

### **At least nine ways to play: Approaching gamer mentalities**

Do digital games and play mean the same things for different people? This article presents the results of a 3-year study in which we sought for new ways to approach digital games cultures and playing practices. First, the authors present the research process in brief and emphasize the importance of merging different kinds of methods and materials in the study of games cultures. Second, the authors introduce a gaming mentality heuristics that is not dedicated to a certain domain or genre of games, addressing light casual and light social gaming motivations as well as more dedicated ones in a joint framework. The analysis reveals that, in contrast to common belief, the majority of digital gaming takes place between "casual relaxing" and "committed entertaining," where the multiplicity of experiences, feelings, and understandings that people have about their playing and digital games is wide ranging. Digital gaming is thus found to be a multifaceted social and cultural phenomenon that can be understood, practiced, and used in various ways.

#### **General information**

Publication status: Published

MoE publication type: A2 Review article in a scientific journal

Organisations: Mathematical modelling with wide societal impact (MathImpact)

Contributors: Kallio, K. P., Mäyrä, F., Kaipainen, K.

Number of pages: 27

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Publication date: Jul 2011

Peer-reviewed: Yes

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Journal: GAMES AND CULTURE: A JOURNAL OF INTERACTIVE MEDIA

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ISSN (Print): 1555-4120

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Scopus rating (2011): CiteScore 2.4 SJR 0.695 SNIP 1.438

Original language: English

ASJC Scopus subject areas: Cultural Studies, Communication, Anthropology, Arts and Humanities (miscellaneous),

Applied Psychology, Human-Computer Interaction

Keywords: digital games, game research methodology, games cultures, heuristics, playing mentalities

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Source: Scopus

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Research output: Contribution to journal > Review Article > Scientific > peer-review

### **Integrating discrete events and continuous head movements for video-based interaction techniques**

Human head gestures can potentially trigger different commands from the list of available options in graphical user interfaces or in virtual and smart environments. However, continuous tracking techniques are limited in generating discrete events which could be used to execute a predefined set of commands. In this article, we discuss a possibility to encode a set of discrete events by integrating continuous head movements and crossing-based interaction paradigm. A set of commands can be encoded through specific sequences of crossing points when a head-mouse cursor such as a scaled pointer interacts with a graphical object. The goal of the present experiment was testing the perceptual-motor performance of novices in target acquisition tasks using a subset of round head gestures and symbolic icons designating eight types of directional head movements. We have demonstrated that the novices can equally well execute round head gestures in clockwise and counter-clockwise directions by making two crossings for about 2 s or three crossings for about 3 s. None of the participants reported neck strain or other problems after 360 trials performed during a 40-min test in each of 5 days.

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Augmented Human Activities (AHA)

Contributors: Evreinova, T. V., Evreinov, G., Raisamo, R.

Number of pages: 8

Pages: 739-746

Publication date: Nov 2011

Peer-reviewed: Yes

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ISSN (Print): 0144-929X  
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Scopus rating (2011): CiteScore 1.9 SJR 0.516 SNIP 1.052

Original language: English

ASJC Scopus subject areas: Developmental and Educational Psychology, Arts and Humanities (miscellaneous), Social Sciences(all), Human-Computer Interaction

Keywords: Continuous input, Crossing-based interaction, Dwell time, Gestures, Head tracking, Round head gestures  
DOIs:

10.1080/01449290903353013

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Research output: Contribution to journal › Article › Scientific › peer-review

### **Long term outcome after subarachnoid haemorrhage of unknown aetiology**

**Background and purpose:** The aim of this study was to assess the long term outcome after non-aneurysmal subarachnoid haemorrhage (SAH). **Methods:** 1154 patients with SAH were treated in our hospital between 1989 and 1999. From this patient population, 97 patients had a non-aneurysmal SAH. All hospital records and death certificates were studied and 33 patients were examined by MRI and MR angiography more than 9 years (mean 12 years) after the initial bleeding. **Results:** The cohort consisted of 97 patients. Mean follow-up time was 9 years (range 0-19). During the follow-up period, 13 patients (13%) died. Four (4%) died from the initial bleeding less than 5 weeks after the initial haemorrhage. There was no delayed mortality due to SAH or subsequent bleedings. MR angiography revealed no new findings in 33 surviving patients. **Conclusions:** Excess mortality during the first year after SAH was higher than 4%, and remained thereafter comparable with the general population. There were no rebleedings and MR imaging did not reveal any vascular pathology that could explain the earlier SAH.

### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Integrated Technologies for Tissue Engineering Research (ITTE), Tampere University Hospital, Medical Imaging Centre

Contributors: Pyysalo, L. M., Niskakangas, T. T., Keski-Nisula, L. H., Kähärä, V. J., Öhman, J. E.

Number of pages: 3

Pages: 1264-1266

Publication date: Nov 2011

Peer-reviewed: Yes

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Scopus rating (2011): CiteScore 8.3 SJR 2.301 SNIP 1.864

Original language: English

ASJC Scopus subject areas: Clinical Neurology, Psychiatry and Mental health, Surgery, Arts and Humanities (miscellaneous)

DOIs:

10.1136/jnnp.2010.239335

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Source: Scopus

Source ID: 80053620497

Research output: Contribution to journal › Article › Scientific › peer-review

### **To exclude or not to exclude: White matter hyperintensities in diffusion tensor imaging research**

**Objective:** A practical methodological issue for diffusion tensor imaging (DTI) researchers is determining what to do about incidental findings, such as white matter hyperintensities (WMHI). The purpose of this study was to compare healthy control subjects with or without WMHIs on whole brain DTI. **Method:** Participants were 30 subjects (age=37.7, SD=11.3, Range=18-60; 70% female) who had no known developmental, general medical, neurological or psychiatric condition that could have had an adverse affect on brain morphology. **Results:** MRI (3 Tesla) revealed, at minimum, a WMHI in eight subjects (26.7%). Fractional anisotropy (FA) was calculated for 19 regions of interest (ROI). Frequency distributions of FA

scores for the 19 ROIs were calculated. The 10th percentile for each ROI was selected as a cut-off score. Having four or more low FA scores occurred in 16.7%. More subjects with incidental findings met criterion for low FA scores (37.5%), compared to 9.1% of subjects with no findings. When subjects with minor WMHs were retained and only those with multiple incidental findings were excluded, 8.3% of the retained subjects met criterion for low FA scores compared to 50.0% of the excluded subjects. Conclusions: The decision to include or exclude subjects who have incidental findings can influence the results of a study.

#### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Integrated Technologies for Tissue Engineering Research (ITTE), and GF Strong Rehab Center, Medical Imaging Centre, Pirkanmaan sairaanhoitopiiri, Tampere University Hospital, Neuroimmunology Unit, University of Tampere, Medical School, Walter Reed National Military Medical Center

Contributors: Iverson, G. L., Hakulinen, U., Wäljas, M., Dastidar, P., Lange, R. T., Soimakallio, S., Öhman, J.

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Journal: BRAIN INJURY

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Scopus rating (2011): CiteScore 2.9 SJR 0.635 SNIP 0.913

Original language: English

ASJC Scopus subject areas: Clinical Neurology, Arts and Humanities (miscellaneous), Developmental and Educational Psychology

Keywords: Diffusion tensor imaging, Methodology, Traumatic brain injury

DOIs:

10.3109/02699052.2011.608409

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Source: Scopus

Source ID: 81255144004

Research output: Contribution to journal › Article › Scientific › peer-review

#### Reliability, validity and clinical usefulness of the BNI fatigue scale in mild traumatic brain injury

Objectives: The purpose of this study was to examine the reliability, validity and clinical usefulness of the Barrow Neurological Institute Fatigue Scale (BNI-FS) in patients with mild traumatic brain injuries (MTBI). Methods and procedure: Participants were 125 patients enrolled from the Emergency Department (ED) of Tampere University Hospital, Finland who had sustained an MTBI. The average number of days from injury to the interview and questionnaires was 24.1 (SD=5.4, Range=8-38). The patients were compared to a healthy control sample. Patients completed the Barrow Neurological Institute Fatigue Scale, Fatigue Impact Scale (FIS), Beck Depression Inventory-Second Edition (BDI-II), Rivermead Post-concussion Symptom Questionnaire (RPSQ) and the health assessment measure EuroQol five Dimension (EQ-5D) Visual Analogue Scale (VAS). Results: The MTBI group had significantly greater total scores on the BNI-FS than the control group (p

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Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Integrated Technologies for Tissue Engineering Research (ITTE), Department of Neurosurgery, Tampere University Hospital, Neuroimmunology Unit, University of Tampere, Medical School, and GF Strong Rehab Center, Medical Imaging Centre, Pirkanmaan sairaanhoitopiiri, School of Management (JKK)

Contributors: Wäljas, M., Iverson, G. L., Hartikainen, K. M., Liimatainen, S., Dastidar, P., Soimakallio, S., Jehkonen, M., Öhman, J.

