurate than controls when making judgements about feet. To examine the integrity of the foot representation in BIID, BIID participants and age/sex-matched controls judged the laterality of feet displayed in different orientations. Reaction time and accuracy were measured. No significant differences, in terms of reaction times or accuracy, emerged between BIID participants and controls. This suggests that the representation of the foot in BIID, while possibly impaired, is still accessible for mental rotation. This representation might be reinforced through everyday use of the limb itself.

Manja Engel, Anouk Keizer, Manos Tsakiris, Chris Dijkerman
Experimental Psychology, Utrecht University

Agency in anorexia nervosa patients

Anorexia nervosa (AN) is an eating disorder where patients have an extreme fear of gaining weight while being severely underweight. One aspect of this disorder is control seeking behaviour. Patients with AN attempt to take control by exerting control over food intake and other eating related behaviors. This pathological need for control is one of the maintaining factors of anorexia.

Feeling of control is closely related to the sense of agency (SoA). SoA is referred to as the feeling of controlling one's own actions and the ability to influence the external world with these actions. SoA is frequently measured by the Libet task where participants make subjective estimates of the time they make an action and the time of a consequence. When the feeling of agency occurs, the estimated time of action and consequence are compressed together in time.

This study the Libet task is used to measure SoA in AN patients, recovered AN patients and healthy controls. This is the first study that investigates SoA in AN using the Libet task. Data collection is still in process.

Mark Carey, Catherine Preston
Department of Psychology, University of York

The Moving Rubber Hand Illusion: Investigating Body Perception in Eating Disorders

Body dissatisfaction is a common symptom amongst eating disorders and is thus a key target for therapy. Many current treatments focus on cognitive components of body dissatisfaction and body image, however, recent research suggests that body dissatisfaction may be influenced by an inaccurate perceptual experience of the body, which is not addressed in most treatments. Indeed, research using multisensory illusion methods in healthy individuals has shown how changes to the perception of one's body can influence the emotions related to the body. Therefore, the present experiment aims to investigate the relationship between abnormal body perception in relation to body satisfaction within eating disorder patients, compared with healthy controls. Individuals will be tested on the stability of body perception using an experimental perceptual illusion, named the Moving Rubber Hand Illusion. Links between illusion susceptibility and body satisfaction levels will be explored using explicit and implicit measures. Such work aims to increase our understanding of the links between perception of the body and its influence on emotional experience, which may help identify a key risk of relapse within the disorder.

Thursday 28th - SESSION 4: Developmental, Social & Applied Psychology

Linda van Ooijen-van der Linden, Maarten van der Smagt, Susan te Pas, Liesbeth Woertman
Experimental Psychology, Utrecht University

Signal Detection Theory in university admission

In university admission, decisions are made or advice is given based on available information at the time of application. This is a signal detection problem. The available predictors of academic success for our programme are information on prior academic achievement, an assessment of programme-specific academic potential based on a work sample, and non-grade-based psychosocial factors such as motivation. After having awaited the academic success of psychology students of cohorts 2013-2014 to 2015-2016, they were all classified as unsuccessful or successful based on their grades or ECTS. Retrospective, hypothetical selection decisions were made for each applicant to determine the accuracy of different predictors in discerning successful students from unsuccessful students. A hypothetically rejected and subsequent unsuccessful student is deemed a correct rejection. A hypothetically admitted and subsequent unsuccessful student, is deemed a false alarm. Successful students who would have been rejected are deemed misses and those who would have been admitted, hits. We present how the application of signal detection theory in selection and advice in university admission provides information on the predictive validity of admission tools on both group and the individual level and on the effects of different criteria on selection outcomes.

Remo van der Heiden, Chris Janssen
Experimental Psychology, Utrecht University

How humans interact with (autonomous) cars

Car manufacturers are currently working on the development of autonomous vehicles. In this process, more and more driving functionality is being automated. In effect, automation takes away responsibilities regarding vehicle control from the human driver. However, this shared control creates new challenges. One specific challenge is how a car can effectively warn a driver for an upcoming event.
In driving simulator studies, we studied:
(1) how susceptible the brain is to potentially relevant auditory signals (van der Heiden, Janssen, Donker, Hardeman, Mans, Kenemans, submitted);
(2) how fast drivers react to in-car warnings while distracted or not distracted (van der Heiden, Janssen, Donker, Merkx, 2018);
(3) how different auditory warnings contribute to a better handover of control from the vehicle back to the human driver (van der Heiden, Iqbal, Janssen, 2017).
The results show that drivers are less susceptible to auditory signals when they are driven autonomously compared to when they are stationary. We also found that sometimes humans react to slow to in-car warnings, and that the take-over does not always go smooth, but benefits from earlier warnings. The combined results provide useful insights in the capabilities and limitations of human alert detection in vehicles.

