

# CyberTherapy & Rehabilitation



21st Annual CyberPsychology, CyberTherapy  
& Social Networking Conference

# CYPSY21

June 27-29 2016.

Institute of Art, Design and Technology, Dun Laoghaire, Dublin

Conference Abstracts



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## Letter from the Secretary General and Editor-in-Chief

Professor Dr. Brenda K. Wiederhold

### *Welcome to the 21<sup>st</sup> Annual CyberPsychology, CyberTherapy & Social Networking Conference!*

Welcome to the 21st Annual CyberPsychology, CyberTherapy & Social Networking Conference (CYPSY21). Jointly organised by the Interactive Media Institute (IMI), in collaboration with the Institute of Art, Design & Technology (IADT), Virtual Reality Medical Institute (VRMI) and International Association of CyberPsychology, Training, & Rehabilitation (iACToR), CYPSY21 is honoured to have in attendance researchers, clinicians, policymakers and funding agents from 20 countries.

I would like to offer a special thanks to this year's Conference Co-chair and Conference Coordinator, Dr. Grainne Kirwan. She has worked tirelessly to ensure that every aspect of CYPSY21 is picture perfect. Also my thanks to the local Organiser, IADT, who is so graciously hosting this year's conference. Our scientific program this year features 4 Keynote Speakers and two days of parallel tracks. Many thanks to our Scientific Committee Chairs, Dr. Willem-Paul Brinkman, Professor Tom Buchanan, Dr. Chris Fullwood and Professor Giuseppe Riva as well as the members of this year's Scientific Committee for their immeasurable commitment to helping shape this excellent program.

As well, our appreciation goes to CYPSY21's Website Chair, Nicola Fox Hamilton, for her work in designing the website and in promoting our visibility. And to Dr. Silvia Serino, thank you for serving as Managing Editor for this year's Conference Proceedings (Annual Review of CyberTherapy and Telemedicine (ARCTT) and the CyberTherapy & Rehabilitation (C&R) Magazine. Finally, CYPSY21 would not have been possible if not for the generosity of our sponsors and supporters. Thank you for continuing to believe in our two-fold mission to improve the quality and accessibility of healthcare through technology, while also exploring how these same technologies are impacting individual behaviour, interpersonal relationships and societies.

The future looks bright as we embark upon our third decade of exploration of Virtual Reality and Social

Networking in behavioural healthcare. Our community has accomplished much in its short history and continues to grow and flourish. Some accomplishments specifically related to the CYPSY Conference include:

- CyberPsychology, Behavior & Social Networking Journal (CYBER). Published by Mary Ann Liebert, Inc. in New York, CYBER is now in its 19th year of publication. Indexed in Medline, CYBER is the CYPSY conference's official journal.
- iACToR. Founded in 2006, CYPSY is iACToR's official conference and CYBER is iACToR's official journal. As of May 2016, iACToR comprises 564 members.
- C&R Magazine. Now in its 9th year, C&R is indexed in PsycEXTRA. As of 2014, C&R began publishing CYPSY's annual conference abstracts.
- ARCTT. Now in its 14th year, ARCTT is indexed in PsycINFO and features select full papers from each CYPSY conference.
- Awards and Honours. Each year, the conference recognises an established member of our community with a Lifetime Achievement Award; a New Investigator with an award for outstanding research quality; and tomorrow's leaders, our student members, with outstanding poster awards.

I would like to thank you all for your commitment to CYPSY; for taking the time to join this year's conference to celebrate new discoveries and enrich our community with your participation. As our numbers grow, we hope we may remain a close-knit community.

Professor Dr. Brenda K. Wiederhold  
Ph.D., MBA, BCB, BCN  
Chief Executive Officer  
Interactive Media Institute  
President,  
Virtual Reality Medical Institute



## Letter from the Conference Co-Chair

Dr. Gráinne Kirwan

### *Welcome to the 21<sup>st</sup> Annual CyberPsychology, CyberTherapy & Social Networking Conference!*

Having spent the last few months spamming your e-mail folders, I'm delighted to welcome you all to IADT and Dun Laoghaire and meet you in person.

It's an honour for me to be Co-chair of CYPsy21, and I'd like to thank you all for your patience during the planning stages. I'd especially like to thank those who are presenting research at the conference – all of the abstracts are fascinating, and my biggest dilemma of the conference has been making difficult decisions regarding which sessions to attend.

I'd like to echo Brenda's thanks to the Scientific Committee, the Scientific Committee Chairs, Nicola Fox Hamilton and Dr. Silvia Serino, as well as our very generous sponsors (listed on the inside front cover). I'd also like to thank: our four keynote speakers, who are so kindly giving of their time and knowledge (see their bios and abstracts on pp. 5–8); our small army of volunteer helpers (they're the ones wearing the black caps); Audrey Stenson, who prepared the book of abstracts; Laura Griffin, Catherine Friend and Dean McDonnell for organizing social events such as the table quiz and the Irish dancing lesson; Paddy McAlister and Kieran Granville who kept the payments in order; the IADT Executive (particularly Dr. Annie Doona, Bernard Mullarky and Jessica Fuller); the catering and

caretaking staff in IADT (without whom none of this could happen at all); and the administrative personnel who have patiently managed my limited knowledge of everything from purchase orders to printing costs – I'd particularly like to thank Linda Carroll, Linda Doyle, and Thelma Gill for their very kind support. I'd also like to thank Prof. Dr. Brenda Wiederhold, for her faith in my ability to organize this event. Finally, I'd like to thank Dr. Marion Palmer, my Head of Department, for supporting my work on this conference. It was Marion who helped to make my dream of an MSc in Cyberpsychology a reality, and without her, the chain of events which led to the conference taking place here would never have happened. She is retiring during this summer, and CYPsy21 will be one of her last events as a member of staff in IADT. I am privileged to have had such an amazing mentor.

I hope that you enjoy the conference, learn from the talks and posters, and enjoy the social events too. I look forward to meeting as many of you as I can over the coming three days.

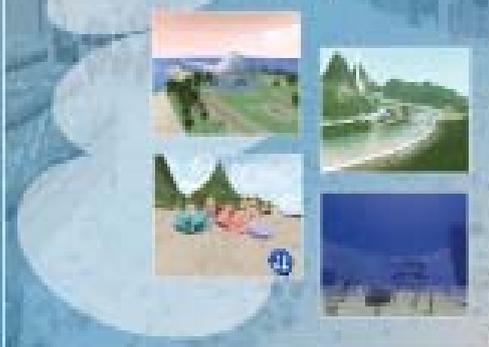
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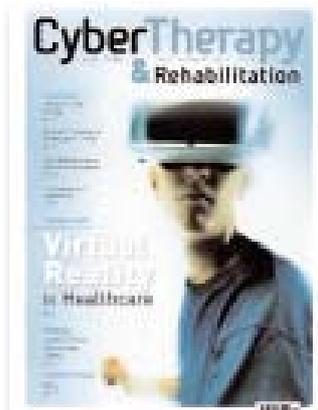
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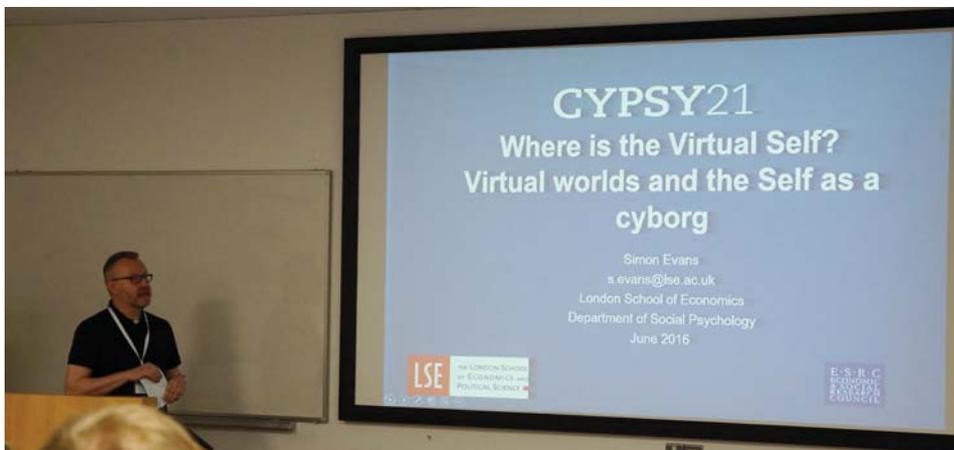
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- ▶ LETTER FROM THE EDITOR-IN-CHIEF  
*B.K. WIEDERHOLD* p 1
- ▶ LETTER FROM THE CYPHY21 CO-CHAIR  
*G. KIRWAN* p 2
- ▶ CONFERENCE HIGHLIGHTS  
*G. Kirwan* p 6
- CYPHY21 SPONSORS  
p 8
- ▶ ABSTRACTS:  
21<sup>st</sup> Annual CyberPsychology, CyberTherapy  
& Social Networking Conference  
p 11



# Highlights of the 21<sup>st</sup> Annual CyberPsychology, CyberTherapy & Social Networking Conference

► by Gráinne Kirwan

The Dún Laoghaire Institute of Art, Design, and Technology (IADT) buzzed from 27–29 June as it hosted the 21st Annual CyberPsychology, CyberTherapy & Social Networking Conference (CYPSY21). This conference is a forum for the presentation of research relating to the psychology of digital technologies, with particular focus on virtual and augmented reality and social media. It was jointly organised with the Interactive Media Institute (IMI). The early CYPSY conferences examined the potential of virtual reality (VR) in healthcare and therapeutic settings, but the conference has evolved to examine how this potential has been realised, along with other aspects of behaviour and technology, such as social media. Previous conferences were held in the University of California, San Diego (CYPSY20 – 2015), the Catholic University of America, Washington, DC (CYPSY19 – 2014), and the Catholic University, Brussels (CYPSY18 – 2013).

The 2016 conference included four keynote speakers, a symposium on the use of virtual reality in the assessment and treatment of psychosis, 72 individual oral presentations and 35 posters. Over 160 delegates attended from 20 countries, including South Korea, Australia, Canada and the United States of America. The conference opened during the evening of 27 June at the Royal Marine Hotel, Dún Laoghaire, with opening addresses by Prof. Brenda Wiederhold (Conference Co-chair) and Dr Annie Doona (President, IADT). These were followed by the opening keynote by Stephen Howell, Academic Engagement Manager at Microsoft Ireland, who discussed the use of natural user interface games for health. He demonstrated how

the Scratch programming language could be used by researchers for prototyping research projects. He also demonstrated how easy it can be to develop and test games with little previous hardware or software hacking or coding experience. The first full day of the conference included dual-track oral presentations, examining topics such as technology-mediated therapies and benefits, cognitive psychology and simulations, self-presentation online, cyberbullying and problematic online behaviour, and clinical applications of virtual reality. In the evening keynote speaker Prof. Daniel Freeman of the University of Oxford presented an overview of his work on the use of virtual reality in the understanding and treatment of paranoia, including references as to how the media has portrayed his important research. Prof. Freeman's talk was followed by a second keynote of the evening, Dr Gary O'Reilly of University College Dublin. Dr O'Reilly described how his game, Pesky gNATs, has developed, and the benefits of the application in cognitive behaviour therapy interventions for young people. Following a buffet dinner, delegates took part in a table quiz sponsored by Microsoft Ireland, which included viciously difficult questions (which flavour are cats unable to taste?), and some amazing prizes. The final day of the conference included the presentation of more research examining problematic online behaviour, clinical applications of VR, communication patterns and behaviour, VR in the treatment and prevention of PTSD, online support, gaming, positive applications of technology and advances in cyberpsychology. The final keynote of the conference was presented by Dr

John McCarthy of University College Cork on digital publics and counter-publics. He described his research examining varieties of community participation online, particularly the intra- and inter-personal tensions experienced where those communities face and tackle a similar problem. The conference wrapped up with an awards ceremony, gala dinner, and an Irish dancing lesson.

Conference co-chairs for CYPSY21 were Prof. Brenda K. Wiederhold (Interactive Media Institute) and Dr Grainne H. Kirwan (IADT). The conference included four Scientific Chairs: Prof. Giuseppe Riva (Istituto Auxologico Italiano), Dr Willem-Paul Brinkman (Delft University of Technology), D. Chris Fullwood (University of Wolverhampton) and Professor Tom Buchanan (University of Westminster). The Scientific Committee comprised of 38 international experts in the psychology of virtual reality and/or social media.

CYPSY21 was kindly sponsored by Science Foundation Ireland, Fáilte Ireland, Microsoft Ireland, IADT, IMI, Istituto Auxologico Italiano, Mary Ann Liebert and the Université du Québec en Outaouais. Thanks to Jennifer Murphy for the photos included in this report. CYPSY22 will be held in the University of Wolverhampton, the United Kingdom, from 26–28 June 2017.

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# Highlights of the 21<sup>st</sup> Annual CyberPsychology, CyberTherapy & Social Networking Conference



Figure 1: The four keynotes of the conference (clockwise from top left): Mr Stephen Howell (Microsoft Ireland); Dr Gary O'Reilly (University College Dublin); Prof. John McCarthy (University College Cork); Prof. Daniel Freeman (University of Oxford)



Figure 2: Nicola Fox Hamilton, former chair of SIGMAC, presents her doctorate research on ratings of online dating profile attractiveness



Figure 3: IADT BSc (Hons) Applied Psychology graduates (left to right) Alex Lee, Katie Doyle and Chloé Beatty present research conducted with their supervisors John Greaney and Joachim Pietsch on a prototype system for easier administration of medication

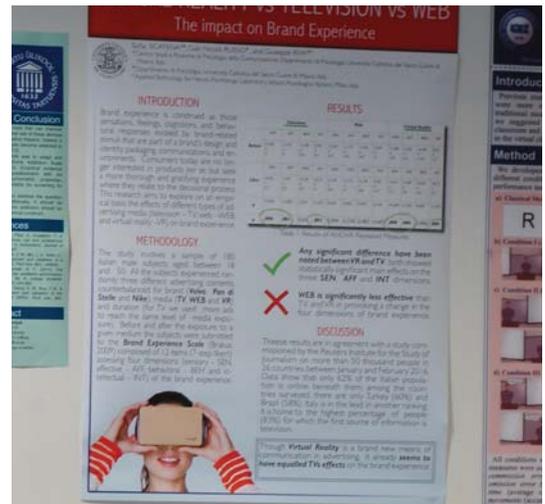


Figure 4: Delegates at the conference could try out many of the virtual worlds described in research presentations

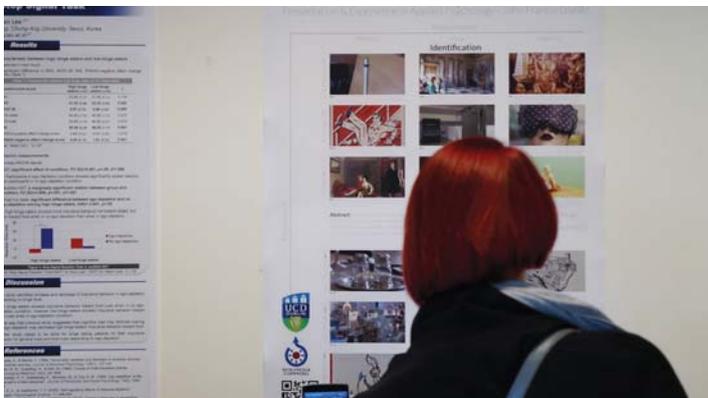
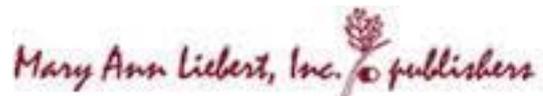


Figure 5: A conference delegate quickly grabbing the QR code provided on John Francis Leader's poster to follow up on later

# A Special Thank You To: CYPSY21 Exhibitors & Supporters





**Annual Review of Cybertherapy and Telemedicine 2011**

Advanced Technologies in the Behavioral, Social and Neurosciences

Editors: B. K. Wiederhold, S. Bouchard, and G. Riva

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Cybertherapy – the provision of healthcare services using advanced technologies – can help improve the lives of many of us, both patients and health professionals, while tackling the challenges to healthcare systems.

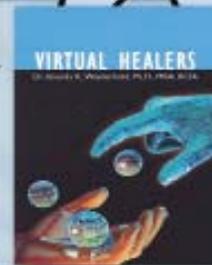
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**Virtual Healers**

Brenda K. Wiederhold, Ph.D., MBA, BCIA

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Virtual Reality in the Mental Health arena is barely over a decade old. Because VR is still such a young and focused field, the members of its community have come together as a tight-knit family. In *Virtual Healers*, Dr. Brenda K. Wiederhold, herself a pioneer of VR, sits down in casual one-on-one interviews with more than a dozen of the top researchers of this select group.



**Virtual Healing**

Brenda K. Wiederhold, Ph.D., MBA, BCIA

\$ 19.95

Along with aliens and time travel, virtual reality (VR) is often thought of as a science fiction dream. Though it was developed nearly five decades ago, the use of VR in the private sector, particularly in the field of patient care, has become a possibility only in the past decade. As programmers are creating more detailed and interactive environments, the rapid advancement of technology combined with decreasing costs has turned VR into a promising alternative to traditional therapies.

**Virtual Reality Resources**

By Brenda K. Wiederhold, PhD, MBA, BCIA

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We, at the Interactive Media Institute, realized early on that it was relatively difficult for professionals wanting to break into the Virtual Reality (VR) field to locate relevant information. While the material was out there, there was no clear organizational structure or database to link it. To solve this problem, we have put together *Virtual Reality Resources*, a relevant compilation for researchers and clinicians alike.



**CyberTherapy Conference Archives 1996-2005**

A Collection of all abstracts from the past 10 years of CyberTherapy

By Brenda K. Wiederhold, PhD, MBA, BCIA

\$ 29.95

A decade ago, CyberTherapy, then still in its infancy, only existed as a specialized Virtual Reality and Behavioral Healthcare Symposium at the Medicine Meets Virtual Reality (MMVR) Conference. It is now clear that in 1996, we had only begun to realize what promise might lie ahead for both VR technology and the CyberTherapy Conference.

# iACToR Resources

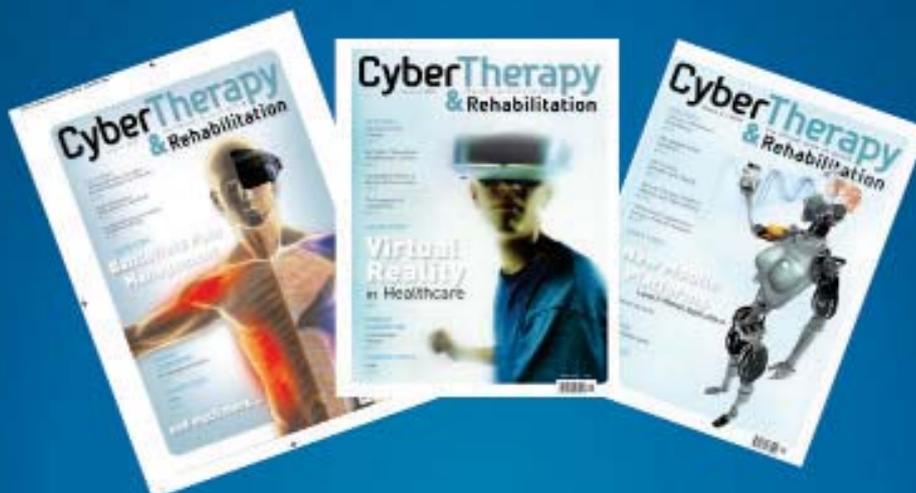
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# Abstracts:

## 21<sup>st</sup> Annual CyberPsychology, CyberTherapy & Social Networking Conference

### Technology-mediated therapies & benefits 1

Computerised cognitive behavioural therapy for adjustment disorders: Preliminary efficacy data

Iryna RACHYLA<sup>a,1</sup>, Soledad QUERO<sup>a,b</sup>, Mar MOLES<sup>a</sup>, Daniel CAMPOS<sup>a</sup>, Adriana MIRA<sup>a</sup> and Sonia MOR<sup>a</sup>

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<sup>b</sup>CIBER de Fisiopatología de la Obesidad y Nutrición (CIBEROBN), Spain

<sup>1</sup>Corresponding Author

Iryna RACHYLA  
rachyla@uji.es

**Abstract.** Computerized Cognitive Behavioral Therapy (cCBT) has proven to be an effective, acceptable and low-cost way to provide help to people with anxiety and mood disorders. However, further research is needed on the efficacy of cCBT for other DSM-5 disorders, such as adjustment disorder (AD). Although AD is a highly prevalent mental health problem which causes considerable suffering, many patients with this diagnosis do not receive the care they need. In order to give a feasible solution to this situation, TAO (Adjustment Disorders Online) was developed. TAO is a self-help internet-delivered treatment for AD. It consists of seven-module computerized program that assists the participants in acquiring the knowledge and skills for managing their emotional distress, solving problems, overcoming the stressful events which are causing them suffering and, finally, increasing

their resilience. Every week the participants receive access to a new module and are encouraged to put into practice new skills and do the exercises that are requested. In order to make the intervention more interactive and dynamic, TAO includes multimedia resources, such as videos, illustrations, music and exercises that provide quick feedback. The aim of the present work is to describe TAO program and to offer efficacy preliminary data among patients with the diagnosis of AD. This study represents an advance in the new and promising field of cCBTs and will provide additional, more accessible treatment options for people suffering from this high prevalent psychological problem.