Number of pages: 7

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Peer-reviewed: Yes

#### Publication information

Journal: BRAIN INJURY

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Scopus rating (2012): CiteScore 3 SJR 0.771 SNIP 0.919

Original language: English

ASJC Scopus subject areas: Clinical Neurology, Arts and Humanities (miscellaneous), Developmental and Educational Psychology

Keywords: Fatigue, Measurement, Mild traumatic brain injury

DOIs:

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Source: Scopus

Source ID: 84862277712

Research output: Contribution to journal › Article › Scientific › peer-review

### **Long-term excess mortality of patients with treated and untreated unruptured intracranial aneurysms**

**Background and aim:** Subarachnoid haemorrhage (SAH) patients have an excess mortality proportion in long-term outcome studies because of the high rate of cerebrovascular and cardiovascular deaths. The aim of the present study was to assess the excess long-term mortality among patients with unruptured aneurysms with no previous SAH and to compare excess mortality after coiling, clipping and without treatment. **Methods:** Between 1989 and 1999, a total of 1294 patients with intracranial aneurysms were admitted to our hospital. Of these, 1154 had previous SAH and were excluded leaving 140 patients with 178 intracranial unruptured aneurysms as the study population. The patients were followed up until death or by the end of April 2011. Causes of death were determined. Relative survival ratios (RSRs) were calculated and compared with the matched general population. **Results:** Mean follow-up time was 13 years (range 1-19). During the follow-up period, 36% of patients died. Death was caused by cerebrovascular event in half of the cases. There were 12% excess mortality at 15 years in men and 35% excess mortality in women compared with general population. Excess mortality among women over 50 years was significantly higher than that among men ( $p=0.018$ ). **Conclusions:** Patients with untreated unruptured aneurysms have 50% excess long-term mortality compared with general population. Men with treated unruptured aneurysms have a survival proportion comparable with matched general population. Women, instead, have 28% excess mortality after surgical treatment and 23% excess mortality after endovascular treatment of unruptured aneurysms.

### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Integrated Technologies for Tissue Engineering Research (ITTE), Tampere University Hospital, Finnish Cancer Registry

Contributors: Pyysalo, L., Luostarinen, T., Keski-Nisula, L., Öhman, J.

Number of pages: 5

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Peer-reviewed: Yes

### **Publication information**

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ASJC Scopus subject areas: Surgery, Arts and Humanities (miscellaneous), Clinical Neurology, Psychiatry and Mental health

DOIs:

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URLs:

<http://www.scopus.com/inward/record.url?scp=84879947090&partnerID=8YFLogxK> (Link to publication in Scopus)

Source: Scopus

Source ID: 84879947090

Research output: Contribution to journal › Article › Scientific › peer-review

### **Poststroke dementia is associated with recurrent ischaemic stroke**

**Objective:** To investigate whether poststroke dementia (PSD) diagnosed after ischaemic stroke predicts recurrent ischaemic stroke in long-term follow-up. **Methods:** We included 486 consecutive patients with ischaemic stroke (388 with first-ever stroke) admitted to Helsinki University Central Hospital who were followed-up for 12 years. Dementia was diagnosed in 115 patients using the Diagnostic and Statistical Manual of Mental Disorders, 3rd edition (DSM-III) criteria. The effects of risk factors and PSD on survival free of recurrent stroke were estimated using Kaplan-Meier log-rank analyses, and the HRs for stroke recurrence were calculated using Cox proportional hazards models. **Results:** In the entire cohort, patients with PSD had a shorter mean time to recurrent stroke (7.13 years, 95% CI 6.20 to 8.06) than patients without dementia (9.41 years, 8.89 to 9.92; log rank p

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Integrated Technologies for Tissue Engineering Research (ITTE), University of Helsinki, Tampere University Hospital

Contributors: Sibolt, G., Curtze, S., Melkas, S., Putaala, J., Pohjasvaara, T., Kaste, M., Karhunen, P. J., Oksala, N. K. J., Erkinjuntti, T.

Number of pages: 5

Pages: 722-726

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#### **Publication information**

Journal: JOURNAL OF NEUROLOGY NEUROSURGERY AND PSYCHIATRY

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Original language: English

ASJC Scopus subject areas: Surgery, Arts and Humanities (miscellaneous), Clinical Neurology, Psychiatry and Mental health

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Research output: Contribution to journal > Article > Scientific > peer-review

### **The connection between ruptured cerebral aneurysms and odontogenic bacteria**

**Background:** Patients with ruptured saccular intracranial aneurysms have excess long-term mortality due to cerebrovascular and cardiovascular diseases compared with general population. Chronic inflammation is detected in ruptured intracranial aneurysms, abdominal aortic aneurysms and coronary artery plaques. Bacterial infections have been suggested to have a role in the aetiology of atherosclerosis. Bacteria have been detected both in abdominal and coronary arteries but their presence in intracranial aneurysms has not yet been properly studied. **Objective:** The aim of this preliminary study was to assess the presence of oral and pharyngeal bacterial genome in ruptured intracranial aneurysms and to ascertain if dental infection is a previously unknown risk factor for subarachnoid haemorrhage. **Methods:** A total of 36 ruptured aneurysm specimens were obtained perioperatively in aneurysm clipping operations (n=29) and by autopsy (n=7). Aneurysmal sac tissue was analysed by real time quantitative PCR with specific primers and probes to detect bacterial DNA from several oral species. Immunohistochemical staining for bacterial receptors (CD14 and toll-like receptor-2 (TLR-2)) was performed from four autopsy cases. **Results** Bacterial DNA was detected in 21/36 (58%) of specimens. A third of the positive samples contained DNA from both endodontic and periodontal bacteria. DNA from endodontic bacteria were detected in 20/36 (56%) and from periodontal bacteria in 17/36 (47%) of samples. Bacterial DNA of the *Streptococcus mitis* group was found to be most common. *Aggregatibacter actinomycetemcomitans*, *Fusobacterium nucleatum* and *Treponema denticola* were the three most common periodontal pathogens. The highly intensive staining of CD14 and TLR-2 in ruptured aneurysms was observed. **Conclusions:** This is the first report showing evidence that dental infection could be a part of pathophysiology in intracranial aneurysm disease.

#### **General information**

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MoE publication type: A1 Journal article-refereed

Organisations: Integrated Technologies for Tissue Engineering Research (ITTE), Tampere University Hospital, University of Tampere, Medical School, Ita-Suomen yliopisto

Contributors: Pyysalo, M. J., Pyysalo, L. M., Pessi, T., Karhunen, P. J., Öhman, J. E.

Number of pages: 5  
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Journal: JOURNAL OF NEUROLOGY NEUROSURGERY AND PSYCHIATRY

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Ratings:

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Original language: English

ASJC Scopus subject areas: Surgery, Arts and Humanities (miscellaneous), Clinical Neurology, Psychiatry and Mental health

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Source: Scopus

Source ID: 84885659901

Research output: Contribution to journal › Article › Scientific › peer-review

#### **Subjective responses to synthesised speech with lexical emotional content: The effect of the naturalness of the synthetic voice**

This study aimed to investigate how the degree of naturalness and lexical emotional content of synthesised speech affects the subjective ratings of emotional experiences and how the naturalness of the voice affects the ratings of voice quality. Twenty-four participants listened to a set of affective words produced by three different speech synthesis techniques: formant synthesis, diphone synthesis and unit selection synthesis. The participants task was to rate their experiences evoked by the speech samples using three emotion-related bipolar scales for valence, arousal and approachability. The pleasantness, naturalness and clarity of the voices were also rated. The results showed that the affective words produced by the synthesisers evoked congruent emotion-related ratings in the participants. The ratings of the experienced valence and approachability were statistically significantly stronger when the affective words were produced by the more humanlike voices as compared to the more machinelike voice. The more humanlike voices were also rated as statistically significantly more natural, pleasant and clear than the less humanlike voice. Thus, our findings suggest that even machinelike voices can be used to communicate affective messages but that increasing the level of naturalness enhances positive feelings about synthetic voices and strengthens emotional communication between computers and humans.

#### **General information**

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MoE publication type: A2 Review article in a scientific journal

Organisations: Augmented Human Activities (AHA), Field robotics for efficient work sites (FIRE)

Contributors: Ilves, M., Surakka, V.

