

JAHRESBERICHT 2010

Allgemeine Psychologie und Methodologie



**Fakultät für Psychologie
Universität Basel**

JAHRESBERICHT 2010

Allgemeine Psychologie und Methodologie

Mitarbeiterinnen und Mitarbeiter der Abteilung (per 31.12.2010)

<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 PD. Dr. Iris-Katharina Penner (BrainStim-Projekt) Dr. Markus Stöcklin
<i>Assistierende</i>	Dipl. Psych. Natalia Adamski (BrainStim-Projekt) M.Sc. Nina Bechtel (UKBB-Projekt) M.Sc. Silvia Heinz (MMI-Projekt) M.Sc. Martian Hubacher M.Sc. Sebastien Orsini M.Sc. Nadine Oser (UKBB-Projekt) M.Sc. Alexandre Tuch
<i>Hilfsassistierende</i>	B.Sc. Timon Elmer (MMI-Projekt) B.Sc. Julia Kreiliger (MMI-Projekt) B.Sc. Elisa Mekler B.Sc. Sandra Seckelmann (MMI-Projekt) B.Sc. Mirjam Seckler B.Sc. Sharon Steinemann (MMI-Projekt) B.Sc. Dominic Zwahlen (UKBB-Projekt)
<i>Lehraufträge</i>	Prof. Dr. Andreas Gold (FS 2010) Christian Hübscher (FS 2010) Dr. Stefan Leuthold (HS 2010) Prof. Dr. Christian Rösler (FS 2010, HS 2010) Prof. Dr. Hans Spada (FS 2010)

Kurze Chronologie des Jahres 2010

Kurzer chronologisch geordneter Gesamtüberblick über bemerkenswerte Vorkommnisse im Jahr 2010 Sicht der Abteilung für Allgemeine Psychologie und Methodologie

Januar 2010

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

Februar 2010

Die Schering AG bewilligt ein Projekt von Iris-Katharina Penner gemeinsam mit Ludwig Kappos (Neurologie, Universitätsspital Basel) im Bereich der Multiple Sklerose-Forschung (Förderung für 24 Monate mit CHF 400'000).

April 2010

Die Freiwillige Akademische Gesellschaft (FAG) bewilligt Nina Bechtel ein Stipendium zur Fertigstellung ihrer Dissertation (Förderung mit CHF 8'000).

Juni 2010

Klaus Opwis wird als externer Experte in die Berufungskommission für das *Professur für Methodenlehre und Evaluation* der Philosophischen Fakultät der Universität Zürich berufen.

Javier Bargas-Avila beginnt einen dreimonatigen Forschungsaufenthalt (Juni-September) *als eingeladener Gastwissenschaftler* bei Prof. Dr. Kasper Hornbæk am Department of Computer Science an der Universität von Kopenhagen (Dänemark).

Dezember 2010

Klaus Opwis wird von der Schweizerischen Universitätskonferenz (SUK) in Absprache mit dem Zentrum für Testentwicklung und Diagnostik (ZD) der Universität Fribourg als externes Mitglied mit psychodiagnostischer/psychometrischer Kompetenz in den neu zusammengesetzten *Beirat für den Eignungstest für das Medizinstudium* (EMS) berufen.

Ehrungen/Auszeichnungen

Javier Bargas-Avila wird bei der Zeitschrift *Interacting with Computers* im jährlichen Dank an die Reviewer mit einer besonderen Erwähnung (*Special mention*) ausgezeichnet.

Drittmittel in 2010

2010 konnten Drittmittel im Umfang von rund CHF 250'000 erfolgreich eingeworben werden, die insbesondere zur Finanzierung zusätzlicher Personalanstellungen (Lehrbeauftragte, Assistierende, Doktorierende, Hilfsassistierende) genutzt wurden.

Personalia in 2010

Januar 2010

Dr. Stefan Pauwels beendet seine Tätigkeit als DM-finanzierter Forschungsassistent und wechselt in die Privatwirtschaft (Züricher Kantonalbank).

Februar 2010

PD Dr. Iris-Katharina Penner beendet ihre Tätigkeit als universitäre Oberassistentin und wechselt auf eine DM-finanzierte Tätigkeit als wissenschaftliche Mitarbeiterin und Projektleiterin.

