Poster Session

Wednesday, 20 January 2016 14:00-16:00				Balint Hall
1	**Corina**	**Aguilar-Raab**	**University Heidelberg, Germany**	corina.aguilar-raab@med.uni-heidelberg.de
	(Title: to be announced)			
2	**Vasilis**	**Anagnostopoulos**	**ETH Zurich, Switzerland**	anagnwstopoulos@hotmail.com
	Location-Aware Mobile Tracking for Tourist Assistance			
3	**Friederike**	**Blume**	**University of Tübingen, Germany**	friederike.blume@uni-tuebingen.de
	Eye Tracking in 3D Virtual Reality (VR) Classrooms in Children with and without Attention-Deficit/Hyperactivity Disorder (ADHD)			
4	**Tatiana**	**Esau**	**University of Duisburg-Essen, Germany**	tatiana.esau@uni-due.de
	Action-Oriented Analysis of Engineering Design Problem-Solving Processes in Technology Education			
5	**Nina**	**Gehrer**	**Eberhard Karls Universität Tübingen, Germany**	nina.gehrer@googlemail.com
	Social information processing in violent offenders with antisocial personality disorder			
6	**Johannes**	**Hellenbrand**	**University of Duisburg-Essen, Germany**	johannes.hellenbrand@uni-due.de
	Using eye tracking to identify the underlying cognitive processes of generative drawing as a self-regulated learning strategy			
7	**Alex**	**Junghans**	**ETH Zürich, Switzerland**	alex.junghans@hest.ethz.ch
	Survival Curve Processing and Numeracy: an Eye Tracking Study			
8	**Laura**	**Kress**	**University of Bern, Switzerland**	laura.kress@psy.unibe.ch
	How do optimistic expectancies influence visual attention?			
9	**Christian**	**Lander**	**Universität Saarbrücken, Germany**	Christian.Lander@dfki.de
	Methods for Improving Eye Tracking Calibration and Multi User Interaction			
10	**Pascal**	**Lienert**	**ETH Zurich, Switzerland**	pascal.lienert@hest.ethz.ch
	Affective responses to high-voltage power lines: The importance of siting			
11	**Magdalena**	**Luniewska**	**Polish Academy of Sciences / University of Warsaw, Poland**	luniewskam@gmail.com
	Vocabulary size and organization of the mental lexicon of Polish children			
12	**Shanmugaraj**	**Madasamy**	**Institute of Technology Blanchardstown, Ireland**	innoraj@gmail.com
	Investigation of Driver Distraction Factors using Eye Gaze Measurements			
13	**Diego**	**Navarro**	**Blekinge Institute of Technology, Sweden**	diego.navarro@bth.se
	Psycho-pysiological Feedback as an Input for Virtual Reality and Video Game Interaction			
14	**Michele**	**Oliver**	**University of Guelph, Canada**	moliver@uoguelph.ca
	DRiVE Lab 2.0 (Driving Research in Virtual Environments 2.0)			

15	**Johanna**	**Schmid**	**Eberhard Karls Universität Tübingen, Germany**	johanna.schmid@uni-tuebingen.de
	Visual Attention and Goal Pursuit: Do Implementation Intentions Modulate Visual Attention in Adolescents With and Without Attention-Deficit/ Hyperactivity Disorder?			
16	**Ines**	**Spenthof**	**University of Freiburg, Germany**	ines.spenthof@psychologie.uni-freiburg.de
	Eye-contact avoidance and gaze patterns in dyadic social interactions: A pilot study.			
17	**Tim Claudius**	**Stratmann**	**University of Oldenburg, Germany**	tim.claudius.stratmann@uni-oldenburg.de
	Improving the Situation Awareness of OOWs by tracking and shifting their visual spatial attention			
18	**Rafael**	**Veras Guimaraes**	**University of Ontario Institute of Technology (UOIT)**	rafaveguim@gmail.com
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19	**Stefanie**	**Wetzel**	**Bauhaus-Universität Weimar, Germany**	stefanie.wetzel@uni-weimar.de
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21	**Anika**	**Bauer**	**Universität Osnabrück, Germany**	anika.bauer@uni-osnabrueck.de
	Selective visual attention for one's own body – An eye-tracking study in adolescents with Anorexia and Bulimia nervosa			
22	**Chandan**	**Kumar**	**University of Koblenz**	kumar.ire@gmail.com
	(Title: to be announced)			