---

Online counselling: Facebook and Skype as new “trusted setting” for psychological support

Davide ALGERI<sup>a</sup>, Sara GABRI<sup>b</sup>, Luca MAZZUCHELLI<sup>c</sup> and Alessandra MICALIZZI<sup>b,1</sup>

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Alessandra MICALIZZI  
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**Abstract.** Distance psychological counselling is becoming a relevant phenomenon: on one hand, psychosocial studies show how the protection of the screen can

help self-disclosure practices; on the other one, the strength of the relation can be compromised in the perception of the interlocutors. The paper aims at showing the results of a fieldwork carried out in Italy by the SIPO, Service for Online Psychology that offers online psychological support by two virtual channels (Facebook chat and Skype videochat). The study would investigate the following goals: Individuating the main drivers that lead to choose a mediated service; Defining pros and cons of the use of mediated technology; Monitoring the quality of the service and identifying the levels of satisfactions and the areas of improvement. The research was based on two steps fieldwork: users are invited to fulfil two online questionnaires, the first one at the beginning and the second one at the end of the treatment. During the last two years, SIPO has collected 614 questionnaires overall and the results have been elaborated by SPSS 18. The results show how peculiar the two instruments are and how each reaches different targets. Behind a substantial difference in its users and in the content treated by the two channels, there is however a common element: the awareness and trust with which the subjects turn to the online psychologist, witnessed also by the motivation to begin psychotherapy following the encounter with the professional psychologist online.

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## Teletherapy and its Effect on the Therapeutic Frame

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**Abstract.** The “frame” is a well-theorized concept in contemporary psychoanalytic writing. Switching patient interaction from a face-to-face to a teleconferencing modality alters the psychoanalytic frame. José Bleger’s 1967 paper “Psycho-analysis of the Psycho-analytic Frame” specifically and proto-Relational Latin American psychoanalytic theory in general is used as the theoretical ground for discussing the idea that there are actually two frames in any treatment—the explicit frame the patient and analyst agree to (which, Bleger argues, is more the analyst’s than the patient’s) and a wholly unconscious patient’s frame, which is how the patient would prefer to have the relationship structured. Profoundly upsetting the nature of the therapeutic relationship (in this case, the analyst’s to another country and the change in communicative modality) allows each therapist-patient dyad a chance to see in retrospect what part of our two overlapping frames were unacknowledged and unanalyzed “bastions,” places in the treatment that are mutual blind spots. My current work with patients over Skype has become a rich site for exploring how a shift in the frame produces an opportunity to see the treatment from a new angle, to experience the treatment differently, and to talk about those experiences differently. As Bleger put it, “if the ‘meta-’ varies, the contents vary radically.” Three patient vignettes will be discussed as clinical examples.

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Efficacy of delivering cognitive-behaviour therapy in videoconference to people suffering from generalized anxiety disorder: preliminary results of a randomized control trial

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**Abstract.** The efficacy of delivering cognitive-behaviour therapy (CBT) via videoconferencing technology has been documented for several disorders (Duncan et al., 2014) but no study has yet focused on generalized anxiety disorder (GAD). The current multisite study addresses this issue with a randomized control trial conducted following all CONSORT guidelines for clinical trials, for psychotherapy trials, and for non-inferiority trials. The 112 adult participants (mean age = 40.7, 82% females) were: (a) screened with the ADIS-IV; (b) randomly assigned to either face to face (n=63) or videoconference CBT (n=49, further randomized among treatment sites); (c) treated by therapists from five different sites following a standardized treatment manual; (d) participated to sessions that were video recorded to ascertain adherence to the manual; (e) and completed validated outcome measures at pre-treatment, post-treatment and 6 and 12-month follow-ups. Repeated measures ANOVAs confirmed: (a) that both treatments were effective in treating GAD (e.g., Penn-State, ADIS, Intolerance of Uncertainty, BDI) at post and follow-up assessments, with all p’s < .000 and effect sizes > 1.5; b) delivering CBT in videoconference was significantly more effective than in face to face on the Penn State Worry Questionnaire [ $p < .05$ , partial eta squared = .05], and c) all other variables showed equivalence of the two treatments. In summary, telepsychotherapy was clearly not less effective than face to face. The advantages for the patients and variables involved in treatment processes (i.e., telepresence, working alliance, findings on the Penn State) are discussed.

Cybertherapy: A scientific model? A text mining analysis of published abstracts

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**Abstract.** In the field of cybertherapies, meta-analysis reveal the scientific advancement in different fields, such as virtual reality exposure therapy for anxiety disorders (Powers & Emmelkamp, 2008) or the effect of immersive technology on user presence (Cummings, Bailenson, 2015). Certainly, knowledge about a phenomenon depends on results. But, following a socio-constructivist approach (Kendler et al., 2011), it seems obvious that these results also depend on the researcher’s intentionality, which fluctuates with social, cultural, economic, political or theoretical circumstances. Researchers’ implicit models (Epstein, 2008) also impact the design of the studies, the results and consequently, the scientific representation of the investigated phenomenon. One way to assess scientific models is to study publications’ abstracts. In order to observe the scientific models in cybertherapies and their evolution, we analyzed 857 abstracts from indexed Pubmed publications, obtained in January 2016 with the following requests: “cybertherapy” OR “computer based therapy” OR “online therapy” OR “web based therapy” OR “tele psychology” OR “telepsychotherapy” OR “tele-mental health “. Following data-mining methods (Han, Kamber & Pei, 2012), we combined (a) classical approaches in lexicometry (Gupta et Lehal, 2009; Han et al., 2012), (b) the « Meaning Extraction Method » (Chung et Pennebaker, 2007) and (c) network analyses (Paranyushkin, 2011). We also crossed data with publications dates to observe the evolution of the concepts. Data analysis is in progress. Results will help us to observe the evolution of scientific models in cybertherapies as well as the evolution

## ▶ ABSTRACTS

of concepts such as emotions or intersubjectivity.

### Cognitive Psychology & Simulations

Effects of fidelity on driving behaviour – An experimental study

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Abstract. In the last years, the investigation of driving behaviour in simulated driving environments has been growing in importance (Fischer, Labusch, Bellmann, & Seehof, 2015). Using simulation has several advantages compared to research with real cars in real environments. Simulations are economic, can be standardized, and offer the opportunity to observe driving behaviour in precise driving situations and to save the relevant data (Allen, Rosenthal, & Cook, 2011; Hoffmann & Buld, 2006). The objective of this study is to figure out whether different simulation environments lead to differences in psychophysiological reactions and driving performance while driving in a simulated environment. In accordance with recent research (Bowman & McMahan, 2007) we expect that higher levels of presence also influence psychophysiological reactions and driving performance. An experiment will be conducted comparing several driving simulations (i.e. Oculus Rift, CAVE, 2D display) while participants perform the Lane Change Task (Mattes, 2003). Psychophysiological signals (ECG, Eyetracker, breathing belt) will be measured during the task, presence will be measured by the Presence Questionnaire (PQ; Witmer & Singer, 1998), retrospectively. The results of this study are a first step to identify a simulation environment that is suitable to generate psychophysiological reactions. This

knowledge can be used for further research to create an efficient and economic driving simulation.

Impulsiveness and need for touch in omnichannel context, the importance of the device

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Abstract. In the past, consumers used to go to brick-and-mortar stores to gather information and often concluded their shopping there, with the physical store probably being one of their few sources of information. Nowadays, with the arrival of digital devices, the number of sources of information has grown. Consumers tend to combine these with brick-and-mortar establishments both to search and buy, leading to the emergence of omnichannel behavior. Omnichannel behavior refers to the use of both physical and digital channels combined with the delivery of seamless shopping experiences. In this context, there is a lack of research which considers online and mobile devices separately; academic literature has focused mainly on online and offline channel choice for each decision-making stage. For that reason, the goal of this study is to investigate how two of the key defining traits of consumer purchasing behavior – impulsiveness and need for touch – influence the use of each device in the omnichannel decision-making process. Results from a sample of 284 real digital (online and/or mobile) shoppers of clothes confirm that personal traits influence omnichannel consumer behavior. These results confirm that impulsive shoppers make greater use of mobile devices whereas individuals with high need for touch are more predisposed to use online devices in their omnichannel process. Therefore,

firms should take into account that omnichannel individuals display different features such that each strategy must adapt to the demands of each channel, these being determined by what consumers expect to find on that channel and how they use it.

Virtual crime scene simulator

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Abstract. Imagine the following scenario: an inexperienced law enforcement officer enters a crime scene and – on finding a USB key on a potential suspect – inserts it into a nearby Windows desktop computer hoping to find some information which may help an on-going investigation. The desktop crashes and all data on the USB key and on the Windows desktop has now been potentially compromised. However, the law enforcement officer in question is using a Virtual Crime Scene Simulator and has just learned a valuable lesson. Virtual Crime Scene Simulator is a modern first-person 3D exploration game designed for training law enforcement and forensic students in different aspects of cybercrime investigation from meticulous search of physical and digital crime scenes to interrogating suspects present on the scene. VCSS can be used to simulate various pitfalls arising during crime scene processing including improper evidence handling, team (mis-)coordination, failure to follow procedure or ask correct questions during interrogation. This talk will focus on the challenges of providing a believable natural language interaction between the investigator and the suspect avatar using scripts written in Artificial Intelligence Markup Language. The results of initial user evaluation and related issues, such as multilingual



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support, will also be briefly discussed.

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Head mounted display Virtual Reality in context-reinstatement of eyewitness recall

Joanne CARROLL<sup>a,1</sup>, Grainne KIRWAN<sup>a</sup>, John BUCKLEY<sup>a</sup> and Olivia HURLEY<sup>a</sup>

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Abstract. Context reinstatement is used to improve memory of material and events when recalled in an environment similar or identical to the environment in which they were initially experienced. It can, therefore, be used to retrieve information about a crime from eyewitnesses. The current research examined if the Oculus Rift could benefit the recall of details of a fictitious crime by eyewitnesses. After watching a video of a fictitious crime, participants (N = 44) were asked to recall the event in one of four conditions. In the experimental condition, participants were asked to recall the events using an Oculus Rift, which virtually replicated the room the video was witnessed in. These results were compared to three control conditions, where participants recalled the events in (i) the same room that the video was played in, (ii) a neutral interview room, or (iii) an Oculus Rift virtual replication of the neutral interview room. A significant difference was found for quality of information recalled by participants, based on the retrieval location. Post-hoc tests identified the highest scoring conditions as those that used the Oculus Rift, with participant groups in all VR conditions significantly outperforming real room condition participant groups. No significant differences were found between the two VR conditions, or the two real room conditions. While higher quality of information was identified in the virtual reconstruction of the environment that the crime was viewed in, this appeared to be due to the use of VR, rather than context reinstatement.

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Information recall and spatial memory using e-reader and print modes of presentation

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Abstract. E-reader devices may be attractive to university students as a means of accessing textbooks and journal articles without the inconvenience of transporting printed material. However, there is limited empirical data available on the relative merits of each mode of presentation on information absorbed, particularly in relation to the spatial memory of positioning of graphical material. A 2 (mode) x 3 (type of material) experimental design was conducted, with 20 undergraduate participants in each condition. Participants were required to read a journal article, a chapter in a textbook, or the same chapter separated from the rest of the book. Each type of material was presented either via an e-reader or in print format. Post-test, participants completed a multiple-choice quiz (MCQ) on the material, and their scores were compared to an identical pre-test quiz. Participants were also required to indicate the approximate position of three figures from the text using a multiple choice option. A MANOVA identified a significant medium-sized effect of both the type of material and the mode of presentation on the combined dependent variable of information recalled, although no interaction effect was noted. Post-hoc tests using Bonferroni adjustments indicated that printed versions of the material resulted in greater increases in MCQ scores than e-reader versions did. While e-reader devices may be more convenient for students, potentially resulting in increased access of the material, it appears that this mode of presentation may have

detrimental effects on learning when compared to consumption of printed content.

### Self-presentation online

Just untag it: Exploring the management of undesirable Facebook photos

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Abstract: Facebook is the most popular social networking site (SNS) in the world. This study explored the methods individuals use to manage perceived invasions of privacy in the form of undesirable Facebook photos uploaded and tagged by other users. Limited previous research has focused solely on untagging, deletion request, privacy setting and face-to-face management methods. A series of qualitative focus group discussions identified these and further management methods, such as emailing or texting the uploader to request the removal of the image. An online quantitative questionnaire examined the relationship of the identified methods with age, gender and personality traits. Untagging was the most frequently cited management method in both the focus group discussions and online questionnaire. Contrary to previous studies, the findings suggested that women were not more likely to untag than men. Younger Facebook users were found to be more likely to untag than older users but were not more likely to use Facebook management methods. Agreeable individuals were more likely to use direct management methods. On average participants chose three methods they would use to manage these undesirable impressions. Future research should investigate the influence of the photo content and the tagged user's relationship with the uploader on the

management of undesirable SNS photos.

The role of social identity and online social capital on psychosocial outcomes in MMO players

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Abstract. Given the contradictory nature of the literature on the role of online gaming engagement on psychosocial outcomes, we

specifically explored this issue in respect of a number of different indicators of “engagement”. Additionally, we examined the role of social identity and online social capital as potential factors relevant in link between online gaming engagement and psychosocial outcomes. We addressed these issues in two sub-samples of Massively Multiplayer Online (MMOs) players; adolescents (aged 14-17 years) and adults (18+ years). An online questionnaire was completed by MMO players in which we measured; MMO engagement (i.e. type of player and degree of involvement in MMO activities), dimensions of online social capital, social identity as an MMO player, self-esteem, loneliness, social competence, and life

satisfaction. Preliminary findings in adults revealed a number of key relationships between MMO involvement and social identity and also with dimensions of online social capital. Most noteworthy, the findings also revealed players’ sense of MMO social identity was positively related to self-esteem, suggesting a positive function of the identity process associated with MMO membership for psychosocial well-being. Taken together, the current findings suggest the utility of exploring gaming engagement in a more holistic way and accounting for player identity as one influential factor on psychosocial outcomes associated with online gaming.

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Factors predicting partner entitlement in online dating profiles

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Abstract. Psychological predictors of online daters have been explored in great depth. For example, rejection sensitivity predicts one's inclination to join an online dating site (Blackhart et al., 2014). The outcomes of engaging in online dating have however received far less attention in the academic literature, although evidence suggests sex differences in how the online dating experience is perceived. For instance, whereas men report finding the experience frustrating due to a lack of responses, women are often overwhelmed with the number of messages received (Zytka et al., 2014). An interesting question that arises from this is the impact that using online dating services might have on perceptions of partner entitlement, and this presentation will aim to shed some light on this. The primary aim of the talk will be to discuss whether specific factors predict the level of partner entitlement communicated in online dating profiles. Although entitlement may refer to one's right to have or do something (Attridge & Berscheid, 1994), partner entitlement in this context refers to the expectations that daters have about what they feel they deserve in terms of the characteristics and qualities of potential romantic partners. A number of variables will be mined from real dating profiles, including physical attractiveness, education level, sex and age. Further, participants will be asked to rate the level of partner entitlement communicated in the profiles of daters and these scores will be correlated against the previously mentioned variables to see which factors might predict online daters' expectations of potential partners.

The thematic factors of deception detection online in communication dyads

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Abstract. Where humans have been found to detect lies only at the rate of chance, communication online can elicit higher rates of trust and sharing personal information. The current study investigates the effect of social norms and trust on perception of detecting deception in online communication. This qualitative study first analysed self-reports from participants (N=40) of why they believed they had been told the truth or lied to by a confederate in a factorial between-subjects experiment. The experiment required participants to detect 2 lies out of 5 conversation topics in a testing dyad either online or offline, with one of four confederates. It measured the effect of trust, perspective taking and communication medium on accurate deception detection. Secondly, participants were asked to describe where they would expect to be lied to online. Using thematic analysis, the emergent themes of conversation flow, online disinhibition, relationship closeness [i.e. perceived intimacy] to the communication partner were identified as primary factors in deception detection in this study. Implications include a caution to online communication where a paradox arises: Individuals do not expect close friends to lie. However, perceived intimacy and accurate deception detection may be obscured by online communication.

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Self-esteem and the motivations of male and female students when choosing Facebook profile pictures

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Abstract. Social Networking Sites surround people's lives in today's world, with Facebook being the most popular. Within Facebook, profile pictures (PPs) are one of the most prominent aspects, as they are one of the first things viewed on a user's page, and users view them as an important part of their Facebook presentation. Therefore, the motivations behind users' choice of PPs are important when examining Facebook users' behaviours. Three motivations were researched; to look attractive, to show personality and to show social ties. Similarly, the effect on self-esteem is important in connection to Facebook, and therefore should be explored in relation to Facebook PPs. A questionnaire design was employed. A student sample were invited to complete a series of questionnaires, the Rosenberg Self-esteem Scale, the Motivations when Choosing a Facebook Profile Picture Questionnaire and two qualitative questions. Data collected was separated into quantitative and qualitative elements. For the quantitative elements, three two-way ANOVAs were conducted, incorporating the three motivations and self-esteem. The qualitative data was coded, submitted for inter-rater reliability and conclusions were drawn. The study provides enhanced understanding surrounding the motivations of Facebook users, and therefore increasing the literature relating to people's actions on social media sites. Additionally, it is important to understand the impact that social media has on users' self-esteem, and how this can affect the information that is portrayed online.

## Symposium: The use of Virtual Reality in the assessment and treatment of psychosis

The use of immersive virtual reality systems for therapy

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Abstract. This talk will review where we have come from and what we can look forward to in the use of Virtual Reality for therapy. For some time Immersive Virtual Reality systems have shown promise as a tool to deliver exposure therapy. From the post-traumatic stress experiments of Larry Hodges to the fear of public speaking studies by Mel Slater, there was much evidence of promise for such therapy. In the last ten years as character motions have become easier to generate and the realism of the appearance of virtual characters has improved, immersive virtual reality has become a realistic option for implementing therapy that involves social interaction. Studies involving social phobia, paranoia, and psychosis have all now been conducted, further emphasising the expansion in use of this technology. In the coming years as facial motions and realistic hand tracking become standard the possibility for intuitive social interaction will become standard in virtual reality. As these types of interaction are supported, IVRs will achieve a new level of effectiveness. Finally, with the arrival of new low cost head mounted displays, virtual reality therapy in an immersive virtual reality will become commonplace as a tool for clinicians.

Adverse life events and paranoid ideation in individuals at ultra high risk of psychosis

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Abstract. Adverse life events in childhood have been linked with an increased risk of experiencing psychotic symptoms such as hallucinations, delusions and paranoia of both clinical and non-clinical severity. In this study we used virtual reality to explore the link between adverse life events in childhood and later paranoid ideation in the individuals at ultra high risk (UHR) of developing psychosis. Data was collected for 64 individuals in the UHR group for psychosis, and 43 healthy controls, using measures of adverse life events and state paranoid ideation in a virtual environment (London Underground Train). The UHR group were characterised by higher rates of historical adverse life events and by increased paranoid ideation in the VR environment. The association between being adverse life events and paranoid ideation in the UHR group suggests that they should become a target for assessment and for intervention.

Childhood trauma and social stress reactivity in psychosis: a virtual reality study

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Abstract. Childhood trauma may be related to risk for psychosis by the mechanism of sensitization to social stress. Virtual Reality (VR) provides the opportunity to test this mechanism by controlled experimental exposure to different social environments. Fifty-five patients with recent onset psychotic disorder (FEP), 20 patients

at ultra-high risk for psychosis (UHR), 42 siblings of patients with psychosis and 53 controls walked five times in a virtual bar with different levels of environmental social stress. Virtual social stressors were population density, ethnic density and hostility. Social stress sensitivity was measured with paranoia and subjective distress in response to virtual social stress exposures, childhood trauma and self-esteem were assessed at baseline. Multilevel random intercept regression analyses were used to test childhood trauma as predictor and moderator of paranoia and subjective distress in VR. Social stress sensitivity was tested as mediator between childhood trauma and symptoms of psychosis. Childhood trauma was significantly associated with higher paranoia and subjective distress in the virtual social stress experiments. There was a positive and linear interaction between childhood trauma and degree of environmental social stress on paranoia and subjective distress. Social stress sensitivity measures mediated associations between childhood trauma, (minor) psychotic and affective symptoms, and psychosis liability. Childhood trauma is associated with heightened social stress sensitivity and contributes to psychotic and affective dysregulation later in life by sensitized paranoid and stress response to social stressors.