Number of pages: 15

Pages: 117-131

Publication date: 1 Feb 2013

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#### **Publication information**

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ISSN (Print): 0144-929X

Ratings:

Scopus rating (2013): CiteScore 2.5 SJR 0.705 SNIP 1.444

Original language: English

ASJC Scopus subject areas: Developmental and Educational Psychology, Arts and Humanities (miscellaneous), Social Sciences(all), Human-Computer Interaction

Keywords: emotion, naturalness, synthesised speech

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<http://www.scopus.com/inward/record.url?scp=84874406163&partnerID=8YFLogxK> (Link to publication in Scopus)

Source: Scopus

Source ID: 84874406163

Research output: Contribution to journal › Review Article › Scientific › peer-review

### **Demographic differences in perceived benefits from gamification**

In recent years, "gamification" has been proposed as a solution for engaging people in individually and socially sustainable behaviors, such as exercise, sustainable consumption, and education. This paper studies demographic differences in perceived benefits from gamification in the context of exercise. On the basis of data gathered via an online survey (N = 195) from an exercise gamification service Fitocracy, we examine the effects of gender, age, and time using the service on social, hedonic, and utilitarian benefits and facilitating features of gamifying exercise. The results indicate that perceived enjoyment and usefulness of the gamification decline with use, suggesting that users might experience novelty effects from the service. The findings show that women report greater social benefits from the use of gamification. Further, ease of use of gamification is shown to decline with age. The implications of the findings are discussed.

### **General information**

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MoE publication type: A1 Journal article-refereed

Organisations: Research group: TUT Game Lab, Mathematical modelling with wide societal impact (MathImpact)

Contributors: Koivisto, J., Hamari, J.

Number of pages: 10

Pages: 179-188

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### **Publication information**

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Original language: English

ASJC Scopus subject areas: Arts and Humanities (miscellaneous), Human-Computer Interaction, Psychology(all)

Keywords: Demographics, Games for health, Gamification, Gender, Persuasive technology, Social networking

DOIs:

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Source: Scopus

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Research output: Contribution to journal › Article › Scientific › peer-review

### **Measuring flow in gamification: Dispositional Flow Scale-2**

This paper measures flow in the context of gamification and investigates the psychometric properties of the Dispositional Flow Scale-2 (DFS-2). We employ data gathered from users of an exercise gamification service (N = 200). The results show that the original DFS-2 factorial structure does result in a similar model fit as the original work. However, we also present a factorial respecification that satisfies more recent model fit thresholds. Beyond validating the original DFS-2 instrument in the context of gamification, the psychometric analysis and the respecifications suggest that the components of flow divide into highly correlated conditions of flow (which were also found to be more salient in the context of gamification: autotelic experience, balance of skill and challenge, control, clear goals, and feedback) and into possible outcomes (merging action-awareness, concentration, loss of sense of time, and loss of self-consciousness) from achieving flow.

### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Research group: TUT Game Lab, Mathematical modelling with wide societal impact (MathImpact),

Department of Information and Service Economy, Aalto University

Contributors: Hamari, J., Koivisto, J.

Number of pages: 11

Pages: 133-143

Publication date: 2014

Peer-reviewed: Yes

### **Publication information**

Journal: Computers in Human Behavior

Volume: 40  
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Scopus rating (2014): CiteScore 5.1 SJR 1.536 SNIP 2.377

Original language: English

ASJC Scopus subject areas: Arts and Humanities (miscellaneous), Human-Computer Interaction, Psychology(all)

Keywords: DFS-2, Exergames, Flow, Games for health, Gamification, Persuasive technology

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Source: Scopus

Source ID: 84906832723

Research output: Contribution to journal › Article › Scientific › peer-review

### **Global social knowledge management - Understanding barriers for global workers utilizing social software**

Utilizing social software as a part of a global knowledge management strategy has raised increasing interest in enterprises as well as in the educational domain. Rather than being proactive, organizations tend to face barriers related to knowledge management after the problems occur. When dealing with social technologies in a distributed setting, organizations and individuals face a variety of barriers currently unrecognized in knowledge management literature. Within the study, we analyze knowledge management literature extending the body of knowledge with barrier analysis regarding global challenges as well as social software. Our focus is especially on knowledge exchange and globally distributed collaboration activities in organizations. We argue for contextualized understanding of the barriers, recognizing the challenges studied in similar activities. The paper concludes with a synthesis of these interrelated components, proposing a Global Social Knowledge Management-barrier framework that demonstrates the wide spectrum of possible challenges in globally distributed, social software supported knowledge management activities.

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Managing digital industrial transformation (mDIT), Jyväskylän yliopisto

Contributors: Pirkkalainen, H., Pawlowski, J. M.

Number of pages: 11

Pages: 637-647

Publication date: Jan 2014

Peer-reviewed: Yes

#### **Publication information**

Journal: Computers in Human Behavior

Volume: 30

ISSN (Print): 0747-5632

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ASJC Scopus subject areas: Arts and Humanities (miscellaneous), Human-Computer Interaction, Psychology(all)

Keywords: Barriers, Global collaboration, Knowledge management, Knowledge sharing, Social software

DOIs:

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Source: Scopus

Source ID: 84889083844

Research output: Contribution to journal › Article › Scientific › peer-review

### **Assessment of mild traumatic brain injury with the King-Devick Test® in an emergency department sample**

Objective: The King-Devick Test® (K-D) is a brief measure of cognitive processing speed and rapid gaze shifting that appears sensitive to the effects of sport-related concussion. This study evaluated its diagnostic and incremental validity in civilian patients with mild traumatic brain injury (MTBI). Methods: Participants with MTBI (n=26) and controls with non-head injuries (n=33) were prospectively recruited from an Emergency Department (ED). They underwent a clinical evaluation including the K-D test and the Sport Concussion Assessment Tool 2 (SCAT2). Magnetic resonance imaging (MRI) was conducted within 10 days post-injury. Results: The patients with MTBI differed from those without MTBI on components of the SCAT2, including the Symptom Scale (Cohen's d=1.02-1.15, p



### General information

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MoE publication type: A1 Journal article-refereed

Organisations: Integrated Technologies for Tissue Engineering Research (ITTE), GF Strong Rehab Centre, Tampere University Hospital, Massachusetts General Hospital

Contributors: Silverberg, N. D., Luoto, T. M., Öhman, J., Iverson, G. L.

Number of pages: 4

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Publication date: 1 Nov 2014

Peer-reviewed: Yes

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Original language: English

ASJC Scopus subject areas: Clinical Neurology, Arts and Humanities (miscellaneous), Developmental and Educational Psychology, Medicine(all)

Keywords: All neuropsychology/behavior, Assessment of cognitive disorders/dementia, Brain trauma, Diagnostic test assessment, MRI

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Research output: Contribution to journal > Article > Scientific > peer-review

### A Barrier framework for open e-learning in public administrations

E-Learning and openness in education are receiving ever increasing attention in businesses as well as in academia. However, these practices have only to small extent been introduced in public administrations. The study addresses this gap by presenting a literature review on Open Educational Resources [OER] and E-Learning in the public sector. The main goal of the article is to identify challenges to open E-Learning in public administrations. Experiences will be conceptualized as barriers which need to be considered when introducing open E-Learning systems and programs in administrations. The main outcome is a systematic review of lessons learned, presented as a contextualized Barrier Framework which is suitable to analyze requirements when introducing E-Learning and OER in public administrations.

### General information

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MoE publication type: A1 Journal article-refereed

Organisations: Managing digital industrial transformation (mDIT), Ruhr West University of Applied Sciences, Jyväskylän yliopisto

Contributors: Stoffregen, J., Pawlowski, J. M., Pirkkalainen, H.

