

# **JAHRESBERICHT 2009**

## **Allgemeine Psychologie und Methodologie**

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**Fakultät für Psychologie  
Universität Basel**

# JAHRESBERICHT 2009

## *Allgemeine Psychologie und Methodologie*

### **Mitarbeiterinnen und Mitarbeiter der Abteilung (per 31.12.2009)**

<i>Abteilungsleitung</i>	Prof. Dr. Klaus Opwis, Ordinarius für <i>Allgemeine Psychologie und Methodologie</i>
<i>Sekretariat</i>	B.Sc. Cornelia Witthauer
<i>Wissenschaftliche Mitarbeitende</i>	Dr. Javier Bargas-Avila PD Dr. Pasquale Calabrese Dr. Markus Stöcklin
<i>Assistierende</i>	M.Sc. Nina Bechtel (UKBB-Projekt) M.Sc. Maja Kobel PD. Dr. Iris-Katharina Penner M.Sc. Stefan Pauwels (ZKB-Projekt) M.Sc. Sandra Roth M.Sc. Alexandre Tuch
<i>Hilfsassistierende</i>	B.Sc. Noemi Gsponer (MMI) B.Sc. Martina Hubacher (Kognitive Neuropsychologie) B.Sc. Elisa Mekler (MMI) B.Sc. Sebastien Orsini (MMI) B.Sc. Donja Rodic (Kognitive Neuropsychologie) B.Sc. Mirjam Seckler (MMI)
<i>Lehraufträge</i>	Prof. Dr. Andreas Gold (FS 2009) Christian Hübscher (FS 2009) Dr. Stefan Leuthold (HS 2009) Prof. Dr. Christian Rösler (FS 2009, HS 2009) Prof. Dr. Hans Spada (FS 2009)

## Kurze Chronologie des Jahres 2009

*Kurzer chronologisch geordneter Gesamtüberblick über bemerkenswerte Vorkommnisse im Jahr 2009 aus Sicht der Abteilung für Allgemeine Psychologie und Methodologie*

### *Januar 2009*

Pasquale Calabrese wird im Januar 2009 als Co-Investigator mit der Aufgabe des neuropsychologischen Projektkoordinators des transatlantischen Projektes: *Neurotoxicity in Primary Central Nervous System Lymphoma: An international, collaborative, observational study of cognition in long-term survivors* betraut. (Projekt in Kooperation mit Prof. Dr. E.A. Neuwelt, Oregon Health & Science University (USA), PD Dr. A. Korfel, Charité Berlin, Campus Benjamin Franklin. Förderung: OHSU Knight Cancer Institute # CPC-07100-L.

Pasquale Calabrese wird im Januar 2009 als Mitglied in das Medizinische Qualitätsnetz Bochum (Med-QNB) berufen.

Klaus Opwis wird als externer Experte in die Berufungskommission für die *W3-Professur für Kognitionswissenschaft* der Wirtschafts- und Verhaltenswissenschaftlichen Fakultät der Albert-Ludwigs-Universität Freiburg berufen.

### *Februar 2009*

Die Nationalversicherung Schweiz bewilligt eine Projektzusammenarbeit mit Javier Bargas-Avila, Klaus Opwis und Sebastien Orsini im Bereich der Mensch-Maschine-Interaktion (Förderung für 9 Monate mit rund CHF 50'000,-).

### *März 2009*

Pasquale Calabrese ist seit März 2009 beratendes Kooperationsmitglied zum Aufbau der Stroke-Unit am Klinikum Dortmund (D) tätig.

Iris-Katharina Penner schliesst ihr Habilitationsverfahren an der Fakultät für Psychologie erfolgreich ab.

### *April 2009*

Pasquale Calabrese wird am 28. April 2009 in Bonn zum Vorstandsmitglied der Gesellschaft für Prävention e.V. gewählt.

### *Juli 2009*

Pasquale Calabrese wird am 13. Juli in Wien zum Vorstandsmitglied der European Memory Clinics Association (EMCA) gewählt.

### *September 2009*

Iris-Katharina Penner hält ihre Antrittsvorlesung an der Universität Basel zum Thema *Fatigue im Wandel der Zeit: Ennui, Lassitude, Mattigkeit, Neuasthenie, Chronic Fatigue Syndrome oder einfach nur grenzenlose Erschöpfung*.

### *Oktober 2009*

Pasquale Calabrese ist seit Oktober 2009 Mitglied im Editorial Board des Journals *Multiple Sclerosis International*.