Renata Di Lorenzo, A. Blasi, C. Junge, C. van den Boomen, R.van Rooijen, C.Kemner
Departments of Experimental and Developmental Psychology, Utrecht University

The interplay between face and emotion processing: an fNIRS study with 5-month-olds

Understanding facial expressions is a crucial skill for social communication. In adults, facial expressions activate a set of brain networks involved in basic face processing and in emotion processing that are highly interacting. In infancy, however, little is known about when and how these networks develop. The current study uses functional near-infrared spectroscopy (fNIRS) to measure differences in five-month-olds' brain activity in response to fearful or happy expressions and to houses. Our results show that irrespective of facial expressions, there are significant HbO2 increases in the right occipital region. Yet sensitivity to emotions appears to be still immature at this age, with the right temporal areas showing a different pattern of HbO2 concentration levels: HbO2 increased (non-significantly) for fearful and decreased (significantly) for happy facial expressions. Together these results suggest that at five months, occipital areas are already subserving face-processing skills, while the emotion-processing network seems not fully developed.

Björn ’t Hart, Marijn Struiksma, Ton van Boxtel & Jos van Berkum
UiL OTS, dept Talen, Literatuur & Communicatie, UU

Processing morally loaded language in stories: simulation, evaluation, or both?

In research on embodied language processing, activity of the corrugator supercilii or ‘frowning muscle’ is usually assumed to reflect the conceptual simulation of ‘valenced linguistic meaning’, such as, with for example “Mark was furious”, the negative meaning of the word “furious”, or the language-driven simulation of a furious story character. However, because the frowning muscle is part of how we express our *own* emotions, one would expect it to also reflect how the reader him- or herself feels about what’s happening in a story. How do these different uses of our emotion system relate to one another as people read a story? We report on several EMG studies in which we examined what happens when emotions simulated by the reader as they make sense of a story are at odds with emotions felt by the reader over particular story events, e.g., when people read “Mark was furious” or “Mark was happy” when the protagonist at hand is a really bad person, rather than a good one. Our findings have interesting implications for the understanding of embodied language processing, as well as for the understanding of how people relate to the characters in narrative.

Thursday 28th - SESSION 5: Imaging & Numerosity

J.A. van Dijk, A. Fracasso, N. Petridou, S.O. Dumoulin
Experimental Psychology, Utrecht University; Spinoza Centre for Neuroimaging, Amsterdam

Evaluating linear systems theory for sub-millimetre laminar fMRI

A fundamental assumption of nearly all fMRI analysis methods, is that the relationship between local neuronal activity and the fMRI signal follows linear system theory, i.e. increases in neural activity cause proportional increases in fMRI signal amplitude. These assumptions are validated for conventional resolutions (>1mm isotropic) but not for sub-millimetre laminar fMRI. Ultra-high field MRI (7T) allows for laminar imaging, i.e. measuring responses across the cortical thickness. However, known vasculature relationships across lamina strongly affect the signal and may affect the linearity assumptions. Here, we tested the basic assumptions of linear systems theory in V1, V2, and V3 at sub-millimetre isotropic resolution using 7T MRI. We evaluated whether fMRI response amplitudes were proportional across stimulus intensity and duration. We find that the assumptions for linear system theory hold and can be applied for sub-millimetre laminar fMRI.

Akhil Edadan, Wietske Zuiderbaan, Alessio Fracasso, Serge O. Dumoulin
Experimental Psychology, Utrecht University; Spinoza Centre for Neuroimaging, Amsterdam

Change blindness. Is V1 change blind?