Number of pages: 11

Pages: 674-684

Publication date: 2015

Peer-reviewed: Yes

### Publication information

Journal: Computers in Human Behavior

Volume: 51

Issue number: B

ISSN (Print): 0747-5632

Ratings:

Scopus rating (2015): CiteScore 5.5 SJR 1.583 SNIP 2.184

Original language: English

ASJC Scopus subject areas: Human-Computer Interaction, Psychology(all), Arts and Humanities (miscellaneous)

Keywords: E-Learning, Open education, Open Educational Resources, Public Administrations

DOIs:

10.1016/j.chb.2014.12.024

Source: Scopus

Source ID: 84920915233

### **Clinical correlates of retrograde amnesia in mild traumatic brain injury**

Primary objective: The purpose of this study was to examine the clinical significance of retrograde amnesia (RA) in patients with acute mild traumatic brain injuries (MTBI). Methods and procedures: An emergency department sample of patients (n=75), aged 18-60 years, with no pre-morbid medical or psychiatric conditions, who met the WHO criteria for MTBI were enrolled in this prospective, descriptive, follow-up study. This study examined the presence and duration of RA in relation to socio-demographics, MTBI severity markers including neuroimaging (CT, MRI) and clinical outcomes (Rivermead post-concussion symptoms questionnaire, post-concussion syndrome (PCS) diagnosis and return to work (RTW) status) at 2 weeks, 1 month and 6 months post-injury. Main outcomes and results: GCS scores and duration of post-traumatic amnesia (PTA) were related to RA. Those with GCS scores of 14 vs. 15 were more likely to have RA ( $\chi^2(1)=13.70$ , p

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Integrated Technologies for Tissue Engineering Research (ITTE), Tampere University Hospital, Massachusetts General Hospital, Department of Neurosciences and Rehabilitation, Turku University Hospital

Contributors: Luoto, T. M., Iverson, G. L., Losoi, H., Wäljas, M., Tenovuo, O., Kataja, A., Brander, A., Öhman, J.

Number of pages: 8

Pages: 565-572

Publication date: 1 May 2015

Peer-reviewed: Yes

#### **Publication information**

Journal: BRAIN INJURY

Volume: 29

Issue number: 5

ISSN (Print): 0269-9052

Ratings:

Scopus rating (2015): CiteScore 3.1 SJR 0.816 SNIP 0.877

Original language: English

ASJC Scopus subject areas: Clinical Neurology, Arts and Humanities (miscellaneous), Developmental and Educational Psychology, Medicine(all)

Keywords: Concussion, Head injury, Post-concussion syndrome, Retrograde amnesia, Return to work, Traumatic brain injury

DOIs:

10.3109/02699052.2014.1002421

URLs:

<http://www.scopus.com/inward/record.url?scp=84928895151&partnerID=8YFLogxK> (Link to publication in Scopus)

Source: Scopus

Source ID: 84928895151

Research output: Contribution to journal › Article › Scientific › peer-review

### **Understanding the most influential user experiences in successful and unsuccessful technology adoptions**

Abstract Understanding processes underlying technology adoption or non-adoption is an important research theme often addressed using the technology acceptance model (TAM) approach. The objective of this research was to investigate most influential user experiences in successful and unsuccessful technology adoptions using user experience related concepts and methods in conjunction with the TAM. Participants (N = 76) described their most influential user experiences related to one successful and one unsuccessful technology adoption process and evaluated both experiences using rating scales, including the central TAM related scales and user experience related scales probing emotions, psychological needs, user values, task load, and the impact of technology on the user's well-being. The results suggested that user experience and technology acceptance related viewpoints can complement each other in order to gain a more holistic understanding of the factors affecting the success or failure of technology adoptions, and the results showed how these variables typically behave in both contexts. The overall valence of user experience was significantly affected by perceived usefulness, the fulfillment of psychological needs, and the salience of negative emotions in the most influential user experiences of successful adoptions, and by perceived usefulness, output quality, and the salience of negative emotions in the unsuccessful adoptions.

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Department of Pervasive Computing, Research area: User experience

Contributors: Partala, T., Saari, T.

Number of pages: 15  
Pages: 381-395  
Publication date: 25 Jul 2015  
Peer-reviewed: Yes

#### **Publication information**

Journal: Computers in Human Behavior  
Volume: 53  
ISSN (Print): 0747-5632  
Ratings:

Scopus rating (2015): CiteScore 5.5 SJR 1.583 SNIP 2.184

Original language: English

ASJC Scopus subject areas: Human-Computer Interaction, Psychology(all), Arts and Humanities (miscellaneous)

Keywords: Emotions, Technology acceptance, Technology adoption, User experience, User needs, Well-being

DOIs:

10.1016/j.chb.2015.07.012

Source: Scopus

Source ID: 84937879051

Research output: Contribution to journal › Article › Scientific › peer-review

#### **What contributes to first-year student teachers sense of professional agency in the classroom?**

This study explores Finnish first-year primary teacher students (N = 244) sense of professional agency in the classroom. In addition, the interrelation between student teachers sense of professional agency and the perceptions of teacher education as a learning environment is explored. The sense of professional agency in the classroom simultaneously requires the motivation to learn, efficacy beliefs about learning and intentional acts for facilitating and managing new learning in the classroom. The results showed that these basic elements are embedded in the contextualised components of student teachers professional agency, entailing judgements of ones competence in teaching, transformative and collaborative practice, reflection in the classroom and modelling as a learning orientation. The results further suggested that teacher education provided an encouraging learning environment for student teachers. However, only peer relations in the learning environment were positively related to perceived professional agency.

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Regulation of learning and active learning methods (REALMEE), Ita-Suomen yliopisto, University of Helsinki

Contributors: Soini, T., Pietarinen, J., Toom, A., Pyhältö, K.

Number of pages: 19

Pages: 641-659

Publication date: 18 Aug 2015

Peer-reviewed: Yes

#### **Publication information**

Journal: TEACHERS AND TEACHING: THEORY AND PRACTICE

Volume: 21

Issue number: 6

ISSN (Print): 1354-0602

Ratings:

Scopus rating (2015): CiteScore 1.9 SJR 1.186 SNIP 1.497

Original language: English

ASJC Scopus subject areas: Education, Arts and Humanities (miscellaneous)

Keywords: Classroom, Professional agency, Student teacher learning, Student teachers, Teacher education

DOIs:

10.1080/13540602.2015.1044326

URLs:

<http://www.scopus.com/inward/record.url?scp=84931566080&partnerID=8YFLogxK> (Link to publication in Scopus)

Source: Scopus

Source ID: 84931566080

Research output: Contribution to journal › Article › Scientific › peer-review

#### **"Working out for likes": An empirical study on social influence in exercise gamification**

Today, people use a variety of social and gameful (mobile) applications in order to motivate themselves and others to maintain difficult habits such as exercise, sustainable consumption and healthy eating. However, we have yet lacked understanding of how social influence affects willingness to maintain these difficult habits with the help of gamification services. In order to investigate this phenomenon, we measured how social influence predicts attitudes, use and further

exercise in the context of gamification of exercise. Our results show that people indeed do "work out for likes", or in other words, social influence, positive recognition and reciprocity have a positive impact on how much people are willing to exercise as well as their attitudes and willingness to use gamification services. Moreover, we found that the more friends a user has in the service, the larger the effects are. Furthermore, the findings of the empirical study further provide new understanding on the phenomenon of social influence in technology adoption/use continuance in general by showing, in addition to subjective norms, how getting recognized, receiving reciprocal benefits and network effects contribute to use continuance.

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Research group: TUT Game Lab, Pori, Mathematical modelling with wide societal impact (MathImpact)

Contributors: Hamari, J., Koivisto, J.

Number of pages: 15

Pages: 333-347

Publication date: 1 Sep 2015

Peer-reviewed: Yes

#### **Publication information**

Journal: Computers in Human Behavior

Volume: 50

ISSN (Print): 0747-5632

Ratings:

Scopus rating (2015): CiteScore 5.5 SJR 1.583 SNIP 2.184

Original language: English

ASJC Scopus subject areas: Arts and Humanities (miscellaneous), Human-Computer Interaction, Psychology(all)

Keywords: Continued use, eHealth, Gamification, mHealth, Social influence, Social networking

DOIs:

10.1016/j.chb.2015.04.018

URLs:

<http://www.scopus.com/inward/record.url?scp=84928503372&partnerID=8YFLogxK> (Link to publication in Scopus)

Source: Scopus

Source ID: 84928503372

Research output: Contribution to journal › Article › Scientific › peer-review

#### **Defining user experience goals to guide the design of industrial systems**

The key prerequisite for experience-driven design is to define what experience to design for. User experience (UX) goals concretise the intended experience. Based on our own case studies from industrial environments and a literature study, we propose five different approaches to acquiring insight and inspiration for UX goal setting: Brand, Theory, Empathy, Technology, and Vision. Each approach brings in a different viewpoint, thus supporting the multidisciplinary character of UX. The Brand approach ensures that the UX goals are in line with the company's brand promise. The Theory approach utilises the available scientific knowledge of human behaviour. The Empathy approach focuses on knowing the actual users and stepping into their shoes. The Technology approach considers the new technologies that are being introduced and their positive or negative influence on UX. Finally, the Vision approach focuses on renewal, introducing new kinds of UXs. In the design of industrial systems, several stakeholders are involved and they should share common design goals. Using the different UX goal-setting approaches together brings in the viewpoints of different stakeholders, thus committing them to UX goal setting and emphasising UX as a strategic design decision.