The effect of Virtual Reality Exposure Therapy (VRET) on social participation in people with a psychotic disorder: A multi-site randomized controlled trial (Symposium)

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Vol. 108 of NATO Science for Peace and Security Series - E: Human and Societal Dynamics  
Editor: B.K. Wiederhold  
September 2013, 232 pp., hardcover  
ISBN 978-1-61499-188-5  
Price: €108 / US\$157 / £92

The number of cases of post traumatic stress disorder (PTSD) affecting both combat veterans and survivors of armed conflict has increased in recent years. Exposure to traumatic events can cause PTSD, and the serious consequences of this disorder can often lead to impulsive and destructive behaviors such as drug abuse and uncontrollable anger. Combat related PTSD is also one of the strongest contributing factors to the high suicide risk in returning troops.

This book will provide a valuable resource for all those whose work involves dealing with post traumatic stress disorder.

**Pain Syndromes – From Recruitment to Returning Troops  
Wounds of War IV**

Vol. 91: NATO Science for Peace and Security Series - E: Human and Societal Dynamics  
Editor: B.K. Wiederhold  
July 2012, 252 pp., hardcover  
ISBN: 978-1-60750-985-1  
Price: €120 / US\$174



In October 2011, twenty-seven scientists and representatives from NATO and partner countries met in Südkärnten, Austria for a three-day NATO Advanced Research Workshop entitled "Wounds of War: Pain Syndromes – From Recruitment to Returning Troops."

The book addresses four key questions:

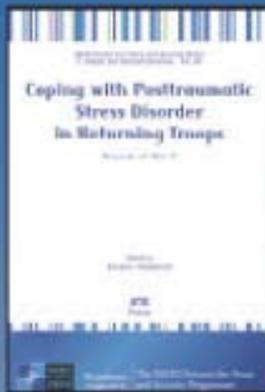
1. Vulnerability to Pain syndromes: Are certain types of people at a higher risk for pain syndromes (background, ethnicity, childhood trauma, etc.)?
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**Coping with Blast-Related Traumatic Brain Injury in Returning Troops  
Wounds of War III**

Vol. 86 : NATO Science for Peace and Security Series - E: Human and Societal Dynamics  
Editor: B.K. Wiederhold  
November 2011, 224 pp., hardcover  
ISBN: 978-1-60750-796-3  
Price: €120 / US\$174

It has been shown that those who have served in both combat missions and peacekeeping operations are at increased risk for Traumatic Brain Injury (TBI). Research suggests that this may result from their "wounds of war". Some wounds may be "invisible", such as depression, stress, and chronic pain, while others, such as physical disabilities, are more obvious. The aim of this publication, is to critically assess the existing knowledge and to identify directions for future actions.



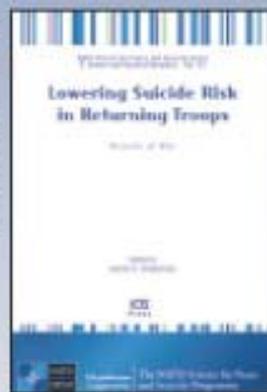
**Coping with Posttraumatic Stress Disorder in Returning Troops  
Wounds of War II**

Vol. 68 : NATO Science for Peace and Security Series - E: Human and Societal Dynamics  
Editor: B.K. Wiederhold  
August 2010, 312 pp., hardcover  
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Military post traumatic stress disorder (PTSD) is a common and disabling consequence of war, terrorism and natural disasters which presents an increasing problem for service men and women around the world. It has been shown that those who serve in both combat missions and peacekeeping operations are at greater risk of developing PTSD as a result of the 'wounds of war'. These wounds may take the obvious form of physical disabilities, but 'invisible' wounds, such as depression, anxiety, stress and chronic pain may also lead to an increased risk of PTSD. This book presents full papers, focused on the key presentations from the NATO Advanced Research Workshop, Wounds of War: Coping with Posttraumatic Stress in Returning Troops, held in October 2009. These papers critically assess existing knowledge in the field and identify directions for future action. The book addresses the five key issues of PTSD: vulnerability, diagnosis and assessment, prevention, treatment and associated disorders. While PTSD may be an invisible illness, its effects are certainly not invisible. Countries must work together to develop prevention and treatment strategies which ensure that service men and women everywhere are able to assimilate back into society to lead productive lives and enjoy the freedom they fought to protect. The purpose of this book is to contribute to this process.

**Lowering Suicide Risk in Returning Troops  
Wounds of War**

Vol. 42: NATO Science for Peace and Security Series - E: Human and Societal Dynamics  
Editor: B.K. Wiederhold  
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ISBN: 978-1-58603-889-2  
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Lowering Suicide Risk in Returning Troops: Wounds of War discusses the topic of increased suicide risk in service men and women around the world. Research has shown that those who have served in both combat missions and peacekeeping operations are at an increased risk for suicide. Research suggests that this may result from their 'wounds of war'. Some wounds may be more 'invisible'; such as depression, posttraumatic stress disorder, and chronic pain, while others are more visibly apparent; such as physical disabilities. Whatever the wound, however, it seems they may all lead to an increased risk of suicide. In this book, many aspects of military suicide and how to effectively deal with this issue are discussed. Specifically, some of the questions raised are: How do we detect those who are vulnerable to increased suicide risk, possibly due to a combination of genetics and past environmental insults? How do we most appropriately assess for increased risk? Once detected, how do we help to decrease that risk? Are there pre-deployment training methods we can employ to help 'inoculate' individuals against increased risk? Are there in-theater and post-deployment methods most appropriate for dealing with this risk?

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**Abstract.** A large number of patients with a psychotic disorder live a life of limited participation in society, even if their psychotic symptoms have been treated successfully. An important factor in sustaining social isolation is that when social anxiety and distrust increase, the patient has learned to flee the situation and as a consequence experiences a reduction in anxiety. In this study we study the use of Virtual Reality Exposure Therapy (VRET) to enhance social participation and wellbeing for patients suffering from a psychotic disorder and social withdrawal. The study design is a single blind RCT with three-month follow-up. The VRET.P treatment consists of sixteen treatment sessions of sixty minutes each, within an eight-week timeframe. Social participation was measured by the PsyMate Experience Sampling Method before and at end of treatment, and at three-month follow-up. One hundred and sixteen participants were included in the study. Fifty-eight participants received the VRET.P treatment right away. The other fifty-eight participants received treatment as usual during the study, and were offered the VRET.P treatment after the follow-up measurement. We have finished data collection for the study; the last follow-up measurements have taken place in December 2015. We will be able to present the results of the study in June 2016 on the conference. Clinical implications and limitations of the results and the study will be discussed.

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Examining the role of presence in the AVATAR therapy

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**Abstract.** One could define AVATAR therapy as a therapeutic process to virtually embody the voice hearing

experience: to give a physical representation to the personified but disembodied voice. This virtual embodiment of the experience is fully achieved by matching the voice of the avatar to the current auditory verbal hallucination (AVH). The aim of this study is to examine the participant's creation of the avatar (or entity that will be used during the AVATAR therapy), the perception of the avatar's intentions and hostility, sense of presence during the interaction as well as levels of anxiety when facing the avatar. Data from twenty participants (n=20) allocated to the AVATAR therapy will be examined. In particular, scoring from the PSYRATS-Auditory Hallucinations Section (Haddock et al, 1999), Beliefs about Voices-Revised Questionnaire (Chadwick, Lees and Birchwood, 2000), Sense of Presence Questionnaire (Slater et al, 1995) and State Social Paranoia Scale (Freeman et al., 2007) will be analysed in relation to therapy engagement, participant's persecutory thoughts about the avatar and anxiety reduction as well as in relation to specific phenomenological aspects of the AVH (e.g. feeling the presence of the voice in the external space) (Moseley, Fernyhough and Ellison, 2013). This is a work in progress study hence final results won't be available until the conference date. I will discuss the clinical implications of the findings.

### Cyberbullying & Problematic Online Behaviour (1)

Attentional bias in problematic social networking sites internet users

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**Abstract.** The evidence from the field of substance-related and addictive disorders suggests that attentional bias for stimuli related to substance or an activity (gambling) of abuse,

is a marker of addictive behaviour. Additionally this bias has been argued to be substance or activity (gambling) specific. In the field of problematic internet use this bias has been illustrated for generic and for a specific potential subtype, online gaming. However, online gaming can arguably be executed in the offline environment as well, and as such, its reliability and validity in regard to online activities has been questioned. The objective is to validate whether cognitive bias which is found in the field of substance-related and addictive disorders is evident in a potential subtype of problematic internet use, Social Networking Sites (SNS) which contains activities which are predominantly pursued online. Eighty-five participants performed the Visual Dot-Probe task containing SNS related images while recording eye movements which provides a direct measure of the allocation of attention. In addition a Pleasantness Rating task provided an index of the perceived pleasantness of each image presented in the Visual Dot-Probe task. Overall problematic SNS internet users and SNS internet users with higher levels of urges to be online showed a preference for SNS images compared to the control images. It is indicative that cognitive processes (attentional bias) which is a marker of addiction is also evident in problematic SNS internet users.

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A conceptual model of factors leading to the digital exclusion of people with neurodevelopmental disorders

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Abstract. The development of Internet has revolutionized the way humans interact, online as well as offline. In the words of Tim Berners-Lee, “the power of the Web is in its universality. Access by everyone regardless of disability is an essential aspect.” However, people with neurodevelopmental disorders (i.e. intellectual disability or autism spectrum disorder) share sensorimotor, cognitive or social impairments that limit accessibility to the WWW and their use of Internet, thereby reducing their potential for social participation in this virtual community. Our study aims to build a model of factors leading to digital exclusion for people with ID or ASD. A review of the literature was performed to identify factors associated with digital exclusion of people with neurodevelopmental disorders. This analysis led to the creation of a digital accessibility pyramid, comprising five levels: 1- access to digital devices, 2- sensorimotor skills, 3- cognitive skills, 4- technical skills, 5- social skills. Progression in the pyramid is based on the premise that to ensure optimal use of the information and communication technologies, people must develop the necessary skills or receive the necessary support from their environment to attain each level from the bottom up. Ethical and psychosocial issues permeate each of these levels, leading to the addition of a transversal dimension to the model. By addressing these issues, we could ensure the digital social participation not only of people with ID/ASD but other disabilities as well.

#### Cyberbullying: Emotional correlations

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Abstract. Cyberbullying (CB) is a trending topic in psychological science since it has a lasting impact

on its victims. A significant amount of literature is focused on adolescence, but the phenomenon occurs in different stages of life. This study aims to study the relationship between CB and other demographic and psychological variables. The sample consisted of 652 adult participants with a mean age of 26.6 years (SD = 9.6), in which 65 were excluded from analysis due to reported psychiatric and / or neurological diseases or substance abuse. 55.9% are women and 76% are single. 60% reported having an intermediate experience with computers and 82% reported accessing online social networks in over 50% of the days. 97% have internet at home (92.3% wireless). Demographic variables, cyberbullying (CBQ) and three emotional states (anxiety, depression and stress, DASS-21) were assessed through GoogleDocs. Results: Positive, moderate and significant correlations were found between cyberbullying and anxiety, depression and stress. Also, Caucasian participants reported significantly lower results of cyberbullying when compared to African participants. No significant differences in cyberbullying were found for social networking frequency of use and gender, but men reported significantly higher values of depression, while women had significantly higher values of stress. More computer experience led to significantly lower values of both anxiety and stress, while there is a statistical trend ( $p = .57$ ) that suggest that more gaming might lead to cyberbullying behaviours. Ethnicity should be more thoroughly studied as a factor, as should age and the gaming profile.

#### Does Moral Emotion Play Role in Cyber Bullying?

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Abstract. Number of cyber-bullying among the Internet user has been increased. In the cyber-world, everybody can post unusual act, words, pictures, even video to express their negative feeling. This may directly effect to persons target and also people who read them, consequently, they may experience uncomfortable feeling. This research questioned does moral emotions of cyber bullying actors, for example shame, guilt, detached have correlation with their cyber bullying action? The purpose of this study is to find out which moral emotions most play role in cyber-bullying. A survey had been carried out to collect both moral emotion and cyber-bullying data. One hundred and eighty students, 101 females and 79 males participated in this study. A simple correlation showed that shame and externalization are higher compare with guilt, detached, alpha pride, and beta-pride. All aspects of moral emotions negatively correlated with cyber-bullying. Beta pride is the lowest while externalization is the highest correlation with cyber-bullying. This research supports previous finding that moral emotions plays important role in cyber-bullying. Each aspect of emotion will be discussed further.

#### Clinical Applications of Virtual Reality (1)

The potential of virtual reality technologies to support people with an autism condition: A case study of acceptance, presence and negative effects  
(Oral Presentation)

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Abstract. There has been much discussion about the potential application of virtual reality

technologies (VRTs) using head-mounted displays (HMDs) for users with autism. However, very few, if any studies, have yet to explore and investigate the acceptance, presence and ecological validity of these platforms. On the other hand, literature is well developed in areas such as virtual environments (Parsons, et al., 2006; Parsons & Cobb, 2011), virtual worlds (Newbutt, 2013; Kandalaft, 2013) and virtual reality (Strickland et al., 1996), but few have considered the resurgence in HMDs for autistic users. Many of the affordances associated with VEs and VWs may be applied HMDs and VRTs and so are seen a potential opportunity for people with autism to tackle challenges faced on a daily basis. We present findings from a study that worked with a HMD and 29 participants with an autism condition. We ran an experiment in two phases. Phase I considered acceptance of this wearable technology; looking at issues of sensitivity. Phase II considered sense of presence, immersion, ecological validity and negative effects (Lessiter, et al., 2001). Concluding with pre- and post-anxiety measurements (Spielberger, 2010). The paper will discuss the quantitative findings, together with a rich illustration (i.e figures) of the study. Results revealed that all 29 participants were willing to wear the HMD. The majority of the participants reported an enjoyable experience, high levels of 'presence', and was very likely to use HMDs again; they also reported low levels of negative effects and with minimal anxiety.

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Response latency and disfluency of children from 6 to 9 years while they are interacting with a virtual agent or a human narrator

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**Abstract.** Interfaces with virtual agents are increasingly present in the daily lives of children. However, few studies define the characteristics of the interactions between children of school age and a virtual agent. The aim of this study is to specify the characteristics of an interaction between a virtual agent and children compared to a human-child interaction. In this research, the fluidity (measured by response latency) and spontaneity (measured by disfluency rate) of oral language of forty-five 6-to-9-year-old children were compared in a collaborative narrative situation, while interacting with a virtual agent, while interacting with an adult via webcam, or while interacting with an adult face to face. In addition, we have distinguished three types of utterances preceding the response of children (comment; direct question; demand for attention). Children's response latency is shorter after the demands for attention ( $p < .04$ ) and shorter when they are in the face-to-face situation than when they are in the human via webcam and avatar situation ( $p < .001$ ). However, children's disfluency rate is smaller faced to the virtual agent than facing the other two human narrators ( $p = .024$ ). Our results show that response latency is responsive to Computer-Mediated-Communication (CMC) and type of utterance, while disfluency is reactive only to the nature of the narrator (human VS avatar). The narrator's virtual nature and the CMC lead children to change their way of interacting. We will discuss future research and applications in developmental psychology.

**Keywords.** Virtual agent, Response latency, Disfluency, Child-computer interaction

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Assessing sexual preferences in a forensic context using immersive virtual reality

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**Abstract.** The Virtual Reality Applications in Forensic Psychiatry laboratory (VRAFP), which is located in a maximum security forensic psychiatry hospital (Philippe-Pinel Institute of Montreal, Quebec, Canada) is dedicated to both research and clinical expertise. Part of its mission is to routinely assess to be controlled and dangerous sex offenders in a forensic context. VRAFP developed the first virtual reality (VR) based testing protocol differentiating between child molesters, rapists and non-offenders (e.g.,  $F(1;36) = 14.34$ ,  $p = .001$ ). In fact, 3D sexual stimuli do as well or even better than audio stimuli (e.g., audio stimuli  $AUC = .79$ ,  $p = .05$ ; 3D avatars  $AUC = .92$ ,  $p = .001$ ). Combining standardized audio assessment with 3D visual contents strengths both type of stimuli while increasing penile response ( $F(2, 20) = 8.43$ ,  $P = 0.001$ ). Furthermore, standardized 3D synthetic characters can easily have their emotional content modulated (sexual openness or sexual closure, for instance) which in turn provide added clarity on clients sexual offending preferences (i.e., distinguishing between avoidance and approach offenders). Most importantly, virtual reality and synthetic 3D characters ease the combined use of measurement technologies in the assessment of sexual deviance (e.g., penile plethysmography, eye-tracking and electroencephalography). This last asset greatly facilitates triangulation of diagnostic information which results in increasing reliability and discriminant validity of the overall evaluation, while bridging with potential VR-based therapeutics for this difficult clinical population.

Cue exposure treatment through virtual reality reduce cigarette craving in real life environments

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**Abstract.** Previous studies have shown that cigarette craving can be effectively reduced by applying virtual reality cue exposure treatment (VR-CET) in laboratory settings. However, to our knowledge, no study to date has analyzed the generalization of VR-CET effects into real life. This study aimed to explore the influence of VR-CET on craving for cigarettes in real world contexts. The sample comprised 32 treatment-seeking smokers who had been smoking 17.7 (SD = 5.4) cigarettes per day for 19.9 (SD = 10.1) years. All participants completed a VR-CET for smoking cessation which involved an exposure session once a week over five consecutive weeks. During two different periods, 7-days before the first exposure session and the last exposure session, participants were instructed to keep a continuous record of their level of craving each time they smoked a cigarette. Cigarette craving was recorded from 0 to 10 using self-monitoring forms. The participants reported a mean craving score of 7.15 (SD = 1.38) 7-days before the first exposure session and 6.39 (SD = 2.02) 7-days before the last session. T-tests analysis indicated that craving differed significantly between assessment periods ( $t(31) = 2.34, p = .026, \text{partial } \eta^2 = .15$ ). These results show that cigarette craving was reduced after treatment, suggesting that VR-CET has an effect on craving for cigarettes in real-world environments. This finding provides evidence that VR-CET could improve extinction generalizability across contexts which could be critically important for the efficacy of smoking cessation treatments.

Active vs. passive Virtual Reality distraction techniques in the reduction of subjective experience of experimentally induced physical discomfort

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**Abstract.** While considerable research has demonstrated the positive effects of Virtual Reality (VR) in distraction from pain, limited work has been done examining the relative benefits of active control and passive use of VR, as well as the effectiveness of the emerging VR headsets targeted towards the consumer market. Most studies to date have explored the effectiveness of VR as a distractor for pre-existing pain, without examining its effectiveness for discomfort which was experimentally induced. The current research aimed to discover whether active VR distraction results in greater reduction of perceived physical discomfort than passive distraction in a healthy adult population. The study consisted of 27 adult students, employing an experimental repeated measures design in which participants completed four conditions; a baseline measure, watching a video, playing a computer game and exploring a VR world using an Oculus Rift Head Mounted Display. During all four conditions participants remained seated while holding their non-dominant leg approximately 30cm from the floor, up to a maximum of five minutes. Subjective discomfort was measured using a self-report questionnaire and measurement of time that the participants maintained the discomfort-inducing pose. Discomfort was tolerated to a greater extent in the conditions which required greater activity and involvement, with the VR task having the greatest positive effect. The evidence suggests that active distraction with a consumer-targeted VR device combined with higher levels of a sense of presence have the ability to reduce discomfort experienced by

healthy adults undergoing a laboratory induced discomforting condition.

Technology-mediated therapies & benefits (2)

Use of Smart Phone Apps to Address PTSD Symptoms

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**Abstract.** Military service members (SMs) are often reluctant to seek help for PTSD symptoms. We hypothesized greater comfort with a discrete app-based study, and describe participants' app usage. We report on 132 participants enrolled in Guided Education and Training via SMARTphones to promote resilience, still in progress. Participation requires a history of trauma and a PCL score of 28-49. All participants are introduced to study apps and cognitive behavioral techniques by a psychologist, and randomized to 6 weeks of daily text messages either directing app use or providing inspirational sayings. Apps include Eventful for social engagement, yoga, meditation and Tactical Breather for relaxation, and LifeArmor for psychoeducation. Participants complete the PCL and PHQ-9 on a secure website weekly during the 6-week intervention, and 3, 6 and 12 months later. Participants are 51% female; 63% White, 19% Black, 10% Asian, 14% Latino; 55% married, 31% single; 14% separated/divorced. Mean age is 34; 70% are active duty, 20% reservists; 35% are Navy, 32% Army and 12% National Guard. Mean PCL and PHQ-9 scores are 36 and 6.7, respectively. To date, 97% have completed post-intervention questionnaires, 94% at 3 months. Nearly all (96%) used some apps during the study: 14% daily, 59% several times/week, and 13% once/week. Tactical Breather (61%), meditation (54%), LifeArmor (52%), and yoga (47%) were used most, while Tactical



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Breather, meditation, and yoga were deemed most helpful. Conclusions: SMs are enthusiastic; compliant app users, particularly with highly valued relaxation apps. Impact will be reported upon study completion.