### *November 2009*

Pasquale Calabrese wird am 27. November 2009 in Berlin zum Vizepräsidenten der Deutschen Akademie für Alterspsychologie, e.V. gewählt.

Die Nationalversicherung Schweiz verlängert die bestehende Projektzusammenarbeit mit Javier Bargas-Avila, Klaus Opwis und Sebastien Orsini im Bereich der Mensch-Maschine-Interaktion (Förderung für 12 Monate mit rund CHF 90'000).

## **Ehrungen/Auszeichnungen**

### *November 2009*

Markus Stöcklin wird von den Studierenden der Psychologie zum *Dozenten des Jahres 2009* gewählt.

## **Drittmittel in 2009**

2009 konnten Drittmittel im Umfang von rund CHF 125'000 erfolgreich eingeworben werden, die insbesondere zur Finanzierung zusätzlicher Personalanstellungen (Lehrbeauftragte, Assistierende, Doktorierende, Hilfsassistierende) genutzt wurden.

## Lehrveranstaltungen

### *Frühlingssemester 2009*

#### *Bachelorstudium*

Kognitive Psychologie II: Denken, Problemlösen, Sprache (Propädeutische Vorlesung; Opwis)  
Statistik II (Propädeutische Vorlesung mit Übung; Stöcklin)  
Kognitive Neurowissenschaften (Penner)  
Emotion, Motivation, Kommunikation (Spada)  
Lehren und Lernen: Einführung in die Instruktionspsychologie I (Gold)  
Empirisch-Experimentelles Projektseminar (Roth & Tuch)  
Einführung in die Analytische Psychologie C.G. Jung (Roesler)  
Praxis der analytischen Psychotherapie C.G. Jungs: Anwendungen und Vertiefungen (Roesler)

#### *Masterstudium*

Wahrnehmungsforschung (Opwis)  
Aktuelle Forschungsthemen der Mensch-Maschine Interaktion (Bargas-Avila, Pauwels, Roth, Tuch)  
Konzeption und Design von User Interfaces II (Hübscher)  
Evaluationsmethoden der Mensch-Maschine-Interaktion (Bargas-Avila)  
Ästhetik und Emotion in der Mensch-Maschine Interaktion (Roth & Tuch)  
Praxis der empirischen Forschung: Komplexe Varianzanalytische Designs (Stöcklin)  
E-Prime: Computerbasierte experimentelle Psychologie (Stöcklin)

#### *Masterprojekte*

Kognitions- und Neurowissenschaften (Opwis/Bargas/Calabrese/Penner)  
Mensch Maschine Interaktion (Opwis/Bargas)

### *Herbstsemester 2009*

#### *Bachelorstudium*

Kognitive Psychologie I: Wahrnehmung, Gedächtnis (Propädeutische Vorlesung; Opwis)  
Forschungsmethoden & Statistik I (Propädeutische Vorlesung mit Übung; Stöcklin & Opwis)  
Grundlagen der Mensch-Maschine Interaktion (Bargas-Avila)  
Statistik III (Stöcklin)  
Empirisch-Experimentelles Projektseminar (Roth & Tuch)  
Einführung in die Analytische Psychologie C.G. Jung (Roesler)  
Praxis der analytischen Psychotherapie C.G. Jungs: Anwendungen und Vertiefungen (Roesler)

#### *Masterstudium*

Gedächtnisforschung (Opwis)  
Experimentelle Neurowissenschaften (Calabrese & Penner)  
Funktionelle Neuroanatomie (Calabrese & Penner)  
Ausgewählte Themen der Neurowissenschaften: Von der Klinik zur Bildgebung  
(Calabrese & Penner)  
Theoretische Grundlagen und Modelle der Mensch-Maschine-Interaktion (Leuthold)

Praxis der empirischen Forschung: Regressionsanalytische Verfahren (Stöcklin)  
Eye-Tracking Methoden in der Mensch-Maschine Interaktion (Roth & Tuch)

*Masterprojekte*

Kognitive Neuropsychologie und Entwicklungsneurologie (Opwis/Calabrese/Penner)  
Kognitions- und Neurowissenschaften (Opwis/Bargas/Calabrese/Penner)  
Mensch Maschine Interaktion (Opwis/Bargas-Avila)

*Master of Advanced Studies in Human Computer Interaction Design (MAS-HCID)*

Psychologie: Einführung in die Kognitive Psychologie (Reijnen)