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Augmented Human Activities (AHA), VTT Technical Research Centre of Finland, School of Arts, Aalto University, Jyväskylän yliopisto

Contributors: Kaasinen, E., Roto, V., Hakulinen, J., Heimonen, T., Jokinen, J. P. P., Karvonen, H., Keskinen, T., Koskinen, H., Lu, Y., Saariluoma, P., Tokkonen, H., Turunen, M.

Number of pages: 16

Pages: 976-991

Publication date: 3 Oct 2015

Peer-reviewed: Yes

#### **Publication information**

Journal: Behaviour and Information Technology

Volume: 34

Issue number: 10

ISSN (Print): 0144-929X

Ratings:

Scopus rating (2015): CiteScore 2.9 SJR 0.637 SNIP 1.083

Original language: English

ASJC Scopus subject areas: Developmental and Educational Psychology, Arts and Humanities (miscellaneous), Social Sciences(all), Human-Computer Interaction

Keywords: experience-driven design, industrial systems, user experience, user experience goal

DOIs:

10.1080/0144929X.2015.1035335

URLs:

<http://www.scopus.com/inward/record.url?scp=84938972446&partnerID=8YFLogxK> (Link to publication in Scopus)

Source: Scopus

Source ID: 84938972446

Research output: Contribution to journal > Article > Scientific > peer-review

### **Teachers professional agency and learning-from adaption to active modification in the teacher community**

The aim of this study was to examine teacher learning in terms of teachers professional agency in the professional community of the school. Altogether 2310 Finnish comprehensive school teachers completed a survey. Results showed that teachers active efforts to learn in the professional community and to promote school development cannot be explained, and hence reduced, to a single behavioral attribute. The findings indicated that teacher learning in terms of professional agency in the professional community consists of several elements including: skills, efficacy beliefs, and motivational factors, which entail transforming ones teaching practices, experiencing collective efficacy, constructing positive interdependency, the appreciation of mutual agreements, and using active strategies of help-seeking. The investigation also suggests that the use of modifying strategies is characteristic of both the teachers professional agency as well as the strategies employed to reduce stress.

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Regulation of learning and active learning methods (REALMEE), University of Helsinki, Ita-Suomen yliopisto

Contributors: Pyhalto, K., Pietarinen, J., Soini, T.

Number of pages: 20

Pages: 811-830

Publication date: 3 Oct 2015

Peer-reviewed: Yes

#### **Publication information**

Journal: TEACHERS AND TEACHING: THEORY AND PRACTICE

Volume: 21

Issue number: 7

ISSN (Print): 1354-0602

Ratings:

Scopus rating (2015): CiteScore 1.9 SJR 1.186 SNIP 1.497

Original language: English

ASJC Scopus subject areas: Education, Arts and Humanities (miscellaneous)

Keywords: proactive strategies, professional agency, teacher community, Teacher learning, work stress

DOIs:

10.1080/13540602.2014.995483

URLs:

<http://www.scopus.com/inward/record.url?scp=84939777466&partnerID=8YFLogxK> (Link to publication in Scopus)

Source: Scopus

Source ID: 84939777466

Research output: Contribution to journal > Article > Scientific > peer-review

### **Human anterior thalamic nuclei are involved in emotion-attention interaction**

Patients treated with deep brain stimulation (DBS) provide an opportunity to study affective processes in humans with "lesion on demand" at key nodes in the limbic circuitries, such as at the anterior thalamic nuclei (ANT). ANT has been suggested to play a role in emotional control with its connection to the orbitofrontal cortex and the anterior cingulate cortex. However, direct evidence for its role in emotional function in human subjects is lacking. Reported side effects of ANT-DBS in the treatment of refractory epilepsy include depression related symptoms. In line with these mood-related clinical side effects, we have previously reported that stimulating the anterior thalamus increased emotional interference in a visual attention task as indicated by prolonged reaction times due to threat-related emotional distractors. We used event-related potentials to investigate potential attentional mechanism behind this behavioural observation. We hypothesized that ANT-DBS leads to greater attention capture by threat-related distractors. We tested this hypothesis using centro-

parietal N2-P3 peak-to-peak amplitude as a measure of allocated attentional resources. Six epileptic patients treated with deep brain stimulation at ANT participated in the study. Electroencephalography was recorded while the patients performed a computer based Executive-Reaction Time test with threat-related emotional distractors. During the task, either ANT or a thalamic control location was stimulated, or the stimulation was turned off. Stimulation of ANT was associated with increased centro-parietal N2-P3 amplitude and increased reaction time in the context of threat-related emotional distractors. We conclude that high frequency electric stimulation of ANT leads to greater attentional capture by emotional stimuli. This is the first study to provide direct evidence from human subjects with on-line electric manipulation of ANT for its role in emotion-attention interaction.

#### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Integrated Technologies for Tissue Engineering Research (ITTE), Tampere University Hospital

Contributors: Sun, L., Peräkylä, J., Polvivaara, M., Öhman, J., Peltola, J., Lehtimäki, K., Huhtala, H., Hartikainen, K. M.

Number of pages: 7

Pages: 88-94

Publication date: 1 Nov 2015

Peer-reviewed: Yes

#### Publication information

Journal: NEUROPSYCHOLOGIA

Volume: 78

ISSN (Print): 0028-3932

Ratings:

Scopus rating (2015): CiteScore 5.9 SJR 2.054 SNIP 1.137

Original language: English

ASJC Scopus subject areas: Experimental and Cognitive Psychology, Arts and Humanities (miscellaneous), Cognitive Neuroscience, Behavioral Neuroscience

Keywords: Anterior thalamic nuclei, Attention, Deep brain stimulation, EEG, Emotion, Epilepsy

DOIs:

10.1016/j.neuropsychologia.2015.10.001

URLs:

<http://www.scopus.com/inward/record.url?scp=84943805450&partnerID=8YFLogxK> (Link to publication in Scopus)

Source: Scopus

Source ID: 84943805450

Research output: Contribution to journal > Article > Scientific > peer-review

#### Brownfield Process: A method for modular product family development aiming for product configuration

Modularisation, product platforms, product families and product configuration are efficient product structuring tactics in mass customisation. Industry needs descriptions of how the engineering should be done in this context. We suggest that key engineering concepts in this field are partitioning logic, set of modules, interfaces, architecture and configuration knowledge. A literature review reveals that methods consider these concepts partly or with different combinations, but considering all of them is rare. Therefore, a design method known as the Brownfield Process is presented. The method is applied to an industrial case in which the aim was rationalisation of existing product variety towards a modular product family that enables product configuration. We suggest that the method is valuable in cases with similar goals.

#### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Research area: Design, Development and LCM, Department of Mechanical Engineering and Industrial Systems

Contributors: Pakkanen, J., Juuti, T., Lehtonen, T.

Number of pages: 32

Pages: 210-241

Publication date: 2016

Peer-reviewed: Yes

#### Publication information

Journal: DESIGN STUDIES

Volume: 45B

ISSN (Print): 0142-694X

Ratings:

Scopus rating (2016): CiteScore 5.1 SJR 1.32 SNIP 2.622

Original language: English

ASJC Scopus subject areas: Engineering(all), Architecture, Computer Science Applications, Artificial Intelligence, Social Sciences(all), Arts and Humanities (miscellaneous)

Keywords: Design method, Design process, Engineering design, Product design, Product development

Electronic versions:

bfp\_desstud

DOIs:

10.1016/j.destud.2016.04.004

URLs:

<http://urn.fi/URN:NBN:fi:tty-201608194419>

Source: Scopus

Source ID: 84967235654

Research output: [Contribution to journal](#) › [Article](#) › [Scientific](#) › [peer-review](#)

### **Assessing fraction knowledge by a digital game**

Serious or educational games gain increasing research interest as tools to augment traditional instructional approaches on scholastic learning, especially in mathematics education. In this study, we investigated whether game-based approaches may not only be useful to foster numerical learning but may also be valid as an assessment tool. To measure their conceptual knowledge of fractions eleven-year-old students played a math game on tablet computers using tilt-control to navigate an avatar along a number line for a total of 30 min. Findings indicated that hallmark effects of fraction magnitude processing typically observed in basic research, such as the numerical distance effect, were successfully replicated using the game-based assessment. Moreover, fraction comparison performance as well as fraction estimation accuracy correlated significantly with students' math grades. Therefore, the results of the current study suggest that game-based learning environments for fraction education (even using tilt-control) may also allow for a valid assessment of students' fraction knowledge.

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Research group: TUT Game Lab, Pervasive Computing, University of Tübingen

Contributors: Ninaus, M., Kiili, K., McMullen, J., Moeller, K.