The Feel Good Island: Evaluating the effectiveness of a technology based CBT intervention for adults with an intellectual disability and anxiety or depression

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Abstract. People who have an intellectual disability (ID) suffer a similar if not greater prevalence of mental health problems than the general population, yet the development of evidence-based psychological treatments to meet the needs of this population has been slow. Given its strong evidence base in the general population, Cognitive Behavioural Therapy (CBT) has been increasingly implemented for use with people who have an ID. Pesky Gnats is a CBT computer game designed to make the metacognitive elements of CBT more accessible to children with internalising difficulties. The Feel Good Island has been developed as a similar technology-based CBT adaptation for adults with a mild to moderate ID who experience anxiety or depression. A randomised controlled treatment trial was conducted with 26 participants in the 7 week intervention group and 26 participants in treatment as usual group. Each participant was evaluated on the Glasgow anxiety and depression scales at pre, post 7 week, and 3 month follow up. Results will be discussed in relation to the ability of a technology-based approach of CBT to effectively treat anxiety and depression in this population and in relation to the efficacy of traditional

CBT with this population. Findings of the present study will add to knowledge of making CBT more accessible to adults with an ID and will represent a novel investigation of technology assisted therapy in introducing computerised CBT to this population.

Serious games in group help to evaluate the risk of suicide

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Abstract. Serious games can be used in many contexts and also in the field of psychotherapeutic mediations. The game Clashback by Prof. Pommereau has been developed in order to re-create situations of crisis between teenagers and their family. The main character of this game is Chloe, a 16-year-old girl who is trying to convince her father to allow her getting a tattoo. The player chooses the replies that he/she considers best in order to achieve this goal. We used this game with teenagers between 14 and 19 years old who have suicidal tendencies (group 1) or have attempted to commit suicide (group 2), during their full hospitalisation in a psychiatric centre for an average duration of one month. We proposed the game to groups of teenagers, but only one member of the group played during a single session. Every game was recorded and it provided a quantitative profile about the player, on aspects such as sociability, impulsiveness and adaptability. We compared these results to genogram, medical diagnosis and to qualitative data collected during scheduled clinical interviews during hospitalisation. We compared the 3 mentioned aspects between the group 1 and group 2, each of them composed of 20 participants (10 girls and 10 boys). Results show that the sociability and adaptability are higher for teenagers of group 1,

whereas impulsivity seems higher for teenagers of group 2. These results indicate the possibility to use this kind of technological support as a complement in the psychological evaluation of measuring the risk of suicide.

The cyber-counseling objective structured clinical examination tool

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Abstract. The Cyber-Counseling Objective Structured Clinical Examination (COSCE), is a method and tool used to assess the competence level of trainees and professionals who practice text-based cyber-counseling. Similar tools exist for face to face and video-based counselling but this is the first tool developed specifically for text-based services. The COSCE was developed in collaboration with the University of Toronto Faculty of Social Work and has been examined for internal consistency, interrater reliability, and interclient reliability as well as construct validity. The tool has been applied in professional and clinical training environments. It is proving to be a reliable and valid tool in assessing the competence of cyber-counseling practitioners.

Perceptions of the risks and benefits of being online for people with an intellectual disability

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Abstract. A digital divide appears to exist, with people with an intellectual

## Cyberpsychology, Behavior, and Social Networking

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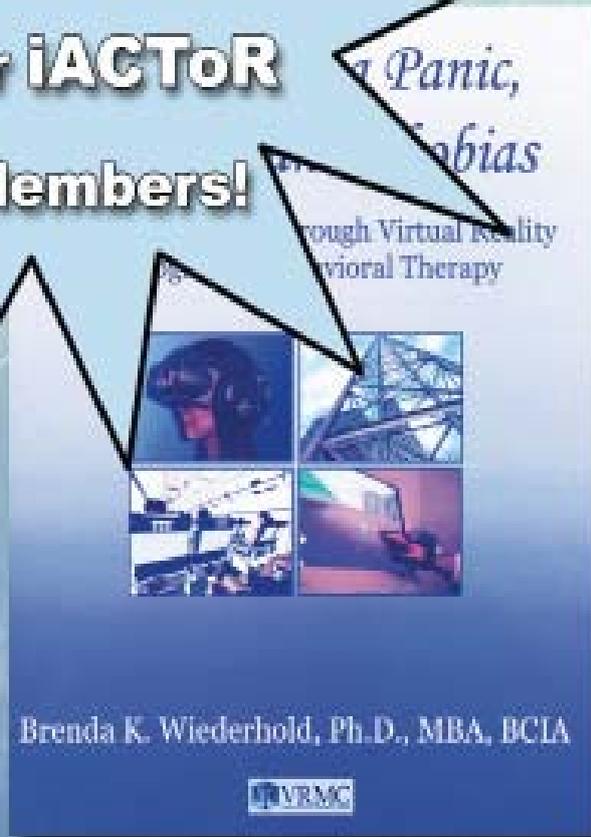
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By Dr. Brenda K. Wiederhold, PhD, MBA, BCIA

This book is written as a starting point toward helping the large portion of our population that suffers from anxiety disorders to overcome their fears and control their anxiety. It is a resource to enable those suffering from anxiety to take control of their lives and become an active participant in their own recovery.

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disability (ID) not accessing the Internet to the same degree as the general population. Being online has the potential to enhance life opportunities for people with ID. Attitudinal barriers to accessing the online world appear to need further consideration, with a view to altering negative attitudes. Issues of safety, risk and protection online for people with ID have yet to be adequately investigated and may serve as barriers to getting online. This survey aimed to gauge the views of people without ID of those with ID using the Internet. Specific aims were to explore: 1. The risks and benefits perceived to be likely to affect people with ID. 2. How perceived risks and benefits relate with internet use and background characteristic of respondents. This exploratory survey recruited an opportunity sample of people from varying backgrounds who were asked to complete a survey containing both open and closed questions about their background characteristics, Internet use and the risks and benefits of being online. Quantitative data were analysed descriptively and comparatively, qualitative data were analysed using semantic thematic analysis (Braun & Clarke, 2006). Preliminary results indicate participants who participated believed that both the risks and benefits of being online are greater for people with intellectual disabilities in comparison to themselves. What people's perceptions of the risks and benefits potentially mean for inclusion of people with intellectual disabilities online will be considered and future research ideas postulated.

### Clinical Applications of Virtual Reality (2)

The use of haptic virtual environment, satisfaction with body regions and anti-fat attitudes to predict touch of body area on virtual humans

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**Abstract.** Research demonstrates that exposure to idealized images contributes to body image dissatisfaction in women. Eye-tracking visual attention studies on how women attend to these images showed that participants avoid looking at model's body areas of reported dissatisfaction. A possible limitation of these studies could be that avoidance is the result of participants' awareness of the fact that their visual attention is measured. Having previously found that the use of haptic devices to physically interact with virtual humans (VH) is less susceptible to experimental bias in measuring anti-fat attitudes, we want to use haptic avoidance to document avoidance of specific body areas. We randomly assigned 61 male and female participants to one of the experimental conditions involving giving a virtual hug to a female or a male, normal or overweight VH. We verified the hypothesis that participants' choice of the body area for their virtual touch will be predicted by their satisfaction with particular body parts and their anti-fat attitudes. We found that for female participants, regardless of the sex or weight status of the VH, 1) touching VH lower torso was predicted by less anti-fat attitude, and avoidance of the upper torso and upper limb areas, and 2) touching VH shoulder/upper limbs areas was predicted by concerns with own stomach area and avoidance of VH stomach waist and lower torso areas. For male participants, touching VH lower torso area was predicted by exposure to the female overweight VH, and less anti-fat attitudes. Our results are consistent with the avoidance hypothesis.

Inside and outside the Self. Virtual reality and repertory grids in the spatial analysis of anorexic patients' meanings

Clelia MALIGHETTI<sup>a,1</sup>, Silvia SERINO<sup>b,c</sup>, Giuseppe RIVA<sup>b,c</sup> and Sabrina CIPOLLETTA<sup>a</sup>

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**Abstract.** Anorexia Nervosa (AN) is an eating disorder characterized by severe body image disturbances, whose causes are still not clear. Within the theoretical framework of the Allocentric Lock Theory emphasizing the role of spatial reference frame processing in body image, the present study investigated spatial deficits in the processing of egocentric and allocentric reference frames in AN patients. The research also analysed the role played by spatial deficits in the world of AN patients, showing the meanings characterizing the AN experience. It deepened the investigation of spatiality in relational terms through the study of how patients build the Self and their interpersonal world. The experimental included 12 AN patients and a control group of 12 participants. Results obtained with a well-validated virtual reality-based procedure, showed that AN patients were less accurate in retrieving an allocentric representation and in updating it with perceptual-driven inputs in respect to control group. Using a Repertory Grid, we found that the consequences of these anomalies may be associated with a rigid, one-dimensional construction of the Self and of the world in the AN experience. These results support the hypothesis that the impairment of the spatial domain, probably linked to the assumption of a single and rigid referential perspective, may be one of the causes of body image disturbances in AN.

Impact of distractors on executive control in older adults: Construct-driven and function-led approaches

to neuropsychological assessment

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**Abstract.** Whilst virtual environment-based neuropsychological assessments have been presented as potential aides in enhancing ecological validity, many were modelled on construct-driven approaches found in traditional assessments. Recently, neuropsychologists have been arguing for a new generation of “function-led” neuropsychological assessments that are developed from directly observable everyday behaviors. In the current project, we review findings from both construct-driven and function-led VE-based neuropsychological assessments of cognitive functions in 45 undergraduate students (mean age: 19.96; SD: 2.85) and 40 older adults (mean age: 75.56; SD = 7.43). For the construct-driven assessment, we used a Virtual Apartment with an embedded bimodal Stroop task that included distraction and no distraction conditions. For the function-led assessment, we used a Virtual Multiple Errands Test, wherein participants were immersed in a virtual grocery store and asked to carry out various tasks. Results of the construct-driven comparison revealed the aging sample to be significantly impacted by distractors, as evidenced by higher distraction condition response times for color-naming, word-reading, and interference conditions. The college-aged sample was less affected by distractors, only showing elevated distraction response times in the color-naming condition. Results of function-led assessment revealed significant differences (favoring younger adults) for all aspects of the evaluation. Specifically, older aged individuals were more vulnerable to external disturbance (e.g., ambient

noise and distractors in a virtual environment) than younger age controls. In conclusion, the use of virtual reality-based construct-driven and function-led neuropsychological assessments appears to have potential for increased ecological validity using a virtual environment with real world distractors.

---

Virtual reality public speaking training – An experimental study on the effects of task difficulty, goal orientation, and social presence on user performance

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**Abstract.** Virtual reality (VR) public speaking applications are effective at training speech giving skills, inducing and reducing fear (Wiederhold & Wiederhold, 2005), but comprehensive studies on the underlying interplay of contributing factors like individual factors, task characteristics, and factors created by the usage situation like presence are still mostly lacking. In this study, the effects of task difficulty, goal orientation, and social presence on public speaking performance in a virtual environment were analyzed. An experimental, cross-sectional, 2x3 within-subject study was conducted with N = 36 undergraduate students (36% men, 64% women, mean age=26.42 years (SD=3.42)). Independent variables were task difficulty (speech-giving with/without preparation, within-subject factor) and goal orientation (performance goal, mastery goal, undifferentiated). Observed speech performance behavior served as the dependent variable, social presence as a moderating variable. Task difficulty (F=9.6; df=1; p=.004; ηp2=.225) and goal orientation (F=5.65; df=2; p=.008; ηp2=.255) showed significant and large effects on performance, with lower performance scores for the difficult task and performance goal orientated

participants. Social presence as a covariate influenced the effect of task difficulty: it no longer reached statistical significance and was small (F=.39; df=1; p=.538; ηp2=.014). The combined effect of task difficulty and social presence was significant and large (F=5.37; df=1; p=.028; ηp2=.166). The results of the study indicate that goal orientation and task difficulty in combination with social presence have an effect on speech performance. This underlines the role of social presence in virtual public speaking applications and the need for more studies concerning the interplay of contributing factors in VR.

### Cyberbullying & Problematic Online Behaviour (2)

Online and offline life: Key factors for a functional use of Internet

Martina BENVENUTI<sup>a,1</sup> and Elvis MAZZONI<sup>a</sup>

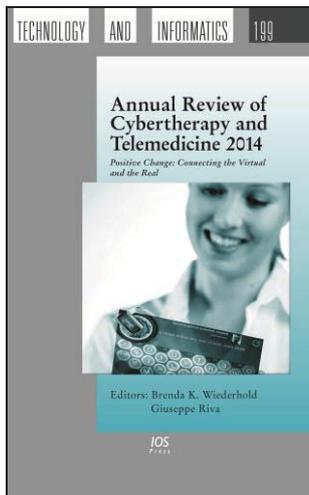
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**Abstract.** This contribution presents an ongoing research project that tries to overcome the use of the concept of web addiction to explain the massive use of the social web in the lifecycle, by means of concepts derived from the Cultural-Historical Activity Theory tradition such as functional organ and inverse instrumentality. Starting from the concepts of functional organs (Kaptelinin 1996) and inverse instrumentality (Ekbia & Nardi, 2011), we present a study whose purpose is to analyze the use of social web during lifetime. In particular, the study explores factors that underlie a problematic use of Internet compared to those that develop and improve human abilities. The sample consists of 1215 Italian participants (354 adolescents, 521 emerging adults and 340 adults) who filled in an online survey concerning many factors that scholars have found related to the use of Internet (such

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### **Annual Review of Cybertherapy and Telemedicine 2014**

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The evolution of healthcare delivery systems has included an increased reliance on technology. There has been a significant shift in the nature of care prevention, diagnosis and treatment, which has decreased the importance of traditional methods of care delivery. Cybertherapy has started to make progress in treating a variety of disorders, but more work is needed in a number of areas, including the development of easy-to-use and more affordable hardware and software and objective measurement tools, the need to address potential side-effects, and the implementation of more controlled studies to evaluate cybertherapy in comparison to traditional therapies.

This book, the 2014 Annual Review of Cybertherapy and Telemedicine (ARCTT), presents a carefully structured overview of subjects related to the area of cybertherapy and telemedicine. The book is divided into six sections. An introductory editorial explains the focus of this year's issue, and is followed by a section entitled Critical Reviews, which summarises and examines emerging cybertherapy topics. The third section includes chapters on Evaluation Studies, and the contributions in section four, Original Research, deal with new cybertherapy methods and approaches. The fifth section, Clinical Observations, includes case studies and research protocols with long-term potential, and the final sixth section presents papers describing future research work.

The book will be of interest to both health professionals and patients, and to anyone else interested in the continued improvement of healthcare systems.

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as self-esteem, life satisfaction, job satisfaction, problematic Internet use, social support, mindfulness, self-control, likability). Self-esteem, self-control, mindfulness and offline social support are factors having an inverse correlation with the problematic internet use. These findings have important implications in offline life since they show that, to promote a functional use of Internet to achieve life developmental tasks, we have to put specific attention and improve these four key factors, which prevent a problematic internet use.

---

Group Aggression and Bullying through Complex Systems Agent Based Modeling

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Abstract. Bullying is a devastating activity and sometimes can have lasting and permanent negative consequences on an individual. It universally occurs across people of all ages cultural, nations, and has been observed in schools and workplaces. While bullying is universal, it remains difficult to study as conducting live experiments is out of the question because of moral and ethical reasons. Instead, computer simulation can model the natural social and humanistic interactions. Agent based modeling is one computer simulation approach that can provide verification of theories, social interactions, testing of 'what-if' scenarios, which can lead us to observe new and emergent behaviors. All of this can be done within a virtual world consisting of virtual people. This paper will discuss our approach to modeling gang bullying as an agent-based system. We will also present results from our computer simulations, along with identification of future opportunities.

---

School climate, aggressive attitudes and willingness to seek help for cyberbullying

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Abstract. Cyberbullying occurs within a social context. This social context also encompasses the environment the young people find themselves, which a large amount of time happens to be the school. A positive school culture and climate is both inclusive and accepting of difference, and in addition, supports students to divulge and examine bullying behaviour is essential. It is also associated with reduced aggression and violence among students, whereas negative school climate encourages or facilitates bullying as a normative behaviour. The relationship between school climate and student willingness to seek help for bullying was the primary focus of this study, with further examination of school climate and aggressive attitudes predicting student willingness to seek help for bullying. The sample consisted of one hundred and twenty-two students from a co-educational post primary school. A between groups, questionnaire design was employed to measure perceptions of school climate, aggressive attitudes and student willingness to seek help for bullying. Analysis, through the use of correlations found a strong positive relationship between supportive school climate and student willingness to seek help, with high levels of willingness to seek help associated with high levels of perceived supportive climate. Further analysis employing multiple regression found that school climate and aggressive attitudes were significant predictors of student willingness to seek help for bullying, with school climate being the most

significant predictor, accounting for 34.4% of the variance in willingness to seek help. These findings may hold particular relevance when implementing bullying prevention strategies within schools.

---

Discriminating male and female cyberbullies and Internet trolls by individual differences and self-esteem

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Abstract. Research has yet to assess the relationship between cyberbullying and Internet trolling. They both engage in similar forms of electronic harassment; however, a key distinction is whether the instigators know their targets or victims. In addition, the current study will examine whether there are sex differences between cyberbullies and Internet trolls on personality characteristics and levels of self-esteem. In the current study, 307 respondents completed an anonymous Internet-based survey measuring cyberbullying and trolling behaviors, individual differences, self-esteem, and moral-decision making. Next, respondents were classified based on their self-reported cyberbullying and/or trolling behaviors (70 cyberbullying-only, 20 trolling-only, 129 both cyberbullying and trolling, and 88 neither behavior). Results suggested a significant positive correlation between cyberbullying and trolling behaviors. However, the chi-square analysis revealed that women were significantly more likely to engage in cyberbully-only behaviors compared to men, and men were more likely to engage in both cyberbullying and trolling behaviors. In addition, there were individual differences between respondents who engaged in cyberbullying-only and trolling-only behaviors, specifically, trolls scored

significantly higher on extraversion than cyberbullies. There was also a significant interaction between sex and cyberbullying-only vs. trolling-only behaviors on levels of hedonism and openness to experience. Finally, there was a significant interaction in that women who self-reported only engaging in trolling scored higher on hedonism compared to respondents who self-reported cyberbullying-only or both cyberbullying and trolling behaviors. Overall, this research suggests there are sex and individual differences between the types of individuals who engage in either cyberbullying and/or trolling behaviors.

---

Cyberharassment and cyberbullying; Individual and Institutional perspectives

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Abstract. Research on finding a relationship between institutional policy and the proliferation of cyberstalking, cyberharassment and cyberbullying in young adults, is limited. A National Institute of Justice (1998) study on a 4,446 USA student sample reveals that stalking on university campuses has a different profile than stalking nationally because of the nature of their mate-seeking age, proximity of the perpetrator to its victim and the facile way of accessing personal information. For this study, data from an undergraduate sample was gathered. Data gathered in this study suggests that online communication is ambiguous and there is a need for online norms, to which young people can adhere. Participants were generally not aware that the university had a policy on acceptable use of network. Moreover, participants

were sensitive to being harassed and while being aware of how they were affected by the online behaviour of others, there was less certainty of the effects of their own behaviour.

### Clinical Applications of Virtual Reality (3)

Virtual Reality Environments to rehabilitation Attention deficits in schizophrenic patients

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Abstract. Cognitive dysfunction is a core feature of schizophrenia. Patients with schizophrenia shown perform poorly on tasks that require vigilance or sustained attention. Patients with more pronounced attention deficits are least likely to acquire skills in psychosocial programs as the attention problems makes it difficult for them to process the information given in groups, and they may not be able to sustain attention for the session duration. The study aimed to develop a Virtual Reality cognitive training to improve the selective, divide and sustained attention. Specifically, we developed, via the NeuroVr 2.0 software, three different virtual environments with the hierarchical sequences of tasks. The study included two clinical samples of patients suffering from schizophrenia disorder: experimental group (9 patients) treated with pharmacological therapy and Virtual Reality cognitive training (10 weekly individual sessions); control group (6 patients) received pharmacological therapy and Integrated Psychological Treatment. Before and after training

we assessed the cognitive functions, both in cases and controls. During the training, the patients' performance was registered and we evaluated time of execution, total errors, partial errors. Social and clinical characteristics of the groups were compared using Fisher's exact test and Mann-Whitney test. Wilcoxon test was used to compare pre- and post-training cognitive performances. Both VR training and IPT were associated with improved performance in the divided attention task. After the training, the experimental group showed improvements in: reduced time of execution, improvement in sustained attention. These preliminary investigations suggest that virtual reality training may improve cognitive functioning in psychotic patients.

