

23rd Annual CyberPsychology, CyberTherapy & Social Networking Conference

Hilton Lac-Leamy, Gatineau (Québec) Canada, June 26-28 2018

Complete Program

Roots and Future of Using Technologies to Foster Physical and Mental Wellbeing

<http://interactivemediainstitute.com/cypsy23/>

Table of Content

Sponsors and Exhibitors	3
Messages from Conference chairs and organizers	5
Message from the City of Gatineau Mayor	8
CYPSY23 Save the date	9
CYPSY23 Call for abstracts	10
General Information	11
Conference Chairs and Organizers	13
Scientific Committee	14
Awards & Honors.....	16
Keynote speakers	17
JUNE 26th 2018 Program	19
Commissioned digital arts performance and exhibition	55
JUNE 27th 2018 Program	56
JUNE 28th 2018 Program	106
Gala Dinner.....	158
Index of all authors	159

CYPSY23 Conference was made possible thanks to:

Our Conference organizers



Interactive Media Institute:

<http://interactivemediainstitute.com/wordpress/>



Canada research Chair in clinical cyberpsychology:

<http://www.chairs-chaire.gc.ca/chairholders-titulaires/profile-eng.aspx?profileID=805>



Université du Québec en Outaouais : <https://uqo.ca/english>

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VTRT Solutions

Messages for CYPSY23 Chairs & Conference organizers

Dear Conference Attendees:

I am pleased to welcome you to the 23rd annual CyberPsychology, CyberTherapy & Social Networking Conference (CYPSY23), the official conference of the International Association of CyberPsychology, Training, & Rehabilitation (iACToR). Technology continues to play an increasingly important role in the evolution of healthcare. It is allowing individual citizens to become more active participants in their own health and well being, transitioning care from the clinic into the home and moving the continuum from treatment to prevention. Wearable computers have become part of the everyday fabric of society, giving patients access to continuous monitoring and providing individuals with the ability to intervene early in their own health status to help prevent disease onset.

CYPSY23 will be providing all attendees with several publications this year. These publications are an important part of our continued mission to inform and educate the scientific community. This year's publications include: 1) the Annual Review of CyberTherapy & Telemedicine (ARCTT), which contains selected full conference papers, indexed in PsycINFO. The peer-reviewed papers are an integral part of disseminating the rigorous scientific findings being presented at this year's conference. 2) CyberTherapy & Rehabilitation Magazine (C&R), which includes abstracts from all of this year's presentations. 3) Free 60-day access to the conference's official MEDLINE-indexed journal, CyberPsychology, Behavior & Social Networking Journal (CYBER), published by Mary Ann Liebert, Inc. These well-established publications, together with the CYPSY conference series, iACToR member association and hosting of CE workshops by our American Psychological Association (APA)-accredited 501c3 non-profit, Interactive Media Institute, combine into one powerful communications platform to disseminate both the promise and the peril of advanced technologies, such as Virtual Reality and Social Networking, on individual and societal health and well being.

I would like to take this opportunity to extend a special "thank you" to all those who have helped make CYPSY23 possible. First, merci beaucoup to this year's Co-Organizers and Conference Co-Chairs, Professor Stéphane Bouchard and Geneviève Robillard. This is the 3rd time they have served as Co-Organizers and Conference Co-Chairs, and each year (2006, 2011 and this year), they and their team have worked tirelessly and enthusiastically to create an outstanding experience for us all. Many thanks also to this year's prestigious Scientific Committee, who have helped put together an outstanding scientific program. Their efforts are very much appreciated. A heartfelt thank you to Dr. Silvia Serino, who has served as Managing Editor for 4 years now for the ARCTT as well as C&R Magazine.

This conference would not be possible without our sponsors, and I would like to thank all of them for their generous support of our community and belief in our mission. Specifically, Université du Québec en Outaouais, Interactive Media Institute, City of Gatineau, Fonds de recherche du Québec, Fortified Marketing, Government of Quebec, Greg Fergus, In Virtuo, Kelencontent, Mary Ann Liebert, Inc. Publishers, Maryse Gaudreault, Mental Health Commission of Canada, Strongest Families Institute, Therapy Assistance Online, Thought Technology Ltd., Virtual Reality Medical Center, Virtual Reality Medical Institute and VTRT Solutions.

At this year's conference, we are excited to welcome over 200 participants and speakers from 23 countries. Thank you for taking the time to come to CYPSY23. We appreciate your willingness to share

your research and to be part of the CYPSY community. Your attendance, presentations and input are an invaluable contribution to the conference's success and to our community's future.

CYPSY24 will be held June 24-26, 2019 in Norfolk, Virginia (USA). Please help us celebrate our 24th anniversary by attending! I sincerely hope that you find this year's conference an interesting and intellectually stimulating event, and I look forward to your active participation in the coming years. Together we can all play a part in ensuring a positive future for healthcare!

Create your own reality!

A handwritten signature in cursive script that reads "Brenda K. Wiederhold".

Professor Dr. Brenda K. Wiederhold, Ph.D., MBA, BCB, BCN
2018 CYPSY Conference Co-Chair
President, Virtual Reality Medical Center
Chief Executive Officer, Interactive Media Institute
Editor-in-Chief, CyberPsychology, Behavior & Social Networking Journal
Secretary General, International Association of CyberPsychology, Training & Rehabilitation

Messages for CYPSY23 Chairs & Conference organizers

Welcome to Gatineau! My first words are to acknowledge that the land on which we gather for the CYPSY23 Conference this week is the traditional unceded territory of the Algonquin Anishnaabeg People, also known as the Algonquins. As co-host of CYPSY23, I am pleased to extend a warm welcome to all attendants. The Université du Québec en Outaouais is a leading institution in the field of clinical applications of cyberpsychology tools and we are proud to host the conference. Thanks to the ongoing support of the university, my team and our sponsors, participants will have the opportunity to be immersed during a few days in what I hope will be a memorable experience in this nice location facing the Lac Leamy.

When planning for the conference, we set up four goals: increase attendance to the conference by researchers and students, improve the already high standards of innovation and quality that have been the hallmark of past conferences, host a conference that would be scientifically interesting yet fun to attend, and celebrate the roots and the future of using technologies to foster physical and mental wellbeing. When looking at the program, attendance of early pioneers and bright new minds, registration rates and early feedback from colleagues, I think we have reached our goals.

My first thanks go to the organizing committee (Geneviève Robillard and Catherine Brisebois), who worked with dedication, professionalism, patience, and devotion on all aspects of the conference. I would also like to thank and extend my gratitude to Dr Brenda K. Wiederhold who gave us the opportunity to organize the conference in Gatineau for the third time now. I want to express my sincere thanks to the many volunteers who are giving us a hand onsite. Finally, I must highlight the contribution of all our sponsors, without whom we would not be able to provide such a good conference.

For those interested, here are some facts about the conference. We received 188 submissions, and 168 conferences, symposium, workshops and posters will be presented this year. As I am writing these lines, we have 220 registrations from 23 countries, including 85 students. The cyberarium and the workshops are back on the schedule this year, plus the addition of a full-day and officially commissioned digital arts performance and exhibition, an official morning run and yoga class, and many special social and networking events. The conference is doing its best to be eco-friendly and reduce its ecological footprint by using recycling material whenever possible and reduce the volume of printed documents (e.g., putting the preliminary and full programs online, electronic version of handouts for the workshops). Each and every member of the Scientific Committee (37 people, 40% women, representing 16 countries) reviewed between 5 and 14 abstracts (except a few charitable souls who reviewed 22 and 57 submissions) and each of them being reviewed by up to four reviewers from the Scientific Committee. The first round of reviews was completed before the conference for all 25 Full papers that were received; each of them being reviewed by two to four reviewers from the Scientific Committee. Finally, the committee reviewing the poster was equally balanced in terms of expertise in technology vs clinical applications, quantitative vs qualitative methods, and gender.

I hope that you will enjoy the scientific and social aspects of this year's conference. As you will witness, the field of cyberpsychology is evolving at an increasing pace, thanks to the rigorous empirical work of all our presenters, from the early pioneers to the next generations of scientists, clinicians, and developers.

Sincerely,


Stéphane Bouchard, Ph.D.

Message du Maire

Suite au succès des deux dernières éditions, Gatineau est fière d'avoir été choisie pour la troisième fois comme ville hôte de la Conférence annuelle CyberPsychologie, CyberThérapie et réseautage social.

Au cours de la dernière décennie, le Laboratoire de cyberpsychologie de l'Université du Québec en Outaouais, en collaboration avec la Chaire de recherche du Canada en cyberpsychologie clinique, a acquis une grande visibilité à l'échelle nationale et internationale. Il est aujourd'hui reconnu dans le monde entier pour la qualité de ses recherches et pour son expertise en télépsychothérapie ainsi que dans le développement de technologies de réalité virtuelle pour la prévention et le traitement des troubles de santé mentale.

C'est avec grand plaisir que nous accueillons les 300 experts de multiples disciplines qui participeront à cet événement organisé par le professeur Stéphane Bouchard, qui se tient à nouveau à l'Université du Québec en Outaouais, une institution centrale qui continue d'animer la vie scientifique et intellectuelle chez nous.

Bonnes réflexions et bonne conférence,

Le maire,



Maxime Pedneaud-Jobin

A Message from the Mayor

Gatineau is pleased to announce that, further to the success of the last two editions, it has been chosen for a third time as the host city for the Annual CyberPsychology, CyberTherapy & Social Networking Conference.

Over the past ten years, the Cyberpsychology laboratory at the Université du Québec en Outaouais, in collaboration with the Canada Research Chair in Clinical Cyberpsychology, has gained a great deal of national and international recognition. It is currently known around the world for the quality of its research and for its expertise in telepsychotherapy and the development of virtual reality technologies for the prevention and treatment of mental health disorders.

We are delighted to welcome the 300 experts from various fields who will be participating in this event organized by Professor Stéphane Bouchard. The Conference will once again take place at the Université du Québec en Outaouais, a central institution that remains a driving force in our scientific and intellectual community.

I wish you a most stimulating Conference,

The Mayor

CYPSY24

Norfolk State University
Norfolk, Virginia, USA

June 24-26, 2019



For more information about
Interactive Media Institute's 24th
Annual CyberPsychology,
CyberTherapy & Social Networking
Conference, please visit:
interactivemediainstitute.com or
email cybertherapy@vrphobia.com

CYPSY23 – Call for abstracts

It is our pleasure to invite you to join us at the 23rd Annual CyberPsychology, CyberTherapy & Social Networking Conference. CYPSY23 that will take place on **June 26 to 28, 2018** at Hotel Hilton Lac-Leamy in **Gatineau, Canada**. Jointly organized by the [Interactive Media Institute](#) in collaboration with the [Université du Québec en Outaouais \(UQO\)](#), the [Canada research Chair in clinical cyberpsychology](#) and the [Virtual Reality Medical Institute](#), this conference is an international networking and sharing platform for researchers, clinicians, policymakers and funding agents to share and discuss advancements in the growing disciplines of CyberTherapy, CyberPsychology and Social Networking.

CYPSY23 invites presentations in Virtual Reality, Social Networking, Online Behaviour, Games for Health, Augmented and Mixed Reality, Avatars, Shared Virtual Worlds, Video Game Virtual Reality (VGVR), Mobile Health and other emerging applications.

Encouraged topics include, but are not limited to:

- Addiction to technologies
- Advanced interaction training
- Apps (mobile applications for smartphones, etc.)
- Arts and storytelling using technology
- Brain computer interfaces
- Cognitive and/or physical therapy
- Connected objects / Internet of things
- Cross-cultural differences relevant to cyberpsychology
- Cyberbullying
- Cybercrime
- Cybersecurity
- eHealth
- Embodied experiences and / or body ownership
- Engineering issues applied to cyberpsychology
- Games for health and / or serious games
- Gaming and technology (gameplay, technologies, performing arts, law and politics, etc.)
- Human-computer interactions
- Implications of technologies in humanities (archeology, history, law, etc.)
- Neurorehabilitation
- Non-invasive physiological monitoring devices
- Personality and internet use
- Positive technology
- Presence and / or telepresence
- Robotics
- Smart homes and / or home automation (domotics)
- Social applications of technology
- Social implications of Facebook, Twitter, etc.
- Social networking
- Technology for education and / or learning

- Technology for psychotherapy
- Technology for physical and medical health
- Telehealth and telepresence
- Using technology in education and learning
- Using technology in marketing (neuromarketing, AR, etc.)
- Videoconferencing and / or telepsychotherapy
- Virtual Reality and Augmented Reality in general
- Virtual reality for the film / movie industry
- Wearable computing
- Cyberpsychology and Addictions (related to substance, games, gambling, sex, etc.)
- Cyberpsychology and ADHD
- Cyberpsychology and Anxiety disorders and phobias (including OCD and PTSD)
- Cyberpsychology and Autistic and related disorders
- Cyberpsychology and Cognitive disorders (dementia, etc.)
- Cyberpsychology and Depression and mood disorders (including bipolar disorders)
- Cyberpsychology and Developmental disorders
- Cyberpsychology and Eating disorders
- Cyberpsychology and Neurological diseases
- Cyberpsychology and Obesity
- Cyberpsychology and Pain (chronic and acute)
- Cyberpsychology and Personality disorders
- Cyberpsychology and Phantom limb
- Cyberpsychology and Schizophrenia, psychotic and / or delusional disorders
- Cyberpsychology and Sleep disorders
- Cyberpsychology and Cancer
- Cyberpsychology and Cardiology
- Cyberpsychology and Other medical, psychological or socio-cultural disorder or problem

General Information

Date: **June 26 – 28, 2018**

Venue: **Hilton Lac-Leamy, Gatineau (QC) Canada**

CYPSY23 will be held at the Hilton Lac-Leamy in Gatineau (Québec) Canada. This hotel and conference center is located about 20 minutes by car from Ottawa (ON) and about 2 hours from Montréal (QC). See the [Travel Information](#) section for more information.

About the CYPSY Conference

The CYPSY Conference began in 1996 and featured presentations dealing mainly with conceptual matters, ‘what ifs’ and the future possibilities of healthcare and technology. The conference largely focused on Virtual Reality, but has now grown to be more inclusive of other interactive technologies and to include presentations that demonstrate controlled clinical trials. It has also grown to include the investigation of social networking tools on individual behavior, society, and interpersonal relationships.

Language of the Conference

This conference is held in the province of Québec, where we are proud of our official French language. However, given the international nature of the conference and its main organiser (Interactive Media Institute), English is the official language of the conference. Our staff will be happy to serve you in English and French (and sometimes Spanish and Italian), but all conferences and presentations (including workshops, unless advertise otherwise) will be in English. Questions could be asked in French if a member of the audience is kind enough to translate it. There will not be any simultaneous translation services. Note that some Welcome messages from guest speaker may be in French (e.g., discourse from the Mayor of the city of Gatineau).

Nous sommes très sensibles à l’importance du français, autant comme langue officielle au Québec que pour l’avancement des connaissances scientifiques dans la francophonie. Toutefois, compte tenu de la nature internationale de ce congrès et de l’organisateur principal (Interactive Media Institute), l’anglais sera la langue officielle. Les membres de notre personnel se feront un plaisir de vous servir dans les deux langues, et parfois même plus, mais toutes les conférences et les présentations (incluant les ateliers, à moins qu’un atelier soit offert expressément en français) seront en anglais. Vous pouvez poser des questions en français, mais il faudra alors compter sur la générosité d’un membre de l’auditoire pour la traduire en anglais. Il n’y aura pas de service de traduction simultanée.

Conference Chairs and Organizers



Professor Dr. Brenda K. Wiederhold, Ph.D., MBA, BCB,

BCN 

Conference Co-Chair & Organizer

Interactive Media Institute

Virtual Reality Medical Institute



Professor Dr. Stéphane Bouchard, Ph.D. 

Conference Co-Chair & Organizer

Université du Québec en Outaouais

Chairholder of the Canada research Chair in clinical cyberpsychology

Local Conference Coordinator



Geneviève Robillard, M.Sc. 

Research Coordinator, Cyberpsychology Lab of UQO

Université du Québec en Outaouais

email: cypsy23@uqo.ca T: +1 (800) 567-1283 ext. 2531

Scientific Committee

<p>Mariano Alcaniz, PhD Universitat Politècnica de València</p>	
<p>Philippe Archambault, OT, PhD McGill University</p>	
<p>Rosa María Baños, PhD Universitat de València</p>	
<p>Stéphane Bouchard, PhD Université du Québec en Outaouais</p>	
<p>Willem-Paul Brinkman, PhD Delft University of Technology</p>	
<p>Georgina Cárdenas-López, PhD UNAM</p>	
<p>Laurence Caron, MSc Association Québécoise pour la réadaptation sociale</p>	
<p>Ana-Maria Crétu, PhD Carleton University</p>	
<p>Andreas Duenser, PhD Cognitive Inf. Team, Autonomous Syst., CSIRO</p>	
<p>Jesse Fox, PhD The Ohio State University</p>	
<p>Chris Fullwood, PhD University of Wolverhampton</p>	
<p>Andrea Gaggioli, PhD Università Cattolica del Sacro Cuore di Milano</p>	
<p>Pedro Gamito, PhD Universidade Lusófona de Humanidades e Tecnologias</p>	
<p>Erik Geslin, PhD L3Di UCO Laval</p>	
<p>José Gutierrez Maldonado, PhD University of Barcelona</p>	
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Brenda K. Wiederhold, PhD, MBA, BCB, BCN Interactive Media Institute	
Mark D. Wiederhold, MD, PhD, CPE, FACP, FACPE Virtual Reality Medical Center	

Awards & Honors

At the 23rd Annual CyberPsychology, CyberTherapy & Social Networking Conference (CYPSY23), awards are presented to pay tribute to individuals for their outstanding achievements. This year's conference will feature these awards:

Lifetime Achievement Award

To celebrate two decades of exciting advances in cybertherapy as well as the growth of the CyberPsychology, CyberTherapy & Social Networking Conference itself, we are proud to announce the 14th Annual CyberTherapy Lifetime Achievement Award. This award has a tradition of honoring a person who has demonstrated outstanding lifetime achievements in the fields of advanced technologies and healthcare. It is the highest honor given by our community.

All members of the CyberPsychology, CyberTherapy & Social Networking Conference Program Committee are invited to nominate one of their colleagues as a recipient of this award, which promises to honor a long line of esteemed researchers. This year recipient of the Life time Achievement Award is Professor **Dr Pedro Gamito from the Universidade Lusófona de Humanidades e Tecnologias (Portugal)**. Past recipients include Professor Dr. Stephane Bouchard (2005), Professor Dr. Brenda K. Wiederhold (2006), Professor Dr. Giuseppe Riva (2007), Professor Dr. Cristina Botella (2008), Professor Dr. Hunter Hoffman (2009), Professor Dr. Sun I. Kim (2010), Professor Dr. Mark D. Wiederhold (2011), Professor Dr. Mariano Alcaniz (2012), Professor Richard M. Satava (2013), Professor Andrea Gaggioli (2014), Professor Jang-Han Lee (2015), Professor José Giutérrez-Maldonado (2016) and Professor Rosa Baños (2017). Please see the complete list of the previous years' Lifetime Achievement Award recipients by visiting our website: www.interactivemediainstitute.com. This annual award is sponsored by the Interactive Media Institute (IMI).

CRC-Clinical Cyberpsychology New Investigator Award for a presentation of outstanding research quality

The aim of this prize is to reward the presentation of strong methodological studies at the CyberTherapy, CyberPsychology and Social Networking conference. The recipient must be a researcher who is new to the field of cyberpsychology. It is open to both oral / symposium or poster presentations and to researchers from all countries and disciplines. The award is delivered by Stéphane Bouchard, chairholder of the Canada research Chair in clinical cyberpsychology. It includes a certificate and a check of 1,000 \$ US. The deadline to submit your presentation is **June 18th, 2018**. Further information about the award, including eligibility criteria and the application process [are available here](#). **The winner of this year CRC Award is Bruno Porrás García (University of Barcelona, Spain).**

Young Minds Research Award

To showcase outstanding achievements in a student poster submission to the CYPSY Conference, the Young Minds Research award, sponsored by Mary Ann Liebert, Inc. publishers, are presented to those projects judged to have the greatest potential to contribute to the innovative field of cyberpsychology, cybertherapy, training, and rehabilitation. All posters submitted by student presenters – those who have not finished their PhD program – are eligible to compete for the 250 \$US award. Posters will be judged by the scientific chairs for scientific merit and ease of presentation. To see the complete list of the previous Student Poster Award recipients please visit: www.interactivemediainstitute.com. 2018 winners are: **Marie-Hélène Tessier (Université Laval, Canada)** and **Jason Feinberg (George Mason University, USA)**. They were presented with a cash award and certificate of achievement.

Keynote speakers

We are pleased to announce that we have distinguished keynote speakers confirmed for CYPsy23.



Wijnand Ijsselsteijn, Ph.D. Professor 

Technische Universiteit Eindhoven, Human-Technology Interaction Group (the Netherlands)

Title of presentation: Telepresence: The psychology of closeness and distance

June 26th, 2018 (4:00-5:00pm)

SUMMARY:

Distance, and its counterpart, closeness or immediacy, have direct physical and psychological relevance to the human being. In our embodied interactions with everyday reality, our brains are specifically tuned to objects and organisms that are close to the body. Transgressions of personal space are acutely noted, and objects close to the body take on specific significance as they may directly harm a body's physical integrity or, in the case of tools, may directly enhance a body's physical reach and ability. Closeness in space and time thus signal relevance and potential impact of environmental and social stimuli. In telepresence, media-technology aims to bring distal environments within proximal reach. In doing so, it is bridging some, but not all, determinants of distance. This has profound psychological effects that are not fully understood to date. In this talk, I will use two examples, taken from telemedicine and drone warfare, to highlight the psychological effects of telepresence. Even though these examples seemingly occupy opposite ends of the care-harm spectrum, they share a number of interesting commonalities that will help us unpack the effects of telepresence on empathy and compassion, emotional impact, and decision-making quality.