Number of pages: 10

Pages: 197-206

Publication date: 1 May 2017

Peer-reviewed: Yes

#### **Publication information**

Journal: Computers in Human Behavior

Volume: 70

ISSN (Print): 0747-5632

Ratings:

Scopus rating (2017): CiteScore 7.4 SJR 1.555 SNIP 2.182

Original language: English

ASJC Scopus subject areas: Arts and Humanities (miscellaneous), Human-Computer Interaction, Psychology(all)

Keywords: Alternative assessment, Digital game, Fractions, Mathematics, Serious game

DOIs:

10.1016/j.chb.2017.01.004

Source: Scopus

Source ID: 85008958389

Research output: [Contribution to journal](#) › [Article](#) › [Scientific](#) › [peer-review](#)

### **Do badges increase user activity? A field experiment on the effects of gamification**

During recent years, the practice of adding game design to non-game services has gained a relatively large amount of attention. Popular discussion connects gamification to increased user engagement, service profitability, goal commitment and the overall betterment of various behavioral outcomes. However, there is still an absence of a coherent and ample body of empirical evidence that would confirm such expectations. To this end, this paper reports the results of a 2 year (1 + 1 year – between-group) field experiment in gamifying a service by implementing a game mechanic called 'badges'. During the experiment a pre-implementation group (N = 1410) was monitored for 1 year. After the implementation, the post-implementation (the gamified condition) group (N = 1579) was monitored for another full year. Results show that users in the gamified condition were significantly more likely to post trade proposals, carry out transactions, comment on proposals and generally use the service in a more active way.

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Mathematical modelling with wide societal impact (MathImpact), University of Tampere

Contributors: Hamari, J.

Number of pages: 10  
Pages: 469-478  
Publication date: 1 Jun 2017  
Peer-reviewed: Yes

#### **Publication information**

Journal: Computers in Human Behavior  
Volume: 71  
ISSN (Print): 0747-5632  
Ratings:

Scopus rating (2017): CiteScore 7.4 SJR 1.555 SNIP 2.182

Original language: English

ASJC Scopus subject areas: Arts and Humanities (miscellaneous), Human-Computer Interaction, Psychology(all)

Keywords: Achievements, Badges, Engagement, Game design, Gamification, Persuasive technology

DOIs:

10.1016/j.chb.2015.03.036

URLs:

<http://www.scopus.com/inward/record.url?scp=84961291905&partnerID=8YFLogxK> (Link to publication in Scopus)

Source: Scopus

Source ID: 84961291905

Research output: Contribution to journal › Article › Scientific › peer-review

#### **Why do people buy virtual goods: A meta-analysis**

During the last decade, virtual goods have become an important target of consumption online (especially in games, virtual worlds and social networking services) amongst physical and digital goods. In this study we investigate the question of why do people purchase virtual goods by conducting a meta-analysis (random effects model) of the existing quantitative body of literature (24 studies) on the topic. The meta-analysis revealed an important aspect of value of virtual goods: contrary to traditional goods, the reasons why people purchase virtual goods are tightly connected to the platform where they are sold in. These findings underline the significance of service design and its relationship to the formation of value of virtual goods: the value of virtual goods is context-bound, and therefore, bound to the environment where they are usable in. Most factors that were found to be significant predictors of purchase behavior (such as network effects, self-presentation, enjoyment, ease of use, flow and use of the platform) are directly related to the aspects and design of the platform beyond the general attitudes towards virtual goods themselves. Moreover, we found that enjoyment and prolonged use of the platform were more important predictors for purchases in virtual worlds than in games.

#### **General information**

Publication status: Published

MoE publication type: A2 Review article in a scientific journal

Organisations: Pervasive Computing, Gamification Group, Turun Yliopisto/Turun Biomateriaalikeskus

Contributors: Hamari, J., Keronen, L.

Number of pages: 11

Pages: 59-69

Publication date: 1 Jun 2017

Peer-reviewed: Yes

#### **Publication information**

Journal: Computers in Human Behavior

Volume: 71

ISSN (Print): 0747-5632

Ratings:

Scopus rating (2017): CiteScore 7.4 SJR 1.555 SNIP 2.182

Original language: English

ASJC Scopus subject areas: Arts and Humanities (miscellaneous), Human-Computer Interaction, Psychology(all)

Keywords: Free-to-play, Freemium, Online games, Social networking services, Virtual goods, Virtual worlds

DOIs:

10.1016/j.chb.2017.01.042

Source: Scopus

Source ID: 85012307873

Research output: Contribution to journal › Review Article › Scientific › peer-review

#### **Content structure is king: An empirical study on gratifications, game genres and content type on Twitch**

While video games have been widely investigated from the perspective of play, an emerging online media phenomenon is the spectating of video game play, captivating millions of users daily. This study investigates the relationship of video game genres, content type and viewer gratification in the context of live gaming. To study this phenomenon, we employ an online questionnaire study (N = 1097) to investigate six categories of gratifications: affective, information seeking, learning



to play, personal integrative, social integrative & tension release motivations and their relationship with game genres and stream types. The results of this study demonstrate that “the medium is the message”, highlight the importance of archetypal structure (i.e. the type of streamed content) over content topic (i.e. the genre of games being streamed), and help to build a better understanding of user generated content and the democratization of media.

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Research group: TUT Game Lab, Pervasive Computing, Aalto University

Contributors: Sjöblom, M., Törhönen, M., Hamari, J., Macey, J.

Number of pages: 11

Pages: 161-171

Publication date: 1 Aug 2017

Peer-reviewed: Yes

#### **Publication information**

Journal: Computers in Human Behavior

Volume: 73

ISSN (Print): 0747-5632

Ratings:

Scopus rating (2017): CiteScore 7.4 SJR 1.555 SNIP 2.182

Original language: English

ASJC Scopus subject areas: Arts and Humanities (miscellaneous), Human-Computer Interaction, Psychology(all)

Keywords: Genres, New media, Social media, Streaming, User-generated content, Uses and gratifications, Video games

DOIs:

10.1016/j.chb.2017.03.036

Source: Scopus

Source ID: 85015997285

Research output: Contribution to journal > Article > Scientific > peer-review

#### **How games induce cooperation? A study on the relationship between game features and we-intentions in an augmented reality game**

Seamless cooperation between individuals is essentially a crucial aspect of any successful endeavor. A host of literature has been published in the academic realm about how cooperation could be cultivated. However, true cooperation often forms organically without external enforcement. Recently, there has been one special example of a context where cooperation seemed to have effortlessly sprung up between people who might not even have had previous connections. The context is video/online games; games such as Ingress, Pokémon Go, and World of Warcraft bind people together to work against insurmountable odds and to overcome jointly held challenges. Organizations of many types have recently begun to gamify their structures and services in order to cultivate such seamless cooperation. However, before this potential of games can be successfully wielded outside video games, we need to understand better how games are able to cultivate such cooperation. Therefore, in this study we investigate how games can induce and cultivate we-intention of working as a group. Specifically, we investigate how cooperative game features affect different forms of group dynamics and how they further translate into we-intentions. We employ data from users of the augmented reality game Ingress (N = 206). The results show that cooperative game features induce we-intentions via positively increasing group norms, social identity, joint commitment, attitudes toward cooperation, and anticipated positive emotions. The findings imply that practitioners who are looking to increase cooperation should find that gamification inspired by cooperative game design is beneficial and preferable over individual-based gamification efforts.

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Pervasive Computing, Karlsruhe Institute of Technology, Insitute for Technical Physics, Germany, Robert Bosch GmbH, University of Mannheim, Gamification Group

Contributors: Morschheuser, B., Riar, M., Hamari, J., Maedche, A.

Number of pages: 15

Pages: 169-183

Publication date: 1 Dec 2017

Peer-reviewed: Yes

#### **Publication information**

Journal: Computers in Human Behavior

Volume: 77

ISSN (Print): 0747-5632

Ratings:

Scopus rating (2017): CiteScore 7.4 SJR 1.555 SNIP 2.182

Original language: English

ASJC Scopus subject areas: Arts and Humanities (miscellaneous), Human-Computer Interaction, Psychology(all)

Keywords: Augmented reality, Cooperation, Gamification, Location-based games, Online games, We-intention

DOIs:

10.1016/j.chb.2017.08.026

Source: Scopus

Source ID: 85028695881

Research output: Contribution to journal › Article › Scientific › peer-review

### **Social motivations of live-streaming viewer engagement on Twitch**

Little is known about the motivations underlying viewer engagement in the rapidly growing live-streaming multimedia phenomenon. This study trialled an eight-factor socio-motivational model, based on Uses and Gratifications Theory, to explain four aspects of live-stream viewer engagement. Cross-sectional data was collected through an international, online self-report survey of Twitch users (N = 2227). Multiple and ordinal linear regression analyses identified six motivations which helped to explain live-stream engagement: social interaction, sense of community, meeting new people, entertainment, information seeking, and a lack of external support in real life. Compared to mass media, viewer motivations to engage in live-stream entertainment appear to have a stronger social and community basis. Furthermore, live-stream viewers who preferred smaller channels (<500 viewers) were more motivated by social engagement than viewers who preferred larger channels. These findings offer insight into the motivations for live-stream engagement, and help to lay a foundation for further research.

### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Pervasive Computing, Vision and Sensing, ESTeM, University of Canberra, Gamification Group, School of Science, Aalto University

Contributors: Hilvert-Bruce, Z., Neill, J. T., Sjöblom, M., Hamari, J.

Number of pages: 10

Pages: 58-67

Publication date: 14 Feb 2018

Peer-reviewed: Yes

### **Publication information**

Journal: Computers in Human Behavior

Volume: 84

ISSN (Print): 0747-5632

Ratings:

Scopus rating (2018): CiteScore 9.4 SJR 1.711 SNIP 2.418

Original language: English

ASJC Scopus subject areas: Arts and Humanities (miscellaneous), Human-Computer Interaction, Psychology(all)

Keywords: eSports, Motivation, Social media, Streaming, Twitch, Uses and gratification

DOIs:

10.1016/j.chb.2018.02.013

Source: Scopus

Source ID: 85042386608

Research output: Contribution to journal › Article › Scientific › peer-review

### **Investigating relationships between video gaming, spectating esports, and gambling**

An established body of research exists in which playing video games has been associated with potentially problematic behaviours, such as gambling. An issue highlighted by the recent emergence of game-based gambling practices such as loot boxes, social network casinos, free-to-play game mechanics, and gambling using virtual goods and skins. This study investigates relationships between a range of gambling activities and the consumption of video games in general, and the newly emergent phenomenon of esports in particular. In addition, these practices are considered in relation to established measures assessing game addiction and problematic gambling. The study employs Partial Least Squares modelling to investigate data gathered via an international online survey (N = 613). Video game addiction was found to be negatively associated with offline gambling, online gambling, and problem gambling. Video game consumption had only small, positive association with video game-related gambling and problem gambling. Consumption of esports had small to moderate association with video game-related gambling, online gambling, and problem gambling. The primary finding of this study are that contemporary video games are not, in themselves, associated with increased potential for problematic gambling, indeed, the position that problem gaming and problem gambling are fundamentally connected is questioned.

### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Research group: TUT Game Lab, Pervasive Computing, Gamification Group, School of Management (JKK)  
Contributors: Macey, J., Hamari, J.  
Number of pages: 10  
Pages: 344-353  
Publication date: Mar 2018  
Peer-reviewed: Yes  
Early online date: 20 Nov 2017

#### Publication information

Journal: Computers in Human Behavior  
Volume: 80  
ISSN (Print): 0747-5632  
Ratings:

Scopus rating (2018): CiteScore 9.4 SJR 1.711 SNIP 2.418

Original language: English

ASJC Scopus subject areas: Arts and Humanities (miscellaneous), Human-Computer Interaction, Psychology(all)

Keywords: Addiction, Esports, Free-to-play, Gambling, Games, Virtual Goods

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URLs:

<http://urn.fi/URN:NBN:fi:uta-201803261454>

#### Bibliographical note

DUPL=40410108

Source: Scopus

Source ID: 85035771336

Research output: Contribution to journal > Article > Scientific > peer-review

#### Improving competing voices segregation for hearing impaired listeners using a low-latency deep neural network algorithm

Hearing aid users are challenged in listening situations with noise and especially speech-on-speech situations with two or more competing voices. Specifically, the task of attending to and segregating two competing voices is particularly hard, unlike for normal-hearing listeners, as shown in a small sub-experiment. In the main experiment, the competing voices benefit of a deep neural network (DNN) based stream segregation enhancement algorithm was tested on hearing-impaired listeners. A mixture of two voices was separated using a DNN and presented to the two ears as individual streams and tested for word score. Compared to the unseparated mixture, there was a 13%-point benefit from the separation, while attending to both voices. If only one output was selected as in a traditional target-masker scenario, a larger benefit of 37%-points was found. The results agreed well with objective metrics and show that for hearing-impaired listeners, DNNs have a large potential for improving stream segregation and speech intelligibility in difficult scenarios with two equally important targets without any prior selection of a primary target stream. An even higher benefit can be obtained if the user can select the preferred target via remote control.

#### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Signal Processing, Oticon A/S, Cirrus Logic

Contributors: Bramsløw, L., Naithani, G., Hafez, A., Barker, T., Pontoppidan, N. H., Virtanen, T.

Number of pages: 14

Pages: 172-185

Publication date: 1 Jul 2018

Peer-reviewed: Yes

#### Publication information

Journal: Journal of the Acoustical Society of America

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Ratings:

Scopus rating (2018): CiteScore 3.1 SJR 0.726 SNIP 1.214

Original language: English

ASJC Scopus subject areas: Arts and Humanities (miscellaneous), Acoustics and Ultrasonics

DOIs:

10.1121/1.5045322

#### Bibliographical note

INT=tie,"Barker, Tom"

Source: Scopus

Source ID: 85049961883

Research output: Contribution to journal › Article › Scientific › peer-review

### Optimized reference spectrum for rating the impact sound insulation of concrete floors

It has been long recognized that the single-number quantities presented in the standard ISO 717-2 [(2013) International Organization for Standardization] do not correlate especially well with the subjective judgment of living impact sound sources directed to the floors. The aim of this study was to find single-number quantities which are well associated with the subjective annoyance caused by different impact sounds. Experimental data of laboratory measurements of impact sound insulation of floors and a psychoacoustic experiment was used [Kylliäinen et al. (2017). Acta Acust. Acust. 103, 236-251]. The five studied impact sound types were walking with hard shoes, socks, and soft shoes, super ball bouncing, and chair moving. A fundamental requirement was that the single-number quantities can be expressed as the sum of  $L'_{n,w}$  or  $L'_{n,T,w}$  and a spectrum adaptation term. Reference spectra were derived by the means of a mathematical optimization method. Reference spectra for each sound type were defined separately. An optimized reference spectrum based on all five sound types explained the annoyance of these sound types reasonably well ( $r^2 = 0.93$ ) and better than any of the standardized single number quantities (e.g.,  $r^2 = 0.86$  for  $L'_{n,w} + C_{1,50-2500}$ ).

#### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Civil Engineering, Research group: Building Acoustics, Turku University of Applied Sciences

Contributors: Kylliäinen, M., Virjonen, P., Hongisto, V.

Number of pages: 10

Pages: 407-416

Publication date: 2019

Peer-reviewed: Yes

#### Publication information

Journal: Journal of the Acoustical Society of America

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Issue number: 1

ISSN (Print): 0001-4966

Ratings:

Scopus rating (2019): CiteScore 3.2 SJR 0.656 SNIP 1.215

Original language: English

ASJC Scopus subject areas: Arts and Humanities (miscellaneous), Acoustics and Ultrasonics

DOIs:

10.1121/1.5087553

Source: Scopus

Source ID: 85060649204

Research output: Contribution to journal › Article › Scientific › peer-review

### Model checking and validity in propositional and modal inclusion logics

Propositional and modal inclusion logic are formalisms that belong to the family of logics based on team semantics. This article investigates the model checking and validity problems of these logics. We identify complexity bounds for both problems, covering both lax and strict team semantics. By doing so, we come close to finalizing the programme that aims to completely classify the complexities of the basic reasoning problems for modal and propositional dependence, independence and inclusion logics.

#### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Computing Sciences, Tampere University, Leibniz Universität Hannover, University of Helsinki, Hasselt University

Contributors: Hella, L., Kuusisto, A., Meier, A., Virtema, J.