Mai 2010

Lars Frasseck beginnt seine Tätigkeit als DM-finanzierter Mitarbeiter (Bereich Softwareentwicklung/Programmierung).

Juli 2010

Dr. Sandra Roth beendet ihre Tätigkeit als universitäre Assistentin und wechselt in die Privatwirtschaft (Roche).

Dipl. Psych. Natalia Adamski beginnt ihre Tätigkeit als DM-finanzierte Forschungsassistentin.

August 2010

M.Sc. Martina Hubacher beginnt ihre Tätigkeit als universitäre Assistentin.

Oktober 2010

M.Sc. Silvia Heinz beginnt ihre Tätigkeit als DM-finanzierte Forschungsassistentin.

Lehrveranstaltungen

Frühlingssemester 2010

Bachelorstudium

Denken, Problemlösen, Expertise (Opwis)
Forschungsmethoden und Statistik II (Propädeutische Vorlesung mit Übung; Stöcklin & Opwis)
Kognitive Neurowissenschaften (Penner)
Emotion, Motivation, Kommunikation (Spada)
Lernschwierigkeiten: Ursachen, Diagnose, Prävention und Intervention (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

Verhaltensneurologische Syndrome (Calabrese)
Aktuelle Forschungsthemen der Mensch-Maschine Interaktion (Orsini)
Konzeption und Design von User Interfaces (Hübscher)
User Experience – Ein neues Paradigma, oder alter Wein in neuen Schläuchen? (Bargas-Avila)
Praxis der empirischen Forschung: Komplexe Varianzanalytische Designs (Stöcklin)
E-Prime: Computerbasierte experimentelle Psychologie (Stöcklin)
Nicht-apparative Methoden und Verfahren der Neuropsychologie über die Lebensspanne
(Calabrese & Penner)
Aktuelle Forschungsthemen der Mensch-Maschine Interaktion (Orsini)

Masterprojekte

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

Herbstsemester 2010

Bachelorstudium

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

Masterstudium

Gedächtnisforschung (Opwis)

Ausgewählte Themen der Neurowissenschaften: Von der Klinik zur Bildgebung
(Calabrese & Penner)

Funktionelle Neuroanatomie (Calabrese & Penner)

Theoretische Grundlagen und Modelle der Mensch-Maschine-Interaktion (Leuthold)

Aktuelle Forschungsthemen der Mensch-Maschine Interaktion (Bargas)

Experimentelle Neurowissenschaften (Penner/Calabrese)

Online Forschung in der Mensch-Maschine Interaktion (Orsini)

Praxis der empirischen Forschung: Regressionsanalytische Verfahren (Stöcklin)

Eye-Tracking Methoden in der Mensch-Maschine Interaktion (Orsini & Tuch)

Masterprojekte

Kognitive Neuropsychologie und Entwicklungsneurologie (Opwis/Calabrese/Penner)

Kognitions- und Neurowissenschaften (Opwis/Bargas/Calabrese/Penner)

Mensch Maschine Interaktion (Opwis/Heinz/Orsini/Tuch)

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

Psychologie: Einführung in die Kognitive Psychologie (Opwis & Roth)

Publikationen in 2010

Originalarbeiten / Artikel in wissenschaftlichen Zeitschriften / Proceedings mit Peer-Review¹

Albert, D., Opwis, K. & Regard, M. (2010). Effect of drawing hand and age on figural fluency: A graphomotor study with the five-point test in children. *Child Neuropsychology*, 16, 32-41.²

Abstract. The aim of the study was to assess conceptual thinking in children in relation to age and motor dominance. We investigated the effect of the right and the left hand in a fluency task in four groups of 127 healthy right-handed children (age 5–12 years) and an adult control group. They performed the Five-Point Test twice, once with their dominant right and once with their nondominant left hand. The number of items and errors were analyzed with respect to age, drawing hand, and motor transfer. The performance of boys and girls did not differ. There was a significant effect for age and a prominent interaction between age, hand, and order (right hand or left hand first). Performance improved linearly with age. The dominant right hand performed generally better and there was a learning effect for both hands, but there was a learning advantage for the dominant hand, which increased with age. The influence of motor dominance in this fluency task seems to establish before conceptual maturity (around age 7, respectively 9 to 10).