BIOGRAPHY:

Prof.dr. Wijnand Ijsselsteijn has a background in artificial intelligence and cognitive neuropsychology. He obtained his PhD in 2004 on the topic of telepresence. Since 2012, he is full professor of Cognition and Affect in Human-Technology Interaction at Eindhoven University of Technology (TU/e). He has an active research program on the impact of media technology on human psychology, and the use of psychology to improve technology design. His current projects deal with the ways in which media technology can transform our sense of self and other, can influence prosocial and healthy behaviours, and can promote stress reduction and wellbeing, for example through the use of mediated social touch or affective computing. He has a keen interest in the relationship between data science, AI, and psychology, and works on technological innovations (e.g., sensor-enabled mobile technologies, virtual environments) that make possible novel forms of human behaviour tracking, combining methodological rigor with ecological validity. He is visiting professor at the Jheronimus Academy of Data Science in Den Bosch (www.jads.nl) and is scientific director of the interdisciplinary Center for Humans and Technology at TU/e (www.tue.nl/CenterHT), which explicitly focuses on people- and value-centred perspectives of technology understanding and design. He has published over 200 peer-reviewed academic papers in journals and conferences, and has (co-)edited 10 volumes. His most

recent co-edited book “Immersed in Media: Telepresence Theory, Measurement, and Technology” appeared in 2015.



Mariano Alcañiz, Ph.D. Professor



Universitat Politècnica de València (Spain)

Title of presentation: The Future Fabrics of Reality: Integrating Cognitive Neuroscience and Mixed Reality Technology for Human Characterization

June 27th, 2018 (4:15-5:15pm)

SUMMARY:

In the last two years, technological tools known as Mixed Reality Interfaces (MRI) have appeared on the market, which not only allow user interaction with a virtual environment, but also allow the physical objects of the user’s immediate real environment to serve as elements of interaction with the virtual environment. That is, MRIs are perfect tools to introduce into our reality new virtual elements (objects and virtual humans) that will generate a new reality in our brain. Today, MRIs are the most technologically advanced tools that human beings have used to date to improve their reality and generate artificial realities that improve the reality they live. In the last year, there is an unusual interest in MRI in the ICT industry. That means that MRI will be a revolution in human communication mediated by new technologies, as in the moment was the irruption of the mobile phone. To date, only a very basic aspect of MRIs is being investigated, its ability to simulate our current reality. However, the above question calls for a paradigm shift in current MRI research. It is necessary to advance towards this new paradigm by proposing a basic research scheme that will allow to analyze the influence of individual personnel variables and MRI interaction aspects will have on basic aspects of human behavior. In this talk, we present several examples of how MRI can be used for human behavior tracking and modification, we describe different research projects results and we conclude with a discussion of potential future implications. A special focus will be made in how neuroscience provide guidance for the development of psychological conceptualizations of mental illness and treatment that go beyond a reductionistic biological etiology.

BIOGRAPHY:

Dr. Mariano Alcañiz is Full Professor at the Polytechnic University of Valencia (Spain) and Director of the European Laboratory of Immersive Neurotechnologies (LENI). He is a professor of Biomedical Engineering and has courtesy appointments in Virtual Reality. His research interest is to understand and classify the relevant significance of each aspect of the human activity and how to use this information in computer mediated technologies for enhancing human abilities and quality of life. From a technological point of view, his objectives are to improve interactive technology in virtual environments used at different formats and the development of algorithms, methods and techniques for ubiquitous and non-obtrusive measurement of human activity. His research is being applying in different fields like health, psychology, marketing, human resources, education and training. Dr. Alcañiz has published more than 300 articles in books, journals and conferences. He has been coordinator of various European projects and national research projects related to the area. He is also coordinator of several national R&D programs of excellence. He is the National Program Coordinator of the Information Society Technology (IST) of the Ministry of Science and Innovation of Spain and he is the Spanish representative for ICT area at the Horizon 2020 European Research Program Committee.

He is also member of the executive committee of EURO-VR association. He has been founder of several spin-off companies related with his research field.

JUNE 26th 2018 Program

09:00-12:00 Session Workshop AM-1: Exploiting artificial intelligence through virtual reality and vice versa

Pre-registration is required for workshops (see website)

CHAIR: [Pietro Cipresso](#)

LOCATION: [Morrice](#)

ABSTRACT:

WORKSHOP 1-AM : June 26th, 2018 Exploiting Artificial Intelligence through Virtual Reality and Vice Versa
Pietro Cipresso, FPsyS, CStat, CSci, PhD Senior Researcher Applied Technology for Neuro-Psychology Lab
IRCCS Istituto Auxologico Italiano – Milano Assistant Professor in Psychometrics Catholic University of Milan, Italy

Educational Objectives and Abstract Upon completion of this workshop, the participant will be able to: 1. Build Virtual Environments from the scratch, by using free software 2. Use the Virtual Reality to conduct experiments about human behavior 3. Collect data by using Virtual Reality and the body (BodyPass EU project) 4. Geometrical topology in VR and logging systems for event-data recording 5. AI and Psychophysiology: Nervous System, Endocrine System, and Gene Transcription 6. AI and Exhibited Behavior Patterns (also analyzed by using Microsoft Kinect and cameras) 7. Computational Science, Complex Networks, and Simulations 8. Toward an integrated platform of human behavior simulation: The Petribus model Description: Dr. Cipresso and Colleagues will guide the participants through the enchanted brand new world of emulation and simulation, with the aim to build a culture of human behavior simulation by using virtual reality. The pragmatic path has been thought to drive the participant to understand and build VR for AI and to use AI for VR experiment. The approach will be used to integrate data in virtual environments that can be effectively used for both clinical and research purposes. By fusing data from biosensors and devices interconnected within the VR environments, it is possible to synchronize all these signals with the log of the VR events that the researcher has set to identify experimental conditions as well as unexpected occurrences, incidental findings and all of the behaviors one may wish to analyze. In this sense, VR can be considered a great way to collect quantitative data of people's actual behaviors during realistic situations in simulated environments. In any case, the use of new technologies and new methods can only be driven by a new class of psychologists and psychometricians who rely on the actual knowledge of psychological science as it is at the moment, but also can build new ways of thinking, such as AI-based, about psychological settings, experiments, studies, and, above all, interventions. These capabilities will provide a deeper understanding of human behavior through AI and computational techniques, and lead to improvements in the well-being of humankind. Target Audience: Researchers, non-math experts, non-psycho experts, curious explorer Approach: Formal lecture and practical demonstrations Materials (open access - available for free ... to find them in google is the first step of the course !!):

Cipresso P, & Immekus, J. C. (2017). Back to the Future of Quantitative Psychology and Measurement: Psychometrics in the Twenty-First Century. *Frontiers in Psychology*, 8, 2099. Cipresso P, Matic, A., Lopez, G., & Serino, S. (2017).

Computational paradigms for mental health. *Computational and Mathematical Methods in Medicine*, 2017.

Cipresso P, Bessi, A., Colombo, D., Pedroli, E., & Riva, G. (2017). Computational psychometrics for modeling system dynamics during stressful disasters. *Frontiers in Psychology*, 8, 1401.

Cipresso P, Serino S, Riva G (2016), Psychometric assessment and behavioral experiments using a free Virtual Reality platform and computational science. *BMC Medical Informatics and Decision Making*, 16 (37). DOI: 10.1186/s12911-016-0276-5

Cipresso P, Riva G (2016). Computational psychometrics meets Hollywood: The complexity in emotional storytelling. *Frontiers in Psychology*, 7:1753. DOI: 10.3389/fpsyg.2016.01753

Cipresso P (2015). Modeling Behavior Dynamics using Computational Psychometrics within Virtual Worlds. *Frontiers in Psychology (Quantitative Psychology and Measurement)*, 6:1725. doi: 10.3389/fpsyg.2015.01725

Cipresso P, Matic, A., Giakoumis, D., & Ostrovsky, Y. (2015), Advances in computational psychometrics, *Computational and Mathematical Methods in Medicine*, Article ID 418683. DOI: 10.1155/2015/418683

Cipresso P, Serino S (2014), *Virtual Reality: Technologies, Medical Applications and Challenges*, Nova Publishers, ISBN: 978-1-63321-933-5

09:00-12:00 Session Workshop AM-2: Treatment of posttraumatic stress disorder: From pharmacotherapy to virtual reality

Pre-registration is required for workshops (see website)

CHAIR: [Barbara Rothbaum](#) (CANCELLED)

LOCATION: [Julien-Gagnon-Walker](#)

09:00-12:00 Session Workshop AM-3: Psychophysiological monitoring tool for VR clinical work and research

Pre-registration is required for workshops (see website)

CHAIR: [Jon Bale](#)

LOCATION: [Krieghoff](#)

ABSTRACT:

WORKSHOP 3-AM : June 26th, 2018 Psychophysiological Monitoring Tool for VR Clinical Work and Research

Jon Bale Thought Technology Ltd. Montréal (Québec) Canada <http://www.thoughttechnology.com>

Description: Join this workshop where Jon Bale will review Thought Technology devices for measuring autonomic functioning and how they can be integrated with virtual reality technology. This session will give participants hands-on experience monitoring physiology and psychophysiology, as they examine breathing, heart rate variability, skin conductance, skin temperature, and muscle tension in a variety of contexts. Targeted Audience: Researchers, Mental health Providers Looking for tools to monitor, evaluate or train psychophysiological metrics of performance, anxiety, attention, or calm focus Topics: ADHD, Anxiety disorders and phobias (including OCD and PTSD), Cognitive disorders dementia, etc.), Depression and mood disorders (including bipolar disorders), Health applications (in general), Non-invasive physiological monitoring devices, Pain (chronic and acute), Positive technology and / or positive psychology, Technology for education and / or learning, Technology for psychotherapy, Technology for physical and medical health.

10:20-10:40 Coffee break for workshop attendees

Coffee - Delfosse room

12:00-12:45 Lunch (on your own)

12:45-13:00 Session 1 of opening talks

Welcoming remarks from Conference Chairs and organizers Brenda K. Wiederhold & Stéphane Bouchard.

CHAIR: [Brenda Wiederhold](#)

LOCATION: [Julien-Gagnon-Walker](#)

13:00-15:00 Session Symposium 1: Transformative experience design: Using virtual reality, brain-based technologies and the language of arts to support self-transcendent experiences

CHAIRS: [Andrea -Gaggioli](#), [Alice Chirico](#) and [Bernhard Riecke](#)

LOCATION: [Krieghoff](#)

13:00 [Andrea Gaggioli](#), [Alice Chirico](#) and [Bernhard Riecke](#)

Transformative experience design: Using virtual reality, brain-based technologies and the language of arts to support self-transcendent experiences

SPEAKER: [Andrea Gaggioli](#)

ABSTRACT. SYMPOSIUM CHAIRS: Andrea Gaggioli, Alice Chirico and Bernhard Riecke

There are experiences in life that are able to generate profound and long-lasting shifts in core beliefs and attitudes, including subjective self-transformation [1]. These experiences have the capacity of changing not only what individuals know and value, but also how they see the world. For these

characteristics, transformative experiences are gaining increasing attention not only in psychology and neuroscience, but also in philosophy. From a psychological perspective, transformative change is often associated to specific experiential states, defined “self-transcendence experiences”. These are transient mental states that allow individuals experiencing something greater of themselves, reflecting on deeper dimensions of their existence and shaping lasting spiritual beliefs. These experiences encompass several mental states, including flow, positive emotions such as awe and elevation, “peak” experiences, “mystical” experiences and mindfulness (for a review, see Yaden et al. [2]). Although the phenomenological profile of these experiential states can vary significantly in terms of quality and intensity, they are characterized by a diminished sense of self and increased feelings of connectedness to other people and one’s surroundings [2]. Previous research has shown that self-transcendent experiences are important sources of positive psychological outcomes, including increased meaning in life, positive mood and life satisfaction, positive behavior change, spiritual development and pro-social attitudes. One potentially interesting question related to self-transcendent experiences concerns whether, and to which extent, these mental states can be invited or elicited by means of interactive technologies. This question lies at the center of a new research program – transformative experience design (TED) [3] – which has a two-fold aims: (i) to systematically investigate the phenomenological and neurocognitive aspects of self-transcendent experiences, as well as their implications for individual growth and psychological wellbeing; and (ii) to translate such knowledge into a tentative set of design principles for developing “e-experiences” that support meaning in life and personal growth. More specifically, the TED framework has identified three possible assets that can be combined to achieve this goal. The first strategy concerns the use of advanced simulation technologies, such as virtual, augmented and mixed reality, as the elective medium to generate controlled alteration of perceptual, motor and cognitive processes. The second asset regards the use of the language of arts to create emotionally-compelling storytelling scenarios. The third and final element of TED concerns the use of brain-based technologies, such as brain stimulation and bio/neurofeedback, to modulate neuro-physiological processes underlying self-transcendence mental states, using a closed-loop approach. The central assumption of TED is that the combination of these means provides a broad spectrum of transformative possibilities, which include, for example, “what it is like” to embody another self or another life form, simulating peculiar neurological phenomena like synesthesia or out-of-body experiences, and altering time and space perception. The safe and controlled use of these e-experiences hold the potential to facilitate self-knowledge and self-understanding, foster creative expression, develop new skills, and recognize and learn the value of others. The goal of this symposium is to introduce attendees to emerging research in transformative experience design as well as to explore the theoretical and methodological challenges associated to this topic.

Presentations: - Katerina Stepanova, A framework for studying Transformative Experiences through VR - Andrea Gaggioli, Closing the loop: User-Adaptive Generative Virtual Reality - Alexandra Kitson, Lucid Dreaming as a Lens into Transformative Experience Design for Virtual Reality - Alice Chirico, The Continuum of Self-transcendence: Flow Experience and the emotion of Awe

Name of the discussant: will be communicated later to the conference organizers

References

[1] Miller, W. R., & C' de Baca, J. (2001). *Quantum change: When epiphanies and sudden insights transform ordinary lives*. New York: Guilford Press.

[2] Yaden, D. B., Haidt, J., Hood, R. W., Jr., Vago, D. R., & Newberg, A. B. (2017). The varieties of self-transcendent experience. *Review of General Psychology*, 21(2), 143-160.

[3] Gaggioli, A. (2016). *Transformative Experience Design*. In Human Computer Confluence. Transforming Human Experience Through Symbiotic Technologies, eds A. Gaggioli, A. Ferscha, G. Riva, S. Dunne, and I. Viaud-Delmon (Berlin: De Gruyter Open), 96–121.

13:22 [Ekaterina Stepanova](#), [Denise Quesnel](#), [Alexandra Kitson](#), [Mirjana Prpa](#), [Ivan Aguilar](#) and [Bernhard Riecke](#)

A framework for studying transformative experiences through virtual reality

SPEAKER: [Ekaterina Stepanova](#)

ABSTRACT. Our view of the world forms based on our experiences. Certain experiences can have a strong powerful effect that could transform an individual’s worldview. These experiences are often described as transformative, or in strong cases, pivotal. Such experience can occur when an individual witnesses a powerful natural phenomenon, such as a vast ocean or mountain views, underwater world, or the view of the Earth from space. After admiring the beauty of the world, individual sometimes experience a shift in their consciousness, and adjust their worldview based on the newly received perspective. Such experiences are profoundly positive, but unfortunately very rare and private, and thus difficult to study or reproduce. We are presenting a framework that suggests a method of studying transformative experience through the use of Virtual Reality (VR) technology. The immersive powers of virtual reality can “teleport” the immersant from the lab into a different world, thus providing the researchers with a unique real-time access to these inherently private emotional experiences in a controlled lab condition. In order to understand such complex phenomena we are proposing to describe it as a progression through different stages or levels of the experience, and assess each stage and transition individually.

Our framework outlines the progression of the transformative experience in 3 stages: perceptual dissonance, cognitive shift, and behavioral change. The initial stage is a perceptual experience that is presenting a familiar concept, but from a novel perspective, thus creating a perceptual dissonance. Awe-inspiring experiences often share a common characteristic of perceptual vastness, which is arguably impossible to achieve in controlled lab conditions without the use of VR. This stage can elicit emotional responses, such as awe, that can be measured with a use of physiological measures, e.g. goosebumps (Quesnel & Riecke, 2017). After being faced with a perceptual dissonance an individual will have to intake this information, and either accommodate it, assimilate it, or reject it (Gaggioli, 2016). If accommodation was successful, the experience would move to the stage of the cognitive shift; the individual’s worldview is altered in order to account for the new experience. This stage can be assessed through implicit measures of attitudes, e.g., implicit association test. Transition to the third stage of the behavioral change happens if there was also a dissonance between the new worldview and the individual’s behavior – this process can be explained through the theory of cognitive dissonance. The third stage can be evaluated through observation of behavior both inside VR and after the experience. To illustrate this framework in a specific context we will look at a VR experience design inspired by the Overview Effect – the profound feeling experienced by astronauts observing the vastness and beauty of the Earth from space, that results in a cognitive shift of increased feeling of connectedness and consequently increased pro-social and pro-environmental behavior.

Through an iterative design of a the VR experience, and the use of this framework to assess the progression of a transformative experience, we will be able to identify the key characteristic and triggers in the VR experience that facilitate the progression between the stages of the transformative experience. Understanding how to design for transformative experience in VR will make such profound transformative experiences more accessible both for the researchers interested in studying them as well as for the general public wishing to improve their well-being.

References: Gaggioli, A. (2016). Transformative experience design. Human Computer Confluence. Transforming Human Experience Through Symbiotic Technologies, 96-121. Quesnel, D., & Riecke,

B. E. (2017). Awestruck: Natural Interaction with Virtual Reality on Eliciting Awe (pp. 205–206). In IEEE Symposium on 3D User Interfaces, Los Angeles, CA, USA

- 13:44 [Andrea Gaggioli](#), [Stefano Triberti](#), [Alice Chirico](#), [Pietro Cipresso](#), [Giuseppe Riva](#), [Monica Cameirao](#), [Yuri Almeida](#), [Tatiana Vieira](#), [Luis Eduardo Velez-Quintero](#) and [Sergi Bermúdez I Badia](#)
Inside-out: Conceptual design and prototype of a system for the automatic generation of emotional metaphors in virtual reality
SPEAKER: [Andrea Gaggioli](#)

ABSTRACT. In this contribution, we describe the design and preliminary evaluation of a system designed to generate visual metaphors of emotions according to the user’s affective responses at runtime. In this VR experience, called the “Emotional Labyrinth”, the user walks through an endless maze, whose structure and contents are automatically generated according to four basic emotional states: joy, sadness, anger and fear. These affective states are automatically detected on the basis of cardiorespiratory measures, using the heuristic decision tree developed by Reinville et al. (2006). When an emotional state is detected, different visual metaphors are generated at runtime to portray the elicited emotional responses: for example, the emotional state of sadness is visually rendered as rain; joy is represented by blooming flowers. To unlock the next level of the maze, the user has to solve an “emotional challenge”, consisting in the self-induction of target emotional states, i.e., by thinking about the flowers to induce joy. The difficulty of the next labyrinth is determined by the user’s performance in the emotional challenge. A preliminary study was carried out to evaluate the capacity of the selected emotional metaphors to induce the corresponding target emotion. Four versions of the Emotional Labyrinth, each depicting a different visual metaphor of emotion (i.e., Darkness, Fire; Flowers; Rain), were tested regarding their ability to convey target emotional states, respectively: Fear; Anger; Joy; Sadness. 10 female participants (age range 24-41, M=28.10, SD=4.88) navigated into each version of the virtual environment and filled out ad hoc questionnaires to report their emotional responses (4 VAS on the four target basic emotions), according to a within-subjects design. Physiological measures were also collected. Repeated measures analyses showed that each environment conveyed the target emotion more than other potentially intervenient emotional states. However, the visual metaphors of “fire” induced both fear and anger at a greater extent than other displays. Implications of these findings for the design of self-adaptive emotional content generation systems in VR are drawn.

- 14:06 [Alexandra Kitson](#) and [Bernhard E. Riecke](#)
Going beyond: Lucid dreaming as a lens into transformative experience design for virtual reality
SPEAKER: [Alexandra Kitson](#)

ABSTRACT. Technology is rapidly growing and becoming more present in our daily lives. Yet, rather than being a source of making our lives easier and more fulfilling, technology is being used as a source of escapism and compulsive consumption of information, and this can lead to a loss of meaningful and authentic connection. Authentic connection is important in sustaining positive well-being and relationships. Technologies, such as social platforms aimed at connecting people exist, but are often used superficially and do not provide that meaningful connection people seek. Emerging technologies such as virtual reality (VR) are fundamentally different, unlike smartphones or screens, in the way they can immerse users and have the potential to alter their behaviour and mental state. So, it becomes essential that designers carefully study the implications of VR for its users, and consider the human perspective when creating these experiences in order to keep the human condition intact. Especially in the fields of VR, we are in uncharted territory – a vast amount of applications and content yet with little or no regulation. Without standards and guidelines for effective VR content, we diminish the potential for harnessing this technology for positive experiences and well-being.

Researchers in the past decade have investigated how VR might be used to facilitate transformative experiences, sudden and profound changes in the self-world, by creating novel opportunities for learning and insight [1]. More recently, the human-computer interaction community has emphasized the use of interaction design for promoting positive health and well-being. From this research, the fields of Positive Technology and Positive Computing have formed with the goal of applying a scientific-based approach to designing interactive systems for well-being and positive change. A key challenge interaction designers face is designing for technologies that are purposefully built to foster transformative experiences. One possible way to approach this challenge is to ground VR experience design in real human experiences; there happens to exist a transformative experience that very closely mimics VR – lucid dreaming.