Our internal representation of visual world is not as detailed, as illustrated by the change blindness paradigm wherein people fail to detect changes in a visual scene. Here we investigate, at what level of visual processing this information is lost. Since it is well established that primary visual cortex (V1) is strongly modulated by contrast energy, we ask whether we can identify high contrast changes from V1 even if they are not detected by the participants. We acquired fMRI data while participants viewed pairs of images (natural and synthetic) shown consecutively. The image pairs were - both images at high contrast, both images at low contrast and alternating high and low contrast (change).We projected the difference of fMRI activity for change condition from other two conditions of each recording site into visual space using their corresponding pRF (population receptive field). For the synthetic images, results show that V1 visual space projections differ in changed region for change condition as compared to the control conditions. In the natural images, we were able to identify the changes from V1 visual space projections in some but not all images. To conclude, V1 can detect changes in a scene without reaching conscious awareness.

Yuxuan Cai, Jelle van Dijk, Wietske Zuiderbaan, Wietske van der Zwaag, Ben Harvey, Serge Dumoulin
Experimental and Applied Psychology, VU University Amsterdam, Amsterdam, Netherlands

Topographic numerosity maps dynamically adjust to the presented numerosity range

Numerosity, the set size of a group of items, is essential to guide behavior and decisions. Previously, we have described a network of topographic maps in human association cortex representing small numerosities in an orderly fashion. Here, we investigated the neural representation of larger numerosities. Using 7T fMRI, we measured responses elicited by viewing different numerosities. The small numerosity range stimuli consisted of 1 to 7 dots alternated with baseline periods of 20 dots. Larger-range stimuli numerosities ranged from 1 to 64 dots with a baseline of 512 dots. We found the same topographic numerosity maps as in our previous studies. Here, we show the same cortical regions responding to both small and large-range numerosities. Furthermore, the preferred numerosity scaled with the stimulus range. These results indicated that neuronal populations organized in topographic numerosity maps dynamically adjust their preferred numerosity to the numerosity range that is presented.

Jacob M. Paul, Robert A. Reeve & Jason D. Forte
Experimental Psychology, Utrecht University

Probing enumeration eye movements with saccade-terminated trials

Neural circuits implicated in generating saccadic eye movements partially overlap with a specialized fronto-parietal network for processing numerosity. This overlap implies eye movements may play a functional role in exact enumeration of small sets of objects. Alternatively, eye movements may reflect obligatory visual processing demands (i.e., object saliency, gaze heuristics). Here we systematically manipulated the opportunity to saccade during enumeration. Fifteen adults (11 naïve, 4 informed) enumerated random dot arrays under three conditions—(1) saccade-terminated trials: arrays remained visible until one, two or four fixations occurred; (2) duration-terminated trials: arrays were shown for 250ms, 500ms and 1000ms; and (3) response-terminated trials: arrays remained visible until response. Naïve participants were more accurate on saccade-terminated trials despite similar saccade latencies to duration-terminated trials. When informed about how trials would terminate, participants shifted their saccade latencies to match task demands. Spatial fixation distributions were well-characterized by a simple filtering model of proximity grouping, while rotating saccade vectors to align with salient image locations accounted for variability in saccade trajectories. Our findings validate a novel paradigm for investigating enumeration eye movements, emphasise the importance of simple visual grouping mechanisms for computing sets, and raise new questions about spatial-attention mechanisms involved in encoding visual numerosity.

Friday 29th - SESSION 6: Eye movements II

Staal, J., Van Der Geest, J.N., Alsma, J., Frens, M., & Zwaan, L.
Department of Neuroscience, Erasmus Universiteit Rotterdam

Unravelling information processing in correct and incorrect diagnosis using eye-tracking

Background: Diagnostic errors are believed to be caused by cognitive biases, which arise due to fast diagnostic reasoning and selective information processing. We describe the design of a study that challenges this idea and will test the hypothesis that fast and selective reasoning also occurs in correctly diagnosed cases. Methods: Thirty medical residents will solve clinical cases to induce availability bias (phase 1). Subsequently, participants will diagnose 8 cases (phase 2) of which four cases are similar to the biased cases. The primary outcome measures will be obtained using eye-tracking and include the number of relevant and irrelevant features that participants looked at, and the time spent looking at those features. Both measures will be compared between correctly and incorrectly diagnosed cases (both due to availability bias and other diagnostic errors). Discussion: We expect that selectivity in the reasoning process will take place in cases with and without diagnostic errors. Additionally, we expect that correctly diagnosed cases are diagnosed faster than cases with diagnostic errors or cognitive biases. This study will challenge the notion that fast diagnosis leads to diagnostic errors and will contribute to the understanding of how diagnostic errors occur.