Bargas-Avila, J. A., Orsini, S., De Vito, M. & Opwis, K. (2010). ZeGo: Development and validation of a short questionnaire to measure user satisfaction with e-Government portals. *Advances in Human-Computer Interaction*, 10 pages (doi:10.1155/2010/487163).³

Abstract. In recent years, electronic services delivered via the World Wide Web have become increasingly important to governments. Substantial investments have been made to provide crucial services and information to citizens, businesses, and governmental institutions. This paper presents the development of a short questionnaire to measure user satisfaction with e-Governmental portals. After two validations of the instrument with federal e-Governmental portals in Switzerland, a final set of 15 items remained that were tested with 2498 participants. The final version showed high internal consistency (Cronbach's α) of .91, good item difficulties (.51 to .82), and discriminatory power coefficients (.49 to .81), as well as a moderate average homogeneity of .47. The survey was translated into five languages.

¹ 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)**.

² $IF(2010) = 1.7 / IF(5\text{-Year}) = 2.4 / \textit{Clinical Neurology}: 106 - 185 - Q3 // \textit{Medicine/Pediatrics, Perinatology and Child Health}: 66 - 186 - Q2.$

³ Keine Angaben vorhanden // *Computer Science/Human-Computer Interaction*: 37 - 38 - Q4.

Friese, M., Bargas-Avila, J. A., Hofmann, W. & Wiers, R. W. (2010). Here's Looking at You, Bud: Memory Associations with Alcohol Predict Eye Movements for Social Drinkers with Low Executive Control. *Social Psychological and Personality Science*, 1, 143-151.⁴

Abstract. This research investigated the role of individual differences for the control of attention in the early stages of self-regulation. Theories on the development of addiction posit that repeated substance use alters memory structures referring to the substance through classical conditioning processes, leading to the attention-grabbing properties of the substance. The authors predicted that such memory structures influence attentional processes toward the substance, but only in individuals with low executive control. One executive function that is closely related to attention control is working memory capacity. Using eye-tracking methodology, the authors found individual differences in an alcohol single category implicit association test to predict indicators of attention allocation such as initial orienting and attention maintenance for social drinkers low but not high in working memory capacity. This effect primarily resulted from the controlled attention component as opposed to the short-term memory component of working memory capacity. Implications and directions for further research are discussed.

Kobel, M., Bechtel, N., Specht, K., Klarhöfer, M., Weber, P., Scheffler, K., Opwis, K., & Penner, I.-K. (2010). Structural and functional imaging approaches in attention deficit/ hyperactivity disorder: Does the temporal lobe play a key role? *Psychiatry Research: Neuroimaging*, 183, 230-236.⁵

Abstract. Attention deficit/hyperactivity disorder (ADHD) is characterized by widespread structural and functional abnormalities in the brain. We applied different structural imaging techniques such as voxel-based morphometry (VBM), diffusion tensor imaging (DTI), and magnetization transfer imaging (MTI) to study anatomical differences between boys with ADHD and healthy controls, as well as functional magnetic resonance imaging (fMRI) together with independent component analysis (ICA) to detect functional alterations. 14 boys with ADHD and 12 controls were included in our study. Results of DTI showed the expected differences in frontal and cerebellar white matter. VBM and MTI indicated group differences in the temporal lobe. Applying ICA to fMRI data, we extracted four components; two positively correlated to our working memory paradigm and two negatively correlated. Positive components included activation in frontal and parietal regions. Negative components showed activation in anterior and posterior cingulate cortex/precuneus and temporal regions, and were interpreted as forming part of the default mode network. Group differences in the inferior temporal lobe were detected. Applying different techniques, we found differences between boys with ADHD and controls mainly located in the temporal lobe. Therefore, we postulate that research on ADHD should broaden its scope by including the temporal lobe as a potentially important locus of abnormalities in ADHD.