Poster 1: **Corina Aguilar-Raab (University Heidelberg, Germany)**

Title: to be announced

Abstract: to be announced

Poster 2: **Vasilis Anagnostopoulos (ETH Zurich, Switzerland)**

Location-Aware Mobile Tracking for Tourist Assistance

The problem of gaze estimation and tracking attracted a lot of research interest because of its many potential applications in areas such as human attention analysis and gaze-based user interfaces. However, the input from gaze-based devices might not be able to be used in an intuitive, efficient, and privacy-preserving way to provide information services on touristic areas of interest such as city panoramas. This research project is aimed to bridge the gap by designing and developing an outdoor gaze-based interaction platform for tourists visually exploring a city panorama.

Poster 3: **Friederike Blume (University of Tübingen, Germany)**

Eye Tracking in 3D Virtual Reality (VR) Classrooms in Children with and without Attention-Deficit/Hyperactivity Disorder (ADHD)

Children with ADHD are inattentive, hyperactive and impulsive, and these core symptoms are known to affect performance levels at home and at school (American Psychiatric Association, 2013). However, not only school performance is affected, but also the children's and their family's quality of life. Hence, ADHD often requires adequate medical and psychological treatment. With my PhD studies, (1) I aim at implementing a near infrared spectroscopy (NIRS) based neurofeedback training (NF) 3D VR classrooms as a therapeutic intervention in primary school children with ADHD. (2) I will examine how children with and without ADHD perceive classroom situations that differ in the virtual teacher's instructional quality. I aim at applying eye tracking in both projects serving various goals.

(1) A NIRS-based NF aims at increasing the level of oxygenated haemoglobin in prefrontal areas in primary school children with ADHD, as it is known to be decreased in patients with ADHD compared to healthy controls (e.g., Marx et al., 2015; Negoro et al., 2010). To our knowledge, we are the first to implement the NF in a 3D VR classroom visualised through a head-mounted display (HMD). This approach aims at facilitating the transfer of acquired self-regulation strategies from laboratory to real-life classroom situations. In developing the classroom, we aim at creating an ecologically valid scenario, hence it will contain auditory and visual distractors such as fellow students talking and fidgeting, getting up from their places, or mobile phones that ring, for instance. Within this project, we aim at implementing eye tracking as a means to validate whether the distractors presented influence the subjects' attention. We expect that eye movement towards the distractor should occur when the distractors disturb the subjects' attentional focus. Furthermore, eye tracking in NF will be employed as a means to control whether a subject's eyes are open or closed when an HMD is worn.

(2) Different studies provide evidence that teachers' instructional quality crucially influences children's academic development (e.g., Fauth, Decristan, Rieser, Klieme, & Büttner, 2014). However, until today, it is more or less unknown, whether children with ADHD perceive and employ their teachers' instructional offers in the same way as their healthy classmates do. Furthermore, it is unknown, whether children with and without ADHD visually focus on the same things during lessons. Hence, my second PhD study is going to examine the visual foci of schoolchildren with and without ADHD while a virtual teacher explains a certain subject matter to them with varying instructional quality.

Finally, as prospective studies, I plan to investigate where children with and without ADHD look at during real-life lessons at school. Moreover, I plan to examine the effects of a NF in schoolchildren with ADHD on eye movements in virtual as well as real-life classroom situations.

Poster 4: **Tatiana Esau (University of Duisburg-Essen, Germany)**

Action-Oriented Analysis of Engineering Design Problem-Solving Processes in Technology Education

The rapid development of technology and its complexity require multidisciplinary competencies such as problem-solving skills. The solving of engineering design problems belongs to the special case of the problem-solving and is one of the most important action-oriented learning methods in the technical education. In the didactic literature, the action-oriented learning processes, especially with the possibility to interact with real objects, count to highly effective. Nevertheless, currently there are not empirical investigation with respect to the technology education which prove this theses. In particular, it have not been explored what factors do influence the quality of the solution processes in details. So the aim of my project is to verify these theses and to explore the influencing factors. For this a survey will be carried out at schools in Germany and in Luxembourg.