## Publikationen in 2009

### Originalarbeiten / Artikel in wissenschaftlichen Zeitschriften / Proceedings mit Peer-Review<sup>1</sup>

Bargas-Avila, J., Loetscher, J., Orsini, S. & Opwis, K. (2009). Intranet Satisfaction Questionnaire: Development and *Validation* of a Questionnaire to Measure User Satisfaction with the Intranet. *Computers in Human Behavior*, 25, 1241-1250.<sup>2</sup>

*Abstract.* In recent years, Intranets have become increasingly important to their companies. Substantial investments have been made to provide crucial information and workflows to employees. In this context the question of quality assurance arises: how can user satisfaction with the Intranet be measured? This article presents the development of a questionnaire to measure user satisfaction with the Intranet. After a first validation of the instrument (18 items) in an international insurance company ( $N_1=881$ ), a final set of 13 items remained. These were tested with the Intranet of a national retail company ( $N_2=1350$ ). The final version showed a high internal consistency (Cronbach  $\alpha$ ) of .89, good item difficulties (.36 - .73) and discriminatory power coefficients (.48 - .73), as well as a moderate average homogeneity of .44. An exploratory factor analysis revealed two factors, „Content Quality“ and „Intranet Usability“, explaining 56.54% of the variance. Meanwhile, the survey was translated into 10 languages: Chinese, English, French, German, Italian, Japanese, Portuguese, Russian, Slovenian, and Spanish.

Bechtel, N., Kobel, M., Penner, I.K., Klarhöfer, M., Scheffler, K., Opwis, K., & Weber, P. (2009). Decreased fractional anisotropy in the middle cerebellar peduncle in children with epilepsy and/or attention deficit/hyperactivity disorder: a preliminary study. *Epilepsy & Behavior*, 15, 294-298.<sup>3</sup>

*Abstract.* Children with epilepsy are at increased risk for attention deficit/hyperactivity disorder (ADHD). It has been shown that the cerebellum plays a major role in the pathophysiology of ADHD. We aimed to clarify whether children with combined epilepsy/ADHD have the same neurocerebellar pathophysiology as children with developmental ADHD. Eight boys with combined epilepsy/ADHD, 14 boys with developmental ADHD, and 12 healthy boys were investigated using diffusion tensor imaging generating fractional anisotropy (FA) maps. Healthy

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<sup>1</sup> Nachfolgende Angaben zu den einzelnen Zeitschriften sind entnommen dem *Journal Citation Reports* (JCR) *Science Edition* resp. *Social Science Edition* aus dem **ISI Web of Science** (*Impact Factor der Zeitschrift / durchschnittlicher Impact Factor der letzten 5 Jahre / Kategorie: Rangplatz - Anzahl Zeitschriften - Quartil*) respektive - nach dem doppelten Trennstrich (//) - dem *SCImago Journal & Country Rank Portal* auf der Grundlage von **SCOPUS** (*Bereich/Schwerpunkt: Rangplatz - Anzahl Zeitschriften - Quartil*).

*Erläuterung:* Beispielsweise hat die Zeitschrift *Computers in Human Behavior* laut JCR für das Jahr 2010 einen *Impact Factor* (IF) von 1.9. Der durchschnittliche IF der vorausgegangenen fünf Jahre (2006 bis 2010) beträgt 2.3. Die Zeitschrift ist im JCR in zwei verschiedenen Kategorien gelistet: In der Kategorie *Psychology, Experimental*, wo sie nach ihrem IF den Rangplatz 37 von den dort insgesamt 81 gelisteten Zeitschriften belegt und damit einen Rangplatz im 2. Quartil (Q2). Ebenfalls gelistet ist die Zeitschrift in der Kategorie *Psychology, Multidisciplinary*. Dort belegt sie mit ihrem Rangplatz 26 von insgesamt 120 Zeitschriften einen Platz im 1. Quartil (Q1). SCImago listet die Zeitschrift *Computers in Human Behavior* in drei verschiedenen Kategorien (Angaben für das Jahr 2010): Im Bereich (*subject area*) *Computer Science* und dort im Schwerpunkt (*subject category*) *Computer Science Applications* (Rangplatz 54 von 194 Zeitschriften, Q2); im Bereich *Psychology* und dort im Schwerpunkt *Developmental and Educational Psychology* (Rangplatz 29 von 91 Zeitschriften, Q2) sowie im Bereich *Psychology* und dort im Schwerpunkt *Experimental and Cognitive Psychology* (Rangplatz 36 von 53 Zeitschriften, Q3). Die Rankreihung erfolgt jeweils auf der Grundlage des *SCImago Journal Rank Indicator* (SJR), einem speziell normierten Mass für den Impact einer Zeitschrift auf Basis der Einträge in SCOPUS.