---

Virtual Reality and EEG: Towards a new measure to probe cerebral activity associated with empathy

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Abstract. The goal of this study was to explore the use of virtual reality (VR) in conjunction with electroencephalography (EEG) to assess levels of empathy in healthy individuals. Alpha suppression (8-13hz) was examined in two cerebral regions: the somatosensory area (SSA) and the occipital region. Participants (n=24; 12 females) were immersed in a CAVE-like immersive environment. Participants were exposed to three animations depicting different levels of pain. Two different

instructions were given: trying to be empathic or refrain from trying to understand him. Participants' self-reported levels of Cognitive and Affective empathy (Davis' IRI) were used as independent variables. A repeated-measures MANOVA was conducted with a 2 (Regions) x 3 (Animations) x 2 (Instructions) factorial design, with Empathy level on each factor (Affective and Cognitive) as independent variables. First, alpha suppression was lower in the occipital region when compared to the SSA ( $p=.019$ ). Second, there was an interaction between Instructions and Affective Empathy ( $p=.015$ ): participants with higher Affective Empathy showed stronger alpha suppression in both cerebral regions during the Empathy instruction. Third, a significant interaction also emerged between Animations and Affective Empathy ( $p=.012$ ): participants with higher Affective Empathy had a stronger alpha suppression for the pain and movement animations. Finally, there was a triple interaction between Regions, Animations and Instructions ( $p=0.037$ ), with alpha suppression being significantly lower in the central region for the Pain animation during the Objectification condition. Overall, these data suggest that VR combined with EEG could provide cues regarding the level of empathy healthy individual adopt towards a VA.

**Keywords.** Virtual reality, Empathy, EEG, Alpha suppression, Virtual agent

---

Validation of a virtual reality based software to improve pain coping responses in fibromyalgia

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Abstract. Virtual Reality (VR) has

demonstrated being useful to decrease acute and chronic pain, but there is little information concerning Fibromyalgia (FM) treatment. A VR human figure with different features that can be modified in order to represent pain perception (color, movement speed and sound type) was developed for evaluation and treatment. The main objective of this study was assessing whether this figure is able to represent properly pain intensity. The relationship between coping strategies and the pain features of the VR figure was also explored. 40 healthy participants underwent a cold-pressor test (at temperatures between 5 and 7°C). They were asked to modify pain features of the VR human figure, to make it correspond with their pain perception. Pain intensity was also assessed using a virtual analog scale (0-10). Finally, participants completed the Coping Strategies Questionnaire (CSQ). Pain intensity correlated significantly with color ( $r=.723$ ;  $p<.001$ ), movement speed ( $r=.522$ ;  $p<.001$ ) and sound type ( $r=.673$ ;  $p<.001$ ). Higher intensity of pain-related color, higher feeling of stiffness and higher creaking wood noise were related with higher reported pain intensity. Participants with higher scores in these features also showed higher scores in the catastrophism scale of the CSQ. Results show that the pain features of the VR human figure (color, movement and sound) are able to represent pain perception. Furthermore, increased pain features in the figure are related with dysfunctional coping style according to literature. The manipulation of these pain parameters is proposed for reduce pain perception in FM patients.

---

Using virtual reality for cue-exposure therapy in a case of bulimia nervosa

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Abstract. Cue-exposure therapy (CET) has shown promise for the treatment of bulimia nervosa (BN) in patients who did not improve with cognitive behavioural therapy (CBT). This case study aims to describe the use of a new component for CBT by means of virtual reality based cue-exposure therapy (VR-CET) for BN. A 44-year-old female diagnosed with BN who showed persistence of binges two times per day was given six VR-CE booster sessions once finished CBT treatment. The patient was exposed to different VR environments related to binge behaviors in order to diminish or extinguish craving and anxiety responses (assessed by VAS from 0 to 100). Body mass index, frequency of bingeing and purging episodes, eating disorder symptomatology (EDI-3) and food craving (FCQ/S) were assessed before and after treatment sessions. During booster sessions, both anxiety and food craving dropped significantly. No bingeing and purging episodes were reported at the end of the treatment. Patient's mood and confidence to change were also improved. Both eating symptoms and food craving were reduced at the end of the VR-CET (EDI-3 Bulimia subscale: from 30 to 3; EDI-3 Body Dissatisfaction subscale: from 40 to 17; FCQ-Trait: from 194 to 64; FCQ-State: from 55 to 15). The VR-CET presented is

able to reduce bulimia symptoms, body dissatisfaction and craving in a treatment-resistant patient with BN. Likewise, purging and bingeing episodes were extinguished at the end of the treatment. This study supports the use of VR-CE as an effective component for the treatment of BN.

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Investigating self-reported social anxiety after a brief self-compassion induction using virtual reality

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Abstract. Virtual reality exposure therapy (VRET) is increasingly been used to deliver graduated exposure as part of cognitive behavioural treatments for social anxiety disorder. A relatively new therapeutic approach is Compassion Focused Therapy (CFT), which uses self-compassion to re-orientate an individual's motivational frame and assist with emotional regulation during treatment. Self-compassion can be defined as a sensitivity to suffering in oneself and others combined with a commitment to try to alleviate this. There has been little research conducted to date on the use of self-compassion with VRET. This current study investigates if a compassion-focused induction influences self-reported social anxiety in a virtual reality (VR) environment. The primary hypothesis is that compassion induction participants experience less self-reported social anxiety in VR than participants in the control group who receive no induction.

Using a Randomised Controlled Trial design, 24 undergraduate students are assigned randomly to one of two induction conditions. The experimental group participants undertake a self-compassion exercise, while the control group complete a similarly-structured

neutral exercise. Subsequently all participants spend time in a VR environment that has the potential to generate social anxiety. A think-aloud protocol operates during VR exposure. Questionnaires measure levels of trait and state anxiety and self-compassion at key points during the experiment.

The primary hypothesis is tested using mixed model ANOVA on questionnaire results. Think aloud data are analysed using content analysis of participants' reported experience in VR. Research may bear on integrating self-compassion practices into VRET.

### Communication Patterns and Behaviour

Risk factors associated with increased likelihood of youth receiving 'red flag' online sexual solicitations

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Abstract. The availability and widespread use of digital technology has transformed the way in which we consider children and young people to be at risk of harm. One cause for concern is the reported increase in the use of social media platforms to sexually groom young people online (see European Online Grooming Project, 2012). As grooming begins with an initial contact, studies on youth receiving online sexual solicitations from adults can provide first indications of this issue. Due to the sensitive nature of this topic, an online survey was used to obtain retrospective reports from adults regarding their online behaviour and experiences between the ages of 12 and 16 years old. Data was collected from approximately 1,500 18-25 year

olds across Ireland, Italy and the UK. Logistic regression analyses will be conducted to elucidate the risk factors associated with increased likelihood of receiving 'red flag' online sexual solicitations. For the purposes of this study, red flag online sexual solicitations were sexual requests or messages received from an individual at least 5 years older than the respondent. The rationale for this was to capture the cohort of individuals who were exposed to the most serious solicitations, where the sender could have been charged under Ireland's Child Trafficking and Pornography Act 1998. Cross-cultural comparisons will be discussed and implications of these findings for youth online safety campaigns will be considered.

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Indications of gender difference in children's mobile device usage

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Abstract. Smartphones and tablets have become important in daily life as they provide a convenient and mobile means to seek, access and share information. This convenience carries a downside in the rising concern with mobile security. Conveying the importance of personal digital security is notoriously difficult with adult users and perhaps more so for users who are children. Children are avid consumers of novel apps, frequently install new programs, and regularly update existing ones. Since apps can have hidden actions or malicious behaviour, this places them at risk from malicious or modified apps and some teenage users avoid specific apps out of concern for privacy. For example, location information is considered sensitive, so thousands of mobile apps that access GPS data, might impact upon children's privacy and security. This

paper reports a school-based survey of mobile usage as a perspective on issues in smartphone security. Our results suggest that males are more cautious than females in relation to installation of software applications on mobile devices and tend to be more aware of permission issues than their female counterparts. In addition, a larger proportion of males take care to turn off GPS. In contrast, a larger proportion of females than males have received upsetting, attacking or bullying content from other people.

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Why the caged bird sings: Cultural factors underlying the use of online social networks among Saudi Arabian and UK users

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**Abstract.** Psychological research into cultural differences in the use of Online Social Networks (OSNs) is a growing field. Our aim in this study was to investigate whether cultural differences in values, self-construals and relational mobility account for cultural differences in online motivations and behaviour. An online survey was completed by 695 participants during Spring 2014. The sample included students and non-students, male and female, from Saudi Arabia and the United Kingdom, aged 18-55 years old. Both English and Arabic versions of the survey were created and published online. Structural Equation Models tested the hypothesized effects of culture on online motivations and behaviour. The pattern of mean differences in cultural orientation found across the UK and Saudi Arabian samples was largely consistent with the pattern of differences between Western and Middle Eastern observed in existing cultural studies. Saudi participants showed more self-focused motivation

for using OSNs ( $\beta=.36$ ,  $p<.001$ ), targeted their communications more at individuals with whom they had weak offline ties ( $\beta=.26$ ,  $p<.001$ ), and emphasised self-promotion ( $\beta=.15$ ,  $p<.001$ ), acceptance seeking ( $\beta=.17$ ,  $p<.001$ ), and life-streaming ( $\beta=.25$ ,  $p<.001$ ) in their self-presentations. British participants were motivated more by relationship maintenance ( $\beta=.28$ ,  $p<.001$ ), targeted their communications at those with whom they had strong ties ( $\beta=.21$ ,  $p<.001$ ), and emphasised making a positive impression ( $\beta=.15$ ,  $p<.01$ ). Mediation analyses showed that sample differences in online motivations and behaviour were partially explained via self-construals, values and relational mobility. We conclude that constructs from cross-cultural psychology can be applied to understand cultural differences in OSNs usage.

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Online behavior: Interdisciplinary perspectives

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**Abstract.** Online behavior is studied interdisciplinary, it is worth classifying research directions. The following classification is based on empirical experience and analysis of works. Anonymity provokes both risk-taking, alternative identities, crime, dissociative disorders – and charity, volunteer work, online support. Legislators, ethicists, educators, psychiatrists have a common ground. Hybrid behavior means mixed/augmented online and real-life multitasking work, such as use of avatar's (or Siri) recommendations, placing selfies; transhuman prosthetics turns patients into hybrid cyborgs. Here is a field for robotics/computer scientists, neurocognitivists, linguists. Reputation upbringing/development of avatars/characters is practiced in blogging, social

networking, MMORPG. Online reputation means self-imaging by texts, visual/audio files. This skill includes foreseeing social perceptive reactions of little-known audiences. Experts in social psychology, media studies, Big Data, web design find this field promising. Mobility. Gadgets make people mobile, with attitudes to work including freelance, off-office, positions for disabled. When offline, people feel being lost, but many parents restrain kids from use of technologies. Educators, organizational psychologists, venture analysts, media scholars, etc. are welcomed in the field. Immersion is not restricted to augmented/VR systems; it includes fear of immersion into Internet addiction, or into aggressiveness characteristic for videogamers. While fears are wide-spread, views of experts differ. Clinical and developmental psychologists, 3D game designers, psychiatrists should develop the field. Distributed behavior includes remote collaboration based on joint interests. Useful projects were initiated by volunteers as a new economic model. Studies and practical work by sociologists, mathematical psychologists, Big Data specialists, social entrepreneurs, computer scientists may show perspectives for close future.

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The thematic factors of deception detection online in communication dyads

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**Abstract.** Where humans have been found to detect lies only at the rate of chance, communication online can elicit higher rates of trust and sharing personal information. The current study investigates the effect of social norms and trust on

perception of detecting deception in online communication. This qualitative study first analysed self-reports from participants (N=40) of why they believed they had been told the truth or lied to by a confederate in a factorial between-subjects experiment. The experiment required participants to detect 2 lies out of 5 conversation topics in a testing dyad either online or offline, with one of four confederates. It measured the effect of trust, perspective taking and communication medium on accurate deception detection. Secondly, participants were asked to describe where they would expect to be lied to online. Using thematic analysis, the emergent themes of conversation flow, online disinhibition, relationship closeness [i.e. perceived intimacy] to the communication partner were identified as primary factors in deception detection in this study. Implications include a caution to online communication where a paradox arises: Individuals do not expect close friends to lie. However, perceived intimacy and accurate deception detection may be obscured by online communication.

### Virtual reality in treatment and prevention of PTSD and burnout

Virtual reality therapy for the treatment of combat-related post-traumatic stress: A case report

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Abstract. We describe Virtual Reality Graded Exposure Therapy (VRGET) for the treatment of combat-related Posttraumatic Stress (PTS). We also summarize the successful outcome of a case study with an active duty U.S. Navy Officer who completed a combat tour to Iraq in 2005 and since

this combat deployment has reported continuing to experience intrusive PTSD symptoms. The participant was referred for treatment by his Primary Care Physician following this Physician having diagnosed the presence of combat-related PTS. The VRGET system, utilizing three computers, has been discussed in previously published reports. The VRGET protocol has been discussed in previously published reports. As of having completed 10 VRGET sessions, the participant's PTS symptom severity has decreased by greater than 20%. By the time the participant completes an additional 10 VRGET sessions, for a total of 20 VRGET sessions, it is anticipated that his PTS symptom severity will further diminish. Aspects of this participant's delay in seeking treatment for his combat-related PTSD will be discussed. Also to be discussed will not only be the inherent limitations of the results of our case study being generalized to other combat-related PTS treatment populations at other medical centres, military or civilian, but also, like most aspects of mental health, a one-size-fits-all PTS therapy approach is unlikely to emerge. Future work should determine which PTS treatment approaches work best for which patients.

VR-Augmented stress intervention for nurses and physicians

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Abstract. Nurses report some of the highest levels of stress of any professional group. The percentage of nurses with burnout has been reported to be between 40 and 49%. Prolonged stress may lead to burnout, manifesting in both physiological and psychological symptoms. Symptoms such as insomnia, headache and depression are common occurrences.

In a recent review, nurses, including those involving interactions with physicians and patients, as well as workload concerns, reported nine common themes of stressors. The NHS has recognized the need to address stressors in healthcare workers and is working to improve communication and counseling services, as well as preventative stress management services. Multiple studies have shown that psychological resilience can prevent or attenuate burnout. For the past two decades, The Virtual Reality Medical Center (VRMC) has used VR-enhanced cognitive behavioral therapy to treat patients with stress, anxiety, trauma and chronic pain. We have also been able to provide civilian and military first responders with a continuum of care; with VR-enhanced training (stress inoculation training) provided prior to missions and VR-enhanced treatment available both during and after missions. We have now begun to apply this continuum of training and treatment to the ever-increasing crisis of high stress and burnout in both physicians and nurses. Preliminary results from our on-going VR burnout prevention and treatment studies will be presented.

Reactions of victims and non-victims of sexual assault to a virtual aggression scenario

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Abstract. The use of virtual reality in the treatment of posttraumatic stress disorder (PTSD) was shown effective with victims of different traumatic experiences, such as military combat, terrorist attacks, motor vehicle accidents, and criminal violence. However, no study had yet tempted

to evaluate a virtual environment (VE) designed for sexual assault victims. Thus, a new VE was developed specifically for the treatment of PTSD in female sexual assault victims and was tested with 30 participants (19 have never been assaulted in the past, while 11 were sexual assault victims, but none suffered from PTSD). Two virtual scenarios (experimental and control) were presented to them. Both scenarios took place in a VE depicting a crowded bar, but only the experimental scenario would progressively lead to the assault. Participants were asked to rate their level of anxiety during the immersions, while physiological data were gathered throughout the experiment. Questionnaires measuring anxiety (IASTA-Y1), negative affect (PANAS-NA) and virtual reality-related variables (cybersickness and presence) were also given after each immersion. No adverse events were reported by our participants. Repeated measures ANOVAs indicate the levels of anxiety and negative affect are significantly stronger in the experimental scenario than in the control scenario. Moreover, the self-rated level of anxiety increases in the experimental scenario with the addition of trauma-related stimuli (Loranger & Bouchard, 2015). It is also interesting to note that no significant differences were found between victims and non-victims of sexual assault. Implications in the development of VE for traumatic events victims are discussed.

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Interrupting traumatic memories: An emergency room virtual reality intervention for pain reduction and the prevention of PTSD

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Abstract. Memory processes may be central to development of PTSD, and interrupting memory consolidation may prevent PTSD's development. Specifically, use of visuo-spatial tasks has been shown to reduce traumatic intrusions in non-clinical populations. Our study aimed to administer a similar task in a clinical population, using the Virtual Reality SnowWorld environment. We hypothesized that playing with SnowWorld in the Emergency Room, shortly after exposure to a traumatic event, will result in less PTSD, dissociation and pain. Subjects were arrivals to the Emergency Room immediately following exposure to a traumatic event. Subjects were aged 18-65, without loss of consciousness, who experienced a DSM IV defined potentially traumatic event. Subjects signed informed consent. Subjects were randomly assigned to treatment condition (SnowWorld) or control, and were assessed in the ER, as well as 6 month follow up. Analyses of the first 66 subjects indicate that SnowWorld reduced pain levels in the ER. The SnowWorld group reported a significantly greater change in pain scores before and after the intervention, as compared to controls ( $F(1,64)=13.02, P<0.01$ ). Not all subjects have as yet completed follow up assessments at 6 months; the effects on PTSD development at follow-up will be analysed and presented. SnowWorld is quick, non-invasive intervention that may reduce pain in the Emergency Room. Since pain is related to the development of PTSD, this may have long term effects on the rate of PTSD. In addition, the data relating to PTSD symptoms will be examined and its impact discussed.

### Online Support

Examining the Role of Facebook in College Social Adjustment for Undergraduate First Year College Students

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Abstract. College students are increasingly using social networking to communicate with online friends. This research examined if a relationship exists between groups of online friends and college adjustment for first year students. The role of Facebook friends was considered in college adjustment and perceived online social support for first year undergraduate students attending an Irish Institute of Technology. Data was collected online from first year students (N=117). College adjustment was measured using the College Adjustment Test (CAT) and perceived online social support was measured using the Interpersonal Support Evaluation List (ISEL-12) which was adjusted to measure perceived online social support specifically on Facebook. Quantitative analysis was used to measure the relationships between groups of Facebook friends, college adjustment and perceived online social support. Overall there was no significant relationship found between groups of Facebook friends, actual and college friends, college adjustment and perceived online social support. Further investigation revealed significant effect between the number of Facebook friends and the positive affect of college adjustment. The reasons for the differences in results in comparison to existing literature were attributed to the college size, cultural differences and the overall lack of definition of groups of Facebook friends.

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The role of the Internet in adolescents' health information seeking: Results of a national online survey

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Abstract. The study investigated the role of the Internet and Social Media in adolescents' health information seeking: How often do youth turn to the Internet for health-related information? Which types of health-related information do they seek online? How do adolescents evaluate the effects of online health information? An online survey was administered to a national sample of N=963 youth, ages 14-19. The sample was recruited from an internet survey panel in Germany and representative of gender, region and education. The questionnaire included 89 items covering socio-demographic and health related background variables and health-related internet use. Almost all of the respondents (95%) reported using the Internet for health information seeking, 43% reported to do so often, or very often. Only family members and health professionals were consulted with similar frequency. The most popular health related topics adolescents searched for online were healthy lifestyle choices (exercise, nutrition, relaxation, body care) and physical health problems (pain, injuries, acute and chronic illnesses). Less frequently they searched for mental health problems (depression, anxieties, eating disorders) and sexual health related issues (puberty, sexual identity, prevention of unplanned pregnancies and sexually transmitted infections). Both female and male adolescents evaluated the effects of online health information on their well-being as much more positive (5-point Likert scale: M=3.03, SD=1.19) than negative (M=1.71, SD=0.95;  $t(df=916)=26.38$ ,  $p<.001$ ,  $d=1.22$ ). The internet has become an important and predominantly helpful source of health-related information for youth.

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Facilitating effective help-seeking

through ReachOut.com

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Abstract. Many young people experiencing mental health problems will delay seeking help or not seek help at all (Rickwood et al., 2005). Youth mental health service ReachOut.com aims to engage young people and encourage help-seeking by providing mental health information and support in ways that make sense for young people. ReachOut.com attracts over 4,000 Irish visits per week. ReachOut.com has collected cross-sectional data through an annual online survey since 2011. The surveys explored user demographics, help-seeking knowledge, preferences and behaviours and psychological distress. During data collection periods, ReachOut.com visitors were invited to participate in the survey via a 'pop-up' notification. The surveys contained on average 25 questions and employed a mix of open and closed-ended questions. Results from five annual surveys, 2011 to 2015, will be discussed during this presentation. An encouraging increase in the understanding of 'help-seeking' was observed across the five years of data available. Reported engagement with health professionals also increased, however this engagement was lower than expected given the high psychological distress levels as measured by the Kessler-10 scale of psychological distress (Kessler et al., 2003). In terms of help-seeking, a sustained preference towards going online for mental health information and support was reported. Reasons why young people might not seek help were explored through an open-ended question. Help-seeking is a complex process and young people can face many barriers when seeking support. This presentation provides an insight into ReachOut.com visitors and explores how the positive technology of ReachOut.com can

facilitate help-seeking behaviour.

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E-mental health on-campus: College students' views of online help-seeking

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Abstract. Third-level students in Ireland are highly likely to use the internet when seeking mental health information and support.