Lucid dreaming is the experience of knowing one is dreaming while dreaming, giving the lucid dreamer the opportunity to control or shape their dream. In terms of transformative experiences, lucid dreaming is similar to VR in that they both have the potential to manipulate bodily self-consciousness, embody another person's subjective experience, and alter laws of logic and nature. Moreover, both lucid dreaming and VR can alter bodily self-consciousness, allow people to embody another, and simulate impossible worlds. Therefore, we can use lucid dreaming experiences as a lens into how to design for VR transformative experiences. One study so far has looked at applying lucid dreaming to VR transformative experience design [2] and one of the new insights gleaned was to incorporate ceremony into the experience. That is, use rituals or preparations designed to ease the user into and out of the transformative VR experience in order to give users time to open themselves mentally for a profound experience and reflect on their shift in worldview after. From this one study, we can see there is much to learn from these somewhat mystical or spiritual experiences of altered consciousness. Yet, much work has to be done in validating the theoretical design implications.

[1] Gaggioli, A., Chirico, A., Triberti, S., & Riva, G. (2016). Transformative Interactions: Designing Positive Technologies to Foster Self-Transcendence and Meaning. *ANNUAL REVIEW OF CYBERTHERAPY AND TELEMEDICINE* 2016, 169. [2] Kitson, A., Schiphorst, T., & Riecke, B. E. (2018). Are You Dreaming? A Phenomenological Study on Understanding Lucid Dreams as a Tool for Introspection in Virtual Reality. *CHI '18* (accepted). Montreal, ON, Canada: ACM. doi:10.1145/3173574.3173917

14:28 [Alice Chirico](#) and [Andrea Gaggioli](#)

The continuum of self-transcendence: Flow experience and the emotion of awe
SPEAKER: [Alice Chirico](#)

ABSTRACT. This paper is sent to be considered specifically for the Symposium “Transformative experience design: using virtual reality, brain-based technologies and the language of arts to support self-transcendent experiences”

When the boundaries between the Self and the others dissolve, people are prone to enter a self-transcendent experience (STE). A recent model (Yaden, Haidt, Vago, & Newberg, 2017) posited that STEs can be placed on a continuum ranging from a low to a higher intensity. Both the optimal psychological state of flow and the complex emotion of awe have been considered as STEs and placed on this continuum. Despite this promising theoretical underpinning their relationship has not been empirically tested yet. Here, we involved 38 participants (20 females) to investigate the relationship between flow and awe as self-transcendent experiences, in response to three virtual environments (VREs) previously validated to elicit awe (i.e., Forest of tall trees, Mountains and the vision of the Earth from outside its atmosphere). We assumed that since flow is a lower intensity STE than awe, it would be elicited at some extent also when people experienced awe, and that the two experiences would be correlated within each VRE. We assessed flow levels (Flow State Scale) and sense of presence (ITC-SOPI) after the navigation of each environment in a within-subjects design. Our results showed that all environments induced high levels of flow and presence. After

Bonferroni correction, we found that only Mountains elicited higher significant levels of Global flow compared to Earth view. Earth view was the lowest-flow conducive scenario. Paired sample T-Test Bayes Factor (BF) showed that Mountain and Forest induced statistically similar levels of Global flow. More, awe and flow resulted significantly correlated, in line with the STE reference model. Overall, dimensions related to self-transcendence showed significantly high correlations in awe and flow. This study provided the first empirical evidence of the relationship between two phenomena, which are so fleeting but so relevant for individuals' wellbeing, health, and mutual connectedness.

13:00-15:00 Session Symposium 2: Supporting digital inclusion of people with intellectual disability or autism spectrum disorder

CHAIR: [Yves Lachapelle](#)

LOCATION: [Julien-Gagnon-Walker](#)

13:00 [Yves Lachapelle](#)

Supporting digital inclusion of people with intellectual disability or autism spectrum disorder: The inclusive technologies action plan #PTI2022 !

ABSTRACT. The transition to the digital society is ongoing and several elements such as the key role of social networks in linking individuals (provision of services from organizations, disseminate information to citizens, source of entertainment, recent data demonstrates that people from Quebec (Canada) possess an average of at least one desktop and two laptop computers at home and that 90% of them have access to the Internet. More specifically in regard to people with disabilities, it appears that technologies promote more equal citizen participation. In fact, research confirms that actions undertaken to promote the use of technologies by people with intellectual disability (ID) or autism spectrum disorder (ASD) have several beneficial effects: development of academic skills and social skills, better time management, ability to achieve new activities contributing to daily life, increased motivation, reduced anxiety, new possibilities for expressing preferences, etc. Those results are encouraging and show that technological interventions specifically tailored to the needs and capacities of people with ID or ASD can not only have positive effects, but also support their digital inclusion process.

However, effective use of technologies by people with ID or ASD requires the development of new skills (use a mouse or a touch screen) or the adaptation of the digital environment (use of an adapted peripheral). Another element of complexity consists in interacting daily with a digital environment common to most citizens but frequently not well adapted to their specific needs.

This new and fast emerging technological era created a digital gap between people with ID or ASD and connected citizens. Moreover, we observe that, like the poorer and less educated populations, a majority of them are unable to make a smooth transition to the digital society. This gap is reflected more specifically in a sense of social exclusion which is called "digital divide or exclusion".

Despite all efforts made in recent years to support people with ID or ASD to access the digital society, we are still struggling to keep up the pace. Thus, several actors feel overwhelmed by the magnitude of the actions to be undertaken and wholeheartedly ask for the identification of a specific targeted set of actions and the sharing of information and knowledge. This problem requires that we undertake social, political, ethical and technological discussions.

In today's society, digital exclusion is an issue that needs to be addressed and it is within this context that we developed the Charter for Inclusive Technologies (# CTI2016) which proposed 10

recommendations of core actions that shall be addressed by all actors of our society. Following on it, we proposed the 2017-2022 Action Plan for Inclusive Technologies - # PTI2022.

The symposium will start with a presentation of the Charter for Inclusive Technologies (# CTI2016) and the 2017-2022 Action Plan for Inclusive Technologies - # PTI2022 that will be followed by 4 presentations illustrating different ongoing projects which address some of those core recommendations.

1. Core actions recommendations for inclusive technologies of people with ID/ASD : A Charter and an Action Plan for Inclusive Technologies ! (Yves Lachapelle UQTR)
2. The STORM projet : Using video game to promote completion of morning routine for children with Attention Deficit Hyperactivity Disorder and Autism Spectrum Disorder. (Dany Lussier-Desrochers UQTR)
3. Use of the Social Robot Among Children With Autism Spectrum Disorder in School and Social Services Organizations : A Pilot Study. (Laurence Pépin-Beauchesne UQTR)
4. The TASA Program: Using the iPad As a Tool to Promote the Autonomy of Adults With Trisomy 21. (Isabelle Simonato)
5. Useful technologies to support parent skills of individuals with ID (Annie-Claude Villeneuve)

13:20 [Yves Lachapelle](#) and [Dany Lussier-Desrochers](#)

Core actions recommendations for inclusive technologies of people with ID/ASD : A charter and an action plan for inclusive technologies !

SPEAKER: [Yves Lachapelle](#)

ABSTRACT. In June 2016, a scientific event gathered more than 150 participants (people with intellectual disability [ID]/ Autism Spectrum Disorder [ASD], decision makers, professionals, stakeholders, etc.) who issued 10 recommendations to promote greater social participation of people with ID or ASD in the digital society. This initiative is aligned with current Quebec's departmental policies and action plans. Moreover, the preamble to the Charter clearly sets the foundation for this approach.

Many legislative documents, such as the « Equals in every respect: Because rights are meant to be exercised » policy (Office des personnes handicapées du Québec [OPHQ], 2009), emphasize the fact that one of today's greatest challenges is to ensure that society strives to best meet the fundamental needs of people with impairments and disabilities. Seeking innovative solutions to these new challenges, the last decade has been marked by a particular interest in support technologies. For people with ID or ASD, this poses the challenge of ensuring their digital inclusion at all levels while ensuring that they are prevented from being abused and aggressed because of their vulnerabilities. Achieving this goal, requires a shared vision, common commitments and a concerted set of actions.

Although necessary, identifying a set of recommendations seemed insufficient to the participants. In fact, Mrs Deleury, Chair of the Commission on Ethics in Science and Technology and Professor Emeritus at the Faculty of Law of Laval University mentioned the importance of coordinating all actions of stakeholders and put in place measures to materialize the principles of the Charter for Inclusive Technologies. Shortly after, the Integrated University Health and Social Services Centres (CIUSSS) announced the creation of a working committee (N=10) and a committee of experts (N=11) and challenged them to develop a five-year action plan specifying actions to be undertaken

to support the implementation of the Charter's recommendations. The members of these committees were selected on the basis of their expertise and complementarity of knowledge.

The work of these two committees was conducted between November 2016 and May 2017. The mandate of the working committee was to develop an action plan for the Charter for Inclusive Technologies from more than 200 recommendations made by the participants. During a provincial consultation. As for the Expert Panel, its mandate was to approve the action plan and ensure its compliance with the 10 recommendations made in the Charter for Inclusive Technologies.

Accordingly, the recommendations were transformed into 10 guiding principles. For each of them, a series of objectives have been identified. These objectives are linked to specific actions and people responsible for their implementation. In addition, the action plan includes 23 goals and 48 actions to support the concretization of digital inclusion for people with ID or ASD. These are spread over a period of 5 years and involve a variety of actors. The implementation of actions related to the action plan will be closely monitored. To do this, a tactical coordination committee has been created. This presentation will present both the Charter and the Action plan for inclusive technologies.

13:40 [Dany Lussier-Desrochers, Annie Martineau, Marie-Ève Dupont, Laurence Pépin-Beauchesne, Annie-Claude Villeneuve, Line Massé and Annick Vincent](#)

The STORM projet: Using video game to promote completion of morning routine for children with attention deficit hyperactivity disorder and autism spectrum disorder

SPEAKER: [Dany Lussier-Desrochers](#)

ABSTRACT. Problem Morning routines are challenging for children with Attention Deficit Hyperactivity Disorder (ADHD) or Autism Spectrum Disorder (ASD; Fombonne & Couture, 2009; Sallee, 2015). Studies show that these people have deficits in executive functions, and particularly with emotional and behavioural self-regulation and working memory (Gagné, Leblanc, & Rousseau, 2009; Hébert, 2015; Réseau national d'expertise en TSA, 2016). For children with ASD or ADHD, these deficits can hinder the realization of the morning routine. Therefore, to support their children, parents must use systematic daily monitoring combined with frequent reinforcement. However, parents report that this kind of supervision is grueling and exhausting (Bimbrahw, Boger, & Mihailidis, 2012; Sallee 2015)

Objectives This pilot study aims the development of a digital solution supporting the completion of morning routine (project STORM). The prototype, played on an electronic tablet, uses video games to help empower children with ADHD and ASD to complete their morning routine. This pilot study describes the users' experience with STORM prototype. The study will attempt to meet the following three objectives: 1. Identify the acceptance level of the STORM prototype, including perceived utility and ease of use; 2. Explore the perception of children and their parents about the effects of using the STORM prototype on the completion of morning routine; 3. Document if the STORM prototype was used on a daily basis according to the proposed approach.

Method The pilot study uses a descriptive mixed design (qualitative and quantitative). Five families (children aged 6-12 who has a diagnosis of ASD or ADHD) are recruited in order to use the STORM prototype each morning for a 2-week period. To meet the first objective, a semi-structured interview is conducted with families (parents and children) before the experiment. Four themes are discussed : 1) family situation; 2) morning routine; 3) past experiences with technologies and; 4) perception of the HERO prototype. The second objective is achieved through a quantitative data collection using the French version of The Before School Functioning Questionnaire (BSFQ) administered to parents before and after the implementation of the prototype (Wilens et al., 2010). The BSFQ documents the challenges encountered for the realization of daily morning routine. Finally, to document the third

objective, a spyware is installed with the game. This spyware collects information about children's playing habits (e.g. tasks realized by the child, duration of the game sessions, moment of use, etc.).

Relevance of the Project and / or Anticipated Benefits The pilot study will be completed in February. Therefore results will be available in March 2018. The research team believes that this project will contribute significantly to the improvement of morning routine and encourage programmers to involve users from the earliest stages of conception. It is also hoped that the prototype will be appreciated by children and relatives.

14:00 [*Laurence Pépin-Beauchesne*](#), [*Dany Lussier-Desrochers*](#) and [*Yves Lachapelle*](#)

Use of the social robot among children with autism spectrum disorder in school and social services organizations : A pilot study

SPEAKER: [*Laurence Pépin-Beauchesne*](#)

ABSTRACT. PROBLEM The use of digital devices in social services and school environment has increased significantly in the last few years. The emergence of this new practice can be an effective tool for intervention that can respond to the various users' needs (Ayres, Mechling, & Sansosti, 2013; Biggs, Carter, & Gustafson, 2017; Nunes et al., 2010). Among the studies, many of them focused on the potential of using technologies (computers, interactive whiteboards, electronic tablets, etc.) to help children with an autism spectrum disorder (ASD) to develop new skills (Chien et al., 2015; Ganz, Hong, & Goodwyn, 2013; Lorah et al., 2013). Recently, some studies have been interested in a new intervention device, the social robot. Even if studies show benefits, few of them analyzed the implementation process or the attitude of professionals toward this technology in school and social services organizations (Conti, Di Nuovo, Buono, & Di Nuovo, 2017; Huijnen, Lexis, Jansens, & de Witte, 2017; Zubrycki & Granosik, 2016).

OBJECTIVE The objective of the project is to evaluate the implementation process of a social robot used in clinical interventions with children with ASD in two different organizations. Three specific objectives were pursued: 1) Evaluate the clinical effects associated with the use of a social robot; 2) Analyze the technical conditions which need to be met in order to facilitate an optimal deployment in schools and in social services; and 3) Document the issues associated with the transformation of professional practices.

METHOD To meet the objectives, a qualitative descriptive design, specifically a case study, was used. The sample comes from two different organizations : a school (n = 5 teachers and 2 stakeholders) and health and social service (n = 5 clinicians). To be included in this research, one of the criteria was that participants had to have used the social robot during interventions with ASD children for at least 1 month. Semi-structured interviews were conducted. Each interview lasted approximately 60 minutes. In January 2018, a thematic and comparative analysis will be realized in order to document the three objectives (clinical effects, technical conditions, impact on professional practices) and verify the similarities and differences between both environments.

ANTICIPATED RESULTS This study is currently underway and results will be available at the end of winter. As anticipated results, we expect to have similar results for both organizations in the benefits of use of this technology for people with ASD. However, the implementation context will be different and the analysis will highlight the specific conditions that we must take into account to promote a successful use of the social robot. Finally, the results will show the impacts of this new intervention tool on the professional practices for both teachers/stakeholders and clinicians. The attitude of these professionals toward this new intervention device will also be documented.

14:20 [*Isabelle Simonato*](#), [*Dany Lussier-Desrochers*](#), [*Claude Normand*](#), [*Alejandro Romero-Torres*](#) and [*Geneviève Labrecque*](#)

The TASA program: Using the iPad as a tool to promote the autonomy of adults with trisomy

21

SPEAKER: [*Isabelle Simonato*](#)

ABSTRACT. Background. Literature suggests that we are now in a digital Age (Bernier, 2013; Centre facilitant la recherche et l'innovation dans les organisations, 2015; Schmidt & Cohen, 2013). For people with intellectual disability (ID), the current shift to digital society is happening faster than their adaptation process. According to studies, the majority of people with intellectual disability are not able to make a successful transition to the digital world (Wainer, Vieira, & Melguizo, 2015; Wei & Hindman, 2011; Zawisza, Kamiński, Jakuczun, & Gładysz, 2013). Major transformations due to the widespread social transition to digital technology hinders the social participation of this population in numerous dimensions of daily life, and in the exercise of their social roles. Thus, suitable support to learn how to use digital technologies is needed and essential for people with ID who want to be full participants of today's society. An intervention program named TASA (Technology At the Service of Autonomy) was developed by the Regroupement pour la Trisomie 21 (RT21; Trisomy 21 Group) aiming to promote the digital autonomy of adults with Trisomy 21 (Down syndrome). The program is offered four days a week since September 2016. Each participant has access to an iPad to participate in and accomplish various daily tasks and activities in areas such as multimedia, cooking, community skills, and active living. The goal is for participants to become at ease and competent with the use of such technology in their daily life. The Université du Québec à Trois-Rivières was enlisted to help with the design, implementation and evaluation of the TASA program.

Aim. This research aims to evaluate the impacts of the program on the evolution of the digital inclusion and participation trajectories of people diagnosed with Trisomy 21, as well as their self-determination, self-esteem and quality of life, using iPad technology.

Method. This participative research study uses a qualitative descriptive design to develop and evaluate the TASA program. Since September 2017, a doctoral student is present biweekly in the organization to support the RT21 team in its implementation and evaluation. The sample comprises four types of respondents: TASA program managers (n=2), educators (n=2), participants with Trisomy 21 (n=20), and a family member for each participant (n=20). Different data collection tools are used with different actors to meet the objectives. A daily diary is recorded by educators, describing the progress of the activities of the day. Observation notes are taken during the two days of the graduate student's presence among participants and educators in the RT21 classroom or on outings into the community. Semi-directed interviews are conducted by the doctoral student with each of the actors. Four interviews are planned for program participants and their family member, two for managers, and three for program educators. A thematic and comparative analysis will be realized in order to document the evolution of the participants in their digital literacy and autonomy.

Anticipated Results. The data collection is in process until September 2018, but preliminary results will be available this spring for the data collected in 2016-2017. It is expected that a trajectory of technology use will reveal three types of digital technology users (beginner, intermediate and advanced), as well as the facilitating and hindering factors to learning and autonomy. More specifically, it is expected that all TASA participants, regardless of their user type, will have new knowledge and skills in using the iPad for greater autonomy, self-esteem and quality of life in the digital Age.

14:40 [*Annie-Claude Villeneuve, Dany Lussier-Desrochers and Marjorie Aunos*](#)

Technologies Promoting Efficient Parenthood Practices for People With Intellectual Disability

SPEAKER: [*Annie-Claude Villeneuve*](#)

ABSTRACT. Background. In recent decades, number of families headed by parents with ID has increased (Desmet, Éthler & Couture, 2013). However, parents with ID may face several personal and environmental risk factors that may affect their ability to ensure the well-being of their children

(Aunos, Feldman & Goupil, 2008). Consequently, those parents need more accessible services adapted to their specific needs to support them in their parenthood. On the other hand, several applications have been developed to enhance independence and self-determination of individuals with ID (Cullen, Simmons-Reed & Weaver, 2016; Lussier-Desrochers & al., 2017). Using technological devices may be a cost-effective, low-stigmatizing and innovative solution to support parents with ID while being consistent with actual promising practices.

Aim. This project is part of a broader research which explores effectiveness of technological devices to support parent skills of individuals with ID. More specifically, the purpose of this preliminary study is to 1) conduct a literature review and thematic analyse of the parental needs of individuals with ID and 2) to identify applications and technologies that could address those specific needs.

Method. First, a qualitative analyse of existing primary research papers about the parental needs of individuals with ID has been conducted. The databases PsycINFO, SocINDEX, Social Services Abstracts, CINAHL, Cairn and Erudit has been consulted to find articles. Additional search strategies have been used such as scanning bibliographies from selected key publications. Articles were identified by combining search terms related to "ID" with terms related to "parenting" and "needs/challenges". The keywords were chosen by using databases' Thesaurus and recommendations of Sandieson, Kirkpatrick, Sandieson & Zimmerman (2010) who expose the most efficient combination of keywords related to ID. A quality assessment has been conducted for all primary studies identified as meeting inclusion criteria using the scoring system for the quantitative and qualitative studies of Kmet, Lee & Cook (2004). Only articles having a quality score over 40% has been kept. Those articles were analyzed using a thematic analysis method (Paillé & Mucchielli, 2016) with the aid of NVivo 11 software. Finally, a review of the applications and technologies currently available on the market has been carried out to document the adequacy of those technological solutions and the parental needs of individuals with ID.

Anticipated result. As this project is currently in progress, the result will be available at the end of the winter. However, analyses will highlight the predominant themes and sub-themes related to the challenges faced by parents with ID. For each of the needs will be associated applications and technologies that have been studied to support their parenthood until now. Those technologies will be described such as the related-cost and benefits for parents and their children. Given that research in this area is beginning, it is possible that there would not be publications supporting the use of technology to respond some of the needs of parents with ID. In this case, recommendations of applications and technologies will be issued and their relevance to the characteristics of parents with ID will be discussed.

Conclusion. The results could demonstrate how extended are the possibilities to support parents with ID by the use of technological devices and could serve as a foundation for future researches exploring effectiveness of technology to support parents with ID. Implementation of technology in intervention could be an interesting solution to ensure the ongoing support needed by those parents, reduce the intrusion into their lives and overcome the lack of accessibility of the actual specialized parenting program. Finally, implementing technology in intervention could ensure adequate response to the needs of their children and, ultimately, their optimal development.