Durch Fettdruck im folgenden hervorgehoben sind **Rangplätze im 1. Quartil (Q1)**.

<sup>2</sup> IF(2009) = 1.7 / IF(5-Year) = 2.0 / *Psychology, Experimental*: 39 – 74 – Q3 / *Psychology, Multidisciplinary*: 32 – 112 – Q2 // **Computer Science/Computer Science Applications: 45 - 194 – Q1** / *Psychology/Developmental and Educational Psychology*: 29 – 91 – Q2 / *Psychology/Experimental and Cognitive Psychology*: 37 – 53 – Q3.

<sup>3</sup> IF(2009) = 2.6 / IF(5-Year) = 2.8 / *Behavioral Sciences*: 27 – 49 – Q3 / *Clinical Neurology*: 62 – 167 – Q2 / *Psychiatry*: 50 - 117 – Q2 // *Medicine/Neurology (clinical)*: 72 – 236 – Q2.

controls exhibited more FA in the left and in the right middle cerebellar peduncle compared with children with combined epilepsy/ADHD, and more FA in the right middle cerebellar peduncle compared with children with developmental ADHD. Our data show deficient cerebellar connections in both patient groups and endorse the crucial role of the cerebellum in the pathophysiology of ADHD. Our results suggest that ADHD seen in epilepsy might have the same cerebellar pathology as in developmental ADHD.

Kobel, M., Bechtel, N., Weber, P., Burri, M., Klarhöfer, M., Scheffler, K., Opwis, K., & Penner, I.K. (2009). Effects of Methylphenidate on Working Memory Functioning in Children with Attention Deficit/Hyperactivity Disorder (ADHD). *European Journal of Pediatric Neurology*, 13, 516-523.<sup>4</sup>

*Background and aims:* Children with attention deficit/hyperactivity disorder (ADHD) often show deficits in working memory performance. Methylphenidate (MPH) is an effective medication to improve these cognitive difficulties. This study aimed to clarify which effect MPH induces on the underlying functional networks of working memory.

*Methods:* Fourteen boys diagnosed with ADHD and 12 healthy controls were investigated using functional magnetic resonance imaging (fMRI). Each patient was tested twice, once with medication and once without. The fMRI experiments consisted of three verbal N-back tasks with increasing difficulty. Functional images were acquired on a 3 Tesla head scanner.

*Results:* On the behavioral level, medicated patients performed similar to healthy controls and significantly better than without medication. On the functional level, patients showed the expected frontal and parietal activations, which were more pronounced in the 2- and 3- back tasks. Healthy controls showed significantly more activation in these regions and additional activation in the cerebellum. Interestingly, patients showed an additional effect of laterality. Left-sided frontal and parietal activation in patients was significantly less pronounced than in controls.

*Conclusion:* Functional data indicate different activation patterns in verbal working memory tasks between healthy controls and patients with ADHD irrespective of medication condition. Intake of MPH led to a clear improvement on a behavioral level. However, this effect was not reflected by changes in functional brain organization. MPH-induced changes leading to better performance in verbal working memory tasks might be very subtle and therefore not detectable by fMRI.

Martin-Soelch, C., Kobel, M., Stoecklin, M., Michael, T., Weber, S., Krebs, B. & Opwis, K. (2009). Reduced response to reward in smokers and cannabis users. *Neuropsychobiology*, 60, 94-103.<sup>5</sup>

*Background:* Cannabis is one of the most commonly used illicit drugs. Reduced neural and behavioral reactions to reward have been demonstrated in other forms of addiction, as expressed by reduced mood reactivity and lack of striatal activation to rewards, but this effect has not yet been investigated in cannabis users.

*Methods:* We hypothesized that cannabis users and tobacco smokers would evidence lower positive mood ratings in rewarded conditions than control participants and that this reduction would be greater in cannabis users than in smokers. We examined the influence of reward on mood and performance in a group of regular cannabis users, a group of tobacco smokers and a group of nonsmokers while they performed a spatial recognition task with delayed response that incorporated 3 levels of difficulty. Correct responses were either not reinforced or reinforced with money. We measured the accuracy of reactions, reaction times and mood ratings throughout the trials.

*Results:* Cannabis users rated their mood as significantly worse than the smokers and nonsmokers during the easiest level of the rewarded condition. A significant positive correlation between mood ratings and monetary reward was found in the nonsmokers but not in the cannabis users and smokers. The groups did not differ with regard to task performance.