ReachOut Ireland, in collaboration with the HSE and the Irish Association of University and College Counsellors, undertook a study in 2015 to explore help-seeking amongst college students. E-mental health represented one aspect of help-seeking that was investigated, and will be discussed in this presentation. Over 5,000 students from 17 colleges responded to an online survey exploring help-seeking preferences and attitudes. Additionally, four focus groups were hosted with students.

From a variety of e-mental health activities referred to in the survey, students reported being most likely to search for online mental health information (reported by 85% of survey respondents). Notwithstanding this finding, over half of respondents agreed that 'online mental health information can be unreliable', with focus group participants suggesting that online information provided by their college would denote its reliability. Focus group discussions highlighted students' concerns regarding the security of online counselling sessions and trust in providers of online counselling. However, survey respondents reported being significantly more likely to avail of online counselling if provided through their college's counselling service. Results demonstrate the value of providing students with

visible, quality online mental health information, particularly as such information can facilitate further help-seeking. Moreover, results suggest that the provision of online counselling (and additional e-mental health initiatives) should be carefully considered in light of students' concerns, to ensure that they are delivered safely and appropriately meet students' needs.

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The effects of receiving and giving the social support through online community on guilt reduction

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**Abstract.** The present research aims to investigate the effects of receiving and giving social support through online community on guilt reduction. Considering guilt as an interpersonal phenomenon, receiving social support can reduce guilt but only it can induce a feeling of indebted. Compare with receiving support only or receiving any support condition, both receiving and giving support to others can reduce more guilt. Total of 75 participants were randomly assigned to three conditions (25 each). After posting an article about experiencing guilt in online community, participants in the Receiving and Giving Social Support condition (RGSS) received and gave supportive comments from and to others (confederates), participants in the No Social Support condition (NSS) received and gave neutral comments, and participants in the Receiving Social Support condition (RSS) only received supportive comments but gave neutral comments. All participants completed pre- and post-state guilt scale and Guilt-Implicit Association Test (IAT). As a result of social support manipulation, RGSS, NSS, and RSS did not show

any significant differences in the state guilt scores, but RGSS showed significantly lower scores of Guilt-IAT NSS. NSS and RSS did not show any significant differences in Guilt-IAT scores. This research suggests that giving and receiving social support through online community can reduce more guilt compared only receiving support or no support at all.

## Gaming

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Cognitive Styles Specifics of Adult Computer Gamers

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**Abstract.** Cognitive styles represent the ways people operate the information, which have great impact in the way people think, learn and behave. The aim of this study was to find out correlations between computer video games use and specific cognitive styles: field-dependence (FD) – field-independence (FI) and impulsivity – reflexivity. Witkin's Embedded Figures Test (EFT) and Kagan's Matching Familiar Figures Test (MFFT) were used to measure FD-FI and impulsivity – reflexivity styles respectively. 150 people aged 18-35 participated, 90 of them - regular computer gamers and 60 - non-gamers. In the gamers group 30 participants were playing less than 12 hours/week, 60 participants - more than 12 hours/week. It was found out that the gamers were more likely to have FI and reflective cognitive styles. In EFT test gamers performed significantly faster than non-gamers (18.7 sec vs 24.4 sec;  $p = 0,001$ ), and active gamers were the fastest (17.8 sec). In MFFT test gamers showed no significant differences in response time ( $p = 0.159$ ) but made significantly fewer mistakes than non-gamers (5.3 mistakes vs 7.5 mistakes;  $p = 0.036$ ), that makes

them at least "non-impulsive" (unlike predicted in some works). Less active computer games made the least mistakes, significantly less than the non-gamers (4.5 mistakes). The study showed that adult computer gamers are more likely to perceive information analytically and they do not actually show signs of impulsivity, at least while performing cognitive tasks. We also conclude that gamers with different levels of gameplay activity show differences in their cognitive styles.

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Investigating altered perceptions, mental processes and behaviours induced by virtual immersion

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**Abstract.** Besides the numerous benefits of playing videogames, adverse health effects have been observed. As a result an increasing number of research studies have examined the effects of videogame contents (e.g., violence) or excessive playing (e.g., addiction). Recently, a multimodal and holistic framework was developed to investigate the psychosocial effects of videogame playing focusing on identifying the relation between virtual elements (e.g., structural characteristics, contents), and the physiological, perceptual and cognitive mechanisms involved in the transfer of gaming experiences into real life context, so called Game Transfer Phenomena (GTP). The GTP framework was developed based on the analysis of experiences of over 3,500 gamers collected via videogame forums, interviews and a survey. Confirmatory factor analysis confirmed the factorial structure and demonstrated good reliability and validity of the items in the survey. GTP experiences have been classified in three main modalities: (i) Altered sensorial perceptions

comprising perceptions and/or sensations in all sensorial channels, cross-sensorial or multisensory. These were further subdivided into: altered visual perceptions (e.g. visual hallucinations), altered auditory perceptions (e.g. auditory imagery), and altered body/other perceptions (e.g. illusion of body motion). (ii) Automatic mental processes comprising thoughts, urges and automatic mental actions (e.g., intrusive thoughts), and (iii) behaviors and actions including actions inspired by videogame playing and changes in behavior (e.g. verbal outburst). The GTP framework can assist in identifying what and how virtual experiences are transferred to real life context, both for understanding the psychosocial effects of these transfers and for finding ways to promote desirable behaviors and actions.

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#### User involvement in the creation of videogames for therapy

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Abstract. Tell me, and I forget. Teach me, and I remember. Involve me, and I learn. (Ben Franklin). Extensive literature exists on the creation and use of therapeutic VR and games by professionals (“top down” creation), for conditions including stress and trauma. Relatively little has been presented about user involvement (“bottom up” creation) in the generation of such games and VR. This presentation reviews the how and why of such user involvement, at different levels (e.g., creation, “modding” and personalization/localization). Research has examined therapeutic benefits of user-created linear media (e.g., painting, films and videos), which were easier to create than videogames. But recent technology and tools including new game engines and Head-Mounted

Displays make user involvement in game creation much more accessible. Research will be cited that indicates involvement in the creation of interactive media can result in greater immersion and efficacy than passive use of extant games. An example is the customization of avatars to properly reflect patient/player identity. This presentation includes findings by the US DARPA/DoD in game-based therapy and performance improvement via user-wearable sensors to monitor physiological data and signal alerts with mobile devices. Such mobiles can provide gamified biofeedback and short videogames generated with player involvement, in order to drive player/patient metrics to desired normal or optimal ranges. Increased understanding and employment of such technology could have great potential for psychotherapy professionals, as well as empowering patients/users as stakeholders in a healthier future.

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#### Identifying psychological phenomena in the Legend of Zelda video game franchise: A dissemination

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Abstract. The Legend of Zelda (LoZ) is among the most popular video game franchises of all time. LoZ is a role playing game which usually involves a character called Link, who sets out on a destined journey to save a princess and the land of Hyrule, from becoming cursed by an evil king called Ganondorf. The LoZ video game franchise has become so popular, that in recent years an international orchestra called “Zelda Symphony” has been touring worldwide performing the in-game music while audiences watched the video game being played on a cinematic screen. It can be argued

that the LoZ is a medium enriched with psychological phenomena and thus worthy of dissemination. The aim of this presentation is to identify and explore these psychological phenomena which include, and are not solely limited to: music learning, personality change and Jungian archetypes. Support and acknowledgment of existing fan theories relevant to psychology are also mentioned. This presentation may be of most interest to fans of the LoZ video game franchise, video game enthusiasts, and psychology researchers.

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#### Mining through maths: Minecraft play and mathematical problem solving abilities among children

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Abstract. Video games, particularly sandbox game such as Minecraft, may have educational potential for the development of mathematical problem solving skills. Minecraft has the potential to stimulate students to allow them to engage in a discovery process, just as was traditionally a function of play according to Vygotsky. Children can interact with Minecraft in a number of ways, including playing individually, playing with others and observing other’s play. Schoolchildren between the ages of 10 and 12 and their parents will complete a survey at home outlining their Minecraft gaming habits and opinion of maths problem solving. The children will then complete a series of non-verbal reasoning tasks and verbal maths problems in school. Two varieties of verbal maths problems will be provided, with one set using natural world language and problems, and the other set using Minecraft related language

and problems. This is to identify if the skills are learned, and if they can then be applied to non-Minecraft related problems. Data collection is ongoing, analysis will include the use of a MANOVA to investigate the impact of various types and frequencies of playing Minecraft on non-verbal reasoning tasks, and Minecraft and non-Minecraft related verbal maths problems. The findings of this research will identify the potential of sandbox games in developing mathematical skills in children, helping to determine if these might be a useful teaching aid.

## Positive Applications of Technology

Efficacy of a digital education program on Life Satisfaction and digital self efficacy in older adults: A mixed method study

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**Abstract.** People aged 65 and over often have difficulties in interacting with ICTs, even though these technologies are considered to be essential for healthy aging. They allow individuals to maintain their communicative and cognitive abilities and their social relationships even when the former biologically decline and the latter are difficult to keep up as mobility slowly becomes more challenging. This research aims to explore the efficacy of a six-class Digital Education program (taking place in Q1 2016) in improving digital self efficacy (tablet use) and life satisfaction in people aged 65 and over. A quantitative longitudinal design is employed in the research (measurements taken after the first class (T1) and after the last one (T2), 2 month follow up) to track changes

in digital self efficacy and life satisfaction. Sample consists in 500 aged =>65 participants attending the digital education program. Efficacy of the program will be also assessed through ethnographical observation of a subset of participants (n=30; 2 classes). Qualitative and quantitative data will be triangulated. We expect that the participants will show an improvement in both digital self efficacy in using tablets and in life satisfaction. Our goal is to demonstrate, at least preliminarily, that digital education programs can be a good instrument to improve wellbeing and support use of ICTs in people aged 65 and over

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Networked Flow in Blended Learning Settings: A Longitudinal Mixed-Method Study

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**Abstract.** The goal of this contribution is to report progress of an ongoing study, aimed at investigating the process of Networked Flow (NF) in creative learning teams engaged in blended collaborative setting (including both face-to-face and virtual meetings). The NF model suggests that team reaches maximum group creativity when its members experience high levels of flow and social presence. Moreover, the model predicts that emergence of NF is associated with specific group structural dynamics. To this end, we designed and executed a longitudinal study using a mixed methodology that combines qualitative, quantitative and structural analysis of group dynamics. The study involved 102

participants (graduate students enrolled in an academic course on Enterprise Communication). The overall sample included 21 males and 81 females (average age = 22.98, SD = 1.69). Participants formed 10 self-selected teams (mean team size = 10.24; SD = 1.28). The research protocol consisted in a longitudinal mixed-method design, which integrated: (i) the analysis of experiential features of collaborative experience (flow, social presence); (ii) the analysis of communicative interaction; (iii) the structural features of collaboration dynamics (social network indexes); (iv) the assessment of the quality of the creative product. The analysis of the data will be focused on understanding the possible links between processual, structural and experiential features of the creative collaboration, as well as on identifying design guidelines for interventions aimed at improving group creativity.

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Using and Intending: how personal intentions can influence the User Experience of interactive technologies

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**Abstract.** Usability and User Experience evaluations often collect users' opinions about products/ technologies regardless of users' intentions. Specifically, in order to analyze quality features of a technology, random users can be interviewed about experienced/ expected usability, emotional responses, mental workload after or before actual use. Nevertheless, according to the Perfect Interaction Model, an emergent framework in the field of User Experience, users' responses may vary depending on their tendency to perceive the

technology as an opportunity to achieve their own personal goals. In order to test this hypothesis, seventy-one participants were asked to evaluate a website (specifically, a web service for honeymoon planning) in terms of expected usability, emotions and mental workload. Participants in the experimental group provided their evaluations identifying themselves with characters in fictional narratives containing an intention related to the main function of the website, while those in the control group evaluated it acting as impartial evaluators. Results showed that the participants in the experimental group evaluated the website as related to more intense emotions and higher mental workload. Moreover, an interaction effect appeared while considering gender: females in the experimental group considered the website less usable than control ones, while the opposite happened for males. The importance of taking into account users' intentions prior to User Experience and Usability evaluations is discussed.

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Transformative interactions: Designing positive technologies to foster self-transcendence and meaning

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Abstract. Self-transcendence is regarded as a key component of psychological wellbeing. Its defining features are a shift in focus from self-interest to something greater than and beyond ourselves, increased interiority, and an enhanced sense of connectedness. In recent years, a growing number of studies has addressed the potential role of self-transcendent positive

emotions – such as awe, elevation and admiration – in fostering personal development. In particular, recent research suggests that the experience of these emotions can promote self-improvement, prosocial behaviour and spirituality. The purpose of the present contribution is to explore the potential role of interactive technologies in helping individuals to support and cultivate self-transcendent emotions and meaning in their lives. In the first part of the analysis, we will introduce the notion of Computer-Mediated Self-Transcendence (CMST), which refers to the use of computers in supporting, facilitating or enhancing emotional peak experiences. Next, we will describe some early examples and applications of CMST, drawn from our own research. Lastly, we will examine opportunities, challenges and ethical implications of this emerging research topic.

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Psychosocial impact of smart-technology use in acute rehabilitation

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Abstract. Assistive Technology may play a critical role in the rehabilitation of persons with acquired spinal cord injury. Smart-technologies, i.e. Internet enabled mobile technologies, are contemporary forms of assistive technology, and are valued tools in clinical rehabilitation therapies and in the community. While the utilization of smart-technology can be advantageous to measures of occupational performance and functional independence, limited research exists examining the psychosocial impact of smart-technology use on subjective wellbeing and quality of life. Using a constructivist grounded theory

approach, the present research employed an exploratory, mixed-methods, multiple case study design to examine the psychosocial impact of smart-technology use in acute rehabilitation. A sample of eight males with spinal cord injury, attending acute rehabilitation was recruited over a four month period. Analyses of the mixed-methods data yielded rich findings regarding the impacting role of smart-technologies for the men involved in this study. Access to social supports, entertainment media, and information searching were identified as the most meaningful functions afforded by the technologies, and an overarching theme of 'self-driven rehabilitation' emerged as a key moderator of psychosocial impact.

## Advances in cyberpsychology

The wE-care System: Medication Administration made Easy

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Abstract. The misadministration of medication is the eighth most frequent cause of death for patients in primary care (Kohn, Corrigan, & Donaldson, 1999). Although the use of technology in hospitals has shown a decrease in the rate of medication misadministration, little research has been dedicated to medication error in primary/psychiatric medical care. Therefore, the purpose of this project was to develop a system in line with the demands outlined in our ethnographic and secondary research. The two main limitations addressed in our research were illegible handwriting on kardexes (Pre-printed sheets for prescribing medication in hospitals), and over dosage of certain medications,

such as PRNs (Medication that is administered by nurses “as needed”, e.g. Painkillers.). This resulted in the prototype production of an inclusive and easy to use medication administration app; the ‘wE-care system’. Interviews with those employed in the field of medical care were carried out along with user testing within this population, resulting in all design and functions of the app being guided by the needs and demands of these target users. This prototype system aims to allow doctors and nurses to easily communicate with each other, and administer medication without the limitations that currently exist in medical practices.

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### Where is the Virtual Self? Virtual Worlds and the Self as a Cyborg

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**Abstract.** This presentation has its basis in research that explores the extent to which participation in online environments, in particular virtual worlds, reflect a transformation in the experience of Self in society. In this instance, virtual worlds are defined as computer-generated, graphically represented spaces, experienced by many people simultaneously. One aspect of the research has to consider how the Self emerges from the intersections, influences and interactions that occur between the physical and virtual worlds. This has been achieved by capturing the experience of virtual world users as they actively use a virtual world. The methodological technique is Subjective Evidence-Based Ethnography (SEBE). This involves first-person audio-visual recording with a Subcam (a miniature video-camera worn at eye level), followed by a confrontation interview using the recordings to collect participant subjective experience. Participants’ usage of the virtual world Second

Life has been recorded, capturing the inworld activity and the physical world context in which it is framed, and eliciting the first-hand experience of the interaction between the virtual and physical worlds and the Self. Inductive Thematic Analysis of the audio-visual data arising from the usage session and the confrontation interview reveals a number of findings. Amongst these is that there are several levels of interaction occurring between the user, their avatar, other users, the virtual world technology, and the physical environment. In particular the experience of Self that emerges is one in multiple locations, bridged by technological mediation, such that someone who uses virtual worlds becomes a form of cyborg.

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### Mutual rule-shaping with parents to form adolescents’ healthy smartphone usage habits

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**Abstract.** Psychological research into culturSmartphones have become an integral part of adolescents’ lives. However, technology savvy adolescents’ media culture has evolved rapidly, creating concerns regarding abusive smartphone usage. Parents apply various mediation strategies, yet most rules eventually fail because they do not include adolescents’ perspectives. The purpose of this study was to find effective parental mediation in digital media context to form adolescents’ healthy smartphone usage habits that can be applied at home, because media consumption is inevitable. Two sessions of FGI were conducted. A purposive sampling was adopted to identify lived experiences of both adolescents and their parents regarding smartphone and media usage rules. In the first FGI (n=21;

parent: 21), we explored experiences of parents regarding their children’s media usage. In the second FGI (n=24; parent: 13, child: 11), digital media usage rules applied at homes from both adolescents’ and parents’ perspectives were examined. This phenomenological qualitative research revealed parents’ concerns (health, safety, social relationship, developmental issues) and difficulties (lack of understanding of youth’s media culture, confusion in regulation selection, lack of adolescents’ responsibilities) they faced while applying media usage rules. Strategies that did not work were those applied without adolescents’ consensus, which mostly did not consider individual youth’s characteristics and contexts. Adolescents on the other hand sought for autonomy in terms of media use, and furthermore realized the necessity of their responsibility. We suggest parent-child mutual rule-shaping for smartphone usage guidelines for both youth and parents to reach common grounds and increase autonomy of adolescents.

## Posters

The effect of cognitive load on eye-movement and food cravings in external eaters

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**Abstract.** This study aimed to examine the role of cognitive load on attentional bias and craving levels toward food with the analysis of eye-movement in external eaters. As external eaters are easily driven to eat with exposure of food cues, cognitive load which is found to lower attentional bias and cravings for food may be effective to relieve external eating tendency. 100 undergraduates that have high or low levels of external eating were assigned to either of the experimental conditions depending on the levels of cognitive load: solving 2 digits – 1 digit complex subtraction (high-cognitive load condition, n=50), or 2 digits – 1 digit simple subtraction (low-cognitive load condition, n=50). All the participants were instructed to solve 2 digits – 1 digit subtractions while fixating on food and neutral stimuli. The gaze duration and fixation counts were assessed with eye-tracking devices during subtraction tasks in order to analyze attentional bias tendencies. Expected results would be followed: In high-cognitive load condition, high external eaters would show decreased gaze duration, fixation counts and food cravings compared to low external eaters. Whereas, in low-cognitive load condition, the group differences between high and low external eaters would not be significant. The results from the present study suggest that cognitive loads may effectively lower attentional bias and food cravings in external eaters. This presents the implication of cognitive loads as an interrupter in the elaboration of desire processing.

**Keywords.** External eating, Cognitive load, Working memory, Eye-tracking

Memory palaces to improve quality of life in Alzheimer's disease

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**Abstract.** Among elderly adults, retrieval of proper names is a source of unease and distress. This naming deficit is an early symptom of patients coping with neurodegenerative disorders such as Alzheimer's disease (AD). The objective of this project is to examine whether the addition of (virtual) reality to communication strategies (Method of Loci, Face-Name Mnemonic) can enhance recall and recognition of familiar faces in early AD subjects. This study will combine two powerful communication strategies (i.e. MoL and FNM) with (virtual) reality to improve the memory of significant others. We intend to externalize and customize memory palaces for subjects in early AD. Professional architects will construct virtual scale models of the house these subjects presently live in. They function as memory palaces in which photos of significant others are connected to the architectural, spatial environment. In addition we decorate the actual houses in accordance with the scale models. Thus (virtual) reality supports and facilitates participants during their familiar walk along the loci route. The end result of our intervention is a tailor-made and externalized memory palace. We propose this technology to be a relevant instrument to support the memory of early AD subjects to recognize familiar faces. We hypothesize that the postponement of the naming deficit in early AD will temporarily slow down the rate of diminished communicative functioning. We expect to improve the quality of life of early AD subjects and their significant others.

ICARE-R: An Internet-based intervention for promoting resilience in freshmen university students

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**Abstract.** The evidence base of Internet-based interventions in the prevention and treatment of mental health conditions has rapidly grown in the past decade. Yet many European countries (e.g., Germany, Austria, Switzerland, Great Britain, Spain) have not implemented these promising approaches into health systems.

In addition there are several disorders with a growing prevalence that constitute a significant problem, generating important economic, personal and social costs. Adjustment Disorders (AD) constitute an important health problem, and highlight the need of making the person more prepared to deal with stressful situations, more resilient. This study is a multi-country (Spain, Germany and Switzerland) randomized controlled trial (RCT) with two groups comparing the efficacy and cost-effectiveness of unguided Internet-based intervention (ICARE-R) with a care as usual condition. ICARE-R is an unguided Internet intervention program for promoting resilience and coping skills in people at risk of developing AD. The sample for the current study will be students low in resilience confronting a crucial life-event like, the first

year of university. The intervention consists of eight interactive modules design for weekly sessions. The therapeutic components of the program are evidence based techniques selected following the Riff model of psychological well-being, and organized in its by six dimensions: Autonomy, Self-Acceptance, Environmental Mastery, Purpose in Life, Positive Relations, and Personal Growth. The objective for this presentation is to expose the design of the study and the content of ICARE-R.