Pauwels, S. L., Huebscher, C., Bargas-Avila, J. A. & Opwis, K. (2010). Building an interaction design pattern language: A case study. *Computers in Human Behavior*, 26, 452-463.⁶

Abstract. Interaction design patterns are a proven way to communicate good design. However, current pattern collections are not sufficiently powerful and generative to be used as a guide for designing an entire application such as those used in complex business environments. This study shows how we built and validated interaction design patterns that serve as the specification for the redesign of an application. Additionally, they were integrated into a pattern language, as a ruleset for human-computer interaction (HCI) non-professionals to continue development of the application. We demonstrate how individual phases in the redesign of an application can be matched with the process of creating an interaction design pattern language. To facilitate the writing of individual interaction design patterns as well as the development of the pattern language as a whole, a combination of user interviews, controlled experiments and analytical methods has been applied successfully.

⁴ Keine Angaben vorhanden // Keine Angaben vorhanden.

⁵ IF(2010) = 2.1 / IF(5-Year) = 3.1 / *Clinical Neurology*: 90 – 185 – Q2 / *Neuroimaging*: 5 – 14 – Q2 / *Psychiatry*: 64 – 128 – Q2 // ***Medicine/Psychiatry and Mental Health*: 15 – 325 - Q1.**

⁶ IF(2010) = 1.9 / IF(5-Year) = 2.3 / *Psychology, Experimental*: 37 - 81 – Q2 / ***Psychology, Multidisciplinary*: 26 – 120 – Q1** // *Computer Science/Computer Science Applications*: 54 - 194 – Q2 / *Psychology/Developmental and Educational Psychology*: 29 – 91 – Q2 / *Psychology/Experimental and Cognitive Psychology*: 36 – 53 – Q3.

Penner, I.-K. & Calabrese, P. (2010). Managing fatigue: Clinical correlates, assessment strategies. *International MS Journal*, 17, 28-34.⁷

Abstract. The majority of patients with Multiple Sclerosis (MS) experience fatigue and for many subjects concerned it is the most disabling symptom. Fatigue is most prominent in the afternoon and may be aggravated by heat. It has a tremendous negative impact on quality of life and is often one of the major reasons for early retirement and unemployment. Against further assumptions, fatigue can occur at all stages and is often present at the onset of the disease. Reliable assessment however, is difficult as it is a subjectively perceived lack of physical and/or mental energy interfering with intended activities and has to be differentiated from depression, consequences of sleep disorders, cognitive decline, and side-effects of medication. Moreover, fatigue is not directly related to overall disease evolution, to disability levels or localized lesions, although an association with dysfunction of fronto-thalamo-basal-ganglia circuits seems likely. Several therapeutic approaches including pharmacological as well as non-pharmacological strategies are available but an evidence-based specific gold-standard for the treatment of fatigue is still missing.

Roth, S. P., Schmutz, P., Pauwels, S. L., Bargas-Avila, J. A. & Opwis, K. (2010). Mental models for web objects: Where do users expect the most frequent objects in online shops, news portals, and company web pages? *Interacting with Computers*, 22, 140-152.⁸

Abstract. In interface development, it is crucial to reflect the users' expectations and mental models. By meeting users' expectations, errors can be prevented and the efficiency of the interaction can be enhanced. Applying these guidelines to website development reveals the need to know where users expect to find the most common web objects like the search field, home button or the navigation. In a preliminary online study with 136 participants, the most common web objects were identified for three web page types: online shops, news portals, and company web pages. These objects were used for the main study, which was conducted with 516 participants. In an online application, prototypical websites had to be constructed by the participants. Data analysis showed that Internet users have distinct mental models for different web page types (online shop, news portal, and company web page). Users generally agree about the locations of many, but not all, web objects. These mental models are robust to demographic factors like gender and web expertise. This knowledge could be used to improve the perception and usability of websites.

Sacco, L. & Calabrese, P. (2010). Alien hand syndrome: a neurological disorder of will. *Swiss Archives of Neurology and Psychiatry*, 161, 60-63.⁹