Rudolf Burggraaf, Jos N. van der Geest, Ignace T.C. Hooge and Maarten A. Frens
Dept. Neuroscience,, Erasmus MC, Rotterdam

Developmental changes in visual search are determined by changing visuospatial abilities and task repetition: a longitudinal study in adolescents

Using a longitudinal study design, a group of 94 adolescents participated in a visuospatial ability task and a visual search task. Participation was during four consecutive years with intervals of one year. We analyzed the association between changes in visuospatial ability and changes in visual search performance and behavior and estimated additional effects of age and task repetition.
Search performance was analyzed in terms of reaction time and response accuracy. Search behavior was analyzed in terms of the number of fixations per trial, the saccade amplitude and the distribution of fixations over elements that share visual characteristics with the target to a more or lesser extend.
We found that both the increase in age and the yearly repetition of the task had a positive effect on visuospatial ability. We show that the acceleration of visual search during childhood can be explained by the increase in visuospatial abilities with age during adolescence. With the yearly repetition, visual search became faster but also more accurate, while fewer fixations were made with larger saccade amplitudes. Additionally, selecting the next element for fixation became more efficient with task repetition. The combination of increasing visuospatial ability and task repetition make visual search more effective.

A.F. Ten Brink, T.C.W. Nijboer, J. Fabius, S. Van der Stigchel
Department of Experimental Psychology, Helmholtz Institute, Utrecht University, Utrecht, The Netherlands

Location memory and spatial remapping after right parietal brain damage

Neurons in the right posterior parietal cortex (PPC) play a crucial role in spatial remapping. Previous studies have investigated a right hemispheric dominance for spatial remapping: leftward saccades are associated with higher costs of spatial remapping on location memory than rightward saccades, with an opposite pattern for right brain-damaged patients. The designs of these studies suffered from several limitations, however (i.e. multiple eye movements had to be made instead of one, fixations were not controlled for, and ceiling effects were likely present). In the current study, we compared left- versus rightward spatial remapping. We included 15 young controls (18-30 years), 5 PPC patients, and 8 age-matched controls (31-80 years). Participants memorized the location of a briefly presented target, made one saccade, and decided whether the target had shifted. We used a staircase to adjust task difficulty. Bayesian paired samples t-tests were used to compare conditions. A cut-off of a BF in favour of either the null or alternative hypothesis higher than 6 was used to determine statistical significance. In young controls, we found evidence against higher costs for leftward versus rightward saccades (BF01=6.5), i.e. location memory was comparable after left- versus rightward saccades. No further conclusions can be drawn yet.

Suzanne Louwen, Rick van der Vliet, Hieab Adams, Simone Koenraads, Marie-Christine Franken, Vincent Jaddoe, Manon Hillegers, Jos van der Geest, Henning Tiemeier
Neuroscience/Child-Psychiatry, Erasmus MC

Eye movement behaviour and silent reading; a test of cognitive correlates in a population-based study of pre-adolescents.

In a population-based study of 768 pre-adolescents (9-12 years), we examined the associations of oculomotor and phonological skills with eye movement behaviour during silent text reading. Eye movement parameters tested were fixation and regression frequency, saccadic amplitude, and dwell time duration. Additionally, sentence reading speed and single word reading skill (One-Minute Reading Test) were examined and children had previously completed intelligence and language comprehensions tests at age 6 years. Less optimal oculomotor control and poor phonological ability were associated with a less efficient eye movement pattern during text reading, longer reading times and worse word reading skills. Although the associations were small, findings suggest that multiple non-reading and non-linguistic related factors contribute to reading development and should be addressed to improve reading abilities in children with reading problems.

Clara Cámara, Cristina de la Malla, Joan López-Moliner, Eli Brenner
Vision and Control of Action (VISCA) Group, Universitat de Barcelona; Faculty of Behavioural and Movement Science, Vrije Universiteit Amsterdam.