*Conclusions:* Our results suggest that regular cannabis use affects certain aspects of motivation and that both tobacco smoking and cannabis use lead to similar motivational changes. However, the use of cannabis seems to affect motivation in a stronger way than does tobacco smoking alone.

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<sup>4</sup> IF(2009) = 2.0 / IF(5-Year) = 1.8 / *Clinical Neurology*: 90 – 167 – Q3 / *Pediatrics*: 27 – 94 – Q2 // *Medicine/Neurology (clinical)*: 68 – 236 – Q2.

<sup>5</sup> IF(2009) = 2.1 / IF(5-Year) = 2.6 / *Neurosciences*: 153 – 231 – Q3 / *Psychiatry*: 62 – 117 – Q3 / *Psychology*: 33 – 71 – Q2 // ***Medicine/Psychiatry and Mental Health*: 35 – 325 - Q1.**



Pauwels, S.L., Hübscher, C., Leuthold, S., Bargas-Avila, J.A., & Opwis, K. (2009). Error prevention in online forms: Use color instead of asterisks to mark required fields. *Interacting with Computers*, 21, 257-262.<sup>6</sup>

*Abstract.* In this study, a simple but important user interface design choice is examined: when marking required fields in online forms, should GUI designers stick with the often used asterisk that many form design guidelines cite as the de-facto web standard, or should they choose a colored background as a new design solution to visually signal which input fields are required? An experiment with 24 participants was conducted to test the hypotheses that efficiency, effectiveness and satisfaction ratings of colored required-fields exceed those of asterisk-marked required-fields. Results indicate that colored required field marking leads to fewer errors, faster form fill-in and higher user satisfaction.

Penner, I.K., Raselli, C., Stöcklin, M., Opwis, K., Kappos, L. & Calabrese, P. (2009). The Fatigue Scale for Motor and Cognitive Functions (FSMC): validation of a new instrument to assess multiple sclerosis-related fatigue. *Multiple Sclerosis*, 15, 1509-1517.<sup>7</sup>

*Abstract.* Fatigue symptoms are reported by a majority of patients with multiple sclerosis (MS). Reliable assessment, however, is a demanding issue as the symptoms are experienced subjectively and as objective assessment strategies are missing. The objective of this study was to develop and validate a new tool, the Fatigue Scale for Motor and Cognitive Functions (FSMC), for the assessment of MS-related cognitive and motor fatigue. A total of 309 MS patients and 147 healthy controls were included into the validation study. The FSMC was tested against several external criteria (e.g. cognition, motivation, personality and other fatigue scales). The item-analysis and validation procedure showed that the FSMC is highly sensitive and specific in detecting fatigued MS patients, that both subscales significantly differentiated between patients and controls ( $p < 0.01$ ), and that internal consistency (Cronbach's alpha  $\alpha > 0.91$ ) as well as test-retest reliability ( $r > 0.80$ ) were high. Cut-off values were determined to classify patients as mildly, moderately or severely fatigued. In conclusion, the FSMC is a new scale that has undergone validation based on a large sample of patients and that provides differential quantification and graduation of cognitive and motor fatigue.

Penner, I.K., Schläfli, K., Opwis, K., & Hugdahl, K. (2009). The role of working memory in dichotic-listening studies of auditory laterality. *Journal of Clinical and Experimental Neuropsychology*, 8, 1-8.<sup>8</sup>

*Abstract.* We present data related to the role of working memory in dichotic-listening studies of speech lateralization using consonant-vowel syllable stimuli. A working-memory procedure was actually used in the pioneering dichotic-listening studies by Doreen Kimura in 1960, a fact that was forgotten in later dichotic-listening studies, exclusively focusing on the perceptual aspects of speech sound lateralization. Capitalizing on the original Kimura (1961a, 1961b) studies, we hypothesized that an increase in working-memory load leads to an amplified right-ear advantage (REA) in the dichotic-listening task. A total of 30 participants completed a dichotic-listening task including three working-memory load conditions, each consisting of trials of 3, 4, and 5 dichotically presented letter pairs. Results confirmed an enhanced REA as working-memory load increased. This right-ear effect increased significantly from 3 to 4 stimulus pairs and leveled off with the 5th pair. In addition, the assumption was tested that, within a single load condition, the REA appears mainly in late serial input positions. A detailed analysis of the results revealed that only late positions contributed to the overall REA. However, the highest load condition (5 letter pairs) also produced significant ear differences in the early part of the input position curve. The mechanisms likely to be responsible for these results are discussed in terms of top-down and bottom-up processes in hemispheric asymmetry.