Abstract. Alien hand syndrome (AHS) is a neurological disorder in which movements are performed without awareness or conscious will. Phenomena like awareness or consciousness are still poorly studied in physiology and have only become a crucial topic in neuroscience in the last few years. Pertinent experiments in which the volitional control of a movement was studied unanimously, demonstrate that movements are initiated before consciousness occurs. By doing so, the brain adopts internal anticipatory models of voluntary action. Several studies suggest that the parietal cortex is important in activating and maintaining such internal models of action. AHS is characterized by a loss of the sense of agency associated with the purposeful movement of the limb while retaining a sense of ownership. The hand seems to perform acts without intentional guidance by the patient. Thus, the patient has no control over the movements; instead, the hand has the capability of acting autonomously, independent of patient's voluntary control. This complex phenomenon may present in different variants which are caused by different lesions and can be categorized by several dimensions: type of aberrant behavior performed by the affected hand; coordinative disturbances in a bimanual behavior, caused by conflicts arising while using both hands; subjective reactions of the affected individual toward this limb. The syndrome and its variants is caused by lesions to the medial frontal lobe, the corpus callosum and the parietal areas, but can also appear within neurodegenerative diseases, such as corticobasal degeneration, and may even precede them (e.g. Creutzfeldt-Jakob disease). In a functional MRI study of AHS, major activation was reported for the frontal inferior gyrus of the dominant hemisphere in voluntary movement of the affected hand, suggesting an important role of this area in organizing willed actions. Neuro-psychological investigations indicate an involvement of a supramodal attentional system in

⁷ Keine Angaben vorhanden // *Medicine/Neurology (clinical)*: 99 - 242 – Q2.

⁸ IF(2010) = 1.2 / IF(5-Year) = 1.7 / *Ergonomics*: 8 – 14 – Q3 // *Computer Science/Human-Computer Interaction*: 16 – 38 – Q2.

⁹ Keine Angaben vorhanden // Keine Angaben vorhanden.

the organization of movements. AHS serves as a paradigm to study the conscious experience of movement and can be considered as a neurological disorder of will. This review discusses some physiological as well as functional-neuroanatomical aspects, by reporting some actual studies relating AHS to consciousness and will.

Schmutz, P., Roth, S. P., Seckler, M. & Opwis, K. (2010). Designing product listing pages: Effects on sales and users' cognitive load. *International Journal of Human-Computer Studies*, 68, 423-432.¹⁰

Abstract. Product listing pages, where information on multiple products are displayed, represent a vital point of an E-commerce website on which consumer decisions are made. Prior research has shown that the design of product listing pages has an impact on users' performance and their recall of brand names. The aim of this study was to examine effects of presentation on cognitive load and consumer decisions. An online study was conducted comparing presentation type (matrix versus list presentation). List presentation was associated with lower cognitive load and more economic product selections. Eye-tracking data from an additional laboratory experiment suggest that list presentation triggers comparison processes which could account for the differences found.

Tuch, A., Bargas-Avila, J., & Opwis, K. (2010). Symmetry and aesthetics in website design: It's a man's business. *Computers in Human Behavior*, 26, 1831-1837.¹¹

Abstract. In recent years the aesthetic appearance of user-interfaces has become a topic of increasing interest in the field of human-computer interaction (HCI). At the same time, it is well known that there are genderspecific effects in HCI. The present study investigates the effect of web page symmetry by taking gender differences into account. A total of 60 people (30 male, 30 female) participated in a laboratory experiment, where 20 website startpages had to be rated regarding symmetry, intuitive beauty, classical and expressive aesthetics. Results show that vertical symmetry is an important factor in aesthetic website design. It has an impact on intuitive straightforward beauty appraisals and on classical and expressive aesthetics judgments. Asymmetrically designed web pages were considered to be less beautiful and achieved lower scores on the classical and expressive dimensions. Moreover, the study indicates that the symmetry effect only occurs among male participants: only men react unfavorably to asymmetrically designed websites, whereas women's judgments are not influenced by symmetry. These findings should be taken into consideration by website designers, especially when they aim to design for target audience consisting of a majority of a certain gender.

Vukelja, L., Opwis, K. & Müller, L. (2010). A case study of user centered design in four Swiss RUP projects. *Advances in Human-Computer Interaction*, 10 pages (doi:10.1155/2010/329351).¹²

Abstract. We analysed four Rational Unified Process (RUP) projects in Switzerland that identified themselves as following a user-centred approach. Grounded theory served for analysis of 12 interviews with software developers, project managers, and UI specialists. For each professional group we analysed their work context, motivations, work practices, and strategies used to overcome the obstacles to user-centred design. Results show that end users did not participate in the projects. Instead of working directly with end users, participants used data from marketing research or consulted colleagues from other departments. Prototypes played an important role. We suggest the following remedies: (1) developing methods for easy integration of existing company knowledge about products with usability features, (2) professionalising UI design by educating project stakeholders in standard UI design, (3) creating an approved pool of company's personas for UI specialists' work, and (4) educating customers on their right to get good user interfaces.