13:00-16:00 Session Workshop PM-1: Virtual reality graded exposure therapy for the treatment of specific anxiety disorders, including combat-related post-traumatic stress disorder and chronic pain

Pre-registration is required for workshops (see website)

CHAIR: [Dennis Wood](#)

LOCATION: [Morrice](#)

ABSTRACT:

WORKSHOP 1-PM : June 26th, 2018 Virtual Reality Graded Exposure Therapy for the Treatment of Specific Anxiety Disorders, Including Combat-Related PostTraumatic Stress Disorder, and Chronic Pain
Dennis P. Wood, Ph.D., ABPP CAPT MSC USN (retired) Clinical Psychologist, Coronado (CA) USA
<http://www.dennispatrickwoodphd.com> The Virtual Reality Medical Center (VRMC), San Diego (CA) USA*
<http://www.vrphobia.com/>

Description: Virtual Reality-Graded Exposure Therapy (VR-GET) is a type of exposure therapy in which a patient learns to manage fears and anxieties related to their traumas in a controlled, simulated environment which is generated using computers and Virtual Reality. VR-GET combines graded VR exposure with meditation and attention control (e.g., noticing distractions, letting them go and refocusing on the task at hand) in combination with autonomic nervous system control using the J & J Engineering Biofeedback System. The Virtual Reality Medical Center has developed, and/or co-developed, Virtual Reality Graded Exposure Therapy with Arousal Control (VR-GET) for the treatment of Chronic Pain and several Anxiety Disorders, including combat-related Post-Traumatic Stress Disorder (PTSD), Agoraphobia, and Fear of Flying. Regarding combat-related PTSD, this diagnosis is a significant problem among United States warriors returning from combat in Iraq and Afghanistan. Several reports have recommended that the Department of Defense and the Veterans Administration should aggressively develop early intervention strategies and programs for preventing and treating PTSD. VR-GET is once such promising treatment for combat-related PTSD. VR-GET has been evaluated in U.S. Military combat veterans diagnosed with combat-related PTSD. These VR-GET treated veterans have been successfully treated. Concerning the incidence of Agoraphobia, one-third to one-half of those in community samples who have panic disorder also suffer from Agoraphobia. In one NIMH sponsorship study, 2.8% to 5.7% of the population sample met criteria for Agoraphobia (<http://www.vrphobia.com>). According to Dr. Brenda Wiederhold, Surveys estimate that Fear of Flying exists in 10-20% of the population. (<http://www.vrphobia.com>). VR-GET literature has reported that this form of Exposure Therapy has successfully treated both Agoraphobia and Fear of Flying. Chronic Pain has also been identified as pervasive. For instance The American College of Physicians recently issued new nondrug guidelines for treating chronic or recurrent back pain, a condition that afflicts approximately one-quarter of adults at a cost to the country in excess of \$100 billion a year. Drug-free pain management is now a top priority among researchers at the National Center for Complementary and Integrative Health. A comprehensive summary of the effectiveness of nondrug treatments for common pain problems – back pain, fibromyalgia, severe headache, knee arthritis and neck pain — was published last year in Mayo Clinic Proceedings (<https://www.nytimes.com/2017/09/11/well/alternatives-to-drugs-fortreatingpain.html?mcubz=0>). VR-GET has been demonstrated as a successful, non-drug treatment for many common, chronic pain diagnoses! Targeted Audience: Mental health Practitioners with a novice to advance level of training and experience. I would request that my workshop be limited to 20 attendees due to the hands-on training that is planned. Approach: I will review the available clinical literature describing the development of VR-GET and the success that VR-GET has had in treating combat-related PTSD, Agoraphobia, Fear of Flying or Aviophobia and Chronic Pain. I will also describe some of the limitations of VR-GET. Through a combination of didactic and experiential training, participants will become familiar with VR-GET. Of note, I will be bringing a VRMC 3 Computer System with me for the Course participants to view and use during the Course. Learning Objectives: 1. Be able to describe VRMC's VR-GET Treatment Model for the treatment of combat-related PTSD, Agoraphobia, Fear of Flying and Chronic Pain; 2. Observe three simulated demonstrations of VR-GET and participate in at least one 6 minute simulated demonstration of VR-GET; 3. Describe DSM-5's diagnostic criteria for PTSD, Agoraphobia, Fear of Flying/Aviophobia and Chronic Pain; 4. Be able to critically analyze VR-GET Literature regarding combat-related PTSD Agoraphobia, Fear of Flying and Chronic Pain.
*Note. This workshop is sponsored by VRMC.

15:00-16:00 Coffee break

Coffee break combined with poster session - Delfosse & Suzor-Côté room

15:00-16:00 Session Ps1: Poster session

LOCATION: [Delfosse & Suzor-Coté](#)

15:00 [Océane Rosay](#) and [Lise Haddouk](#)

Sexual cyberaddictions: Compulsive online pornography use as symptom of addictive personality disorder

SPEAKER: [*Océane Rosay*](#)

ABSTRACT. Introduction:

In the early 2000s, the development of Information Communication Technologies has extensively increased the rise of the pornographic industry. Finding its origins several thousand years ago, pornography seems to have found the ideal multimedia support: the internet. Easy to access, inexpensive, anonymous: online pornography is nowadays commonly used by everyone. With nearly 30,000 views every second in the world, porn has become a societal object in the same way as television, video games or the internet as a whole (Brand & Al, 2016). As such, access to pornography has not only developed, but has been especially trivialized, giving free rein to many societal debates on its effects (V. Estellon, 2014). According to some authors, the use of pornography is constitutive of deviance (Poulsen & Al., 2013) whereas for others its use goes hand in hand with the normal evolution of the mores of the present society (L. Lajeunesse & Al., 2013). Moreover, according to a recent study (Gouvernet & Al., 2016), pornography does not appear to be pathological, nevertheless the effects of its uses deserve more interest. In any case, the compulsive use of pornographic media can become problematic for several users and deleteriously impact the physiological, professional, social and intimacy areas of pathological users.

Problem:

This research engages with the theme of sexual cyber addiction through an exploratory psychodynamic approach study. In previous research, we observed both quantitative and qualitative variations in the use of pornographic media. The present study aimed to highlight sexual cyber addiction under the etiology of narcissistic-object disorder. By analogy with eating disorders, the hypotheses of anorexic expression, characterized by the restriction in the choice of sexual partners and bulimic expression, characterized by an excess in partner sexual choices has been investigated

Methodology:

Population/Sample: etiology of an object relationship disorder has been investigated concerning 4 unattached men between the ages of 23 and 38 with pathological use of pornographic media. They were recruited from DASA (Sex Addicts Anonymous). To verify these hypotheses, transferential and counter-transferential processes were analyzed using a cohort of 4 male adults', members of DASA France, who had been suffering from a compulsive use of pornographic media for several years. The Internet Sex Screening Test (D. Delmonico & Al., 2003) was administered to each of them to assess the degree of their symptoms. Furthermore, a semi-structured face-to-face interview and a semi-directive research video-interview (L. Haddouk, 2016) have been proposed to study subjects. By using these two interview methods (physical and digital presential), modalities of the subjects' object relationships could be highlighted.

Results:

Scores of ISST highlighted significant risks to present problematic sexual behavior on the internet and problematic uses of pornographic medias for all participants. In addition, the analysis of transferential and counter-transferential processes, both through face-to-face and video-interview, revealed serious narcissistic-object conflicts for the participants. Besides, subjects with anorexic expression of the symptom of addiction to pornography appeared more comfortable and less inhibited by tele-consultation than by face-to-face interviews, as if the screen constituted a medium in the

relationship with the researcher. As such, these results are inline with borderline structuring of the personality of compulsive users of pornography. To conclude, the screen proposed in video-interview, (L. Haddouk, 2016) can be the support of a potential space for the emergence of inter-subjectivity.

15:00 [Iryna Rachyla](#), [Soledad Quero](#), [Cintia Tur](#) and [Sonia Mor](#)

Patients' attitudes and adherence towards an Internet-based intervention for adjustment disorders

SPEAKER: [Soledad Quero](#)

ABSTRACT. Introduction: Information and Communication Technologies are part of everyday life. Therefore, their use is not surprising in different fields, including Psychology. More specifically, the use of internet-based interventions has helped to overcome some of the barriers to psychotherapy (such as its elevated cost or time and mobility constraints, among others), without compromising its effectiveness. Nevertheless, the proportion of patients who agree to receive this kind of interventions is significantly lower than in traditional "face-to-face" therapy. Furthermore, one big and current challenge in this field is to reduce the high drop-out rates that occur with this type of interventions. The aim of the present work is to evaluate the expectations of patients with Adjustment disorder (AjD) towards TAO, an internet-based self-help intervention for this problem, and explore whether these expectations affect the patients' adherence to the program. Method: The sample will include participants from a randomized control trial, which is currently in progress (clinicaltrials.gov: NCT02758418), targeted at comparing TAO and a 7-week waiting list control condition. All participants will receive the same intervention program of seven linear modules and will complete Expectation of treatment scale after the first introductory module where the treatment rationale is given. The adherence will be estimated taking into account the number of completed modules by each participant. On the other hand, patients who have used the program at least once but have not completed the post-intervention assessment will be considered as dropouts. Conclusions: Increasing adherence to Internet-based interventions is a key factor in order to make these interventions reach to those people who may benefit from them. The results of this work will contribute to improve the use of internet-delivered interventions. First, the results will provide relevant information regarding the patients' attitudes towards online psychotherapy, and the importance of including components which enable the promotion of positive expectations of treatment. Second, if any relationship is found between expectations and adherence, it would represent an advance in the field of internet-based interventions and could also help to promote their implementation in healthcare settings.

15:00 [Gieun Nam](#) and [Jang-Han Lee](#)

Home-based attentional bias modification training in obese individuals with binge eating

SPEAKER: [Gieun Nam](#)

ABSTRACT. Attentional bias toward palatable food cues plays an important role in increase in food craving and overeating. Especially, obese individuals with binge eating showed more biased processing to food cues than those without binge eating. Regulating attentional bias toward food cues would be important since attentional bias to food cues could be a risk factor in the development and maintenance of pathological eating behavior. Thus, attentional bias modification (ABM) that makes disengagement of attention from certain cues could be effectively applied to obese individuals with binge eating. The effect of ABM on decreasing attentional bias to food cues, food craving, and food intake have been investigated. Also, further research about multiple session training and sustained training effect over time have noticed to improve effectiveness of ABM training. Multiple session ABM training study showed that the training effect was not sustained for the participants who received single-session ABM training but the effect of the training lasted for 24 hours and 1 week after the training for the participants who were repeatedly trained for 5 weeks. That is, more than one training session may be required to improve effect. Hence, if ABM could deliver home-based training program, it has the advantage of the repeated training without the need to visiting laboratory or hospital for each training sessions. Even though online self-training program have limitations such as difficulty in controlling the extraneous variables, but the necessity for

development of home-based ABM training is emphasized because it can help individuals to perform ABM easily and repeatedly without restriction of time or space. Therefore, the purpose of this study is to investigate whether home-based attentional bias modification training could have sustainable effect on changes of attentional bias for high-calorie food cues in obese individuals with binge eating. A total of 11 obese female university students were recruited who had a high body mass index and body fat percentage. They were divided into two groups by binge eating symptoms: obese with binge eating group and obese without binge eating group. The procedure consisted of four sessions: pre-training, training, post-training, and follow-up sessions. At the pre-training session, baseline attentional process to food cues and food intake were assessed in the laboratory. And then, participants completed ABM training sessions twice per week for a month at home by themselves. In the ABM training session, participants completed ABM training based on visual probe task in which pairs of high and low-calorie food cues presented for 200ms. Participants are asked to respond to the probe that replaced either low-calorie (80% of total trials) or high-calorie food cues (20% of total trials). At the post-training session, changes of attentional process to food cues and food intake were assessed in the laboratory immediately after completing home-based ABM training. Finally, follow-up session was performed in the laboratory one-month after the end of training to verify the persistence of training effect. As results, obese with binge eating group showed decreased attentional bias to high-calorie food cues and decreased food consumption at post-training session compared to baseline. However, these effects were not sustained until one-month follow-up session. The results of the study indicate that multiple sessions in home-based ABM training could have short-term effect which did not last until one-month on regulating attentional bias toward high-calorie food cues and food consumption in obese individuals. Also, ABM training may have differential effects whether obese individuals have binge eating symptoms or not. Further studies should demonstrate factors which could improve long-term effect of home-based ABM training in obese individuals according to eating related behavioral characteristics.

15:00 [*Jessica Navarro*](#), [*Priscila Palomo*](#), [*Marcelo Demarzo*](#) and [*Rosa Baños*](#)

An innovative protocol to manipulate the negative body image of obese patients through the "Machine to be another" and its influence on physical activity: a randomized controlled study
SPEAKER: [*Rosa Baños*](#)

ABSTRACT. Introduction: According to the World Health Organization, overweight or obese adults should perform a minimum of 225 to 300 minutes per week of moderate physical activity (PA). Nevertheless, physical inactivity in obese population is very common. The negative body image has been considered a great barrier to not practicing PA in this population. Research suggest that concerns about the self-image are associated with the decrease of PA. In this context, the majority of research that studies the relationship between PA and body image has focused on social physical anxiety. Individuals who feel uncomfortable with how their body appears in front of others try not to perform PA in the presence of other people, for fear of presenting a negative social image. There is a negative relationship between social physical anxiety and PA practice. In addition, the presence of social physical anxiety is related to other variables associated with the PA practice such as, less enjoyment, lack of PA motivation or extern motivation and beliefs of low self-efficacy. To overcome this barrier Virtual Reality (VR) can help obese patients to overcome their difficulties with their negative body image, allowing the exchange of body image (body-swapping). In this context, the "Machine to be another" (MTBA) paradigm is a VR system designed to generate body swapping illusion and "embodiment" of another body. This procedure tries to offer users an immersive experience of seeing themselves in the body of another person, where the user's body is replaced by the body of the performer. Through the head-mounted display, participants see the first-person perspective of the body performer and this perspective is captured by a camera positioned from the point of view of the body performer. Objectives: This study intends to use the MTBA as an instrument of manipulation of body image during the practice of PA in an obese population and analyzed its impact on the experience of a PA task (pleasure and perceived effort) and on variables related to PA practice (anxiety, self-efficacy, motivation and enjoyment). Method: This study will be

performed with 45 obese people aged 18-50 years from Brazil. Participants will be invited to do 15 minutes of static bicycle to the rhythm of a song. Participants will be randomized in two conditions: 1) "Slimmer body" (SB), where participants will perform the PA task embodying a thinner person, and 2) "Own body" (OB), where participants will perform the PA task with their own body. Measures (affect and perceived effort) will be taken every 5 minutes during the PA task. Other measures (anxiety, motivation, enjoyment and self-efficacy) will be taken before and after the PA task. Finally, measures of "embodiment" will be taken. Results: This work is in progress. A mixed ANOVA 2 (inter) x 2 (intra) will be performed for anxiety, self-efficacy, motivation and enjoyment. Repeated measures ANOVA will be applied to check whether there are differences between two conditions (SB and OB) during and at the end of the PA task in affect and perceived effort. Participants in the "SB" condition are expected to show a lower anxiety during the PA task, greater positive affect and lower effort perception than the "OB" condition during the PA task. Participants in the "SB" condition are expected to show a higher increase on self-efficacy, motivation and enjoyment scores than the "OB" condition after the PA task. Conclusions. If results are positive, the use of VR (body-swapping) and specifically the MTBA could be considered as useful tools to improve the PA experience in obese people and consequently increase the practice in this population. Acknowledgments: CIBEROBN is an initiate of the ISCII.

15:00 [Ji-Young Kim](#), [Mooah Lee](#) and [Jang-Han Lee](#)

The effect of early attentional bias modification on attentional bias toward food-cues of binge eater

SPEAKER: [Mooah Lee](#)

ABSTRACT. Binge eaters often showed approach and attentional bias to high-calorie food when they exposure to food related cues. Biased processing to high-calorie food cues related to craving and it could promote eating behavior in the absence of hunger. Therefore, divert bias away from food stimulus by training could be helpful to modulate cue-driven binge eating behavior. The most commonly used training is computerized attentional bias modification (ABM) training that use visual prove task. ABM training involves the presentation of visual food and neutral stimulus pair, followed by a probe which appears in the location vacated by one of the two stimuli. In the ABM training, participants are required to respond to the probe and the probe is always presented in the location of the neutral stimulus. That is, ABM training designed to disengage from food related cue performing visual probe task. The effect of ABM training that could both regulate attentional bias to food cues and decline overeating behavior have discovered. Recently, research about factors that improve effectiveness of ABM have suggested and automatic attributes have noticed as the crucial factor of ABM that could effectively intervention to binge eating behavior. That is, it is important to directly modify automatic and early biased process to palatable food cues since attentional bias to foods that lead to binge eating occurred early, fast, and reflexively outside of conscious awareness. Although previous studies have showed the possibility of ABM for regulating attentional bias to foods, the existing procedure of ABM relatively focused on late and conscious process that difficult to access automatic biased processing. Automatic attentional bias process is known that it could be detected for short period between 200 and 500ms, but precious procedure of ABM training to effectively control automatic attentional bias need to be investigated. Therefore, this study aimed to investigate the procedure of ABM to modify automatic attentional biased process toward high-calorie food cues in binge eaters. Specially, this study compared the effect of exposure duration for stimulus pair (high and low-calorie food cues) in ABM training based on visual probe task. A total of 60 undergraduate participants who have binge eating tendency were divided into two groups according to exposure duration of stimulus pair in ABM training: micro short ABM group (200ms) and short ABM group (500ms). Visual attention to high and low-calorie food cues and food consumption in bogus taste test were measured before and after completing ABM. The results showed that there were significant differences in changes of visual attention to food cues after completing ABM between micro short and short ABM group. Micro short ABM group showed decreased automatic attentional bias to high-calorie food cues and ate less food in bogus taste test

after completing ABM than short ABM group. This result indicates that micro short ABM training which are constructed stimulus exposure duration of 200ms may have effect on modulating automatic attentional bias to high-calorie food cues and food intake. The results of this study suggest the importance of accessing early and automatic properties in attentional bias modification training for binge eating behavior. Future studies are need to examine the effect of repeated training session of early ABM. Furthermore, the lasting effects of early ABM training on both automatic attentional bias to food cues and food intake should be investigated in follow-up assessments.

15:00 [Vincent Lemieux](#) and [Johana Monthuy-Blanc](#)

Virtual comic Korkifaipo: An application of virtual reality in ED primary prevention context

SPEAKER: [Vincent Lemieux](#)

ABSTRACT. Eating disorders (ED) affect more and more young people. The place of school in student's life is important. So, scholar primary prevention program become unavoidable to prevent ED and obesity. Despite the ministerial recommendation, the prevention programs related to common healthy lifestyles focus exclusively on the level of physical activity and food education, without considering the risk to exacerbate ED. Furthermore, most of ED program, don't integrate Quebec School competences. Nevertheless, 1) The inclusion of the latest ED in the DSM-5, binge eating disorder, requires the integration of ED and obesity prevention programs into a student's holistic focus. 2) The best current pedagogy clearly make room for new technologies such as E-learning, etc., guaranteeing of a better chance to increase student motivation. Eventually, an integration of ED and obesity prevention programs using the new technologies allowing to remediate limitations. This study cases aims to present the use virtual comic named Korkifaipo in case to ED primary prevention program among high school students.

The sample of this study is composed by high school students (69 girls and 14 boys) aged between 11 and 14 years old engaged in the veiled prevention program at a high. In the perspective of evaluating the fluctuation of the physical self-perception (PSP) adequately, we used a logbook that the students needed to fill out once a week. On the right page of this logbook, there is an analogical visual scale (Stunkard et al., 1983). This scale had for goal to measure the evolution of the body dissatisfaction. On the left page of this logbook, there is a shortened assessment of physical self-perception (Ninot, 2006) and it has for goal to measure the evolution of the PSP.

During 15 weeks, participants were put in educational situation where the art, theater, french and physical education teacher targeted a protective factor of eating disorders. The art, theater and french teacher use a comics strip as an educational tool. This comic is named Korkifaipo and it only has images. It does not contain dialogues. Plus, at three moments in the middle of the prevention program, during this 15 weeks, participants were immersed in comics using virtual reality. Students were immersed in virtual environments with an MSI GT72 6QE Dominator Pro G laptop [512 GB HDD, Latest 6th Gen, Intel® Core™ i7 processor, GeForce® GTX 980M graphics card, 17.3" Full HD (1920x1080), G-SYNC ready with 75Hz] and an Oculus Rift DK2 head mounted display. At each immersion, students were immersed in the environment of one character. During those immersion, they saw the environment of the character using the first-person perspective. In the first immersion, participants were in the environment of Persona, an anorexic character, in the second immersion, they were immersed in the environment of Naraghi, a bulimic character and in the last immersion, students were immersed in the environment of Mezzo, also a bulimic character.

Using time-series analysis, preliminary results showed that some students had fluctuation of their PSP each time they were immersed. Moreover, by being immersed in the first-person perspective, students can fully understand the character's feeling. Furthermore, verbatim of those meetings can prove it: « he is always sad, I want to know why he always wear a mask » or « When he wears is mask, we don't know what he thinks of, how he feels ». Moreover, students were able to associate their feelings with a character through virtual reality: « I like her. I lived a little bit the same thing »

or « She reminds me, I understand her story's ». In addition to those student's reactions, teachers were unanimous, using the virtual reality has increased the student's motivation for this project.

15:00 [Sylvie Le May](#), [Christelle Khadra](#), [Ariane Ballard](#), [Isabelle Perreault](#), [Jean-Simon Fortin](#), [Mathilde Hupin](#), [Stéphane Bouchard](#), [Melanie Noel](#), [Hunter G. Hoffman](#), [Johanne Dery](#), [David Labbe](#) and [David Paquin](#)

Decreasing recurrent pain and anxiety in medical procedures with a pediatric population: A pilot study protocol

SPEAKER: [Sylvie Le May](#)

ABSTRACT. BACKGROUND: Children with injuries, including burns and fractures, experience severe pain intensity during medical procedures. Current guidelines on pediatric procedural pain management recommend the combination of non-pharmacological and pharmacological interventions to enhance pain management and decrease the side effects of analgesics. Virtual reality (VR) has gained growing consideration as a non-pharmacological method as it engages multiple senses and allows interactions with a virtual world. A single case study assessing the feasibility of a VR intervention via Oculus Rift® in one child of 11 years old with burn injuries during occupational therapy showed a reduction in pain intensity and pain unpleasantness, without any side effects. To our knowledge, no other studies have tested the feasibility of Oculus Rift® for procedural pain management in children with injuries undergoing painful medical procedures.