Poster 5: **Nina Gehrer (Eberhard Karls Universität Tübingen, Germany)**

Social information processing in violent offenders with antisocial personality disorder

Appropriate social functioning depends upon the correct perception and interpretation of verbal and nonverbal information. Deficits in the processing of relevant (non-verbal) social cues are hypothesized to underlie the development and maintenance of antisocial and aggressive behaviour. Consistently, mounting evidence supports the assumption of altered perception and interpretation of affective stimuli in aggressive individuals with antisocial personality disorder (ASPD). Moreover, some studies found evidence for altered visual search patterns in aggressive individuals (e.g., reduced attention to the eye region) when they were instructed to categorize emotional facial expressions.

This project aims to investigate the underlying attentional processes relevant to the perception of facial affect in two groups of incarcerated offenders (violent and non-violent offenders) and healthy controls. In particular, we are interested in investigating how aggressive and dissocial personality traits may relate to deficits in the attention given to salient emotional aspects other people's faces (e.g., number and duration of fixations or number of first fixations in the eye region). Furthermore, we aim to examine possible between-group differences in pupil dilation as a measure of sympathetic nervous system activity during processing of emotional facial expressions.

Poster 6: **Johannes Hellenbrand (University of Duisburg-Essen, Germany)**

Using eye tracking to identify the underlying cognitive processes of generative drawing as a self-regulated learning strategy

(with Maria Opfermann, Annett Schmeck, and Detlev Leutner)

Students often have difficulties dealing with complex scientific texts (Baumert et al., 2001; Schnotz, 1994). In this regard, if one wants to enable students to study for deep level understanding, a generative learning strategy like drawing might be a suitable way to overcome such difficulties. By asking students to make a drawing (e.g., while they read a text) they have to engage in generative learning processes like selecting relevant elements and relations, organizing the material into a coherent mental model and integrating this information with prior knowledge from long-term memory (generative drawing; Leutner & Schmeck, 2014).

The cognitive processes underlying generative drawing are described in van Meter and Garner's (2005) Generative Theory of Drawing Construction (GTDC) and in van Meter and Firetto's (2013) updated version - the Cognitive Model of Drawing Construction (CMDC). One proposed advantage of drawing (in comparison to other cognitive learning strategies like the highlighting) is that self-regulation processes are automatically fostered when using the drawing strategy (Leopold & Leutner, 2015). There is empirical evidence for the so called generative drawing effect (see, for example, Fiorella & Mayer, 2015; Leutner & Schmeck, 2014; Schmeck, 2010; Schmeck, Mayer, Opfermann, Pfeiffer, & Leutner, 2014; van Meter & Firetto, 2013), but it is not confirmed yet that learner-generated drawings foster self-regulation processes more than other generative learning strategies. In other words: There is empirical evidence for learner-generated drawings as a learning strategy, but there is no evidence for the underlying cognitive processes assumed in the CMDC.

The goal of my PhD project is to examine the specific cognitive processes underlying generative drawing as a self-regulated learning strategy and to modify the according theoretical assumptions (if necessary). The CMDC predicts that, by using the drawing strategy, learners' attention will be directed towards key elements and their relations to be taken from a text to be read. Furthermore, it can be expected that the process of drawing prompts the use of other known learning strategies, which support the process of selecting and organizing structural elements. A further prediction is that learners who generate drawings on their own use self-monitoring and self-regulation processes more frequently than learners who do not use this strategy (van Meter & Firetto, 2013).