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Instagram selfies and user self-esteem, subjective happiness levels and personality

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**Abstract.** The prevalence and use of the selfie has become a recent phenomenon with the rise of social media platforms such as Instagram. With much of the recent research on selfies and social media being associated with negativity, the current research examines if there may be more positive attributes linked to the selfie phenomenon. This study aims to quantifiably explore the roles of extraversion, self-esteem and subjective happiness in relation to the number of likes received on a selfie on Instagram. A between groups design was employed. Undergraduate student participants completed a questionnaire that included the Rosenberg self-esteem scale (Rosenberg, 1965), the Subjective Happiness Scale (Lyubomirsky & Lepper, 1999) and the Big Five (Goldberg, 1990). Participants also completed a short questionnaire identifying their selfie-related behaviours and experiences. It was hypothesised that there would be: a positive correlation between

number of selfies and self-esteem; a positive relationship between subjective happiness levels and likes received on a selfie; and a significant difference between introverts and extraverts in relation to the number of selfies posted on Instagram. Data analysis is currently in progress. The research has the potential to contribute to and expand knowledge on the positive attributes related to the selfie phenomenon, as well as providing a greater insight into the characteristics associated with increased selfie distribution.

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Patients' expectations and satisfaction towards an Internet-based treatment for flying phobia: Preliminary data

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**Abstract.** In vivo exposure is the treatment of choice for specific phobias. Despite the proven efficacy of this technique, it is linked to a number of limitations in its acceptance among therapist and patients (i.e., approximately, 20-25% of patients reject in vivo exposure because they consider it too aversive). Information and Communication Technologies (ICTs) could help to overcome these issues. Specifically, the use of computer-assisted exposure programs is an effective alternative for Flying Phobia (FP). Moreover, the Internet is a useful tool for providing these effective psychological treatments. However, to our knowledge, no study exists to investigate the acceptability of an Internet-based treatment for FP. NO-FEAR Airlines is a self-applied program via the Internet that allows people with FP to be exposed to

images and sounds related to their phobic fears. The aim of this work is to offer data about the patients' expectations and satisfaction towards NO-FEAR Airlines in a pilot study. The sample was composed by four participants with a mean age of 34.5 (SD=11.1) residents in Spain (N=3) and Colombia (N=1). Participants completed the Treatment Expectation-Satisfaction Questionnaire and a qualitative interview. All participants reported high expectations (M=8.7; SD=.85) and satisfaction (M=9.4; SD=.44) about the treatment. Broadly, qualitative results highlight that NO-FEAR Airlines' therapeutics tools (psychoeducation, exposure scenarios and overlearning) were considered as very useful. In conclusion, NO-FEAR Airlines was a well-accepted Internet-based Treatment for FP. More studies are needed to confirm these preliminary and promising results in order to promote the dissemination of evidence-based treatments.

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Early intervention Program of childhood obesity by changing habits and supported by Etiobe platform

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**Abstract.** Currently Mexico is the first Latin American country with a high incidence of obesity among children, in the last 10 years has tripled the number of cases. According to the International Obesity Task Force (IOTF), in Mexico 26% of the population between 5 and 11 years are overweight or obese, as well as the 31.85% between 11 and 19 years. Obesity is a chronic, multi-factorial disease, which usually

starts in childhood and adolescence. The treatment is complex and multidisciplinary, involving aspects, both medical and psychological. There is strong evidence that technological advances may help to improve this aspect of treatment. Currently online prevention program is implemented by ETIOBE (Baños et al., 2011). This intervention system has as principal objectives to increase motivation, produce changes in lifestyles and establish healthy habits through an interactive platform that provides information physical activity, good nutrition habits and interactive video games aimed at improving adherence to treatment, increase motivation, and self-control mechanisms. Due to the evidence in previous studies, currently the program has been implemented in four schools in Mexico City, obtaining satisfactory preliminary results, that suggest a weight reduction and waist circumference among the participants; modification in the number of meals per day, including all the food groups and a reduction in the consumption of foods high in caloric content; as well as an increment of physical activity in their daily routine.

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User experience of BenEssere Mamma, a pregnancy app for women's wellbeing

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Abstract. Pregnancy is a complex phase in a woman's life characterized by physiological and psychological changes that can enhance anxiety or negative emotional states and favour risky behaviours. Thus, women's well-being during pregnancy is important for them as well as for the development of the child.

There are many standard

interventions available to support women in this particular phase of life and new technologies are playing an increasingly important role thanks to its spread, the lower costs and its peculiar characteristics (interactivity, sociality, customizability, ubiquity, etc.). Prompted by positive technologies, mothers-to-be can become more engaged in care.

Starting from these premises, the app BenEssere Mamma was developed to help pregnant women better manage anxiety and stress, especially in the last trimester of pregnancy and better cope with childbirth. BenEssere Mamma consists of a brief self-help protocol, delivered through a smartphone, containing mindfulness meditation and guided imagery exercises composed by four modules, for a total of four weeks.

This study reports a brief user experience of BenEssere Mamma mobile app (Beta Version) among pregnant women, delivered by smartphone, PC or tablet. Seventeen mothers-to-be were recruited to a 7-day study and experiences were collected by using an online ad hoc questionnaire. The application was perceived easy to use. Exercises were assessed as pleasant and quite effective. Women reported higher levels of engagement fun and effectiveness in using smartphone than PC or Tablet. Furthermore, women declared interest in continuing to use the application but not daily due to reported lack of time.

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Protocol of an innovative positive psychology intervention addressed to Brazilian pregnant women

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Abstract. regnancy is a major life

event for pregnant women of all the ages and cultures. As our knowledge, the scientific literature does not report any positive psychology intervention addressed to pregnant women. Nevertheless, a positive psychology intervention could be an effective tool in order to live pregnancy as an opportunity and a positive life experience. Thus, we have developed an Internet-based positive psychology training ("Positive Pregnancy") aimed to the promotion of the overall well-being of the future mothers. Positive Pregnancy is a 5-weeks self-applied program composed by four modules based on positive psychology's dimensions: "Mindfulness and Self-Acceptance", "Savoring", "Connectedness", and "Optimism. The aim of this poster is to present the protocol of a study that will compare the difference, in terms of increased mental well-being, between the use of this innovative training and more traditional interventions. Method: 200 Brazilian pregnant women will be randomly assigned to one between three conditions: (1) attending to a prenatal course and participate to the Positive Pregnancy training, (2) attending to a prenatal course, and (3) participate only to Positive Pregnancy. We hypothesize that after five weeks, women assigned to the condition prenatal course plus positive training will report higher levels of mental well-being, positive affect, optimism, positive social relationships, self-compassion, and psychological well-being, and lower levels of depression, anxiety, and negative affect than the women that would be assigned to the other two conditions. Furthermore, we will explore if these changes will be maintained at 1 and 6- months follow-ups.

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Classifying different types of augmented reality technology

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**Abstract.** Augmented reality (AR) has many different forms and has historically been grouped with Virtual Reality. It is the current author's belief that these two types of technology should be classified separately. Also, augmented reality should be further defined. The current presentation breaks down augmented reality into six different subtypes based on products in the commercial sector. Results: (1). Marker-based AR which links paper markers or physical objects to other digital information which somehow enhances the physical object or decodes the marker a. Paper markers (e.g. String AR or Blippar) b. Physical objects as markers (treating visual objects as pictures; e.g., Aurasma), (2). Location-based AR which utilizes GPS (e.g., Yelp), (3). Non-specific digital augmentations which include augmentations of any camera view (e.g., Swat the Fly!), (4). Specific digital augmentations of the real world which interact in some way with the live view (e.g. Swivel), (5). Indirect augmentations of an image of the real world (e.g., Wall Painter), and (6). Visual search engines (e.g., World Lens). After distinguishing AR from virtual reality, breaking down sub classifications for augmented reality, the authors will highlight various innovative AR projects currently under development in the mental health field. We will discuss these projects and how AR is only starting to reach its full potential in the area of improving behavior health.

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Diving into dropout in internet-based treatments

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**Abstract.** Internet-based treatment protocols have been found to be effective for a wide range of disorders. Particularly, the Internet-based psychotherapy for emotional disorders has shown to be equally effective than face-to-face treatments (Amberg et al., 2015; Ebert et al., 2015). Nevertheless, there are few studies on aspects that might hinder Internet-based treatments. An important concern in Internet-based treatment protocols for emotional disorders is the high dropout rates among these protocols in comparison to traditional face-to-face treatments (Van Ballegooijen et al., 2015). Therefore, treatment dropout should be studied in order to establish the principal stumbling blocks when implementing Internet-based treatments and try to find solutions. To do so, a qualitative study is conducted. A total sample of 10 intentionally selected participants will be recruited. All participants are patients who drop out of a transdiagnostic Internet-based protocol (TIBP). In-depth face-to-face and computer-mediated communication interviews, following a semi-structured interview guide, are carried out. A Consensual Qualitative Research (Hill, 2005), based on the Grounded Theory but specifically designed for clinical content, is applied with the aim of establishing the domains, core ideas and categories associated to the treatment dropout. The study is still in progress. The results will be discussed in terms of its clinical utility, trying to establish key aspects in the dropout decision taken by the patients and possible solutions for this important problem.

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Building geographic coverage for Virtual Reality-based therapy to channel patient demand

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**Abstract.** Psious is a team of psychologists and engineers that, beginning in 2013, has focused strictly on facilitating best practices in exposure therapy through use of Virtual Reality and other immersive resources. In spite of mobile technology making it accessible to typical practices, there are still perceptions of lack of demand from patients and high investments in equipment and training, which remain influencing factors against adoption. After success with early-adopters, scaling up to serve the larger mental health market revealed these challenges. To address them, the Psious group launched a limited program in the Spanish home market, with the aim of creating geographic coverage for patients throughout the country, by recruiting a selected group of prominent therapeutic centers. The centers receive free equipment loans, live training, and access to the Psious Toolsuite for treatment of anxiety, phobias, and for training of relaxation techniques. Psious is executing marketing campaigns to drive interested patients to the centers that can offer this therapy. Launched in September 2015, this project has already demonstrated that there was an undetected demand for this specific therapy, as the first pilot center experienced 7 intakes from 36 inquiries within two weeks of our actions. Psious would like to present the poster results of this project: patient capture, therapist engagement, and perception of value in the therapeutic process among a group of newly trained professionals. As well, metadata analysis from the required weekly sessions and formal feedback will yield conclusions about differential patient satisfaction and therapeutic effectiveness.

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Developing a training module using virtual reality to help address

responsive behaviours in dementia

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Abstract. Over 45 million people worldwide are currently living with dementia and will increase to over 130 million by 2050. Dementia is associated with a number of behavioural changes which are an extreme source of stress to informal carers and healthcare providers alike. Existing training programs do not address the real time anxiety felt by these providers. Virtual reality (VR) training modules allow for a more interactive and realistic learning experience that better prepares for real-life situations. Existing training programs were reviewed, key behaviours were identified and a scenario was created for reproduction into virtual reality. Results: Verbal and physical aggression as well as "resistance to care" were identified as key behaviours to include in the scenario. The training scenario is based on three critical moments for interventions from the user in a dining room scene involving interactions with a patient and his daughter (both are virtual characters models with motion capture of their body and facial expressions). The tool is ready to be piloted on a group of pre-professional students, professors, healthcare staff, and informal carers. The justifications for developing such a training tool to use in the context of this vulnerable population as well as the challenges faced in the creation

of the tool will be discussed.

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Increasing empathy towards the visually impaired using virtual reality

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Abstract. Blacked out glasses, blindfolds and pitch black rooms can be used to simulate temporary blindness. This allows sighted people to experience the challenges visually impaired people face. Such experiences are used for raising awareness, creating empathy and fundraising by charities. Virtual Reality (VR) allows one to see and feel the world from someone else's perspective. Empathy is often recognised as the ability "to put yourself in someone else's shoes". By creating a VR experience which safely recreates visual impairments we argue that people who experience low-vision using VR New Media Technologies (VRNMT) will have more empathy towards people with low-vision over those who have not used VRNMT. A randomised control-group pre-test/post-test design was developed. Both groups completed the Empathy Quotient 40-item questionnaire developed by Simon Baron-Cohen. Participants in the experimental group experience exposure to a virtual low-vision experience developed using a 360° video camera and viewable on Smartphones via VR headsets. A mixed 2 x 2 ANOVA will be used to measure empathy levels among the experimental group. Data collection is in progress with final results expected May 2016. Online exposure via VRNMT could greatly enhance levels of empathy for people with low-vision in the general population. Funding amounts and opportunities for all stakeholders involved in efforts to improve the lives of people

with low-vision may also be greatly enhanced.

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Use of Social Media to Manage Negative and Positive Emotion in Daily Life

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Abstract. This study explores use of Facebook and Twitter for managing negative and positive emotion in daily life, focusing on social sharing of emotion. These sites are ideally suited for self-disclosure, support seeking, and personal sharing, although they differ in affordances. Relatively few studies have examined social media use for emotion regulation, and most focused on negative emotion. However, there is growing interest in how people manage positive emotions (e.g., savoring). In this study, 167 undergraduates completed an online survey about their social sharing of emotion on Facebook and Twitter. People posted more often about positive than negative emotion on both Facebook and Twitter. But users of both sites were much more likely to post about negative emotion on Twitter than on Facebook. Facebook was used more often than Twitter to reflect on or savor positive feelings and to celebrate with others. Less offline appraisal support was associated with greater posting on Facebook about negative emotion. Greater subjective well-being was related to posting on Facebook for emotional expression (both positive and negative emotion) and to celebrate positive emotions/experiences with others. Personal characteristics were not related to use of Twitter. Among Facebook users (n = 155), more recalled posting about positive emotion (74%) than negative emotion (32%). The most common negative emotions were sad, angry, and worried, and

the most common responses in comments were support/caring and empathy. The most common positive emotions were happy, grateful, excited, and proud, and the most common responses were happiness, celebration, admiration, support/caring, and pride. Posting about both negative and positive emotion on Facebook was seen as effective, but among those who did both, posting about positive emotion was evaluated as more effective. This study offers insight into potential psychological uses and benefits of SNSs

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Effect of positive/negative reinforcement and punishment by an avatar instructor on student's willingness to take course

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**Abstract.** Thanks to many researchers' contributions, it becomes clear that positive reinforcement and punishment exercise significant impact on decision-making. However, there exists a research void regarding the analysis of effects of positive reinforcement and punishment made by avatars in virtual world settings on users' decision-making. To fill in the void like this, this study created two types of avatars (attractive vs professional) and performed experiments with 60 participants. Target variable is to measure students' willingness to take a course after watching an avatar instructor to teach a course to students in virtual world. Those 60 participants were divided into three groups for the sake of rigor. Each group was controlled differently by mixing positive/negative reinforcement and punishment. Participants were asked to watch a video clip showing how the avatar instructor teach a course to students in virtual world,

and then solve four quizzes. On the basis of quiz results, each participant is given either positive or negative reinforcement and punishment. Results showed that attractive avatar instructor has more significant effects on the students' willingness to take a course in the case of positive reinforcement and punishment. The experiments participants were selected from healthy college students and rewarded with a culture gift card worth of 5 US dollar. PLS was adopted to test the validity of the proposed research model. Experiment results revealed that participants' willingness to take courses was significantly improved when attractive avatar instructor exercised positive reinforcement and punishment.

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The effects of ego depletion in smoking relapsers and abstinent: The Virtual Reality-Smoking Approach Avoidance Task (VR-SAAT)

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**Abstract.** The present study aimed to investigate the effects of cognitive bias-attention and approach-and inhibitory control on tobacco smoking relapse and abstinent with the intervention of ego-depletion. In an ego depleted situation, smokers can experience decreased self-control for reflective system and increased impulsivity towards smoking cues for automatic system. To test this, 138 undergraduate student smokers were recruited for screening 28 relapsers and abstinent. Before and after manipulating ego-depletion with "e-erasing task", all participants completed a free-viewing task to assess attentional bias and a Virtual reality smoking approach avoidance task (VR-SAAT) to assess approach bias. Also, tobacco-specific Go/no-go tasks were conducted to measure inhibitory control ability.

As a result, relapsers had significant higher approach bias and lower inhibitory control on smoking cues than abstinent after ego depletion. There were no significant differences with attentional bias which can be interpreted that not attentional bias but higher approach bias toward smoking cue and lower self-control ability can influence to smokers' behaviour patterns. This result indicates that the modification of approach bias and enhancing inhibitory control ability are needed to prevent smoking relapse in particular ego depleted situation which is prevailing vulnerability throughout the modern society.

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Effects of Virtual Avatar and Humanoid Robot for Social Information Processing

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**Abstract.** Several studies suggested that virtual avatars and humanoid robots will have social roles in near future. However, previous studies didn't pay attention to social information processing with these agents. To address this issue, we designed a novel social information processing paradigm and compared human-avatar and human-robot interactions along with human-human interaction. Forty-five participants were recruited for this study (15 participants for avatar condition, 15 participants for robot condition, and 15 participants for human condition). During interactions with those agents, participants were instructed to memorize pictures as much as possible that appeared at target monitors. We used two different interaction conditions (initiating and responding interactions), and measured picture recognition score and behavioural movements (head movements trajectory).

Picture recognition memory results suggested that there were statistically significant difference in conditions ( $F(1, 42) = 18.042, p < .001, \eta^2 = 0.300$ ), but not in interaction partners ( $p > .233$ ). However, the head-movement results showed statistically significant difference in conditions ( $F(1, 42) = 16.971, p < .001, \eta^2 = 0.288$ ) and in interaction partners ( $F(2, 42) = 9.507, p < .001, \eta^2 = 0.312$ ). These results suggested that the different interaction partners did not affect the performance of picture recognition memory task, but affect the head-movement tendency. We believe this work is an important foundation for social learning with virtual avatar and humanoid robot, and we hope it will ultimately help people with or without handicaps in social learning.

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The effect of ego-depletion on binge eater's impulsivity: Using the computerized Stop Signal Task

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**Abstract.** The goal of this study is to identify the effect of ego-depletion causing an increase in general impulsivity and food impulsivity within binge eaters known to be impulsive by using the computerized Stop Signal Task (SST). 100 participants were categorized by the scores of Binge Eating Scale (BES) and the Eating Attitude Test (EAT-26) into two groups according to the levels of binge eating (high/low). Participants of two groups were randomly assigned into two different conditions: Having cognitive overload condition in which they have to cross out the letter "e" in a sentence within 5 minutes, except when there is a vowel following the letter "e" or when there remains only one vowel if the letter "e" is removed (ego-depletion condition); having no cognitive overload condition in

which they just have to cross out the letter "e" within 5 minutes (control condition). Using Visual Analogue Scale (VAS) and handgrip task performed manipulation check about pre- and post conditions. Impulsivity of participants was measured by two kinds of computerized stop signal task and was counterbalanced: One is a general stop signal task and the other is a modified stop signal task that presented object cues and food cues. The results were that high binge eaters were impulsive for food cues in control condition while low binge eaters were impulsive for food cues in ego-depletion condition. These results could demonstrate that ego-depletion would help high binge eaters reduce food impulsivity in that cognitive overload could diminish temptation for food.

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Mixed Reality Therapy

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**Abstract.** This paper advocates viewing psychological therapy as extended and inclusive of all modes of interaction that are therapeutically beneficial and that may lie outside of traditional therapy. It is proposed that this extended approach to therapy is particularly compatible with an enactive perspective which emphasises the role of action in perception. Also emphasised is the benefit of a constructivist approach and the use of the languages of dynamic systems theory and phenomenology. Highlighting the interplay of the physical, virtual and imaginary, it is argued that all therapy can be viewed as implicitly mixed reality in nature, with the title of Mixed Reality Therapy (MRT) applying formally to therapies that actively seek to manipulate a combination of these reality conditions for therapeutic benefit. A model for recognising reality

condition category errors is offered, various modes of implementation are explored and potential further MRT research opportunities are pointed to in the areas of content selection, presence, embodiment, joint-action and participatory sense-making.

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The effect of binge eaters' anger regulation on eye movement and caloric intake: Using the computerized anger regulation training

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**Abstract.** The present study aimed to investigate the influence of computerized anger regulation training (cognitive appraisal and suppression) on attentional bias to food images and food intake. Considering binge eaters cannot regulate their anger in anger-provoking situation and increase attentional bias to high-caloric food and binge eating, we examined the effect of anger regulation training on attentional bias to food images and food intake. 75 higher binge eaters and 75 lower binge eaters were recruited and randomly assigned to one of the three anger regulation training condition (cognitive appraisal,  $n=25$ ; anger suppression,  $n=25$ ; control group,  $n=25$ ). They were then given anger mood induction with the instruction which was followed by eye movement and bogus taste-test. Expected results were following: After the anger regulation training, compare to participants in the control condition, average dwell time on food image of the anger suppression training group would increase and caloric intake was significantly higher in the suppression condition compared to the reappraisal condition. The results from the present study suggest that higher binge eaters using anger suppression would increase implicit preference and explicit binge eating

and maintain binge eating symptoms.