AIM: The aim of this pilot clinical trial is to assess the acceptability and feasibility of a VR distraction using Oculus Rift® in children with injuries undergoing painful medical procedures. We also plan to evaluate the feasibility of the design and to predict appropriate sample size for a larger-scale clinical trial.

METHOD: Design: Within-subject/crossover study design. Each child serves as his own control and receives both standard and experimental treatment during the same treatment session through a randomized order. Sample and Setting: Convenience sampling of 20 children aged from 7 to 18 years old presenting with an injury to the surgical-trauma outpatient clinics of the CHU Ste-Justine, Montreal, Canada. Interventions. A) Standard care as per the unit's protocol. B) VR distraction through the use of the Oculus Rift® goggles to play a video game. The video game Dreamland was developed by our team with a personalized care content tailored to children to maximize the feeling of immersion and minimize cybersickness, and approved by a team of healthcare professionals in pediatric care. Study proceedings: Medical procedures such as physiotherapy, dressing changes or percutaneous pin removal procedures typically last between 10 to 20 minutes. The duration is divided into two sequences of the same duration (5 to 10 minutes) where the participant receives the same care from the same healthcare professional. For one sequence, only the standard treatment is administered and for the other sequence, children receive the standard treatment in addition to VR distraction in a randomized order. Measures: Pain (NRS) and anxiety (CFS) measures are taken before the treatment session, after the first sequence of the session, and after the second sequence of the session, followed by a measure of nurses' satisfaction level via a questionnaire developed and pretested by the team. The memory of pain and anxiety is then assessed 24h after the procedure. Data is also collected on the occurrence of side effects in addition to the design's feasibility outcomes: participants recruited each month, adherence to study protocol. Data analysis: Quantitative analysis. Mean differences in pain and anxiety scores between the two treatment sequences will be compared using Wilcoxon signed-rank tests.

RESULTS & CONCLUSION: Data collection started on July 10th, 2017. To date, 10 participants have been recruited. We expect to reach the desired sample size by July 2018. Procedural pain management in children remains suboptimal and the importance of developing more effective interventions is required. New technologies can play an important role as non-pharmacological pain management methods, especially since they are becoming inherent parts of children's lives. We

believe that results of this study will ultimately allow improving pain and anxiety management practices in outpatient surgical-trauma clinics by showing that non-pharmacological interventions are feasible interventions, at a relatively low cost, to improve the experience of the child undergoing painful procedures through an innovative approach.

15:00 [Marie-Hélène Tessier](#) and [Philip Jackson](#)

Changing the order of facial action units in pain expressing avatars affects the perceived realism and pain level

SPEAKER: [Marie-Hélène Tessier](#)

ABSTRACT. Introduction. The facial expression of pain encodes the sensory (intensity) and affective (unpleasantness) dimensions of pain. It can be decomposed in terms of Action Units (AUs), the smallest discriminating facial movements. Two groups of AUs are related to the affective dimension: brow lowering (B), and nose wrinkling and upper lip raising (N). Another group of AUs is related to the sensory dimension: orbit tightening and eye lids closure (O). The effect on observers' perception of the temporal order of sensory and affective AUs of pain have yet to be documented to create realistic virtual representations of dynamic pain expression. The aim of this study is to compare the perception of realism and pain in different orders of AUs in pain expressing avatars.

Method. Participants. 45 healthy adults (22 women; 23.6±5.2 years old) were recruited. **Material.** Four avatars were used to create seven videos of dynamic facial expressions: six sequential onsets combining the three groups of AUs (B, N and O) and one synchronized onset. For the sequential expressions (duration = 2800 ms), the onset of the AUs was cumulative with some overlap between the groups. The first group was followed by the onset of the second (at 400 ms) and third (at 800 ms) groups which took place at half of the onset of the previous AUs. For the synchronized expression (duration = 2000 ms), the onset of the three-grouped pain AUs started at the same time. Following the apex of the AUs intensity, all expressions ended by the synchronized offset of AUs. **Procedure.** Participants evaluated the realism of the facial movements of the pain expression and the level of intensity and unpleasantness of the pain perceived, using visual analog scales presented after the videos. The computer task consisted of one block of 112 trials per variable (realism and pain) counterbalanced between participants.

Results. A repeated measures design was used for each variable with the Order of AUs (six sequential and one synchronized) as the within-subject factor. For realism, the ANOVA revealed a significant effect of Order, $F(2.833, 124.648) = 23.080, p < .001, \eta^2p = .344$. Pairwise comparisons highlighted the presence of a group of orders of AUs perceived more realistic (Sequences [BON], [OBN], [ONB], and Synchronized). For pain intensity, the ANOVA revealed a significant effect of Order, $F(3.558, 152.997) = 11.463, p < .001, \eta^2p = .210$. Pairwise comparisons highlighted the presence of a group of sequences perceived more intense (Sequences [ONB], [NOB]). For pain unpleasantness, the ANOVA revealed a significant effect of Order, $F(3.527, 151.658) = 30.061, p < .001, \eta^2p = .411$. Pairwise comparisons highlighted the presence of a group of sequences perceived with a higher level of unpleasantness (Sequences [ONB], [NBO], [NOB]).

Discussion. The order of AUs in the pain expression of avatars affects the evaluation of realism and pain level. A more realistic expression is associated with the onset of the orbit tightening and eye lids closure (sensory dimension) before or at the same time as the nose wrinkling and upper lip raising (affective dimension). Also, a more intense expression is associated with the onset of the frowning of the brows (affective dimension), which occurs last. A higher level of unpleasantness in pain expression is associated with the onset of the nose wrinkling and upper lip raising before the frowning of the brows.

Conclusion. The order of AUs related to the sensory dimension of pain influences only the perception of realism, while the order of AUs related to the affective dimension of pain influences the perception of realism and pain. This finding about the dynamism of pain expression is essential to improve avatar-human interactions.

15:00 [Arina Moraes](#), [Brahim Chebbi](#) and [Line Tremblay](#)

Gross motor skills assessment using Microsoft Kinect

SPEAKER: [Line Tremblay](#)

ABSTRACT. Children who show developmental delay or lower motor skills than expected for their age tend to experience frustration and difficulty in performing physical activities. This reduces their enthusiasm for an active lifestyle. The lack of participation in physical activities directly affects the improvement of childhood health status and quality of life, the advancement of adult health status and the probability of maintaining adequate activity into adulthood. Therefore, an early diagnostic of poor motor skills is very important, because the sooner it is detected the more likely it can be improved or reverted by using instructions and recommendations from a qualified professional. The performance of a fundamental motor skill in early childhood can be investigated using diverse assessment tools. Which one to use depends on the type of test, the context and the availability. Regardless of the type of tool to use to assess the motor skills, all of them involve measurement, i.e. data collection, and evaluation of the information collected. The Test of Gross Motor Development, as known as TGMD, is one of the most common assessment tools found in the literature. The purpose of the TGMD is to measure the gross motor skills of children from 3 to 10-years-old based on qualitative aspects of their performance. The test is a process-oriented test and is used to identify if a child's motor skill development is significantly behind his/her peers' development. Although the classical tests are reliable and useful for motor skills assessment, they have some limitations such as dependence on human observation and high cost to be administrated. Computer-based applications have been widely used in computer science due to their advantages such as immediate feedback, accurate measurements and consistency. In addition, technology has become more advanced and affordable, bringing to the market powerful depth cameras and human motion tracking devices, such as the Kinect sensor, for a low cost. This work aims to develop a reliable computer-based application using Microsoft Kinect sensor to implement the third version of the Test of Gross Motor Development (TGMD-3). The system comprises the Kinect sensor, a contact sensor, algorithms for image processing and algorithms for data assessment. The assessment consists of customized algorithms that verify if the 3D position of the most relevant joints for each skill to be tested varies along time according to the respective performance criteria. The proposed system then returns an immediate feedback to the participant, indicating if s/he passes or fails the selected skill. The experimental phase consisted of administrating the proposed system to implement the TGMD-3 in three different approaches. The first and second experiments intended to test the application's sensibility for determining how well the system detects passes and fails. The last experiment intended to compare the application's results to the classical test results. The experiments were conducted at Laurentian University Ben Avery Gym, in an indoor environment with clear space. The results revealed the computer-based application for assessing gross motor skills is accurate, it shows high levels of agreement when compared to the classical test and it is limited by the space requirements. A plan for the future is to study the psychometric properties of the software using the Kinect sensor and then adapt the assessment algorithms to be used with another depth sensor device to capture 3D body tracking, since the Kinect sensor was discontinued in October of 2017.

15:00 [Gerry Chan](#), [Ali Arya](#) and [Anthony Whitehead](#)

Personalizing the Exergame Experience: A Personality Tailoring Approach

SPEAKER: [Gerry Chan](#)

ABSTRACT. Obesity is linked to many health concerns. One way to combat obesity is participating in regular exercise. Yet, integrating exercise as part of a daily routine can be challenging as it requires a great deal of commitment, effort, motivation, and with the proliferation of modern-day

technology, people are encouraged to be inactive rather than active. Modern technology can afford sedentary behaviours, but can also encourage people to be more physically active. Not all forms of technology afford sedentary behaviours. For example, there is a new generation of video games, called “exergames”, that require players to manipulate virtual objects using a range of body motions and they can be an alternative to traditional non-active games to encourage physical activity and reduce sedentary behaviours.

Exergames are becoming a popular way to motivate exercise participation. Research shows that social exergames are particularly engaging because players experience feelings of cohesion and peer support similar to real-life social activities and organized sports. However, some research suggests that exergames might not be able to maintain exercise interest over the long-term. Growing research evidence suggests that tailoring game content and other players based on individual personality can increase the level of enjoyment experienced in video games which encourage continued play. Although informative, how to tailor game scenarios and other players based on individual player personality are unclear. The goal of this research project is to explore the effects of personality tailoring with respect to game scenario and the personality of other players. We believe that tailoring game scenario and other players to individual personality can encourage continued play, and ultimately enhance exercise adherence.

We conducted a pilot study to investigate the effects of tailoring game scenarios and player preferences based on personality. 10 participants (5 pairs) played virtual Bocce in a closed laboratory setting and completed the intrinsic motivation inventory (IMI), the 10-item personality inventory (TIPI), and a questionnaire consisting of customized items to evaluate the game, as well as, level of social influence one player had on the other. Participant pairs played both competitive (head-to-head) and cooperative (same team) game scenarios. Results showed that player pairs who score high on extraversion and openness particularly enjoyed their game experience together. Yet, player pairs who score high on conscientiousness and openness reported low levels of enjoyment suggesting that they did not enjoy their game experience together. Results also showed that player pairs who score high on extraversion and openness particularly enjoyed playing a competitive game, whereas player pairs who score high on conscientiousness and openness particularly enjoyed playing a cooperative game. With respect to social influence, results showed that player pairs who score high on conscientiousness and openness experienced more positive social interactions in a cooperative game compared to a competitive game. These results have important design implications for motivating continued play. Tailoring game scenarios and other players considering the personality of an individual player can increase or decrease the level of enjoyment experienced between players for determining continued or discontinued play.

In addition to personality-based tailoring, we are currently planning to investigate the effects of other player pairing possibilities such as motivational orientations, as well as the effects of larger groups. To further validate subjective reports, we also plan to collect physiological measures such as heart rate and re-test using a more physically demanding game. Regardless of how a game algorithm assesses the personality of a player, knowing this information helps in tailoring game content and other players in an exergame context that is more likely to increase the level of enjoyment, social interaction and exercise adherence.

15:00 [Changyeol Choi](#), [Joohee Jun](#), [Mingyu Kim](#) and [Kwanguk Kenny Kim](#)

The effects of motion and appearance synchronizations on the cybersickness of human-avatar interaction

SPEAKER: [Changyeol Choi](#)

ABSTRACT. Introduction: Cybersickness (or simulator sickness) is one of important side effects of virtual reality therapy and rehabilitation. Recent research and theory suggests that it is caused by various information mismatch, therefore, the seamless connections between real and virtual world

may be required. However, research on this issue has been limited to the studies of virtual environments, interactions with virtual objects, and virtual reality devices. The impact of virtual avatar on the cybersickness has yet to be rigorously examined. In the present study, we investigated how the cybersickness is affected by interaction with virtual avatar. We compared human-avatar interaction qualities with different motion and appearance synchronization levels between the participants and virtual avatars.

Method: Forty participants (mean age = 23.7, SD = 2.5, 16 females) were recruited for this study. We designed three types of motion synchrony and another three types of appearance synchrony to generate different motion and appearance synchronization levels. The motion synchrony levels were controlled by using different motion capture systems: six camera mocap system – motive, Kinect, and pre-recorded systems; and the appearance synchronizations were controlled by size matched between virtual avatar and participant: 70, 100, and 130% size matching. During each condition of the VR experiences, participants were asked to perform predefined gestures and look their movement through the virtual mirror in virtual room. Each participant was allocated to one of appearance synchrony groups and the sequence of the motion synchrony conditions was counterbalanced across all participants. To measure cybersickness, we used simulator sickness questionnaire (SSQ; 16 item measures but only can measure after each condition), fast motion sickness report (FMS; one item measure and asked their cybersickness in every minute), and postural sway measure (PS; body balance measure on top of balance board after each condition).

Results: Seven participants' PS data were excluded because balance board malfunctions and misleading of participant's instruction. The results suggested that there were significant main effects on the motion synchrony (SSQ: $F(2, 74) = 9.860, p < .001, \eta^2 = 0.210$, FMS: $F(2, 74) = 28.112, p < .001, \eta^2 = 0.432$, PS: $F(2, 60) = 5.238, p < .01, \eta^2 = 0.149$). Participants reported the lower cybersickness according to the motion synchrony levels increasing. The results also suggested that there was effects of the appearance synchronization levels on the PS, $F(2, 30) = 3.871, p < .05, \eta^2 = 0.205$, but no significant effects on the SSQ and FMS (all $ps > .762$). The interaction effect between the motion and appearance synchrony were not significant in the all measures (all $ps > .960$).

Discussion: The pattern of results suggests that the motion and appearance synchrony levels has an impact on the cybersickness of human-avatar interaction. This observation is consistent with previous research on the interaction qualities of virtual environment may have a pivotal role in the cybersickness, and suggested a unique implication that by changing the avatar size the participants' cybersickness can be adjusted. With rigorous follow up studies, these results can be used to reduce cybersickness on the specific VR applications including virtual avatar therapy and rehabilitation.

15:00 [Martin Molin](#), [Emma Sorbring](#) and [Lotta Löfgren Mårtenson](#)

Particip@tion on Internet? Young people with intellectual disabilities and identification processes on Internet

SPEAKER: [Martin Molin](#)

ABSTRACT. Although research on young people's identification processes on the Internet is a growing field, there are few studies that illustrate conditions for young people with intellectual disabilities (ID). Previous studies have shown that young people with ID are worried about being marginalized, and that many in fact are lonelier than other young people. Internet and social networking sites might be of vital importance as a space for exploring alternative and less stigmatized identities. Scandinavian research has shown that a new generation of young people with ID is emerging who have developed somewhat new ways of relating to issues of participation and identity. Mainly these strategies concern the possibilities of expressing alternative self-presentations, which are not necessarily connected to a specific functional impairment or a certain welfare institutional belonging (e.g., special need student or care user). One such strategy can concern

attempts to, in an online setting, present a preferred identity (e.g. that of a hockey fan or a musician), which may differ from their disabled identity, which would be apparent in an offline setting.

A Swedish research project—Particip@tion on Internet? Pupils with intellectual disabilities and identification processes on Internet—aims to describe and analyse how young people (age 16-20) with a mild ID interacts and participate on the Internet. More precisely, drawing upon the perspectives of young people with ID, parents and school staff, we want to study self-presentations, social relations and participation within different kinds of Internet communities. Therefore, the goal of the project is to generate knowledge concerning these complex processes, which could be useful for the nearest surrounding of adults in order to support and help young people with ID with their Internet use. The project comprises qualitative interviews with young people with ID (n=27), parents of young people with ID (n=22) and professionals in special schools (n=17). The transcribed interviews were analyzed, using a thematic content analysis.

A prominent finding in the study concerned the young informants being well aware of both risks and opportunities using Internet and Social Networking Sites. Consequently, the more they interacted with non-disabled peers, the more they experienced negative consequences of Internet use. One conclusion was that these circumstances rather lead to downsizing than upsizing Internet use, and as prolongation, less participation on Social Networking Sites. Although the Internet can be a ‘free-zone’ where the young person can develop social bonds and construct their identity away from adult oversight, parents and professionals are highly present. Young people mostly feel confident but also in no need of support. Professionals and parents do consider the Internet an arena for positive opportunities, but also with risks. The professionals seemed to be more worried about the risks than the parents who state that the opportunities outweigh the disadvantages. For parents, the real risk is described as the risk of loneliness and social isolation. That parents consider the Internet to be an arena for relationships is an interesting change compared to previous research where both parents and professionals are worried about the risks of abuse etc. Overall, the young people with ID are described as a more heterogeneous group by both parents and professionals compared to previous research. Considering young people’s need for autonomy, it is of great importance that parents and professionals balance their level of support depending on the needs of the young person. We recommend that professional practitioners reflect upon the ways that support can be arranged in order to empower young people with ID to participate on the Internet. The experiences of the informants are discussed in a conceptual framework of social identity, participation, sexuality and emancipation.

15:00 [Roxanne Hébert-Ratté](#) and [François Poulin](#)

Facebook user profiles, personality and adjustment in early adulthood

SPEAKER: [Roxanne Hébert-Ratté](#)

ABSTRACT. Introduction: Personality and psychological adjustment have been topics of interest in research on Facebook (FB; Blachnio et al., 2013; Caers, et al., 2013). Links between different components of FB usage (Caci et al., 2014; Gosling et al., 2011) and the personality trait of extroversion have been established in many studies, and the traits of agreeability and openness to experience have also shown to be associated with a higher usage of the virtual platform (Gosling et al., 2011), whereas neuroticism has been shown to be linked to frequency of usage (Caci et al., 2014). On the other hand, the trait of conscientiousness was found to be associated with less FB usage as well as not having a FB account or leaving FB (Ghosh & Dasgupta, 2015; Ryan & Xenos, 2011). Meanwhile, studies on FB usage and depressive symptoms as well as well-being have given rise to contradictory results, whereas studies including anxiety symptoms remain scant.

Objective: To verify the existence of FB user profiles and to link them to different psychological outcomes.

Method: A total of 321 young Canadian adults (60.7% women, $M = 25.37$ years), including 302 FB users, responded to a pen-and-paper questionnaire administered by a research assistant in their home. A hierarchical cluster analysis was performed on 3 FB usage variables: degree of involvement in FB activities, number of FB friends, and time spent on social media. Then, the resulting FB user profiles, as well as a group of non users, were compared on dimensions of personality (Donnellan et al., 2006), symptoms of depression and anxiety (Derogatis, 1983) and well-being (Peterson et al., 2005) using ANOVAs with Tukey post-hoc analyses and chi-square analyses.

Results: Examination of the dendrogram led to the distinction of 3 FB user profiles: Low Investment (34.2% of the sample, distinguished by a lower score on all measures of usage), High Investment with Few Friends (38.4% of the sample, showing a high level of investment and a high amount of time spent on FB but a lower number of virtual friends), and High Investment (27.4% of users, characterized by a high score on all measures of FB usage). Subsequent analyses revealed that the trait of extroversion was higher among participants in the High Investment profile than all other profiles as well as the participants with no FB account and that the level of conscientiousness was higher among the Low Investment profile and non users than the two other groups. Moreover, level of neuroticism was higher in individuals showing High Investment with Few Friends than in those demonstrating Low Investment in FB. As for the adjustment measures, the High Investment users reported higher well-being than the two other profiles, whereas participants in the High Investment with Few Friends profile were more likely (80.2%) to report at least some depressive symptoms compared to participants in the Low Investment cluster.

Conclusions: Our study allowed to bring new light onto the complex reality of FB usage in young adults. By using a person-centered approach, we were able to identify 3 clusters of participants which shown unique relationships with personality and adjustment variables. We were able to distinguish two different groups of highly invested FB users which shown very different outcomes, and to illustrate some of the similarities that can exist between the personality of low FB users and non-users. Together, these results suggest that FB users do not constitute a homogeneous group. Some recommendations for future studies include taking into account the duration of FB non usage, as well as including measures of self-esteem, social support and FB problematic use to better document the diversity of profiles.