First, in order to study the cognitive processes mentioned above, I want to investigate high school students when they are requested to draw on paper while reading on a scientific issue. While the students are reading and drawing, we track their eye movements with Eye Tracking Glasses (SMI). Point-of-view videos, eye movements and the non-digital outputs (like highlighted text and the quality of drawings) will help to make those processes observable. Second, I want to evaluate if the cognitive processes mentioned above are unique for the learner-generated drawing strategy or if they can also be found when other generative learning strategies are applied (e.g., writing summaries). In addition, another goal of my research is to point out differences between good and bad strategy users. In this regard, using Eye Tracking Glasses (SMI) allows us to leave the laboratory setting and to collect data of eye movements in a realistic field setting. My plan is to work with 8th and 9th graders in different schools to shed more light on the strategy's usefulness in practice.

The project's objectives are significant both from a theoretical and practical perspective. From a theoretical perspective, my study will provide insights into the theoretical assumptions of generated drawing as a self-regulated learning strategy and how these assumptions can be distinguished from assumptions regarding other learning strategies. From a practical perspective, my study will provide details as to what are the underlying processes of generative drawing and which of them foster learning. In addition, the underlying cognitive processes of generative drawing as a self-regulated learning strategy are initially recognized based on eye-tracking analyses and thereby in a realistic setting.

References

Baumert, J., Klieme Eckhard, Neubrand, M., Prenzel, M., Schiefele, U., Schneider, W., . . . Weiß, M. (Eds.). (2001). PISA 2000: Basiskompetenzen von Schülerinnen und Schülern im internationalen Vergleich. Opladen: Leske + Budrich.

Fiorella, L., & Mayer, R. E. (2015). Learning as a generative activity: Eight learning strategies that promote understanding. New York: Cambridge University Press.

Leopold, C., & Leutner, D. (2015). Improving students' science text comprehension through metacognitive self-regulation when applying learning strategies. Metacognition and Learning, published online first. doi:10.1007/s11409-014-9130-2

Leutner, D., & Schmeck, A. (2014). The generative drawing principle in multimedia learning. In R. E. Mayer (Ed.), The Cambridge handbook of multimedia learning (2nd ed., pp. 433–448). Cambridge: Cambridge University Press.

Schmeck, A. (2010). Visualisieren naturwissenschaftlicher Sachverhalte. Der Einsatz von vorgegebenen und selbst generierten Visualisierungen als Textverstehenshilfen beim Lernen aus naturwissenschaftlichen Sachtexten (Dissertation). Universität Duisburg-Essen, Essen.

Schmeck, A., Mayer, R. E., Opfermann, M., Pfeiffer, V., & Leutner, D. (2014). Drawing pictures during learning from scientific text: Testing the generative drawing effect and the prognostic drawing effect. Contemporary Educational Psychology, 39(4), 275–286. doi:10.1016/j.cedpsych.2014.07.003

Schnotz, W. (1994). Aufbau von Wissensstrukturen: Untersuchungen zur Kohärenzbildung beim Wissenserwerb mit Texten. Fortschritte der psychologischen Forschung: Vol. 20. Weinheim: Beltz.

van Meter, P., & Firetto, C. M. (2013). Cognitive model of drawing construction: Learning through the construction of drawings. In G. J. Schraw, M. T. McCrudden, & D. R. Robinson (Eds.), Current perspectives on cognition, learning, and instruction. Learning through visual displays (pp. 247–380). Charlotte, N.C.: Information Age Publishing.

van Meter, P., & Garner, J. (2005). The promise and practice of learner-generated drawing: Literature review and synthesis. Educational Psychology Review, 17(4), 285–325. doi:10.1007/s10648-005-8136-3

Poster 7: Alex Junghans, Carmen Keller, Michael Siegrist (ETH Zürich, Switzerland)

Survival Curve Processing and Numeracy: an Eye Tracking Study

People low in health numeracy have problems understanding medical risk information. The aim of the proposed research is to help patients, especially those low in numeracy, understand medical risk information, allowing them to make informed decisions. Graph formats have been found to be more suitable for low numerates. Line graphs, more specifically, survival curves, are recommended for communicating time dependant risks or trends.