Eye movements in interception with delayed visual feedback

In everyday life, electronic devices expose us to various delays between our actions and their consequences. It is known that people can adapt to such delays, but the mechanisms underlying such adaptation remain unclear. This study explored the role of eye movements in interception with delayed visual feedback. In two experiments, eye movements were recorded as participants tried to intercept a moving target with their unseen finger while receiving delayed visual feedback about their own movement. In Experiment 1, the target randomly moved in both lateral directions at two possible velocities. The delay between the participant's finger movement and movement of the visual feedback (cursor) was gradually increased. In Experiment 2, the target always moved in the same way, while the cursor's delay varied across trials. Their gaze was always directed at the target, and they could not know the delay until the cursor started moving, participants must used peripheral vision of the cursor to guide it to the target. Thus, people deal with delays by directing their gaze at the target and using both experience from previous trials (Experiment 1) and peripheral visual information (Experiment 2) to guide their finger in order to hit the target with the cursor.

Friday 29th - Demos & Posters

Christian P. Janssen, Remo M.A. van der Heiden, Stella F. Donker, Nico Romeijn, J. Leon Kenemans
Experimental Psychology, Utrecht University

Driving Simulator

Driving is an interesting domain to study human thought and behavior. Many facets from psychology are involved in driving, including: processing of (visual) information, ignoring distractions, making time-critical and safety-critical decisions, controlling our emotions and mood, navigating a complex environment, and remaining vigilant.

In Utrecht, we use a driving simulator set-up to study these facets of human behavior and thought in regular and automated driving settings. In this demo, we will demonstrate a stripped down version of Utrecht's driving simulator (steering wheel, large screen, secondary device such as a phone, and optional physiological measurement devices). In addition, we will bring pictures and video clips from research that has been done with the simulator set-ups by the various authors. The demonstration is meant to provide a general impression of how the simulator works, and to spark ideas for further collaboration within the Helmholtz center.

Marnix Naber & Koen van der Kooij
Experimental Psychology, Utrecht University

Remote heart rate detection with a webcam

Recent developments in digital image processing algorithms have enabled the extraction of an individual's heart pulsations from video images of human skin surfaces that were recorded from a distance. This method is termed remote photoplethysmography (rPPG). We developed an easy-to-use, open source MatLab algorithm such that scientists gain access to rPPG and can apply it in psychophysiological experiments. The algorithm was tested on videos that were recorded with a cheap, low-end RGB webcam. The accuracy of our rPPG method was further assessed under ambient light conditions on various body parts (faces, wrists and calves), and for a variety of heart rates frequencies caused by physical exercise (50-160bpm). We find that the algorithm detected heart rate as good as previous algorithms and as good as a standard finger clip pulse oximetry device. rPPG is especially accurate on faces, even after exercise when heart rates were subject to increased variability. On the skin surface of hands, rPPG is less accurate but still informative as to whether individuals have exercised or not. On calves, rPPG provides data that are too noisy to accurately extract heart rates. Despite these successes, we hope that fellow scientists will test the algorithm's accuracy in other research settings. For example, it is currently unknown for which camera distances, camera recording settings, and illumination conditions the algorithm is most accurate. We further hope that the online availability of the code will inspire others to improve the accuracy and applicability of the algorithm. During this demonstration you can film yourself with a webcam and receive direct feedback about your heart rate.

Jeroen S. Benjamins, Roy S. Hessels and Ignace T.C. Hooge
Experimental Psychology, Utrecht University

GazeCode: open-source software for manual mapping of mobile eye-tracking data

Eye movements recorded with mobile eye trackers generally have to be mapped to the visual stimulus manually. Manufacturer software usually has sub-optimal user interfaces. Here, we compare our in-house developed open-source alternative to the manufacturer software, called GazeCode. Method: 330 seconds of eye movements were recorded with the Tobii Pro Glasses 2. Eight coders subsequently categorized fixations using both Tobii Pro Lab and GazeCode. Results: Average manual mapping speed was more than two times faster when using GazeCode (0.649 events/s) compared with Tobii Pro Lab (0.292 events/s). Inter-rater reliability(Cohen's Kappa) was similar and satisfactory; 0.886 for Tobii Pro Lab and 0.871 for GazeCode. Conclusion: GazeCode is a faster alternative to Tobii Pro Lab for mapping eye movements to the visual stimulus. Moreover, it accepts eye-tracking data from manufacturers SMI, Positive Science, Tobii, and Pupil Labs.