15:00 [*Marie-Claude Richard*](#), [*Melissa Baillargeon*](#), [*Anne-Helene Harrisson*](#) and [*Joanie Mercier*](#)
Loneliness and Types of Facebook Use in Emerging Adults
SPEAKER: [*Marie-Claude Richard*](#)

ABSTRACT. Loneliness is increasingly considered to be a public health problem. At the same time, the popularity of social networking sites (SNS) is constantly growing. This paradox raises important issues in community psychology regarding the possible links between these phenomena. In this poster presentation, we present the results of an empirical research project aimed at better understanding the relationships between loneliness and the passive and active use of Facebook in emerging adults. It was hypothesized that more frequent active social use of FB would be associated with less loneliness (H1) and that this negative association would be stronger than that between active non-social use of FB and loneliness (H1a), while more frequent passive use of FB would be associated with greater loneliness (H2). In this prospective study, emerging adults living in Quebec City (province of Quebec, Canada) completed an online questionnaire assessing their use of Facebook (Passive and Active Use of Facebook Measure – Gerson, Plagnol, & Corr, 2017), and loneliness (Échelle de solitude de l'Université Laval - Grace, Joshi, & Pelletier, 1993). Data were collected in early January 2018. Participants were emerging adults ($N=311$; $Mage=22.59$, $SD=2.68$ years; 75.6% female). To test the association between loneliness and types of FB use, a multiple linear regression analysis with the standard method of entry was run. The findings suggest that more frequent passive use of Facebook was associated with greater loneliness in a sample of emerging

adults. Prevention interventions promoting more active use of FB could be developed as a constructive means of fostering supportive relationships in emerging adults.

15:00 [Frédéric Grondin](#), [Anna Lomanowska](#) and [Philip Jackson](#)

Empathy in computer-mediated interactions: A conceptual framework

SPEAKER: [Frédéric Grondin](#)

ABSTRACT. Empathy, or the process by which an individual is able to understand and, to some extent, feel what another individual is feeling, is a crucial component of social interactions. Online empathy, or empathy experienced in online settings, has been associated with prosocial interactions in online social support communities and decreased cyberbullying behaviors. However, recent empirical work shows that self-reported empathic tendencies are lower in online compared to offline social interactions and that the link between empathy levels and social support is six times stronger in person than online. Medical and psychosocial literature pertaining to online interventions yields mixed results, where self-reported levels of empathy among mental health providers are comparable to in person environments despite the significantly lower quantity of interventions taking place online versus face-to-face. Thus, inconsistency in the empirical literature warrants establishing a conceptual framework of online empathy that takes the distinctive characteristics of mediated social interactions into account. An essential aspect of computer-mediated communication involves the amount of filtering of nonverbal socioemotional cues, as empathy is evoked and displayed through both verbal and nonverbal signals. Across a nonverbal richness continuum, a specific medium can be qualified as poor by filtering most nonverbal cues (eg., text-based communication) or as rich by allowing the display of the near integrality of nonverbal content (eg., videoconference and virtual reality). These considerations led to the development of a conceptual framework of online empathy revolving around the adequate perception of nonverbal signals to evoke and display empathy in mediated interpersonal interactions. The framework distinguishes feeling, conveying, and perceiving empathy as distinct steps of the empathic interaction and proposes that a greater portion of nonverbal signals is filtered in mediated interactions relative to face-to-face interactions in each exchange of information between interlocutors. Discrepancies in feeling, conveying, and perceiving empathy that may be present in face-to-face interactions can thus be further exacerbated by the filtering of nonverbal signals. An important feature of this conceptual framework is the consideration of empathy from the perspective of both parties involved in the empathic exchange. The interpretation of empirical data through this framework can generate concrete adaptations of computer-mediated communication to foster empathy, thus contributing to the efficacy of social and medical online interventions. The framework also emphasizes the need to further study the perception of verbal and nonverbal cues in relation to empathy across a range of communication media.

15:00 [Mélanie Paulin](#) and [Susan D. Boon](#)

Getting Even on Social Media: Prevalence of Online Revenge Behaviors Between Friends, Romantic Partners, Coworkers, and Family Members

SPEAKER: [Mélanie Paulin](#)

ABSTRACT. Research on online vengeance illustrates that social media platforms are sometimes used for payback, retribution and punishment. These platforms provide highly accessible opportunities for revenge as they have grown both in popularity and influence over the last decade. Consequently, interpersonal revenge enacted through social media warrants independent attention and identifying the prevalence as well as the relationships contexts in which it is most likely to occur is an important first step to broaden our understanding of these behaviors.

This research assessed the prevalence of acts of revenge on social media in four different types of relationship contexts: between friends, between family members, between coworkers, and between romantic partners. Participants were recruited from a western university and through snowball sampling (N = 930).

A mixed design with two within-subjects factors – 3 role (perpetrator, victim, and observer) by 2 revenge type (control/monitoring and direct aggression) – and one between-subject factor – 4 relationship (coworkers, family, friends, and romantic partners) – was employed. Participants were randomly assigned to one of four relationship contexts and the prevalence of online revenge behaviors was assessed with a series of 17 online revenge behaviors specific to social media platforms, modified from a standardized online cyber dating abuse scale. This final scale captured two types of online revenge behaviors: (a) direct aggression and (b) control and monitoring. When reporting on the prevalence of these behaviors, participants rated how often they had been the victim, perpetrated, or witnessed each act.

Collapsing across relationship contexts, a repeated measures ANOVA revealed mean differences between roles in acts of revenge ($F [1.35, 1183.34] = 799.14, p < .001$). Post hoc tests showed that participants were significantly more likely to report witnessing acts of revenge online ($M = 2.22, SD = 1.03$) than they were to report being either the victim ($M = 1.46, SD = .59; p < .001$) or the perpetrator of such acts ($M = 1.33, SD = .40; p < .001$). Participants were also significantly more likely to report being victim than they were to report having perpetrated revenge ($p < .001$). This finding is consistent with the previous literature which illustrates that participants prefer not to associate themselves with acts of revenge given how negatively these acts are perceived by society.

Additionally, a paired sample t test revealed that control and monitoring ($M = 5.54, SD = 2.21$) is significantly more prevalent than direct aggression ($M = 4.69, SD = 1.74; t = 16.03, p < .001$) when revenge occurs on social media. As direct aggression is more often public than control and monitoring, this result suggests that individuals are generally aware of the potential costs involved when being deliberately aggressive before an audience and prefer to get even on social media through behaviors that are of lower potential cost to them.

Although the prevalence of acts of revenge on social media is relatively low ($M = 1.67, SD = .62$), our results suggest it is higher in some relational contexts than others. A one-way between groups ANOVA revealed significant group differences ($F (3, 868) = 42.42, p < .001$). Post hoc tests demonstrated that revenge on social media is significantly more likely to occur between two friends ($M = 1.95, SD = .63$) than between two coworkers ($M = 1.49, SD = .61; p < .001$) or two family members ($M = 1.46, SD = .48; p < .001$) and more likely to occur between two romantic partners ($M = 1.84, SD = .56$) than between two coworkers ($p < .001$) or two family members ($p < .001$). No other group differences achieved significance.

15:00 [Yasser Khazaal](#)

Smartphone apps and games for mental health: Opportunities and challenges for the near future

ABSTRACT. Mental health services are facing two major challenges: First challenge: Many people with mental disorders do not get the help they need. Second challenge: Most of the assessments and treatments of mental disorders take place in clinical settings outside the patient's environment. Smartphone apps may help to overcome such challenges. The apps are mobile services combining computerized tools and Internet communication delivered "in vivo" .. Apps are potentially able to reach people (appealing potential). They may trigger a potential for behavioural change in a specific time and context opening new opportunities for empowering people in their real life (process for change potential).

According with such promises, a lot of commercial smartphone apps were developed. Most of them however lack a scientific basis or specific validation. There is an important gap between the celerity of the market and the psychiatric involvement in this field. It seems however as shown by an increasing number of studies at hand that the appealing potential is, to some extent, reached by apps for mental health. Furthermore, apps based interventions have been shown to be promising or

effective in some trials (process for change potential). It seems however that adherence in naturalistic settings (engagement) is not good enough which challenges the promises of the smartphone apps potential.

User-centered approaches and engagement processes (i.e. possibly games-based) are particularly important to take in consideration for future developments, Games are possibly helpful for engagement and to promote cognitive and behavioural change as suggested by some randomized controlled studies, including among people with severe psychiatric disorders. Future developments in the field may integrate around user needs and well defined psychiatric and psychotherapeutic objectives and processes by different specialists (i.e. Information technologies, information specialists, other medical disciplines, psychology, mathematics, communication...) able to integrate behaviour change mechanisms, apps technologies, and game-mechanisms in coherent, appealing and engaging tools.

15:00 [Hyunjeong Kim](#), [Jong Ho Lee](#) and [Ji Hyung Park](#)

The empirical study on the simulator sickness due to incorrect IPD problem

SPEAKER: [Hyunjeong Kim](#)

ABSTRACT. Introduction: One of the important causes of simulator sickness (SS) is misalignment both individual inter-pupillary distance (IPD) and a head-mounted display (HMD) configuration. Several researchers studied the relationship between human's IPD and HMD configuration. However, these studies could not apply personalized IPD, and might be reflected subjective opinions. We proposed an experimental design that adjusts the HMD's inter-ocular distance and inter-screen distance (IOISD) based on the individual IPD. The goal of the current study was to investigate empirically the variations of SS by the differences between individual IPD and HMD's IOISD.

Method: We developed a program which could coordinate the IOISD based on individual IPD. In accordance with the interval between IOISD and IPD, the task was composed of five conditions: Baseline (B), Baseline + 2mm (B+2), Baseline + 4mm (B+4), Baseline - 2mm (B-2), and Baseline - 4mm (B-4). Baseline means the condition which is same both individual IPD and HMD's IOISD. Twenty participants were recruited, and required to watch a dizzy video in every 5 minutes. During watching the video, participants were asked to rank their perceived degree of SS using fast motion sickness (FMS) verbal ratings from zero to twenty every minute. After watching video, participants immediately filled in the simulator sickness questionnaire (SSQ) which consist a 4-Likert scale.

Results: We conducted repeated measures analysis of variance (ANOVA) to investigate the relationship of SS. SSQ total score showed a statistically significant difference ($F[4, 84] = 5.875, p < .001, \eta^2 = .219$). Our analysis found that the B condition ($M = 19.2, SD = 18.1$) induced the lowest score of SS, followed by the B-2 ($M = 23.3, SD = 21.2$), B-4 ($M = 29.8, SD = 31.1$), B+2 ($M = 34.2, SD = 31.4$), and B+4 ($M = 40.5, SD = 45.0$) condition. We also analyzed SSQ subscores for nausea, oculomotor, and disorientation. Nausea-related subscore showed a statistically significant difference in five conditions ($F[4, 84] = 3.147, p < .05, \eta^2 = .130$). We found also significant differences in oculomotor-related subscore ($F[4, 84] = 7.623, p < .001, \eta^2 = .266$), and disorientation-related subscore ($F[4, 84] = 4.710, p < .005, \eta^2 = .183$). In addition, the average of FMS scores of each condition were used to find differences of five conditions, and it showed a statistically significant main effect ($F[4, 84] = 5.994, p < .001, \eta^2 = .222$).

Discussion: This research verified that human felt less SS when the disparity between the individual IPD and the HMD's IOISD was smaller. The SSQ score was the lowest in the B condition and highly increased by 111% in the B+4 condition. Some participants complained of discomfort of double vision or diplopia in B+2 and B+4 condition. Conventional HMDs have fixed configuration or can adjust only lenses. Many people have complained that their eyes abnormally rotated outward

(divergence) or inward (convergence) when they used HMD according to online forums. This study suggested that HMD should be adjustable both lenses (IOD) and the screen (ISD) to prevent misalignment error.

Conclusion: We investigated the relationship between incorrect IPD issue and SS using new experimental design. We verified incorrect IPD induced more visual discomfort, and the smaller discrepancy between the individual IPD and the HMD's IOISD induced less SS. We hope this research will be an important contribution to reduce SS, and becomes a guideline for HMD users and designers to use virtual reality.

15:00 [*Christopher Stapleton*](#) and [*Jim Davies*](#)

Transcending time and space for human connection, mixed reality & imagination addressing isolation on Earth and deep space exploration

SPEAKER: [*Christopher Stapleton*](#)

ABSTRACT. Language and telecommunications have been able to help mankind transcend time and space to connect with our loved ones. Reading a letter from a deceased relative; calling a spouse deployed around the world; a senior citizen catching up on a family's life by following them on social media. Without this communicative ability, the deprivation of human connection and social engagement can transition into the ill-effects of isolation. How will this intuitive interaction between imagination and media be enhanced or disabled by the implementation of virtuality? This paper covers continued research of mixed reality and the relationship between media and the imagination with story creation. Exploratory research with the therapy community and the space program is starting to inform this next generation of social connection with cyber-cognition.

Telecommunications has transformed our lives by how it expands the imagination for us to be tele-present across former geographical and temporal limitations. It has also brought unexpected social consequences. The distraction of a cell phone call can distract our attention and threaten our lives. Social media can undermine our democracy. Senior citizens can be cut off from society with the digital divide. As a society, we are more technically connected than ever, yet there is a growing epidemic of social isolation that has been deemed as harmful to public health as obesity. There are essential factors that are missing with the current media technology.

We are starting with exploring how to enhance life participation for stroke victims suffering from Aphasia and expanding its application to validate this technique to also address isolation for astronauts.

Isolation & Aphasia: Aphasia is a loss of language due to a stroke, which causes isolation. It is a proxy for astronauts in deep space being deprived of human connection and social engagement. In addition, it impairs people from being "lost in a book," or lost in their imagination through a storytelling with language.

Life Participation Approach to Aphasia (LPAA) provides community outlets that invite People with Aphasia (PWA) into social activities that improve natural abilities while supporting disabilities for improved human connection and social engagement.

StoryTrove is a LPAA activity, which is a box of story-provocative artifacts that reveal a story beyond words to be interpreted by the participant. This is preferably done as a group in a gossip-like conversation that stimulates vivid stories within the imagination.

Conversational Story Creation leverages our inherent talent for gossip to take turns being storyteller (expressive imagination) and story-listener (empathetic imagination) to get lost in our imagination

through the creation of a story as a group conversation. This engagement transforms the story experience from a passive, lonely trance into interactive group “dance.”

StoryTrove Therapy Research is focused on how this emerging form of story experience is expanding PWAs and typical participants to increase human connection, social engagement through exercising the imagination. The results will lead to new forms of stimulus, measure and analysis that can transfer into virtual and tele-therapy.

What features of communication content will facilitate better human connection and social engagement to create significant and persistent memories for loved ones that are millions of miles away? How will available empirical measures might be brought to bear in the scientific and artistic exploration of this problem? With an understanding of what Mixed Reality can achieve, we can begin to design communication methods and content conventions to test the theory. We will present innovative outcomes of these “StoryTrove” and other emerging Mixed Reality applications that are being applied to community venues such as libraries, museums, schools, clinics, entertainment centers as well as for habitation in deep space.

15:00 [Claudia Picard-Deland](#), [Arnaud Samson-Richer](#), [Julianne Chénier](#), [Tyna Paquette](#) and [Tore Nielsen](#)

Learning to fly in virtual reality: The effects of targeted memory reactivation during REM sleep on procedural learning

SPEAKER: [Claudia Picard-Deland](#)

ABSTRACT. Offline reactivation of newly encoded memories is a central process by which sleep contributes to memory consolidation. These neural ‘replays’ occur spontaneously during both rapid eye movement (REM) and non-REM (NREM) sleep, and it has been suggested that dreaming also plays an active role in memory improvement. A growing body of research has shown that these neural replays could also be artificially triggered by replaying an auditory stimulus associated with prior learning, known as targeted memory reactivation (TMR). Our pilot study aims to enhance procedural learning of a VR-flying task with TMR, specifically by presenting task-associated tones during REM sleep. A total of 14 healthy participants (22.33 ± 3.68 yrs old; 12 F) took part in a procedural VR task prior to and following a polysomnographically-recorded morning nap, during which the tones were either replayed (N=9; stim group) or were absent (N=6; control group). Our procedural task (built with Unity 3D) uses the VIVE room-scale system and involves flying in a virtual environment and accumulating points by efficiently passing through a circuit of rings, to engage vestibular and motor systems. Performance was calculated as the number of successfully reached rings, divided by the time to complete the circuit. A mixed-design ANOVA with time (pre-, post-nap) as within-subject factor and group (control, Stim) as between-subject factor revealed a marginally significant interaction between time and condition, $F(1,14)=3.292$, $p=.091$, $\eta^2=.190$, with a higher increase in performance for the Stim group after the morning nap, $t(14)=-2.544$, $p=.025$, while the two groups did not differ in their performance prior to the nap, $t(14)=-1.152$, $p=.269$. These results, although preliminary, suggest that TMR during REM sleep could influence sensorimotor skill performance, presumably by reactivating neural circuits that were formed during the VR-task learning. Future studies will aim to confirm the present results with a larger sample size. We will also assess how an immersive VR-flying experience is incorporated into dreaming processes and whether these incorporations are associated with procedural improvement. Moreover, analyses of sleep micro and macro structure measures will provide more precision on these findings. This study may help develop new sleep-based methods using VR for enhancing, optimizing and rehabilitating balance and motor memory.

15:00 [Ivan Moser](#), [Sandra Chiquet](#), [Sebastian Strahm](#), [Fred W. Mast](#) and [Per Bergamin](#)

Group decision making in multi-user virtual reality and video conferencing

SPEAKER: [Ivan Moser](#)

ABSTRACT. Head-mounted displays enable social interactions in immersive virtual environments. However, it is yet unclear whether the technology is suitable for collaborative work between distant group members. Other communication technologies such as online chat tools or video conferencing systems have repeatedly led to poorer group performance compared to face-to-face interaction. It has been argued that lack of social presence and increased cognitive load might be responsible for these results. The use of a multi-user Virtual Reality (VR) system can help to overcome some of these limitations. Multi-user VR enables users to convey spatially directed, non-verbal behavior (i.e., selective gaze and gestures), which was shown to be beneficial for group performance. Moreover, the entire visual field is taken by the VR display, thus allowing to reduce extraneous cognitive load by means of controlling task-irrelevant stimuli. We set out to compare multi-user VR, video conferencing, and face-to-face interaction in terms of collaborative performance in a group decision task. Furthermore, we examine whether performance is influenced by the feeling of presence, social presence, and cognitive load. Using the hidden profile paradigm, we have started testing small groups of three participants, who are working on a personnel selection case. In the hidden profile paradigm, each participant receives an individual information set containing shared and unshared information about four fictional candidates. The correct (i.e., most favorable) candidate can only be identified if sufficient unshared information is exchanged during the subsequent group discussion. The groups are randomly assigned to discuss the alternatives in a multi-user VR environment via virtual representatives (i.e., avatars), in a video conference, or in a face-to-face setting. Data collection (approx. 150 students) is currently ongoing. Consistent with previous research, we expect poorer performance of the video conferencing system compared to the face-to-face condition. In contrast, we expect better performance in the VR condition, presumably comparable to the face-to-face condition. We will present preliminary analyses and discuss our findings with respect to the potential of multi-user VR as a tool for online collaboration.

15:00 [Elisabeth Beaunoyer](#) and [Matthieu J. Guittou](#)

Virtual communities for health purposes in the elderly: Challenges to implementation and evaluation

SPEAKER: [Elisabeth Beaunoyer](#)

ABSTRACT. With the aging of the population, new strategies must be developed to adequately answer the growing health needs of the elderly. Virtual communities targeted to older adults may represent interesting tools, ranging from providing health-related information to operating preventive programs, or simply reducing social isolation and thus increasing the quality of life of the elderly. Developing and maintaining efficient health-oriented virtual communities is a valid public health strategy if they demonstrate sufficient health benefits for users. However, while this idea is theoretically appealing, the actual process might be relatively hard to operationalize and to evaluate. Generally speaking, several factors should be taken into consideration in the designing process and the evaluation of virtual communities. Indeed, the design of eHealth strategies aiming at developing or supporting communities targeted to elderly population bears generic issues shared with any eHealth virtual community (e.g., user engagement, participation, and acceptance). Furthermore, it also bears additional challenges related to the specificities of the targeted population – the elderly. Among these population-related issues, we should keep in mind the degree of health literacy, the potentiality of engagement in the virtual community by older adults, or potential limitations related to access to care or the presence of (age-related) disabilities. Once designed, evaluation is critical to accompany and support the implementation and large-scale growth of the community. The factors to consider for the evaluation of an online health intervention include patient health outcomes, match to clinical processes, clinician's and patient's satisfaction, and cost-benefits analyses¹. A strategy of evaluation of online health material – particularly when targeted to vulnerable population such as the elderly – should also include tools for readability, sentiment analysis, understandability, usability, as well as rely on regular qualitative assessments by and of the target population². In conclusion, the optimal development of health-oriented senior-targeted virtual communities will require a holistic

approach taking into consideration the specificities and the unique needs of this population. After the initial implantation steps, appropriate evaluation using mixed approach tools will be instrumental to the continuous enhancement of the support potential of this health-oriented communities, and to insure long-term adhesion of the participants to the interface. Such integrated approaches will be necessary for significant positive impact on elderly health to be reached with eHealth strategies.

¹ Beaunoyer, E., & Guitton, M. J. (2017). Effective Use of Virtual Communities for Health-Purposes in the Elderly. In El Morr, C. (ed.). *Novel Applications of Virtual Communities in Healthcare Settings* (pp. 127–146) . Canada: IGI Global.