In the present study, we examined the processing strategies when interpreting survival curves and the effect of numeracy and survival curve training using eye tracking. A group of participants (n = 58) were shown survival curve stimuli and answered the accompanying questions while their eye movements were tracked. Higher numeracy improved survival curve comprehension by increasing visual attention on relevant graph elements. In order to test whether performance can be improved by promoting visual attention of the relevant graph elements, a second group of participants (n = 54) received a training on survival curves prior to the task. In the trained group, the same relationship as in the control group was found for low, but not high, numerates altough high numeracy was still lnked to better performance. Results indicate that the comprehension of survival curves can be facilitated for low numerates by improving their visual attention on relevant graph elements, promoting informed decision making.

Poster 8: **Laura Kress (University of Bern, Switzerland)**

How do optimistic expectancies influence visual attention?

Being able to predict future events is crucial in everyday life, especially when it comes to planning behavior and making decisions. Humans show a robust tendency to overestimate the likelihood of positive events and underestimate the probability of negative events in their future. This optimistic bias seems to act as a protective mechanism promoting mental health and well-being. However, the underlying cognitive mechanisms of optimism bias have not been identified yet. Therefore, the present study investigates in how far optimistic and pessimistic expectancies influence visual attention on positive and negative stimuli.

Thirty healthy students took part in a standard visual search paradigm in which they had to find a target stimulus (happy or sad face) among seven distractor stimuli (neutral faces). Participants were told that they took part in a gamble and that happy faces represented winning money while sad faces represented losing money. Participants' expectancies about the likelihood of winning or losing were manipulated by verbal cues before each visual search array.

First results show significantly longer reaction times for loss targets when high compared to low winning expectancies were induced. In contrast, no influence of expectancy cues was found on the detection of win targets. Moreover, differences in eye gaze behavior and physiological measures will be analyzed.

The described results show a causal relationship between optimistic expectancies and attention engagement to negative stimuli. This reduced attention on negative aspects in the environment might act as a mechanism underlying the positive effects of optimism bias and should, therefore, be further investigated.

Poster 9: **Christian Lander (Universität Saarbrücken, Germany)**

Methods for Improving Eye Tracking Calibration and Multi User Interaction

We perceive most of the world through our eyes. The point of gaze reflects our overt visual attention and naturally indicates what we are interested in. Therefore gaze is used for different kind of applications. Although work exist in the field of gaze interaction and eye tracking, still some serious issues exist that have to be addressed to make the technology usable outside a controlled environment like a lab or over a longer period of time. The poster presents developed methods and planned work that address the issues of calibration of and multi user interaction using head mounted eye tracking systems.

Poster 10: **Pascal Lienert (ETH Zurich, Switzerland)**

Affective responses to high-voltage power lines: The importance of siting

The majority of Swiss high-voltage power lines (HVPLs) are older than 50 years and need to be renewed in order to meet the increased demand of electricity. Additionally, the planned transition from nuclear power to decentralized renewable energy sources in Switzerland creates a need for the modification and expansion of the electricity grid. However, public acceptance of HVPLs is generally low, which often leads to delays and suspensions of planned grid expansion projects. Drawing on the importance of affect in the context of public acceptance of technologies, the goal of the present work was to shed light on people's affective responses towards HVPLs. The results of an online study (N=94) showed that pictures of landscapes with HVPLs evoke significantly stronger negative feelings than pictures of the same landscapes without HVPLs. Moreover, these differences were larger for pictures showing positive surroundings like natural landscapes, recreation areas or residential zones compared to pictures with negative surroundings like highways and industrial areas. This underlines the importance of siting in the context of changes to the electricity grid. To find out whether these findings are simply due to strategic answering and are therefore only found for self-reports, an eye-tracking study (N=96) was conducted to test whether they can also be observed on a more implicit level. Based on previous findings demonstrating that affective responses go along with an increase in pupil size, we expected that participants would show greater pupil dilation while presented with pictures of landscapes with HVPLs compared to the same pictures where the HVPLs were removed. Analysis of the eye-tracking data is still ongoing.

Poster 11: Magdalena Luniewska (Polish Academy of Sciences/University of Warsaw, Poland)

Vocabulary size and organization of the mental lexicon of Polish children

I aim to verify the theories concerning size and organization of mental lexicon in typically developing children and children under the risk of specific language impairment SLI.