¹⁰ IF(2010) = 1.6 / IF(5-Year) = 2.3 / **Ergonomics: 2 – 14 – Q1** / *Psychology, Multidisciplinary*: 36 – 120 – Q2 // *Computer Science/Artificial Intelligence*: 44 – 109 – Q2 / *Computer Science/Human Computer Interaction*: 11 – 38 – Q2 / *Psychology/Experimental and Cognitive Psychology*: 38 – 53 – Q3.

¹¹ IF(2010) = 1.9 / IF(5-Year) = 2.3 / *Psychology, Experimental*: 37 - 81 – Q2 / **Psychology, Multidisciplinary: 26 – 120 – Q1** // *Computer Science/Computer Science Applications*: 54 - 194 – Q2 / *Psychology/Developmental and Educational Psychology*: 26 – 91 – Q2 / *Psychology/Experimental and Cognitive Psychology*: 36 – 53 – Q3.

¹² Keine Angaben vorhanden // *Computer Science/Human-Computer Interaction*: 37 – 38 – Q4.

Monographien und Buchherausgaben

Calabrese, P., Limmroth, V., Mäurer, M., Sailer, M. & Ziemssen, T. (2010). *Multiple-Sklerose-Werkstatt: Aktuelles zu Immunologie, Diagnostik und Therapie*. Stuttgart: Ligatur Verlag (68 Seiten).

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

Bargas-Avila, J.A., Brenzikofer, O., Roth, S. P., Tuch, A. N., Orsini, S. & Opwis, K. (2010). Simple but crucial user interfaces in the world wide web: Introducing 20 guidelines for usable web form design. In R. Matrai (Ed.), *User interfaces* (pp. 1-10). Vukovar: Intech.

Penner, I.-K. (2010). Multiple Sklerose: Fatigue und Kognition. *Leading Opinions Neurologie & Psychiatrie*, 4, 12-14.

Penner, I.-K. (2010). Fatigue. *Schweizer Archiv für Neurologie und Psychiatrie*, 161(5), 149.

Penner, I.-K. (2010). Kognitive Defizite bei MS. In: Ch. Dettmers, P. Bülau & C. Weiller (Eds.), *Rehabilitation der Multiplen Sklerose* (pp. 42-56). Bad Honnef: Hippocampus Verlag.

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

Achtnichts, L., Penner, I.-K., Amann, M., Hirsch, J., Wu, W.E., Rigotti, D., Babb, J.S., Kappos, L., Gonen, O., & Gass, A. (2010). Fatigue in multiple sclerosis: relationship of different MR markers. *Multiple Sclerosis*, 16, S126.

Bechtel, N., Penner, I.-K., Klarhöfer, M., Scheffler, K., Opwis, K. & Weber, P. (2010). The effect of methylphenidate on n-back task performance in boys with epilepsy and or ADHD: A behavioral and functional MRI study. *Epilepsia*, 51, Suppl. 4, 16-17.

Bechtel, N., Penner, I.-K., Klarhöfer, M., Scheffler, K., Opwis, K., & Weber, P. Behavioral and functional effects of Methylphenidate in boys with combined epilepsy/ADHD and boys with developmental ADHD. (2010). 11th International Child Neurology Congress. *The International Journal of Child Neuropsychiatry*, Suppl., 57.

Calabrese, P., Naegelin, Y., Kappos, L., & Penner, I.-K. (2010). Cognitive performance at baseline predicts changes in cognition and cognitive fatigue after a one-year follow-up. *Multiple Sclerosis*, 16, S125.

Calabrese, P., Penner, I.-K., Freedman, M., Polman, C., Edan, G., Hartung, H.-P., Miller, D., Montalban, X., Barkhof, F., Lanius, V., Sandbrink, R., Pohl, C., Stemper, B., Kappos, L. (2010). Relationship between cognitive performance and neurological disability in early MS. *Neurology*, 74 (9), Suppl. 2, A163.

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