² Beaunoyer, E., Arsenault, M., Lomanowska, A. M., & Guitton, M. J. (2017). Understanding online health information: Evaluation, tools, and strategies. *Patient Education and Counseling*, 100(2), 183–189. <https://doi.org/10.1016/j.pec.2016.08.028>

15:00 [Hang Chu](#), [Shasha Pang](#), [Mark D. Wiederhold](#), [Brenda K. Wiederhold](#), [Li Yan](#) and [Yan Lu](#)
Improving the Visual Acuity and Visual Performance in Glaucoma Patients with an Augmented Reality Push-pull Model
SPEAKER: [Hang Chu](#)

ABSTRACT. Introduction: To explore the relationship between binocular inhibitory topography and visual field defects in glaucoma patients. The relationship between binocular contrast attenuation and visual acuity, and the preliminary connection between various sensory deficits and visual nerve pathway defects, can further identify the brain visual defect sites in glaucoma patients. The learning zone of the sensory training threshold, in combination with clinical treatment methods, achieves the goal of controlling the condition of glaucoma patients and even improving their visual quality through the neuroplasticity training of the binocular visual function push-pull model. Method: Fifty-five patients with glaucoma underwent the following basic ophthalmologic examinations, including uncorrected and corrected vision, slit lamp, intraocular pressure, fundus photography, OCT, visual field, CT or MRI of the head to exclude intracranial lesions, followed by brain visual function tests. Long-term neuroplasticity treatment was applied for 3 months. During treatment patients returned to the hospital for review, reassessment, and data acquisition. Result: After 3 months of long-term visual neuroplasticity treatment, 27 (77.14%) patients had visual acuity improvement of 1-2 lines. 35 patients had no stereopsis before treatment, and after training, 21 patients (60%) recovered stereopsis. Conclusion: By combining the dynamic stereo augmented reality model, the binocular suppression topographic map model, and the contrast push-pull model, most patients achieved stereoscopic visual function enhancement and visual acuity enhancement, suggesting that the above models can temporarily activate retinal cell function in glaucoma patients.

15:00 [Wei Shi](#), [Hang Chu](#), [Shasha Pang](#), [Mark D. Wiederhold](#), [Brenda Wiederhold](#), [Li Yan](#) and [Li Li](#)
Dynamic Stereopsis in Children with Cataracts after Cataract Surgery
SPEAKER: [Wei Shi](#)

ABSTRACT. Introduction: To study the binocular-ocular vision in patients with pseudophakia eyes, focusing on the direction of coarse stereopsis, and to explore the relationship between residual binocular vision at the level of the visual pathway of the central nervous system using augmented reality display technology.

Method: A total of 37 children with artificial phakic eyes aged from 4 to 14 years old, 25 males and 12 females were selected from December 2015 to February 2017. They were all undergoing intraocular lens implantation due to congenital or traumatic cataracts (right Eye 11 cases, left eye in 13 cases, both eyes in 12 cases). Routine three-stage visual functions were tested and functions of the brain-vision biological model (stereopsis of structure from motion, large-scale second-order stereopsis) were measured at 1 week, 1 month, and 3 months after surgery. In the stereopsis examination, the biological model used the LG2343P 3D polarized display, and a new algorithm to

generate brain vision-related biologic stimuli. The patients were viewed under binocular vision, and the results of the examination were recorded to analyze the data.

Results: Most of the 37 patients suffered from loss of conventional visual function in both eyes. Bio-model results showed that there was residual dynamic stereopsis (large-cell M-channels) in 10 cases and residual large-scale second-order stereopsis (small-cell P-channels) in 27 cases.

Conclusion: The binocular visual function defect is serious in children with pseudophakia eyes. The residual coarse stereoscopic biological model can be used to measure the high-energy stereopsis of patients with clinical phakic eyes. The defects of large-cell M-channel (motion and depth, stereopsis of structure from motion) is more severe than the loss of small cell P channels (colors and shapes). Our findings suggest new avenues for individualized perception therapy using augmented reality technology.

15:00 [Bing Wang](#), [Hang Chu](#), [Shasha Pang](#), [Mark D. Wiederhold](#), [Brenda K. Wiederhold](#), [Ying Zhi](#) and [Li Yan](#)

The Relationship between Amblyopia, Spatial Resolution and Binocular Visual Perception Eye Position in a Pediatric Population

SPEAKER: [Bing Wang](#)

ABSTRACT. Introduction: The type of amblyopia is usually classified according to visual resolution. This paper investigates the relationship between the type of amblyopia and binocular eye position and spatial distortion topography. We explore the correlation between visual impairment of binocular vision and control deficits in the central nervous system. Clinics provide new evidence and methods using augmented reality technology.

Methods: A total of 109 amblyopia patients aged 4-17 years were selected. Polarization was performed on a 3D computer screen to generate binocular vision, one eye was visually fixed, and the other eye was visually measured as the binocular perception overlapped. The binocular visual perception eye position model and international standard visual acuity table were used to measure the specific performance of each visual function of the patient. The amblyopia level was classified according to visual acuity: 0.2-0.5 for moderate amblyopia, and 0.6-and above for mild amblyopia. The visually perceptible eye positions are classified according to the offset amount: 0.4 degree or less is a type, 0.4-2.0 degree is a b type, and 2.0 degree or more is a c type. Twenty-four cases of amblyopia patients aged 4-17 years were selected for spatial distorted examination. The examination method was as follows: 3D polarizing display (D2343p, LG) was used, the resolution was 1920×1080, and the screen size of the monitor was 51cm×28.7cm. The stimulating image size is 51cm*29cm, the viewing angle is 38deg*18deg, the cross size is 0.33deg*0.33deg, the size of the circle is 0.4deg*0.4deg, and there are a total of 36 circles with a uniform division of 3.6deg from the center, 4.4deg, 5.2deg on three circles.

Results: (1) There were 60 patients with moderate amblyopia and 49 patients with mild amblyopia. There was no correlation between binocular visual acuity and perceived eye position shift in amblyopic patients ($t=0.620$). There was no correlation between perceived eye position shifts of moderate and mild amblyopia ($t=0.669$). In moderate amblyopia, class a accounts for 36.6%, class b accounts for 43.4%, and class c accounts for 20% of patients. Among the mild amblyopia, class a accounts for 20.4%, class b accounts for 65.3%, and class c accounts for 14.18% of patients. There were 12 patients with moderate amblyopia and 12 patients with mild amblyopia. There was no significant difference in deviation distance (pixels) and deviation angle (degrees) between the small circle, middle circle, and great circle among patients with moderate and mild amblyopia ($P>0.05$). The deviation distance and deviation angle of the patients with moderate amblyopia at the small circle were 26.89 ± 27.02 and 39.6 ± 3.71 , and they were 27.20 ± 21.47 and 4.12 ± 3.85 at the middle circle, and 25.92 ± 24.99 and 2.79 at the great circle respectively. ± 2.72 , overall 26.95 ± 24.12 , 3.77

± 3.31 . Patients with mild amblyopia had 20.25 ± 14.16 and 3.74 ± 2.367 offset distances and angles respectively. In the middle circle, they were 19.26 ± 13.55 and 2.75 ± 1.61 , respectively, and the great circles were 19.60 ± 14.45 and 2.36 ± 1.75 , respectively. The overall values were 19.70 ± 13.92 and 2.95 ± 1.98 , respectively.

Conclusion: Binocular visual acuity shift and amblyopic binocular spatial resolution are not a defect-related pathway. There is no correlation between visual acuity classification between perceived amblyopia types and spatial topography. Ambiguity eye position abnormalities exist in different spatial resolution states of amblyopia (normal values below 0.15 degree). Perceivable eye position shifts and abnormalities are potentially related to unstable binocular fixation and ocular fixation abnormalities. Therefore, neurological deficits in amblyopic patients are not only manifested in abnormal spatial resolution, but also manifested as binocular fixation and stability. These findings were accentuated by using augmented reality technology. Discovery of this type of defect provides a new perspective and classification model for the diagnosis and treatment of amblyopia.

15:00 [Frédéric Morasse](#), [Evelyn Vera-Estay](#) and [Miriam H. Beauchamp](#)

Measuring social skills with virtual reality: A validation study focussing on moral reasoning

SPEAKER: [Frédéric Morasse](#)

ABSTRACT. Introduction: Adequate social abilities are critical to an individual's capacity to develop and form lasting relationship and interact with peers. Although several factors are important for the development of social competence, moral reasoning (MR) has shown to be particularly important to the establishment of appropriate social behaviours. MR is defined as how individuals think about moral dilemmas and conventions that govern social interactions in their everyday lives. The Socio-Moral Reasoning Aptitude Level (So-Moral) Task is a computer-based tool that assesses MR using visual vignettes depicting everyday social dilemmas with a moral component. Combining this task with virtual reality (VR) has the potential to increase ecological validity by providing experimental conditions that are reasonably similar to those in a real-world environment. VR is particularly relevant to the study of social skills because it allows participants to react, feel, think and behave as they would in physical reality. VR also increases the validity and accuracy of the participants' responses to social situations. The aim of this study was to validate a VR version of the So-Moral task in adolescents. It was expected that the So-Moral-VR task would produce similar moral maturity levels as the original computer version and ultimately provide a novel and more ecological mode of social assessment. Method: 15 adolescents and young adults between 12 and 25 years ($M = 19.3$, $SD = 4.6$ years, 8 males) were recruited and completed both versions of the So-Moral Task (computer and VR). Participants were presented with 9 or 10 moral dilemmas, depending on the version, and were asked to explain how they would react and why, if they were in that situation. Moral maturity level was assessed for each dilemma based on a validated five level scale. Paired sample t-tests were used to compare moral maturity levels between both versions of the So-Moral Task and a Pearson correlation was used to explore the association between the VR and computer versions. Results: Preliminary results showed no moral maturity difference between the VR and the computer version of the So-Moral Task ($t = 0.511$ $p = 0.618$). Pearson correlation revealed a strong association between the So-Moral-VR Task and the original So-Moral Task ($r = 0.73$ $p = 0.003$). Conclusion: These results suggest that VR version of the So-Moral Task provides similar results as the computer version, thus providing a reliable measure of moral reasoning within a more ecological and dynamic mode of assessment.

16:00-17:00 Session Keynote -1: Telepresence: The psychology of closeness and distance

W. Ijsselstein

LOCATION: [Julien-Gagnon-Walker](#)

18:00-21:00 Art performance / Food and drinks

At Galerie UQO (not in the hotel): UQO: 101, Saint-Jean-Bosco St, Gatineau Room A-0115

(Free shuttle service from the hotel to the Galerie UQO)

LOCATION: [Galerie UQO](#)

INTERO/CEPTION

The exhibition-performance INTERO/CEPTION explores our relationship to ourselves, to others and to our environment through interactive art installations. The new technologies that connect us make possible to live singular experiences giving sometimes the illusion of isolation, but it also allows to create new participative artistic forms, where the aesthetics emerges from the improvisation of the spectators, whether it is individual or collective.

Six installations by nine artists are presented during one day of events at the UQO gallery. The end of the day will be punctuated by short forms of performance. Curators and artists invite you to this exhibition organized jointly with the CYPsy23 conference in Gatineau, Canada.



WITH INTERO/CEPTION:

/ LET'S INTERROGATE THE ART-TECHNOLOGY MEDIUM

Virtual and mixed realities offer new immersive and interactive art forms possibilities in virtual worlds. Artists explore them to propose particular experiences at the frontier between the virtual and the real. This allows to go beyond the limits of science, to live a moment of escape, or a change of point of view that invites to question this world and ourselves.

/ LET'S WONDER ABOUT NEW SPACES

What is this experience made of hybrid scenographies immersing us in these new worlds composed of impossible or paradoxical spaces, and to feel present in there? The attention given to inner sensations could guide our journey in these imaginary spaces.

/ LET'S ASK QUESTIONS IN ACTION

The participatory aspect lies in the scenography designed as an open interactive path where the spectator can freely "trigger" and "transform" the artworks. "We want him to move towards interaction with other viewers. We want to develop in the spectator a strong capacity for perception and action." (GRAV Manifesto, 1963).

/ LET'S FEEL TRANSPORTED

This event composed in tribute to Fluxus (George Maciunas, 1963) also highlights the idea of an art that is experienced, lived, in the coexistence of artistic genres: from the dancing body to the memory of travel, from virtual reality to illusions, from art to science, from music to virtual interactive paintings.

/ LET'S EXPERIMENT FREELY

We offer a space with multiple levels of reading, which allows anyone to get a creative break, to choose its own level of engagement with the artwork. "Any creative act implies a change of point of view offering a new perspective on things, a decentralization that only vicariance is capable of provoking" (Berthoz 2013).

Judith Guez, Jean-François Jégo, artists-curators

JUNE 27th, 2018 Program

08:45-09:00 Session 2 of opening talks

Welcoming remarks Chairs & organizers Brenda K. Wiederhold & Stéphane Bouchard and other dignitaries Charmain Levy (UQO Research Dean) & Louise Boudrias (City of Gatineau). Presence of Hull-Aylmer Member of Parliament Greg Ferguson and Member of the National Assembly of Quebec Maryse Gaudreault

CHAIR: [Stephane Bouchard](#)

LOCATION: [Julien-Gagnon-Walker](#)

09:00-10:30 Session Orals -1: Social networks -1

CHAIR: [Krystelle Shaughnessy](#)

LOCATION: [Julien-Gagnon-Walker](#)

09:00 [Dorothy Wong](#), [Krestina Amon](#) and [Melanie Keep](#)

A desire to belong affects Instagram behaviour and perceived social support

SPEAKER: [Dorothy Wong](#)

ABSTRACT. Research into the impact of social networking sites (SNSs) on user wellbeing has been inconclusive. While some studies show a link between SNS use and decreased satisfaction with life (Kross et al., 2013), increased loneliness (Burke, Marlow, & Lento, 2010), and greater depressive symptoms (Selfhout, Branje, Delsing, ter Bogt, & Meeus, 2009), others show that SNS use can have positive effects on wellbeing. Examples include SNS use being linked with decreased loneliness (Lou, Yan, Nickerson, & McMorris, 2012) and an increased sense of social support (Oh, Ozkaya, & LaRose, 2014). One potential explanation for these discrepant findings is that different motivations for SNS use, especially being motivated by a desire to belong (as discussed in Nadkarni & Hofmann, 2012), may better account for variations in the relationship between SNS use and perceived wellbeing. This study aimed to explore the impact of motivations, frequency of interactions on SNSs, and perceived social support as an indicator of wellbeing among users of a popular, image-based SNS – Instagram. An online cross-sectional survey was completed by 367 Instagram users between March and September 2017, of which 314 were suitable for analysis (84.4% female, aged 13-56 years, median=22, SD=7.9). Participants were recruited through posts on social media, university newsletters, research websites, paid Facebook advertisements, and physical posts on two campuses of The University of Sydney. The majority of participants were from Australia (68%), followed by The United States of America (16%), Singapore (7%), England (5%), Canada (2%), and one participant each from China, India, Italy, Japan, The Netherlands, and Panama. The survey consisted of standardised and non-standardised questionnaires asking participants about their demographics, motivations for using Instagram, frequency of engagement with Instagram, and perceived social support and life satisfaction. This paper reports the results from multiple regression mediation analyses examining the relationship between being motivated by a sense of belonging, frequency of Instagram use, and perceived social support. As hypothesised, being motivated to use Instagram by a desire to belong was significantly positively associated with frequency of viewing ($b=0.06$, $p<0.01$), liking ($b=0.08$, $p<0.01$), and posting images ($b=0.31$, $p=0.01$) on Instagram. A desire to belong also significantly positively predicted total perceived social support [$b(\text{viewing})=0.22$, $p=0.01$; $b(\text{liking})=0.24$, $p<0.01$; $b(\text{posting})=0.24$, $p<0.01$] and perceived social support from friends [$b(\text{viewing})=0.36$, $p<0.01$; $b(\text{liking})=0.33$, $p<0.01$; $b(\text{posting})=0.37$, $p<0.01$] but not from family ($p>0.05$). However, frequency of online behaviour did not mediate the relationship between users being motivated by a sense of belonging and subsequent perceived social support ($p>0.05$). These findings highlight that the more Instagram users are motivated by a desire to belong, the more frequently they view posts, like posts, and post images. Being motivated to use Instagram by a desire to belong also predicts increased feelings of perceived social support. Although more research is needed, these findings suggest that rather than examining frequency of SNS use as a predictor of wellbeing outcomes, researchers should consider the motivations of SNS users as well. That is, a more comprehensive understanding of outcomes of online behaviours would

also include considerations of user motivations. As this study only focused on Instagram, future research could further explore the impact of being motivated by a desire to belong on wellbeing in other, increasingly popular, image-based SNSs such as Snapchat.

09:15 [Melanie Keep](#), [Anna Janssen](#) and [Krestina Amon](#)

#InstaFollow: Types of Instagram followers affects users' image sharing behaviours

SPEAKER: [Melanie Keep](#)

ABSTRACT. Research has consistently found that social networking site (SNS) users are motivated by a desire for positive self-presentation. These users report removing or untagging themselves from unflattering online photos (Pempek, Yermolayeva, & Calvert, 2009), choosing specific profile pictures (Strano, 2008), or curating their profile content (Peluchette & Karl, 2009) to present themselves favourably. Much of this research has been conducted on Facebook, and there is limited understanding of how audience shapes Instagram behaviour, despite the platform's increasing popularity. Researchers have examined publically available Instagram profiles to determine the types of images shared on Instagram (Hu, Manikonda, and Kambhampati, 2014). Keep and Amon (2017), however, found that types of followers predicted how users interacted on Instagram. There is limited understanding of how audience, and stranger followers specifically, affect Instagram photo content. This study aims to address this gap in understanding by presenting findings on the relationship between audience and the types of images shared on Instagram. **Methods** The cross-sectional, online survey was completed by 425 participants (80% female, aged 15 to 63 years, Median=21 years) between March and July 2014. Participants were recruited via social media posts, listings on research study websites, and flyers across two campuses of The University of Sydney. The survey consisted of questions about participants' Instagram use, motivations for sharing images, and privacy concerns (for more detail see, Keep & Amon, 2017). In this paper, we report new findings based on Mann-Whitney U tests comparing the types of images shared on Instagram by participants who expected strangers to view their posts and those who did not. **Results** Under half (47.5%, N=202) of the respondents expected strangers to view their posts. Participants who expected strangers to view their Instagram posts shared significantly more images that they took themselves ($M_{rank}=226.71$) compared to participants who did not expect strangers to view their posts ($M_{rank}=197.86$), $U=19465$, $z=-2.50$, $p=0.012$, $r=-0.12$. Similarly, participants who expected strangers to view their posts ($M_{rank}=166.54$) shared more images they found on the Internet than participants who did not expect strangers to view their posts ($M_{rank}=147.15$), $U=13760$, $z=2.12$, $p=0.034$, $r=-0.10$. There were no significant differences on the proportion of Instagram posts that were reposts of other users' images ($p=0.69$).

Of the images that users took themselves, participants who did not expect strangers to view their posts reported significantly greater proportions of images of friends ($M_{rank}=203.76$) and family ($M_{rank}=193.47$) than participants who expected strangers in their audience ($M_{rank}=174.79$, $M_{rank}=161.75$, respectively), $U_{friends}=15172$, $z=-2.60$, $p=0.009$, $r=-0.13$; $U_{family}=12978$, $z=-2.96$, $p=0.003$, $r=-0.14$. In contrast, participants who expected strangers to view their Instagram posts shared more images of their hobbies ($M_{rank}=215.28$) and memes ($M_{rank}=169.53$) than participants who did not expect strangers to view their posts ($M_{rank}=158.87$, $M_{rank}=147.47$, respectively), $U_{hobbies}=22651$, $z=5.09$, $p<0.001$, $r=0.25$; $U_{memes}=14225$, $z=2.36$, $p=0.018$, $r=0.11$. **Discussion** The findings suggest that participants who expect strangers to view their Instagram posts focus on sharing different types of images to participants who do not expect stranger followers. Specifically, participants in the former group seem to present more curated profiles with a focus on themselves and their interests (i.e. memes, hobbies). In contrast, participants who did not expect strangers to view their Instagram posts shared more images about their relationships. These findings are consistent with the two-factor model of SNS use (Nadkarni & Hofmann, 2012) which states that individuals are motivated to interact on SNSs for self-presentation and a desire to belong. These results provide further evidence that audience, and to an extent motivation, shape people's SNS use.

Although significant, the effect sizes were small, and future research could further explore these relationships in larger and more demographically diverse sample sizes.

09:30 [Gordon Ingram](#)

Who tweets what on Twitter? Gender differences in the use of Twitter compared to Facebook

ABSTRACT. A study by McAndrew and Jeong (2012) found many gender differences in the use of Facebook, and interpreted them in the light of evolutionary psychological theories. Females were more active Facebook users, spent more time on the site, had more Facebook friends, interacted more there with their families, and tended to update their profile picture more often and post more photos of themselves. The current study attempts to test whether similar gender differences apply to the very different environment of Twitter, where interactions are typically more public yet also in many ways more anonymous.

In the pilot phase, participants were recruited by advertising on the site findparticipants.com, targeting regular users of Twitter in the survey description. Of participants who stated they were regular Twitter users at the start of the survey, and completed most of the other questions, 17 were female and 32 were male. One participant preferred not to specify either gender category and was excluded from the current analysis (since it focuses on female/male gender differences), yielding an N of 49. We constructed a questionnaire based on McAndrew & Jeong's (2012) research methods, with some additional questions and changes to existing questions to make them more appropriate in the context of Twitter. The questionnaire took 20–30 minutes to complete, and participants were paid a token sum for starting it. For the full study, around 1000 participants are being recruited by tweeting a survey link to random Twitter users.

The pilot phase did not find similar results for gender differences among Twitter users to the pattern that McAndrew and Jeong (2012) found for Facebook users. Females were not significantly likely to tweet more, use Twitter more often, have more followers or follow other users more, interact more with their families, or update their profile picture more often or post more photos of themselves. However, we did find significant results for three additional questions that we introduced for this study, and which had an evolutionary rationale. Males were more likely to respond (by “liking”, retweeting, or replying) to tweets about what the tweeter does for a job ($t = 2.52, p = .015$), were more likely to post photos of themselves with more than one other person ($t = 2.06, p = .046$), and were more likely to “like” photos tweeted by members of the opposite sex ($t = 2.97, p = .005$).