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The effect of Machiavellian tendency and gender differences on implicit attitudes for white lies in virtual scenario: IAT task

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**Abstract.** The aim of this study was to examine the gender differences in people with Machiavellian tendency to use white lies before truth for their own benefits and whether they have positive implicit attitudes toward Pareto white lies. A total of 91 participants were selected depending on their gender (male/female) and Machiavellian tendency (high/low) among 507 participants who were conducted in the Manipulativeness Scale. After showing the virtual scenario related to white lies, participants were asked to picture themselves within the scenario. Implicit Association Test (IAT) experiment was conducted over two sessions. The purpose of experiment 1 was to measure implicit attitudes toward white lies, and 2 to measure implicit attitudes about intention (Altruistic or Pareto) of white lies. The results of Experiment 1, high group with Machiavellian tendency showed implicitly strong association with white lies. In Experiment 2, female group with low Machiavellian tendency showed implicitly strong association with altruistic white lies and all other groups had implicitly strong association with Pareto white lies. These results show that the group with high Machiavellian tendency had positive attitude toward white lies. In intention of white lies, males with both high/low Machiavellian tendency indicate selfish intention while females with only high Machiavellian tendency indicate selfish intention.

Persona: A digital identity amongst many selves

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**Abstract.** Research into the player of digital games has focused heavily upon two forms of identity, primarily because of their relative permanence. First, there is the out-of-world identity, the player, that engages the virtual world but remains independent of it. Incorporation of personality traits, out-of-game structural influences upon behavior are examples. Secondly, there has been a focus on the avatar, the representation of a self in the virtual environment. The avatar is responsible for the interactions in-game, both social and cultural. For social control mechanisms this break is similar. Official repercussions in digital worlds come in the form of punishing the player, through bans or item removal. Unofficial punishments, however, tend to affect the avatar. Examples are stigmatization, reputation systems, and removal from social groups. This research project, using dramaturgical analysis of interactions and social control in Massively Multiplayer Online Games, finds that there is a third, central aspect of identity, the persona, that operates as the primary agent of interaction for players of digital games. Rather than connect their real life identity to the game, players will incorporate an aspect of their avatar into their interactions. Rather than being entirely embodied within a single avatar, however, this identity is malleable and can incorporate many different roles in and out of the game as well as "alts," or alternative characters. This project argues that research on player interactions should focus upon this dramaturgical persona in order to have the most valuable findings of how individuals use and experience the virtual world.

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Incorporating positive imagery exercises using Information and Communication Technologies (ICTs) with online support in the treatment of fibromyalgia

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**Abstract.** FMS is a chronic musculoskeletal pain condition with unknown etiology, characterized by widespread pain, accompanied by fatigue, function disability, disturbed sleep, and affective disorders. In sum, pain experience in these patients is complex and involves behavioral, cognitive and affective factors that cause an impaired quality of life. However, recently novel clinical interventions have been applied to pain management: from alleviating and decreasing symptoms manifestations to promoting resources for coping with pain; and from routine face to face health care practices, to the addition of e-health resources and information and communication technologies (ICTs). The aim of this study is to describe the utilization of a positive psychology intervention (PPI), the Best Possible Self with fibromyalgia patients and to present preliminary results. For this reason, we incorporated a positive technology system developed by our team that includes narratives, sounds, and visual cues to focus patients' attention on the task and to potentiate the effects of the guided imagery exercise. To improve adherence, we gave patients access to a web-based platform and provide support through text messages twice a week. Our results showed that the BPS imagery exercise led to a significant decrease in pain catastrophizing, depression and impact of pain in functional status, and an increase in wellbeing in fibromyalgia patients

Conclusions: Our results add information of a good way to implement a PPI exercise integrating technologies and encourages us to continue exploring the use of technology-based guided imagery interventions with this population.

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Phubbing: Students' motivations and perceptions of smartphone use during face-to-face interactions with familiar persons

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Abstract. The smartphone has become an indispensable part of the modern individual's life. Considering its popularity and ubiquitous nature, the smartphone has had an impact on the way individuals interact, not only virtually, but face-to-face (FtF). A new social phenomenon called 'phubbing', the non-verbal act of engaging with a mobile device during FtF conversation, has been shown to have an impact on the quality of relationships, conversations and connections between individuals. College students are considered more vulnerable to excessive smartphone usage due to a need to develop a sense of identity, and the formation and maintenance of social relationships. Recent research indicates that more than 1 in 10 students acknowledge that mobile devices disrupt FtF communication, and that despite its popularity, there is no normative guideline for smartphone use. Recent research has a tendency to examine the frequency of phubbing while concealing the manner through which it is performed. For this reason, the present study employed a qualitative design to offer insight into the individual motivations and perceptions of this ever-increasing behaviour. Student smartphone users from the Dun Laoghaire Institute of

Art, Design and Technology were invited to take part in individual semi-structured interviews. Questions surrounding students' motivations for engaging in phubbing behaviour and perceptions of others' phubbing behaviour were asked. Thematic analysis was carried out to identify main themes emerging from the data. The present study offers an individual perspective of phubbing behaviour, providing a deeper understanding of smartphone use.

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WesForYouth Online: The development of an online youth mental health service in rural Canada

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Abstract. Founded in 2012 by Yolanda and Jamie Cameron after losing their son, Wes, to suicide, WES for Youth Online aims to be a hub for youth mental and emotional wellness support in Grey Bruce counties in Ontario Canada. WES for Youth provides: an online safe space where teens can express themselves and get free support and counselling from professional counsellors; resources for teens and parents; insight, inspiration and support; and opportunities to give back to the community.

This presentation will outline the work that went into creating, funding and implementing the WesForYouth project. We will focus specifically on the online counselling component which has seen more than 200 clients since its inception. Insights obtained from the project will be outlined. Lessons for other individuals and agencies keen to deliver services to youth online will be provided.

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Self-efficacy manipulation through an exergame and its influence on physical activity in a sample of

children

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Abstract. Promotion of physical activity (PA) among children is considered as a priority for health organizations and policy. Self-efficacy has shown to be crucial to encourage the adoption of healthy lifestyles, like PA. It refers to the belief in one's own ability to complete tasks and reach goals (Bandura, 1986). To improve it, two variables have been emphasized: execution achievement and vicarious experience. "Exergames" can be a useful tool to manipulate these variables in children. This study explores if the manipulation of the "execution achievement" in an exergame affect PA. Thirty-one children (9-14 aged) were asked to run a kilometer, and "to try to win the opponents". Participants were randomized in 2 conditions: "High Self-efficacy" (HSC), where virtual opponents always run at lower velocity and children always win, and "Low Self-efficacy" (LSC), where virtual opponents always run at higher velocity and children always lose. Measures (subjective tiredness, affect, arousal, speed, time and heart rate) were taken in 5 times: 0, 250m., 500m, 750m., and 1000 m. Statistically significant differences between were found for speed [F (3, 4.580) p< 0.01; η<sup>2</sup>= 0.12], being faster HSC participants, but not for affect, subjective tiredness, arousal, and heart rate. However, all participants scored high on perceived self-efficacy disposition, and the software did not offer feedback about outcomes during the race, only at the end. Despite that, results point out that exergames can be useful to manipulate self-efficacy by means of execution achievement and influence on relevant variables such as speed in order to increase PA.

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## Risks and benefits of internet use by people with neurodevelopmental disorders

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**Abstract.** Electronic social media facilitates the development of relationships, which could lead to greater social inclusion for people with neurodevelopmental disorders [i.e. intellectual disability (ID) or autism spectrum disorder (ASD)]. While there is a dearth of research on Internet use by people with ID or ASD, families, educators and support workers have voiced concerns about online safety. Our study attempts to produce an overview of experiences with Internet from young adults with a diagnosis of ID or ASD. **Sample:** Preliminary results are available on eight subjects: five with ID (3 males, 2 females), and three with ASD (2 males, 3 females) with a mean age of 25 years. **Methodology:** A sociodemographic and Internet use questionnaire was administered with the help of the participants' support worker, followed by an in-depth interview with one of the researchers. All participants used Internet for consuming content (e.g. entertainment, pornography, information, shopping or browsing), or communicating (e.g. Facebook, e-mail, dating sites). Three males played games online, and only the participants with ASD (without ID) created content online. All interviewees with an ID and 2 of 3 with ASD had distressing experiences such as: being insulted online, having false rumors spread, receiving threats or being targets of sexual solicitation. Access to Internet has opened a wide window of opportunity for people with disabilities to participate in a virtual community. However, education and support are needed to ensure safe

and positive Internet use by the population with neurodevelopmental disorders.

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## Effectiveness of a revised virtual reality program for pathological gambling

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**Abstract.** The use of virtual reality (VR) combined with traditional CBT program has shown some efficacy in a previous pilot clinical trial (Bouchard et al., 2012). Nevertheless, we improved our program by adding two more sessions to conduct cognitive restructuring exercises while immersed in VR. Our team is currently assessing the effectiveness of a revised program in a randomized control study. The sample consists of 32 adults (46.9% female, mean age = 46.47) suffering from pathological gambling (mean severity on the PGSI = 19.87, SD = 3.35). Participants entered a residential CBT program delivered in a mixed individual and group format following standardized treatment protocol. The program was delivered by an experienced therapist in two different centres located in the province of Québec (Canada). Four VR sessions were integrated to the regular CBT program. In this study, patients were randomly assigned to either one of two treatment conditions: (a) standard CBT (which include two sessions of imaginal exposure in a neutral VR environment) or (b) CBT + VR (where the imaginal exposure session were replaced by immersions in a VR gambling situation). Pre-post results show a significant reduction on all severity measures (PGSI and EDTJ,  $p < .001$ ; GACS,  $p < .05$ ) with no difference between groups.

**Conclusion:** The findings replicates and support results from our previous study that using VR in a CBT treatment is an effective program to treat pathological gambling.

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## Adaptation and Validation of the 33-item Estonian Smartphone Addiction Scale (E-SAS-33)

Dmitri ROZGONJUK<sup>a,1</sup>, Valdur ROSENVALD<sup>a</sup> and Karin TÄHT<sup>a</sup>

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**Abstract.** Considering the widespread use of smartphones in Estonia, a measuring instrument for distinguishing potential problematic smartphone users is required; therefore, Smartphone Addiction Scale (SAS; 33 items) by Kwon (2013) was adapted to Estonian. A set of questionnaires, including Estonian Smartphone Addiction Scale (E-SAS) and Internet Addiction Test (Young, 1998), were completed by 766 (596 women; 170 men) adults between ages 18-71 years ( $M = 26.1$ ;  $SD = 6.73$ ). To verify the reliability and validity of E-SAS, factor analysis, analysis of variance, internal-consistency test, and correlation analysis between the questionnaires were conducted. The correlation between E-SAS and E-IAT was  $r = .620$ ,  $p < .001$ , Cronbach  $\alpha$  for E-SAS was  $.907$ , test-retest correlation was  $r = .877$ ,  $p < .001$ , which together with other results indicates that E-SAS is a valid and reliable scale which enables to estimate potential smartphone addiction with a self-rating scale. This questionnaire is psychometrically both valid and reliable; it provides a possibility to screen for potential smartphone addiction with relative ease.

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The role of presence in marketing: An experimental study

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**Abstract.** Virtual Reality (VR) is an emerging and advanced technology that sees many possible applications in psychology, thanks to the now mainstream availability of low-cost head-mounted devices. For example, VR is used in combination with cognitive-behavioral therapy as a tool to help people overcome different psychological problems including phobias and eating disorders. However, VR is also emerging as a powerful marketing tool. In the past year, several brands tried to exploit the persuasive potential of VR experiences, creating campaigns that engage and delight shoppers while increasing sales. In order to assess the possible added value of VR to brand recognition, brand awareness and brand recall, we devised an experiment that takes into consideration parameters such as emotional efficacy and sense of presence. Thirty grad students have been randomly exposed to three different media contents produced by three different brands in three different formats: 360° VR video (1st condition), traditional internet video (2nd condition), website (3rd condition). The questionnaires explored the following variables before and after the media exposure: shopping value analysis; consumer reaction to sensorial stimuli in terms of affection; brand experience, product quality perceived. Preliminary results outline a significant efficacy of VR technology in terms of brand recognition, brand awareness and brand recall. If confirmed by final data – available for the conference – these results suggest that VR may have the opportunity to capture a new kind of moment with shoppers, by creating a wow factor that leaves a lasting impression.

Effect of joint attention in virtual classroom

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**Abstract.** Previous studies suggested that a virtual classroom was more ecologically valid and sensitive than traditional measures. On top of those studies, we suggested a new joint attention virtual classroom and investigated an effect of joint attention in the virtual classroom. Twenty-four healthy participants (Mean age: 24.82, SD = 3.4; 38 % female) conducted a within-subject experiment with four different conditions: a) traditional AX-type continuous performance tasks (AX-CPT); b) virtual classroom and no joint attention with a virtual teacher; c) virtual classroom and joint attention using body languages; and d) virtual classroom and joint attention using body languages plus verbal interactions. All conditions were counterbalanced and dependent measures were accuracy, commission error, and omission error. Results suggested that there was a joint attention effect in a commission error,  $F(3, 24) = 3.392, p < 0.023, \eta^2 = 0.294$ . Participants had less commission error when the virtual teacher used body languages and body languages plus verbal instructions (percentage of commission error in condition a was 3.9%, condition b was 3.5%, condition c was 3.0%, and condition d, was 2.2%). We couldn't find any significant effects in other dependent measures (all  $p$ s > 0.098). Although we only included healthy adult participants, we found a significant promotion effect of joint attention in the virtual classroom. However, the sample in the present study was restricted to university students and this study should be replicated and extend using samples of individuals

with attention deficit hyperactivity disorder (ADHD) or autism spectrum disorder (ASD).

Physical Activity: A Cross Sectional Study of Gender, Smartphone 'Fit Apps' and Motivational Quality

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**Abstract.** Lack of physical activity is the fourth largest cause of global mortality. Only 32% of the Irish population are considered to be sufficiently physically active to maintain 'good health'. This information comes at the height of the technology boom, with smartphones serving as an extension of our bodies and affecting our behaviours in so many ways. The negative effects of smartphones are already widely discussed, but the possible benefits of smartphones and the applications that come with them have not yet been sufficiently investigated. The ever-changing landscape of the literature surrounding physical activity behaviours demonstrates how diverse and susceptible to change it is. This and the inconsistencies regarding the relationships between gender and motivational 'types' leaves a lot unanswered in this area of research. In order to fill in these gaps, the present study employed a quantitative design to understand the relationships between Physical Activity, gender, smartphone fitness applications and motivational type. Smartphone users between the ages of 18-35 (the age where most habits are solidified) completed a survey disclosing gender and fit-app usage, along with the Behavioural Regulations in Exercise Questionnaire to discern motivational type, and the Leisure Time Exercise Questionnaire to measure physical activity levels. The results demonstrated the depth

of interaction between the different factors, allowing the potential of these relationships to be used in order to promote physical activity.

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Which environmental factors can modulate level of stress during shopping decisions at the point of sale

Carmen TORRECILLAS<sup>a</sup>, Jaime GUIXERES<sup>a</sup>, Enrique BIGNÉ<sup>b</sup> and Mariano ALCAÑIZ<sup>a,1</sup>

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**Abstract.** It has been proven that stress affects consumer behaviour during shopping experiences (stress of shopping). This relationship can, among others, generate behaviours of acceptance or rejection of certain stores and brands. Traditionally, in consumer behaviour research (CBR), stress of shopping (SoS) has been quantified in response to questionnaires. These responses typically have a cognitive assessment that represents a bias and do not permit to analyse the influence of individual factors during the shopping experiences. Recent advances in neurophysiological and behavioural measurement have shown that certain responses can be suitable indicators for measuring stress in subjects immersed in virtual environments. This study assesses the SoS level of using different physiological signals while immersed in a tridimensional grocery store. For that, several physiological (GSR & HRV) and behavioural (eye tracking and spatial movement) patterns has been analysed while doing shop decisions in a virtual grocery store by a group of shoppers. Using virtual reality let experiment with different kinds of ambient stimulation inside the store in order to recognize the mechanisms that trigger SoS patterns and to what extent they affect shopper's behaviour.

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A comparison of 3D versus 2D virtual environments on the feelings of social exclusion, inclusion and over-inclusion

Eva VENTURINI<sup>a</sup>, Paolo RIVA<sup>a</sup>, Francesco SERPETTI<sup>b</sup>, Leonor Romero LAURO<sup>a</sup>, Federica PALLAVICINI<sup>a</sup>, Fabrizia MANTOVANI<sup>a,1</sup>, Fred MCCMAHON<sup>c</sup>, Kiefer STONECIPHER<sup>c</sup> and Thomas D. PARSONS<sup>c</sup>

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**Abstract.** The traditional Cyberball paradigm (Williams et al., 2000) is a 2D virtual ball-toss game that uses line drawn characters for research on social exclusion. Using this paradigm, studies have reported increased skin conductance levels and increased negative mood in participants that experienced social exclusion (Kelly et al., 2012). While the 2D Cyberball was developed purposefully to be minimal (i.e., devoid of most social information), it lacks the ecological validity that many virtual environments now offer (Parsons, 2015). Given the potential of virtual environments and avatars for enhanced fidelity, we developed a virtual reality-based Cyberball paradigm with highly anthropomorphic avatars, in line with other studies (Mavromihelaki et al., 2014; Kessener et al., 2012). In an effort to assess the impact of increased fidelity and anthropomorphism in the CyberballAvatar (3D) paradigm, the overall objective of this study was to compare the skin conductance levels and the changes in mood between the 3 steps (inclusion, exclusion and over-inclusion) of original 2D low anthropomorphism Cyberball with our new high-anthropomorphism CyberballAvatar in a sample of undergraduate students. Participants were divided in two groups and randomly assigned

to the two conditions, while engaged in each of the Cyberball paradigms. Preliminary findings of between-subject analyses revealed that the high anthropomorphism condition compared to low anthropomorphism condition yields bigger changes in both mood and skin conductance levels in every step of the games: inclusion, exclusion and over-inclusion. Moreover, within-subject analysis showed the highest variation in both skin conductance and mood during the social exclusion step in each condition.

---

The influence of self-categorization and avatar customization on aggression and moral views: A study of violent video game effects

Mike YAO<sup>a</sup>, Kai-Chung PANG<sup>b</sup> and Jeffrey HO<sup>c</sup>

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**Abstract.** In the present research, we examine how player-character identification might moderate the influence of a violent video game on the player's aggressive thoughts and moral stance. We argue that there are two ways through which a player would become psychologically connected to their in-game avatars—role-playing and avatar customization. Primarily a function of perspective-taking and self-categorization, role-playing would allow the player to experience a deeper level identification with the in-game character than would avatar-customization. In a 2 x 3 laboratory experiment, 117 participants played a violent video game. Before completing a game mission, some participants were assigned a generic avatar (no-customization) while other participants either customized their avatar based on a photo of someone else (customization but no identification) or a picture of themselves (customization with identification). They were then randomly assigned to complete one of the two in-game missions. In one

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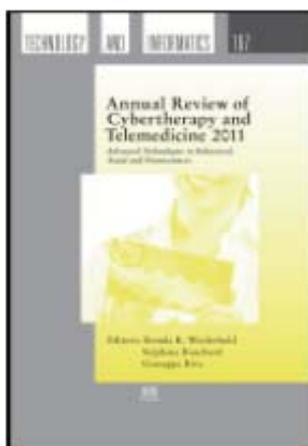
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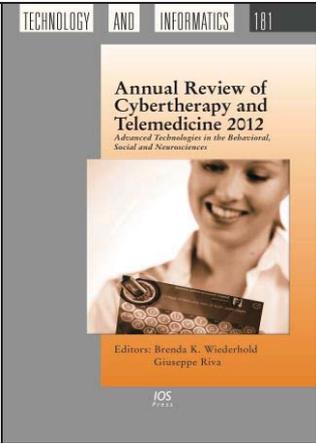
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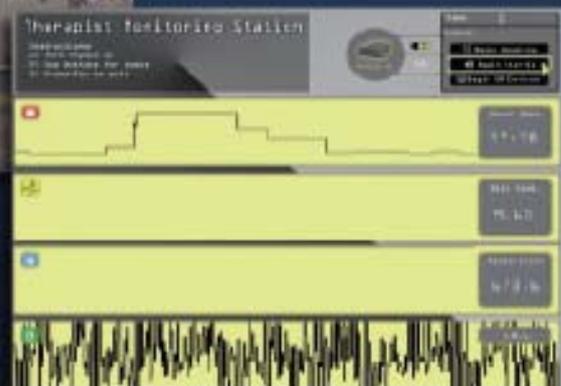
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