Franca Parianen-Lesemann
Experimental Psychology, Utrecht University

Induced Power and Care oppositely affect Cooperation, Punishment and Intergroup Discrimination in Economic Games

Power and Care have been associated with distinct evolutionary goals and differential psycho-physiological as well as behavioral patterns, yet, their impact on economic decision making remains largely unexplored. Leaving it unclear whether, their distinctiveness is reflected in a specific and dissociably impact on decision making across different paradigms and contexts. To answer these questions, we conducted two studies.

The first study systematically compares the impact of Power and Care across a range of economic behaviors. To this end, we experimentally induced participants with either a Care or a Power motive, relative to a control condition, before having them take part in a suite of classic game theoretical paradigms. We show that the Care induction alone raised scores on a latent factor of cooperation-related behaviors, rendering it different to Control, but not Power. Meanwhile, Care and Power differentially affected scores on a punishment related factor, indicating that Power and Care can be differentiated especially with regard to punishments.
The second study follows a similar design, yet this time, decisions are made in an intergroup context. In this context, both Power and Care were proposed to lead to similar behavioral changes, based on the assumption that "intergroup conflict might be driven by '"in-group love'—a cooperative motivation to help the in-group - or by 'out-group hate'- an aggressive or competitive motivation to hurt the out-group, or both."(Halevy, Weisel, & Bornstein, 2011). Yet, also here we find that *Care and Power* differentially affect behavior especially in males: While Care virtually eliminated inter-group discrimination, induced Power in interaction with self-reported attitudes increased them.

Our findings thus show that Care and Power indeed have a dissociable fingerprint in shaping cooperation and punishment as well as intergroup biases regarding these behaviors. Moreover they show, that a range of behaviors and biases can be enhanced or attenuated through context independent motivational inductions, which might help fostering cooperation across group boundaries.

N.A. Leen, F.E. van der Flier, P. Duits, J.M.P. Baas
Experimental Psychology, Utrecht University

Measuring fear trajectories: development of a short fear conditioning task

The lifetime prevalence of anxiety disorders is high and many patients do not benefit sufficiently or relapse after cognitive behavioral therapy (CBT). The fear conditioning paradigm models processes during exposure (extinction) and relapse (return of fear). Our previous work using an (un)instructed conditioning task showed three distinct trajectories based on a trajectory analysis approach. For patients with an anxiety disorder, being classified as poor extinguisher was predictive of low benefit from CBT. The task used in the previous study included physiological measures that are burdensome to acquire and only subjective fear rating trajectories were predictive of treatment success. The aim of the current study is to develop a more convenient fear conditioning paradigm to determine fear learning trajectories.
The developed task takes 15 minutes and focuses on subjective measures of fear (expectancy and fearfulness). Trajectories from latent class analysis were used to predict who shows a return of fear and experiences intrusions a week later.
The findings (N=300) demonstrated fear trajectories on expectancy and fearfulness similar to those found in our previous study.
A future aim is to implement this task in clinical practice to investigate which parameters are predictive of the benefit patients will have from CBT.

Caroline Junge , Lyan Porto , Emma Everaert , Brigitta Keij , Titia Benders , Prof. Paula Fikkert
Departments of Experimental and Developmental Psychology, Utrecht University

Infant preferences in speech segmentation tasks: let's focus on the method

Probing whether infants can behaviorally discriminate between different types of speech stimuli usually involves tasks that measure whether infants prefer listening to one. It remains unclear to predict the direction of infant preference: the literature on speech segmentation documents both familiarity and novelty preferences (Bergmann & Cristia, 2016). In the current study we ask whether the method also contributes to infant preference. While speech segmentation studies traditionally use a headturn-preference set-up (HTP; Jusczyk & Aslin, 1995), some use a single-screen to measure visual fixation (VF; e.g. Altvater-Mackensen & Mani, 2013). Here we test 64 10-month-olds with the same stimuli, but either with a HTP set-up or with a visual fixation procedure using an automated eye tracker. Both procedures are infant-controlled (listening stops whenever child looks away for >2 seconds). Whereas children in the HTP set-up show a robust familiarity preference, the children in the VF set-up show no evidence of learning. We hypothesise that the HPP, which relies on gross motor movements (headturns), offers a more transparent contingency between behaviour and sound presentation, thus enabling infants better to display their preferences. Our study thus suggests that the type of procedure might also contribute to infant preferences in infant-controlled listening studies.