To accomplish my goals I use computer versions of several standarized Polish vocabulary tests (picture naming and picture choice task). The software I use makes it possible to access both: accuracy and reaction time in picture-choice task. Additionally I apply eyetracking to this task in order to check wheter the pattern of looking at different distractor types depends on child's vocabulary size or her classification as being under-risk of SLI or not.

During the workshop I would like to present and discuss the methods used in the project, namely: simultanous collection of eyetracking data and reaction times in picture-choice taks, as well as present preliminary data from 30 monolingual Polish preschoolers who completed the procedure.

Poster 12: Shanmugaraj Madasamy, Barry Kirkpatrick, Catherine Deegan

(Department of Engineering, Institute of Technology Blanchardstown, Dublin-15, Ireland)

Investigation of Driver Distraction Factors using Eye Gaze Measurements

The aim of this PhD research is to integrate a low-cost eye-tracker with a video-based driving simulator to classify driver behavioural types based on the eye-gaze behaviour of simulator participants. The driving simulator has been developed by SIMRG, a cross-disciplinary research group established between the Institute of Technology Blanchardstown in Dublin and Maynooth University in Kildare, Ireland. Studies have shown video-based simulation is a valid tool with which to measure driver steering and speed behaviour. The specific aim of this PhD is to extend the work of the group further into the human factors area, which deals with the cognitive and psychological behaviour of drivers, and incorporate elements such as external driver distraction and the relationship between driver attender type and driver behaviour. We are planning to develop a system to integrate Eye Tracking Technology with a driving simulator to experiment and analyse eye movements of the participants (drivers). The integrated driving simulator with eye tracking technology records the movement of eye gaze over the screen display. The recorded gaze data will be analysed to find various aspects of driver eye gaze and focus which would be useful for assessment of driver behaviour. In this poster, background information on the project is presented alongside preliminary results on a comparison of two low-cost eye trackers that are being considered to collect eye gaze data in the driving simulator.

Poster 13: Diego Navarro (Blekinge Institute of Technology, Sweden)

Psycho-pysiological Feedback as an Input for Virtual Reality and Video Game Interaction

Psycho-physiological feedback is the measurement of different physiological information, in order to relate to a psychological state, when exposed to a particular stimuli or a performing a determined task. This method involves the use of different types of sensors to monitor physiological activities such as brain activity, gaze behavior, muscle tension, electrodermal activity, electrocardiac activity, etc.

Even with the majority of contributions done in the areas of medicine and psychology, psycho-physiological feedback has been previously applied to virtual reality and video games applications, thanks to the release of affordable, yet reliable, sensor technology like the Oculus Rift or the Tobii EyeX. However, most of these contributions had focused on using the physiological feedback from players as an input for video game control, as a method to evaluate game design, or for emotion regulation techniques. Additionally, most of the previous research make use of only one sensor at time.

This project will focus in developing the hardware and software platforms, needed to create a synchronized environment of sensors for physiological feedback interaction. The main goal is to involve player's physiological information into virtual reality and game applications, giving the opportunity to:

a) Research and develop more complex, detailed and novel interaction techniques based on adaptation (game mechanics and elements being influenced by players psychological status) or assistance (Help the players to achieve a particular goal).

b) Improve current emotion recognition systems by involving the use of artificial intelligence algorithms, to identify patterns in the sensor signals.

Poster 14: Michele Oliver (University of Guelph, Canada)

DRiVE Lab 2.0 (Driving Research in Virtual Environments 2.0)

DRiVE Lab 2.0 is comprised of two state of the art virtual reality laboratories housed in the School of Engineering at the University of Guelph in Guelph, Ontario, Canada. One of the laboratories contains a full sized Pontiac G6 OKTAL static car simulator as well as a 12 camera VICON motion capture system. The other laboratory contains a 6 degree of freedom hexapod robot dynamic heavy equipment/car simulator coupled with a 7 camera VICON motion capture system. Also available to both laboratories are two Delsys surface electromyography systems for monitoring muscle activation levels. Both of the laboratories

incorporate visual as well as haptic feedback. The dynamic simulator includes a pair of haptic controls coupled with a virtual reality head mount display whereas the OKTAL simulator uses 6 high definition projectors to provide 300 degrees of coverage on the wrap around screens.