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<sup>6</sup> IF(2009) = 1.7 / IF(5-Year) = 1.9 / *Ergonomics*: 2 – 14 – Q1 // *Computer Science/Human-Computer Interaction*: 11 – 38 – Q2.

<sup>7</sup> IF(2009) = 3.3 / IF(5-Year) = 3.3 / *Clinical Neurology*: 43 – 167 – Q2 // *Medicine/Neurology (clinical)*: 25 – 236 – Q1.

<sup>8</sup> IF(2009) = 1.9 / IF(5-Year) = 2.4 / *Clinical Neurology*: 95 – 167 – Q3 // *Psychology*: 39 – 71 – Q3 // *Medicine/Neurology (clinical)*: 90 – 236 – Q2 // *Psychology/Neuropsychology and Physiological Psychology*: 16 – 39 – Q2.

Pentzek, Dyllong, A., Grass-Kapanke, B. & Calabrese, P. (2009). Die Verortung von Screeningtests in Rahmen der Demenz-Diagnostik. *NeuroGeriatric*, 6, 101-105.<sup>9</sup>

*Zusammenfassung.* Die neuropsychologische Untersuchung ist zentraler Bestandteil der Demenzdiagnostik. Eine aktuelle Umfrage unter Demenzambulanzen gibt Anlass zu der Annahme, dass dieser wichtige Aspekt häufig auf die Durchführung von Screeningtests reduziert wird. Zudem zeigt sich eine unzureichende personelle Ausstattung dieser Ambulanzen mit neuropsychologischer Kompetenz. Aus diesem Anlass werden im vorliegenden Text die Bedeutung und Grenzen von Screeningtests und ihre Abgrenzung zu einer elaborierten neuropsychologischen Demenzdiagnostik geklärt. Während erstere für den Einsatz im Niedrigprävalenzbereich konzipiert und dort auch sinnvoll sind, muss in einer Demenzambulanz die diagnostische Referenzbildung mittels neuropsychologischer Expertise stattfinden.

Schmutz, P., Heinz, S., Métrailler, Y. & Opwis, K. (2009). Cognitive load in eCommerce applications: Measurement and effects on user satisfaction. *Advances in Human-Computer Interaction*, 9 pages (doi:10.1155/2009/121494).<sup>10</sup>

*Abstract.* Guidelines for designing usable interfaces recommend reducing short term memory load. Cognitive load, that is, working memory demands during problem solving, reasoning, or thinking, may affect users' general satisfaction and performance when completing complex tasks. Whereas in design guidelines numerous ways of reducing cognitive load in interactive systems are described, not many attempts have been made to measure cognitive load in Web applications, and few techniques exist. In this study participants' cognitive load was measured while they were engaged in searching for several products in four different online book stores. NASA-TLX and dual-task methodology were used to measure subjective and objective mental workload. The dual-task methodology involved searching for books as the primary task and a visual monitoring task as the secondary task. NASA-TLX scores differed significantly among the shops. Secondary task reaction times showed no significant differences between the four shops. Strong correlations between NASA-TLX, primary task completion time, and general satisfaction suggest that NASA-TLX can be used as a valuable additional measure of efficiency. Furthermore, strong correlations were found between browse/search preference and NASA-TLX as well as between search/browse preference and user satisfaction. Thus we suggest browse/search preference as a promising heuristic assessment method of cognitive load.

Tiemann, L., Penner, I.K., Haupts, M., Schlegel, U., & Calabrese, P. (2009). Cognitive decline in multiple sclerosis: impact of topographic lesion distribution on differential cognitive deficit patterns. *Multiple Sclerosis*, 15, 1164-1174.<sup>11</sup>

*Background:* Multiple sclerosis (MS) is often accompanied by cognitive dysfunction. A negative correlation between cerebral lesion load and atrophy and cognitive performance has been pointed out almost consistently. Further, the distribution of lesions might be critical for the emergence of specific patterns of cognitive deficits.

*Objective:* The current study evaluated the significance of total lesion area (TLA) and central atrophy for the prediction of general cognitive dysfunction and tested for a correspondence between lesion topography and specific cognitive deficit patterns.

*Methods:* Thirty-seven patients with MS underwent neuropsychological assessment and magnetic resonance imaging. Lesion burden and central atrophy were quantified. Patients were classified into three groups by means of individual lesion topography (punctiform lesions/periventricular lesions/confluent lesions in both periventricular and extra-periventricular regions).

*Results:* TLA was significantly related to 7 cognitive variables, whereas third ventricle width was significantly associated with 20 cognitive parameters. The three groups differed significantly in their performances on tasks concerning alertness, mental speed, and memory function.