List of Participants

Surname	First Name	Affiliation (Department, University)
Arkesteijn	Kiki	Human Movement Sciences, VU
Baas	Joke	Experimental Psychology, UU
Baas	Joke	Experimental Psychology, UU
Benjamins	Jeroen	Experimental Psychology, UU
Bos	Jelte	Movement Sciences, VU Amsterdam
Bos	Peter	Experimental Psychology, UU
Brenner	Eli	Human Movement Sciences, VU
Burggraaf-Wingens	Rudolf	Neuroscience, Erasmus MC
Cai	Yuxuan	Experimental and Applied Psychology, VU
Camara Lopez	Clara	Vision and Control of Action (VISCA) Group, Universitat de Barcelona
Carey	Mark	Department of Psychology, University of York
Olivers	Chris	Experimental and Applied Psychology, VU
de Haan	Alyanne	Experimental Psychology, UU
Di Lorenzo	Renata	Experimental Psychology & Developmental Psychology, UU
Dijkerman	Chris	Experimental Psychology, UU
Ding	Yun	Experimental Psychology, UU
Dumoulin	Serge	Experimental Psychology, UU
Edadan	Akhil	Experimental Psychology, UU
Elshout	Joris	Experimental Psychology, UU
Engel	Manja	Experimental Psychology, UU
Frens	Maarten	Neuroscience, Erasmus MC
Gabriël	Beckers	Experimental Psychology, UU
Haafs	Simon	i3B (www.i3b.org)
Harvey	Ben	Experimental Psychology, UU

Heeman	Jessica	Experimental Psychology, UU & VU
Hessels	Roy	Experimental Psychology & Developmental Psychology, UU
Holleman	Gijs	Experimental Psychology & Developmental Psychology, UU
Jackson	Stephen	School of Psychology, University of Nottingham
Janssen	Christian	Experimental Psychology, UU
Junge	Caroline	Experimental Psychology & Developmental Psychology, UU
Kappers	Astrid	Human Movement Sciences, VU
Keizer	Anouk	Experimental Psychology, UU
Kenemans	Leon	Experimental Psychology, UU
Kuiper	Ouren	Human Movement Sciences, VU
Louwen	Suzanne	Neuroscience/Child-Psychiatry, Erasmus MC
Maravita	Angelo	Università degli Studi di Milano-Bicocca
Meier	Isabell	Experimental Psychology, UU
Montoya	Estrella	Experimental Psychology, UU
Naber	Marnix	Experimental Psychology, UU
Nelson	Jacob	Human Movement Sciences, VU
Newell	Fiona	School of Psychology and Institute of Neuroscience, Trinity College Dublin
Overvliet	Krista	Experimental Psychology, UU
Parianen Lesemann	Franca	Experimental Psychology, UU
Paul	Jacob	Experimental Psychology, UU
Romeijn	Nico	Experimental Psychology, UU
Ruis	Carla	Experimental Psychology, UU
Schutte	Iris	Experimental Psychology, UU
Smeets	Jeroen	Human Movement Sciences, VU
Smit	Miranda	Experimental Psychology, UU
Staal	Justine	Neuroscience, Erasmus MC
van der Stigchel	Stefan	Experimental Psychology, UU

Stone	Kayla	Experimental Psychology, UU
Struiksma	Marijn	Taal & Communicatie/UiL-OTS, UU
Stuit	Sjoerd	Experimental Psychology, UU
t Hart	Björn	Taal & Communicatie/UiL-OTS, UU
te Pas	Susan	Experimental Psychology, UU
ten Brink	Teuni	Experimental Psychology, UU
ter Haar	Sita	Cognitive Neurobiology & Experimental Psychology, UU
Tsouli	Andromachi	Experimental Psychology, UU
van Berkum	Jos	Taal & Communicatie/UiL-OTS, UU
van den Boomen	Carlijn	Experimental Psychology, UU
van den Boomen	Carlijn	Experimental Psychology, UU
van der Flier	Febe	Experimental Psychology, UU
van der Geest	Jos	Neuroscience, Erasmus MC
van der Heiden	Remo	Experimental Psychology, UU
van der Smagt	Maarten	Experimental Psychology, UU
Van der Stoep	Nathan	Experimental Psychology, UU
van Dijk	Jelle	Experimental Psychology, UU & Spinoza Centre for Neuroimaging, Amsterdam
van Ooijen-van der Linden	Linda	Experimental Psychology, UU
Zhang	Yajie	Human Movement Sciences, VU