Number of pages: 26

Pages: 605-630

Publication date: 1 Sep 2019

Peer-reviewed: Yes

#### Publication information

Journal: JOURNAL OF LOGIC AND COMPUTATION

Volume: 29

Issue number: 5

ISSN (Print): 0955-792X

Ratings:

Scopus rating (2019): CiteScore 2.8 SJR 0.786 SNIP 1.481

Original language: English

ASJC Scopus subject areas: Software, Theoretical Computer Science, Arts and Humanities (miscellaneous), Hardware and Architecture, Logic

Keywords: complexity, Inclusion logic, model checking, team semantics, validity problem

DOIs:

10.1093/logcom/exz008

Source: Scopus

Source ID: 85080893187

Research output: Contribution to journal › Article › Scientific › peer-review

### **ALICE: An open-source tool for automatic measurement of phoneme, syllable, and word counts from child-centered daylong recordings**

Recordings captured by wearable microphones are a standard method for investigating young children's language environments. A key measure to quantify from such data is the amount of speech present in children's home environments. To this end, the LENA recorder and software—a popular system for measuring linguistic input—estimates the number of adult words that children may hear over the course of a recording. However, word count estimation is challenging to do in a language-independent manner; the relationship between observable acoustic patterns and language-specific lexical entities is far from uniform across human languages. In this paper, we ask whether some alternative linguistic units, namely phone(me)s or syllables, could be measured instead of, or in parallel with, words in order to achieve improved cross-linguistic applicability and comparability of an automated system for measuring child language input. We discuss the advantages and disadvantages of measuring different units from theoretical and technical points of view. We also investigate the practical applicability of measuring such units using a novel system called Automatic Linguistic unit Count Estimator (ALICE) together with audio from seven child-centered daylong audio corpora from diverse cultural and linguistic environments. We show that language-independent measurement of phoneme counts is somewhat more accurate than syllables or words, but all three are highly correlated with human annotations on the same data. We share an open-source implementation of ALICE for use by the language research community, enabling automatic phoneme, syllable, and word count estimation from child-centered audio recordings.

#### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Computing Sciences, Aalto University, CNRS/PSL University, Max Planck Institute for Psycholinguistics, INRIA

Contributors: Räsänen, O., Seshadri, S., Lavechin, M., Cristia, A., Casillas, M.

Number of pages: 18

Publication date: 2020

Peer-reviewed: Yes

#### **Publication information**

Journal: BEHAVIOR RESEARCH METHODS

ISSN (Print): 1554-351X

Original language: English

ASJC Scopus subject areas: Experimental and Cognitive Psychology, Developmental and Educational Psychology, Arts and Humanities (miscellaneous), Psychology (miscellaneous), Psychology(all)

Keywords: Child-centered audio, Language development, LENA, Speaker diarization, Speech processing, Word count estimation

Electronic versions:

ALICE An open-source tool for automatic 2020

DOIs:

10.3758/s13428-020-01460-x

URLs:

<http://urn.fi/URN:NBN:fi:tuni-202009187054>

Source: Scopus

Source ID: 85090115926

Research output: Contribution to journal › Article › Scientific › peer-review

### **A thorough evaluation of the Language Environment Analysis (LENA) system**

In the previous decade, dozens of studies involving thousands of children across several research disciplines have made use of a combined daylong audio-recorder and automated algorithmic analysis called the LENA<sup>®</sup> system, which aims to assess children's language environment. While the system's prevalence in the language acquisition domain is steadily growing, there are only scattered validation efforts on only some of its key characteristics. Here, we assess the LENA<sup>®</sup> system's accuracy across all of its key measures: speaker classification, Child Vocalization Counts (CVC), Conversational

Turn Counts (CTC), and Adult Word Counts (AWC). Our assessment is based on manual annotation of clips that have been randomly or periodically sampled out of daylong recordings, collected from (a) populations similar to the system's original training data (North American English-learning children aged 3-36 months), (b) children learning another dialect of English (UK), and (c) slightly older children growing up in a different linguistic and socio-cultural setting (Tsimane' learners in rural Bolivia). We find reasonably high accuracy in some measures (AWC, CVC), with more problematic levels of performance in others (CTC, precision of male adults and other children). Statistical analyses do not support the view that performance is worse for children who are dissimilar from the LENA<sup>®</sup> original training set. Whether LENA<sup>®</sup> results are accurate enough for a given research, educational, or clinical application depends largely on the specifics at hand. We therefore conclude with a set of recommendations to help researchers make this determination for their goals.

### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Computing Sciences, CNRSPSL University, University of Manitoba, Radboud University Nijmegen, Max Planck Institute for Psycholinguistics, Aalto University, Duke University

Contributors: Cristia, A., Lavechin, M., Scaff, C., Soderstrom, M., Rowland, C., Räsänen, O., Bunce, J., Bergelson, E.

Number of pages: 20

Publication date: 2020

Peer-reviewed: Yes

### Publication information

Journal: BEHAVIOR RESEARCH METHODS

ISSN (Print): 1554-351X

Original language: English

ASJC Scopus subject areas: Experimental and Cognitive Psychology, Developmental and Educational Psychology, Arts and Humanities (miscellaneous), Psychology (miscellaneous), Psychology(all)

Keywords: Adult Word Count, Agreement, Child Vocalization Count, Conversational Turn Count, English, Human transcription, LENA, Measurement error, Method comparison, Reliability, Speech technology, Tsimane'

DOIs:

10.3758/s13428-020-01393-5

Source: Scopus

Source ID: 85088830664

Research output: [Contribution to journal](#) > [Article](#) > [Scientific](#) > [peer-review](#)

### Avatar capital: The relationships between player orientation and their avatar's social, symbolic, economic and cultural capital

Our everyday lives are increasingly digitized, virtualized and gamified. People increasingly live and act through a collection of various digital personas and avatars. However, the question of how peoples' psychological traits may predict the traits and features of their virtual avatars is still relatively unexplored. In this study investigates the relationship between the traits related to gaming preferences and forms of capital (economic, cultural, social and symbolic) their avatar commands. The data was gathered through an online survey (n = 905) amidst the players of a MMORPG Final Fantasy XIV. The results indicate that avatar's cultural capital is associated player's orientation towards achievement-mechanics, immersion and social aspects of games. Economic capital is associated with player's orientation towards achievement and relationship sides of games. Social capital is associated with players' orientation towards immersion and social parts of games, and in-game interests of the player. Symbolic capital is associated with player's orientation towards achievement and social orientations and one's tenure in the game.

### General information

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Computing Sciences, Gamification Group, Turku University of Applied Science

Contributors: Korkeila, H., Hamari, J.

Number of pages: 8

Pages: 14-21

Publication date: 2020

Peer-reviewed: Yes

### Publication information

Journal: Computers in Human Behavior

Volume: 102

ISSN (Print): 0747-5632

Original language: English

ASJC Scopus subject areas: Arts and Humanities (miscellaneous), Human-Computer Interaction, Psychology(all)

Keywords: Avatar, Capital, Digitalization, MMORPG, Video games, Virtualization

DOIs:

10.1016/j.chb.2019.07.036

Source: Scopus

Source ID: 85070617810

Research output: Contribution to journal › Article › Scientific › peer-review

### **Does esports spectating influence game consumption?**

Contemporary digital technologies have facilitated practices related to games whereby users often produce and consume content for free. To date, research into consumer interactions has largely focused on in-game factors, however, the intention to both play the game and to make in-game purchases are influenced by outside factors, including game streams and game-centred communities. In particular, the growth of competitive gaming, known as esports, offers a new channel for consumer engagement. This research explores the potential for esports to be a significant factor in understanding both intentions to play and spend money on games. Our study draws from Motivations Scale of Sports Consumption to empirically investigate the relationship between esports spectating motivations and game consumption: Watching Intention, Gaming Intention, and Purchasing Intention. This survey uses structural equation modelling (SEM) to analyse data collected from a sample of video game players ( $n = 194$ ). This research contributes empirical evidence of the relationship between esports spectating and game consumption, with the relationship between Watching Intention and Gaming Intention found to be particularly strong. Finally, while the MSSC is an adequate measure for esports spectating, additional aspects specific to esports require further investigation, consequently, there may be more optimal measures which can be developed.

### **General information**

Publication status: Published

MoE publication type: A1 Journal article-refereed

Organisations: Computing Sciences, Information and Knowledge Management, Research group: Business Data Research Group, Research group: TUT Game Lab

Contributors: Macey, J., Tyrväinen, V., Pirkkalainen, H., Hamari, J.

Number of pages: 17

Publication date: 2020

Peer-reviewed: Yes

### **Publication information**

Journal: Behaviour and Information Technology

ISSN (Print): 0144-929X

Original language: English

ASJC Scopus subject areas: Developmental and Educational Psychology, Arts and Humanities (miscellaneous), Social Sciences(all), Human-Computer Interaction

Keywords: Esports, free-to-play, game consumption, purchase intention, video games, watching intention

Electronic versions:

Does esports spectating influence 2020

DOIs:

10.1080/0144929X.2020.1797876

URLs:

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### **Bibliographical note**

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dupl=55234949

Source: Scopus

Source ID: 85088953744

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