*Conclusion:* Third ventricle width as a straight-forward measure of central atrophy proved to be of substantial predictive value for cognitive dysfunction, whereas total lesion load played only a minor role. Periventricular

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<sup>9</sup> Keine Angaben vorhanden // Keine Angaben vorhanden .

<sup>10</sup> Keine Angaben vorhanden // *Computer Science/Human-Computer Interaction*: 37 – 38 – Q4.

<sup>11</sup> IF(2009) = 3.3 / IF(5-Year) = 3.3 / *Clinical Neurology*: 43 – 167 – Q2 // *Medicine/Neurology (clinical)*: 25 – 236 – Q1.

located lesions were significantly related to decreased psychomotor speed, whereas equally distributed cerebral lesion load did not. These findings support the idea that periventricular lesions have a determinant impact on cognition in patients with MS.

Tuch, A., Bargas-Avila, J., Opwis, K. & Wilhelm, F. (2009). Visual Complexity of Websites and its Effects on Users Impressions, Psychophysiological Responses, Recognition Rate and Visual Search Time. *International Journal of Human Computer Studies*, 67, 703-715.<sup>12</sup>

*Abstract.* Visual complexity is an apparent feature in website design yet its effects on cognitive and emotional processing are not well understood. The current study examined website complexity within the framework of aesthetic theory and psychophysiological research on cognition and emotion. We hypothesized that increasing the complexity of websites would have a detrimental cognitive and emotional impact on users. In a passive viewing task (PVT) 36 website screenshots differing in their degree of complexity (operationalized by JPEG file size; correlation with complexity ratings in a preliminary study  $r = .80$ ) were presented to 48 participants in randomized order. Additionally, a standardized visual search task (VST) assessing reaction times, and a one-week-delayed recognition task on these websites were conducted and participants rated all websites for arousal and valence. Psychophysiological responses were assessed during the PVT and VST. Visual complexity was related to increased experienced arousal, more negative valence appraisal, decreased heart rate, and increased facial muscle tension (musculus corrugator). Visual complexity resulted in increased reaction times in the VST and decreased recognition rates. Reaction times in the VST were related to increases in heart rate and electrodermal activity. These findings demonstrate that visual complexity of websites has multiple effects on human cognition and emotion, including experienced pleasure and arousal, facial expression, autonomic nervous system activation, task performance, and memory. It should thus be considered an important factor in website design.

Vogt, A., Kappos, L., Calabrese, P., Stöcklin, M., Gschwind, L., Opwis, K., & Penner, I.K. (2009). Working memory training in patients with multiple sclerosis – comparison of two different training schedules. *Restorative Neurology and Neuroscience*, 27, 225-235.<sup>13</sup>

*Purpose:* Evaluation of two different training schedules of a computer based working memory training (*BrainStim*) in patients with multiple sclerosis (MS).

*Methods:* Forty-five MS outpatients were allocated to two different training groups and a control group without training. Patients with treatment received 16 training sessions scheduled either as a high intensity training (4 times per week for 4 weeks) or as a distributed training (2 times per week for 8 weeks). A neuropsychological test battery including self-report measures was applied at baseline and a retest. The baseline assessment was performed twice at an interval of two weeks to control for possible learning effects.

*Results:* In the outcome measures training for both intervention groups led to significantly improved fatigue symptoms as well as working memory -, and mental speed performances. Log files recorded during training showed a similar increase in levels of difficulty for both intervention groups as training progressed. No effects were found on short term memory, quality of life or depression.

*Conclusions:* Since comparable improvements were observed in both training groups, *BrainStim* can be applied as a therapeutic intervention adjusted to the personal agenda of MS patients.

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<sup>12</sup> IF(2009) = 2.4 / IF(5-Year) = 2.9 / *Ergonomics*: 1 – 14 – Q1 / *Psychology, Multidisciplinary*: 18 – 112 – Q1 // *Computer Science/Artificial Intelligence*: 33 – 109 – Q2 / *Computer Science/Human Computer Interaction*: 17 – 38 – Q2 / *Psychology/Experimental and Cognitive Psychology*: 35 – 53 – Q3.

<sup>13</sup> IF(2009) = 3.7 / IF(5-Year) = 3.4 / *Neurosciences*: 70 – 231 – Q2 // *Neuroscience/Neuroscience (miscellaneous)*: 52 – 161 – Q2.

## Monographien und Buchherausgaben

Penner, I.K., Kobel, M., & Calabrese, P. (2009). *BrainStim. Ein interaktives Trainingsprogramm zur Förderung der Hirnleistung*. Bad Honnef: Hippocampus.