The labs involve a multidisciplinary collaboration between Drs. Lana Trick from Psychology, Blair Nonnecke from Computer Information Systems and Michele Oliver from the School of Engineering. Both facilities are being used to develop and test new in-vehicle devices to make driving safer and to reduce the risk of developing repetitive strain injuries in the back, neck and upper limbs. The two simulation facilities allow for the simultaneous investigation of combinations of biomechanical, physiological, and psychophysical basic and applied research questions under realistic operating conditions. One of the integral pieces soon to be added to the suite of monitoring instrumentation is an eye tracking system. This will allow for simultaneous monitoring of operator kinematics and muscle activation levels while tracking where the operator is looking.

Poster 15: Johanna Schmid (Eberhard Karls Universität Tübingen, Germany)

Visual Attention and Goal Pursuit: Do Implementation Intentions Modulate Visual Attention in Adolescents With and Without Attention-Deficit/ Hyperactivity Disorder?

Inattention, hyperactivity, and impulsivity increase the risk for academic impairments in individuals with attention-deficit/ hyperactivity disorder (ADHD). Previous research has shown that implementation intentions (Gollwitzer, 1999) are an effective means to promote the self-regulation of goal-pursuit in individuals with ADHD both in the laboratory (Gawrilow & Gollwitzer, 2008) and in academic settings (Guderjahn, Gold, Stadler, & Gawrilow, 2013). Implementation intentions associate a specific situational cue with certain goal-directed behavior ("If I encounter situation X, then I will initiate behavior Y!"). It has been proposed that implementation intentions elicit automatic performance of goal-directed behavior once the specified situational cue is encountered (Gollwitzer, 1999). Until today, however, the mechanisms underlying the effects of implementation intentions as well as stability of effects over several weeks have received only little empirical investigation. Within the scope of this research we will investigate in 3D virtual reality classrooms whether (1) an implementation intention intervention targeting performance in an academic task modulates visual attention in adolescents with and without ADHD. (2) We aim at examining the temporal stability of implementation intention effects on academic task performance and visual attention across 2-, 4-, and 6-week follow-up assessments. (3) In further studies we aim at examining how varying strengths and frequencies of distractors may impair the effectiveness of implementation intentions and their effect on visual attention in adolescents with and without ADHD to identify conditions that require a combination of implementation intentions with additional self-regulation strategies.

Poster 16: Ines Spenthof (University of Freiburg, Germany)

Eye-contact avoidance and gaze patterns in dyadic social interactions: A pilot study.

Introduction: The face, especially the eye region, provides a multitude of social information, comprising an individual's emotional and mental state. Eye contact is a key signal in regulating social interactions, e.g. it influences the degree of perceived intimacy as well as perceived dominance, and it influences the perception of someone's social competence. In social anxiety disorder the avoidance and fear of direct eye-contact is a frequently reported symptom and is theorized to be modulated by the level of perceived evaluative threat.

Method: This study uses infrared remote eye-tracking in a naturalistic semi-structured dyadic interaction paradigm. In an analogue sample of 120 students the effect of the experimental induced social threat on gaze-behavior was investigated in a 2 x 2 design, with the groups low and high socially anxious and the conditions low and high social threat.

Results: Preliminary findings will be presented. Furthermore different measures of initiation, maintaining and avoidance of eye-contact in a dyadic social interaction are explored and their feasibility as indicators for social functioning will be discussed.

Poster 17: Tim Claudius Stratmann (University of Oldenburg, Germany)

Improving the Situation Awareness of OOWs by tracking and shifting their visual spatial attention

With ships becoming bigger and bigger, navigation and maneuvering without the given technology has become nearly impossible. Seafarers have to rely on information given by their navigational and assistive systems. In this work we are aiming to improve the situation awareness of officers of the watch by optimizing their monitoring behavior. To achieve this, we track the visual spatial attention of the officer of the watch and shift it to areas with potentially unseen critical information. This should lower the risk of sea accidents such as collisions and grounding.