## Kapitel in Sammelbänden und Handbüchern, Beiträge in wissenschaftlichen Zeitschriften ohne Peer Review, Forschungsberichte

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## Kurzbeiträge / Vorträge / Poster/Publizierte (peer-reviewed) Abstracts

Bargas-Avila, J. (2009). *Usability im eCommerce*. Invited talk at the Fachhochschule beider Basel, Basel, Switzerland (4/2009).

Bargas-Avila, J. (2009). *Zufriedenheit im Intranet: Intranet Satisfaction Questionnaire*. Invited talk at the Stimmt Intranet Breakfast; Zürich, Switzerland (8/2009).

Bargas-Avila, J. (2009). *Web 2.0 als Soziale Bewegung – Wie Web 2.0 die Kommunikation verändert*. Invited talk at the Global View Week, University of Basel, Switzerland (10/2009).

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- Bechtel, N., Kobel, M., Weber, P., Klarhöfer, M., Scheffler, K., Opwis, K., & Penner, I.K. (2009). *Decreased fractional anisotropy in the middle cerebellar peduncle in children with epilepsy and/or attention deficit/hyperactivity disorder: a preliminary study*. 2nd International Congress on ADHD, Wien, 5/2009, Vol. 1, 1, pp. 97.
- Bechtel, N., Kobel, M., Penner, I.K., Klarhöfer, M., Scheffler, K., Opwis, K., & Weber, P. (2009). *Deficient functional networks of working memory in children with epilepsy and/or ADHD*. 19th World Congress of Neurology (WCN), Bangkok, 10/2009, Free Paper Abstracts/Journal of the Neurological Sciences, Vol. 285, 1, pp. 113.
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- Penner, I.K. (2009). *Fatigue and cognitive deficit in MS patients*. Symposium on “Neuropsychological deficits in Multiple Sclerosis” in Bologna.
- Penner, I.K. (2009). *Kognitive Störungen bei MS*. 2. Düsseldorfer Parkinson- & MS-Symposium.
- Penner, I.K. (2009). *Fatigue bei MS – grenzenlose Erschöpfung*. Patientenveranstaltung, Inselspital Bern.
- Penner, I.K. (2009). *Neurokognitive Intervention: eine therapeutische Strategie für Patienten mit Schizophrenie?* Vortrag im Rahmen des Weiterbildungsprogramms der Psychiatrischen Universitätspoliklinik Basel.
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- Penner, I.K. (2009). *Gedächtnistraining: Das Potential non-pharmakologischer Intervention in der Prävention kognitiver Defizite*. 9th Conference of the German Society of Prevention and Anti-Aging Medicine (GSAAM).
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- Penner, I.K. (2009). *Structural and functional imaging – correlation with cognitive impairment*. International scientific symposium: pioneering MS therapies into the next decade, Istanbul, Turkey.
- Penner, I.K. (2009). *Lebensqualität verbessern*. Workshop zum Thema Lebensqualität bei Multipler Sklerose. Neurologie, Kantonsspital St. Gallen.
- Penner, I.K. (2009). *Fatigue – the most frequently reported symptom in MS*. MS Standalone Meeting, Barcelona, Spain.
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## **Qualifikationsarbeiten (Abschluss in 2009)**

### **Habilitationen**

Penner, Iris-Katharina (2009). *Neurokognitive Störungen bei Multipler Sklerose: Von der Diagnostik zur Rehabilitation.*

### **Dissertationen**

Bargas-Avila, Javier (2009). *Exploring aspects of usability and user satisfaction with empirical research.*

Kobel, Maja (2009). *Executive functions: Diagnostics and therapy from a neuropsychological perspective.*

### **Masterarbeiten**

Boss, Jakob (2009). *The indirect influence of counter system usability on customer satisfaction.*

Brenzikofer, Olivia (2009). *Empirical-based guidelines for usable web form design.*

Cortesi, Sandra (2009). *ZeGo 2008: Zufriedenheit im eGovernment gemessen an den 26 Kantonsportalen der Schweiz.*

Heinz, Silvia (2009). *Visualisation of the account balance with a bar chart: The influence on table search.*

Linxen, Sebastian (2009). *The impact of navigation and language on international E-learning.*

Ritzmann, Lorenz (2009). *Using autosuggest and dynamic querying to enhance the usability of online banking interfaces.*

Scherler, Viviane (2009). *Testpsychologische Evaluation des P6PROP®-Sport: Entwicklung und testpsychologische Evaluation.*