Poster 18: **Rafael Veras Guimaraes (University of Ontario Institute of Technology, UOIT)**

Abstracting Treemap Visualizations with the Minimum Description Length Principle

Treemap visualizations tend to suffer with over-plotting when depicting very large hierarchies. The level of clutter in such plots hinder readability, and the large number of graphic primitives impacts rendering and interaction. To solve this problem, one can take advantage of the hierarchical structure of the underlying data to abstract selected subtrees, reducing clutter at the expense of information; however, how to determine the appropriate level of abstraction and which subtrees should be preferred for abstraction? I will present a new procedure for automatic abstraction of treemap visualizations based on the minimum description length principle of information theory. The results are illustrated with a prototype web visualization of a hierarchical dataset containing nearly half million nodes.

Poster 19: **Stefanie Wetzel (Bauhaus-Universität Weimar, Germany)**

Rotate it! An adaptive training of student's spatial skills

The aim of this project is to develop an adaptive application for the training of spatial skills of secondary school students. Based on the interactions with the application (such as touch-based interaction on a tablet and gaze data) during the solving of a spatial task, the applied solution strategy of a student shall be estimated live. Students using less efficient strategies shall be supported with live generated hints to acquire more efficient solution strategies.

In a first step, the iPad app Rotate it! was developed to gather touch-based interaction data during mental and physical rotation tasks based on the classical Shepard and Metzler stimuli. Additionally, the user wears a mobile eye tracker (SMI Glasses) to capture eye movements. In a post-hoc analysis, variables based on the interaction, such as the angular disparities between physical rotation stimuli, as well as fixations, transitions, and blinks are operationalized to define features for strategy classification.

Poster 20: **Christopher Zimmerman (Copenhagen Business School, Denmark)**

Evaluating The Social Newsroom - Visual Analytics for Social Business Intelligence

Abstract—Insufficient data visualization in current social media tools is hampering opportunities to make effective meaning and take decisive action from social data. This paper presents the technical architecture of a prototype tool for Social Business Intelligence (SBI) under development. Adopting an Action Design Research approach, the goal of the 'Social Newsroom' is to provide practitioners with user interfaces for leveraging such affordances. The construction of specific interfaces is detailed including monitoring dashboards and insights pillars for visual analytics.

For an overview of the tool and preview of the poster, please see: https://prezi.com/gkajqf_a0qj9/the-social-newsroom/

Poster 21: **Anika Bauer, Silvia Schneider, Manuel Waldorf, Karsten Braks, Thomas J. Huber, Dirk Adolph & Silja Vocks (Universität Osnabrück, Germany)**

Selective visual attention for one's own body – An eye-tracking study in adolescents with Anorexia and Bulimia nervosa

Background: A deficit-oriented body-related attentional bias seems to play an important role in the development of eating disorders. The aim of the present study was to analyze such appearance-related attention patterns for one's own and a peer's body in adolescents with different forms of eating disorders.

Methods: N = 141 female adolescents (n = 30 with Anorexia Nervosa restrictive subtype, n = 26 with Anorexia Nervosa binge/purge subtype, n = 22 with Bulimia Nervosa, n = 20 clinical controls with anxiety disorders and n = 43 healthy controls) looked at standardized photos of their own and a peer's body while their spontaneous eye movements were recorded. After the second photo presentation, participants gave attractiveness ratings for the body areas of both bodies.

Results: Analyses of variance revealed significantly longer fixation times on unattractively evaluated body areas of one's own body compared to the peer's body in all subgroups. Girls with Anorexia Nervosa restrictive subtype looked significantly longer at body areas considered unattractive and significantly shorter at body areas considered attractive than the healthy controls and the clinical controls. Furthermore, the deficit-oriented pattern of attention allocation was significantly correlated with state body dissatisfaction after photo presentation within the eating disorders subsample and the control sample.

Discussion: In general, female adolescents showed a deficit-oriented body-related gaze pattern. However, only girls with Anorexia Nervosa restrictive subtype demonstrated a significantly stronger bias compared to the control groups. These results implicate the implementation of therapeutic interventions focusing on the modification of body-related attentional biases.

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Title: to be announced

Abstract: to be announced