In interpreting the null results for the replication of the Facebook study it is important to realize that achieved power was just under 50% to detect a medium-sized effect. Nevertheless, the fact that not one of seven hypotheses was supported suggests there may be important differences in how women and men use Twitter as compared to Facebook. The less personal environment of Twitter, with its emphasis on political debate, work-related self-promotion, and other forms of “showing off”, may provide a less appealing environment than Facebook to many women. Conversely, given the large number of questions analyzed, the significant results for the new questions could be type I errors. However, these results make sense from an evolutionary point of view: males may be more likely to take an interest in a friend or rival's career, to post photos of themselves bonding with teams of colleagues, and to take an interest in the visual appearance of members of the opposite sex. As stated above, I am presently running a much larger-scale study with about 1000 participants to test these hypotheses more rigorously, along with further hypotheses (again following McAndrew & Jeong, 2012) about participants' age and relationship status.

09:45 [Heyla Selim](#)

Can Twitter act as a tool of psychological resistance? The use of #StopEnslavingSaudiWomen among Saudi Arabian women

ABSTRACT. Introduction/problem This study analyses the psychological dynamics of interactive, politically engaged Twitter usage amongst Saudi Arabian women, focusing on the feminist hashtag #StopEnslavingSaudiWomen. Online social networks can potentially offer individuals in restrictive contexts, such as Saudi Arabia, the ability to speak relatively freely. Such networks can thus be perceived as offering a place of temporary norm suspension (Cooper, 2014). The emergence of this form of online protest might lead to conflict with the Saudi Arabian establishment, challenging as it does existing societal norms. It is important for both the Saudi government and its people, then, to understand the relevant issues raised by this phenomenon. The current research is informed by recent social psychology literature, for example Leach and Livingstone's (2015) argument for psychological resistance as a valid alternative to direct confrontation.

Method/tools The social media analytic tool Keyhole was used to track tweets in both Arabic and English for the hashtag #StopEnslavingSaudiWomen, over a period of one month, stretching from 29 March 2017 to 28 April 2017. A total of 25,942 tweets were collated, comprising 24,758 tweets in English and 1,184 in Arabic. Prior to the process of coding, the data were scrutinised for exclusion criteria. Excluded tweets were retweets, tweets that featured only the hashtag and no other text, links to other sources, and pictures/videos. Following this, the total number of tweets was 7,219. Tweets were then coded and analysed using the thematic analysis (TA) approach. Some advantages of this approach are laid out by Braun and Clarke (2006), who emphasise the flexibility of TA – whereas many qualitative methods stem from a particular epistemological position, thematic analysis is compatible with both realist and constructionist approaches to knowledge. The coded data set was then given to a second coder to analyse, to indicate whether the coding schema was plausible.

Results Themes developed during the process of analysis and coding were informed partly by Haslam and Reicher's (2012) model of collective identity and resistance. Final theme categories were shared common experience of subordination/shared identity (i.e. a sense of common fate; "We're stripped of our basic human rights, this is about all of us"), illegitimacy (the expression that those in charge are wrong/illegitimate; "I am free in myself, God created me free, who are you to deprive me of my freedom!"), cognitive alternatives (the ability to imagine an alternative to the current system; "Saudi women... know we are strong enough to achieve [change]"), leadership (e.g. calls to action, organising resistance; "If these unjust laws change, we will be the champions of this country who helped the next generation to live in peace"), third-party support (appeals for support from those outside of the system in question; "Please use the English hashtag so that we can spread our message abroad"), and oppositional disruption (individuals attempting to delegitimise the resistance movement; "You are the pets of Americans, you don't appreciate being treated like queens in this country").

Conclusion The results of this research demonstrate, in accordance with earlier theorists, that Twitter offers certain means of social psychological resistance. However, the ways in which Twitter users performed resistance were determined in large part by the affordances of the medium in question, as well as the wider context of Saudi Arabian society. Analysis revealed the presence of small instances of resistance that might lay the groundwork for subsequent resistance on a larger scale, with stronger leadership and a greater belief in cognitive alternatives.

09:00-10:30 Session Orals -2: Web-based interventions

CHAIR: [Patricia Lingley-Pottie](#)

LOCATION: [Krieghoff](#)

09:00 [Scott Debb](#)

Information security awareness and African American college students: An exploration of attitudes and behaviors

ABSTRACT. The age of information technology impacts the way people manage their lives and conduct their business on a daily basis. Emerging adults use technology in almost all aspects of their lives, but their overall information and computer literacy does not necessarily follow. Researchers have found that an individual's perception of information security significantly impacts their behaviors and decision-making (Huang, Rau, Salvendy, Gao, & Zhou, 2011). Similarly, research has found that knowledge of information security policy and procedures predicted attitudes towards these policies (Parsons, McCormac, Butavicius, Pattinson, & Jerram, 2014). Emerging adults have been identified as being at high risk and attractive candidates for security attacks (Algarni, Xu, & Chan, 2015; Rezgui & Marks, 2008). Information security awareness encompasses the attitudes, behaviors, and knowledge one's has toward information security and is an essential part of helping to minimize the risk of insider threat and social engineering attacks (Mitnick & Simon, 2002; Parsons et al., 2015; Rezgui & Marks, 2008). Individual personality characteristics play a key role in the formation of attitudes and influence behaviors regarding information security as well as how they present themselves online to include disclosure of personal or sensitive information (Chen & Marcus, 2012; Joinson, Reips, Buchanan, & Schofield, 2010; Power & Kirwan, 2015). Participants recruited for this study were undergraduate students enrolled in one of two neighboring public universities in the Southeastern area of Virginia. Both are four-year institutions, with one classified as a historically Black college/university (HBCU). Surveying occurred between the Spring 2017 and Fall 2017 academic semesters. A demographics questionnaire created for this study was used to gather descriptive information. The Big Five Inventory (BFI; John, Donahue, & Kentle, 1991) is comprised of 44-items and was used to assess personality characteristics across five domains: Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism. This study also utilized the Online Security Behaviors and Beliefs survey, which consists of 75 items that assesses various domains of information security and associated behaviors (Anwar et al., 2016) to measure information security attitudes and behaviors. Results and implications will be discussed in the context of cross-cultural equivalence between the current African American sample and existing data from primarily Caucasian samples.

09:15 [Franziska Burger](#), [Willem-Paul Brinkman](#) and [Mark A. Neerincx](#)

EHealth4MDD: a database of e-health systems for the prevention and treatment of major depressive disorder

SPEAKER: [Franziska Burger](#)

ABSTRACT. Introduction. To date, meta-analyses concerning e-mental health for depression have mostly considered influences of specific interventions, underlying therapy model, and added guidance on clinical outcomes, but have neglected influences of technology. This gap in the literature warranted the creation of an open access database of e-mental health systems, i.e. software applications that support the delivery of psychotherapeutic interventions, for the treatment and prevention of major depressive disorder and dysthymia in adults. The database allows for the systematic examination of the composition of these systems and how this relates to their evaluation context and dropout rates. Method. An exhaustive search was conducted for articles published from 2000 to 2017 describing eHealth interventions for depression on Scopus, PubMed, and Web of Science. A total of 5379 documents were retrieved from the three databases and additional sources. After filtering, 273 primary research articles remained for inclusion in the database. To populate the database, a single coder extracted information on 45 variables concerning systems and their evaluations from the publications. A sample of each high-inference variable was double coded by a second coder to assess reliability. Furthermore, scales were developed to assign a degree of technological sophistication to system functionality. Concurrent validity of these scales was calculated by correlating ratings assigned with the scale to those obtained from an unlabeled ordering task. Results. In filtering, coders agreed on the inclusion or exclusion of records in approximately

80% of cases. Percent agreement in double coding of the high-inference variables was satisfactory given that coders received no training and the number of possible categories was large. Four of the five scales to assess technological sophistication demonstrated concurrent validity. Database. The database consists of a total of 14 tables that can be grouped into three larger clusters. The systems cluster details the e-mental health systems, their functionality, and how these relate to therapeutic techniques (four tables). The systems are characterized on a macro-level (year of completion; whether its purpose is to prevent, treat, or monitor; whether it is guided, unguided, or an adjunct to face-to-face therapy; etc.) and on a micro-level, i.e. their functions. Functions are split into two types: support and intervention functions. Support functions are aimed at increasing adherence to the intervention. These are again categorized into four subtypes: support functions for treatment planning (e.g. scheduling of sessions), treatment execution (e.g. reminders), monitoring (e.g. monitoring of symptoms), and social support (e.g. therapist support). Intervention functions support patient activities aimed at reducing depression symptoms. They are linked to specific therapeutic intervention classes (e.g. the component “identifying and challenging automatic thoughts” is linked to Cognitive Therapy). Each instantiation of a function in each system is rated with regard to its degree of technological sophistication. The database currently contains a total of 265 systems with 2181 instantiations of functions. The second cluster of tables in the database is the evaluations cluster, detailing the empirical studies of the systems in the systems cluster, their design, the employed measurement instruments, and dropout rates per study arm (four tables). Finally, the publications cluster details articles describing systems and their evaluations and the authors of these articles (three tables). The remaining three tables link systems to evaluations, systems to publications, and publications to evaluations. Conclusion. For researchers in both computer science and clinical psychology, the database presents a useful tool for the systematic study of e-mental health interventions for depression. It allows for a better understanding of system composition and of how components contribute to clinical outcomes. Since the database is open access and implemented as a standard MySQL database, it can be linked with other databases, for example, databases of clinical trials.

09:30 [Jon Elhai](#) and [Mojisola Tiamyu](#)

Depression and emotion regulation predict objectively measured smartphone use

SPEAKER: [Jon Elhai](#)

ABSTRACT. Increasing use of smartphones is a notable and worldwide phenomenon, and investigating the potential role this use has on population health is a critical area of research. Prior studies have found psychopathology correlated with frequency of smartphone use. In particular, research demonstrates that depression and anxiety severity are associated with increased, as well as excessive, smartphone use. However, this research has primarily relied on cross-sectional data to examine how psychopathology predicts smartphone use. And furthermore, most of this research has solely utilized subjectively, self-reported rather than objectively measured smartphone use. These methodological shortcomings should be overcome to understand a truer picture of the association between increased smartphone use and psychopathology. Utilizing an intensive repeated measures study design, we used a smartphone application (app) to monitor daily minutes of smartphone use over the course of one week among 68 college students recruited in the Midwestern United States. We tested the validity of the app in monitoring smartphone use by pilot testing it with six research assistants over ten trials each, measured against a stopwatch, finding strong support for its validity. Research participants were first presented an informed consent statement, and those consenting were administered several online survey instruments. The surveys queried demographics, smartphone use frequency, excessive smartphone use (Smartphone Addiction Scale-Short Version), depression severity (Patient Health Questionnaire-9), and emotion regulation (Emotion Regulation Questionnaire, measuring cognitive reappraisal and expressive suppression). After the online survey, in the following week participants met with research assistants to install the app, and their smartphone use was monitored for one week to obtain a daily count of screen time minutes used. We used latent growth curve modeling to examine the role of baseline psychopathology scores of

depression and emotion regulation deficits to predict daily smartphone use and changes over the week, adjusting for age and gender. Seven days of smartphone use in minutes represented the repeatedly measured dependent variable. We estimated the model using maximum likelihood procedures with robust standard errors. We tested not only linear changes, but also non-linear changes over the week of measurement. The sample averaged 240.48 (SD = 98.43) minutes of smartphone use per day. Unexpectedly, we found that lower depression severity predicted increased smartphone use over the week. Additionally, greater use of expressive suppression as an emotion regulation strategy predicted more baseline smartphone use, but less smartphone use over the week. These findings suggest that depression and expressive suppression of emotions accounted for significant variability in objectively measured smartphone use. Depression and emotion regulation are discussed in regard to corresponding patterns of smartphone usage. However, because participants were aware that their smartphone use was being measured, such knowledge could influence results. This project contributes to knowledge of psychopathological correlates of smartphone use by repeated, objective smartphone use measurement.

09:45 [Andrew Campbell](#), [Brad Ridout](#), [Krestina Amon](#), [Brian Collyer](#) and [John Dalgleish](#)

Kids Helpline Circles: Findings from participant action research in the development of a secure national mental health social network

SPEAKER: [Andrew Campbell](#)

ABSTRACT. Kids Helpline - Australia, in collaboration with The University of Sydney, have been developing and trialing a purpose built, national mental health social network for group counselling 13-25 year olds. First conceptualized in 2014, the social network for mental health management is known as 'KHL Circles'. It has now completed its first phase of participatory action research with client and counsellor centered evaluation, leading to an evidence-based design of how to engage young people at risk of self-harm, and who have lived experience with depression and anxiety. The preliminary findings will be presented on its effectiveness and iterative design to best support young people via group counselling in a social network.

During 2017, the first phase of the clinical recruitment cycle, N=78 clients were recruited and divided in 6 groups that underwent group counselling synchronously and asynchronously for a period of 8 weeks, per group. Each group was established with a close age focus (e.g. 13-14 year olds; 18-19 year olds), to stimulate age appropriate discussion and develop related experience disclosure with a counsellor facilitating 24/7. Each participant was surveyed at 2 weekly interviews for depression and anxiety symptomology, distress and levels of perceived social support. Additionally, each client took part in UX for the improvement of the social network platform and various functional tools (e.g. video posting, chat functions, emoji use, etc).

Utilising an 'off the shelf' social network platform known as ELGG <https://elgg.org/> the social network was customized to provide clients with anonymity when engaging with other clients at all times. Whilst this did not stop clients wanting to disclose their identity once relationships were formed, Kids Helpline provides a contractual agreement with its clients that during ELGG use they were to remain anonymous in order to promote confidence and comfort for clients to talk openly about mental health concerns. Inside KHL Circles, client identity is only known by the counsellor in charge of online group counselling sessions.

Findings for the first clinical trial noted clients perceived improvement of mental health distress and increased levels of perceived social support. Given the small sample size significance was not achieved, but the participatory action research method incorporating qualitative feedback and iterative improvements to the group counselling process, mental health modules provided online, and improved functionality of the custom designed KHL Circles, was strongly endorsed by the clients.

It is the focus of yourtown – Kids Helpline, to continue this research indefinitely to ensure the evidence-based for a mental health management model via social networking is validated and developed for duplication by any mental health service internationally. Given this, funding for this project is ongoing via FGX Future Generation Investment Company, as is the commitment of The University of Sydney Cyberpsychology Research Group to conduct and publish this important translational research.

10:00 [Milica Stojmenovic](#), [Robert Biddle](#), [Vivienne Farrell](#) and [John Grundy](#)

The influence of expectations on usability and visual appeal in a web environment

SPEAKER: [Milica Stojmenovic](#)

ABSTRACT. The impact of verbal and textual expectation on the perceived and objective usability and visual appeal of a website was examined. Many studies have been done on the relationship between usability and visual appeal but the results vary vastly. There are many factors that influence the results, including website domain, the type of task, if incentive is given, and metrics used to get the usability and visual appeal measures. However, the impact of expectations on these two variables is understudied. Five preliminary studies [1] were completed in order to get a website that was easy and pretty. Three levels of expectations were implemented: (a) easy and pretty, (b) hard and ugly, and (c) the control – no expectations. A computer laboratory study, in the form of user-based usability test, was completed to determine the effect of textual and verbal expectations on visual appeal and usability. Expectations were implemented textually and/or verbally. The textual expectations were in the form of a nuanced task description. The verbal expectations came from a confederate who acted like a participant and spoke to participants before the study began. A previous study [2] used only textual expectations. The present study repeated the method of the previous study [2] but added verbal expectations to strengthen the implementation.

In the present study, 20 (16 males, 4 females; 16 aged 18-30 years, 4 aged 31+) participants were recruited. All volunteered and were screened for 20/20 or corrected to 20/20 vision and colour blindness.

Statistical results showed that the combination of textual and verbal expectations successfully influenced participants. Specifically, when usability and visual appeal levels were congruent (e.g. both high), then expectations influenced them both equally as participants tended to agree with the expectations, pre- and post-use. When told that the website was going to be hard and ugly, participants were discouraged from using it, stating it was too hard to use, and struggled more when using it. Similarly, participants thought that the website was easier to use and prettier in the high expectations group than in the low expectations group. Outcomes of this research suggest that web developers and project managers should focus on investing in marketing and social media influencers just as much as in the development of a pretty and usable website, given that prior expectations do influence how users experience a website.

[1] Stojmenovic, M., Pilgrim, C., & Lindgaard, G. (2014). Perceived and Objective Usability and Visual Appeal in a Website Domain with a Less Developed Mental Model. OZCHI'14, Dec2-5, Sydney, Australia, 316-323.

[2] Stojmenovic, M., Grundy, J., Farrell, V., Biddle, R., & Hoon, L. (2016). Does Textual Word-of-Mouth Affect Look and Feel? OZCHI'16, Nov29–Dec2, Launceston, Australia, 257-265.

10:15 [Giulia Corno](#), [Guadalupe Molinari](#), [Rocio Herrero](#), [Ernestina Etchemendy](#), [Macarena Espinoza](#), [Alba Carrillo](#) and [Rosa Maria Baños Rivera](#)

Enhancing mental well-being during pregnancy: A pilot study to assess the feasibility of a web-based positive psychology intervention

SPEAKER: [Giulia Corno](#)

ABSTRACT. Detrimental effects of women's negative feelings during pregnancy have been extensively examined and documented, whereas interventions aimed to support and maximize maternal prenatal well-being are scarce. Recently, the research on perinatal care has expanded to a saluthogenic approach. This saluthogenic perspective is supported by Positive Psychology (PP), and

studies have shown the effects of online-based Positive Psychology Interventions (OPPIs) on maximizing well-being in different populations. Indeed, web-based interventions have been indicated to be a promising and advisable form of intervention addressed to pregnant women. The aim of this pilot study was to investigate the feasibility of an OPPI aimed at supporting women's mental well-being during pregnancy. A single-group descriptive pilot study was carried out in order to explore (A) how this intervention would be perceived by pregnant women, and (B) if it would show a preliminary evidence of efficacy in increasing positive mood. 70 pregnant women aged from 21 to 43 years ($M=32.7$, $SD=15.8$), enrolled in the study. At the time of recruitment, women's gestational week ranged from 4th to 34th ($M=19.6$, $SD=9.1$). Women were required to be over 18 years old, to be up to 34 weeks pregnant at recruitment time, and willing to raise the baby. The intervention was available in three languages (i.e., English, Spanish, and Italian), thus participants needed to have adequate knowledge of one of these languages, as well as having regular Internet access. The 5-week, self-applied intervention consisted of four modules (i.e., mindfulness and self-acceptance; savoring; connectedness and gratitude; optimism and meaning in life). Well-being indices (i.e., self-confidence, self-acceptance, optimism, satisfaction with life, connectedness and perceives social support) were assessed before and after each module, as well as activities' frequency, appreciation, easy-to-use and perceived benefit. Women's positive (PA) and negative affect (NA) were assessed before and after the intervention. Qualitative data about a global evaluation of the intervention were also collected. An attrition rate of 37.1% was found from pre- to post-intervention. A series of repeated measure ANOVA revealed no significant difference between PA at pre- and post-intervention ($p= 1.0$). Although NA's values decreased, the analyses did not show significant differences ($p=.3$). Regarding the balance of negative and positive feelings, there was not a significant change ($p=.6$). Self-confidence significantly increased [$F(1,23)=14.6$, $p=.0$, $\eta^2=.4$]. Specifically, Bonferroni post-hoc analyses showed a statistically significant difference between self-confidence values at pre- and post-intervention ($p=.0$). Statistically significant differences were not found for the others well-being indexes. The most appreciated exercise was the connectedness- and gratitude- based "Connectedness" exercise, which was also the one assessed as the most difficult, and the one about which women reported to have perceived the most benefits from its practice. A Pearson correlation revealed positive and statistically significant correlations between frequency and appreciation of all the exercises ($r=.4$ to $r=.8$), as well as between frequency and perceived benefit ($r=.4$ to $r=.7$). Regarding the relation between frequency of practice and easy-to-use, there was a significant positive relation only for the "Connectedness" exercise ($r=.4$). Participants reported to be satisfied with the intervention and they would recommend the program to other pregnant women. The present study has some limitations, as the small sample size and the absence of a control condition and a follow-up evaluation. Although these are very preliminary data, the results presented in this pilot study are encouraging. Future studies are needed in order to investigate and tailor optimal positive interventions for this population.

09:00-10:30 Session Symposium 3: Psychological interventions for post trauma victims and witness of violence supported by e-Health technologies

CHAIR: [Georgina Cardenas-Lopez](#)

LOCATION: [Morrice](#)

09:00 [Georgina Cardenas-Lopez](#)

Psychological interventions in Mexico supported by e-Health technologies

ABSTRACT. This symposium aims to present four projects that are carried out in the Virtual Teaching and Cyber-Psychology Laboratory of the National Autonomous University of Mexico. During its years of operation the lab had consolidated the strategy of developing, evaluating and disseminating evidence based psychological interventions based in e-technologies for Mexican population.

In the last 10 years, the number of socially relevant problems in our country had increased. Among others: child obesity in Mexico had doubled the number of cases of obese children between the ages of 6 and 15; the cases of problem drinkers increment as well Hispanic victims of domestic violence abroad; as well as the shortage of services for the rehabilitation of patients with brain damage that require once the patient leaves the clinic. Addressing to these main psychological issues and incorporating the application of new technologies in Mexico, our team had address the development of On-line interventions in order to overcome geographical limits and social barriers; as well as the adaptation to the cultural and social context of effective interventions, that allows us to support with empirical bases in other populations to obtain the external validity of effective interventions and scientific advance in this emergent field.

Conformed by four papers, this session will present results of three On-line interventions, as well as a prevention platform for child obesity: (1) the evaluation of psychological counselling program to Mexican migrant community in USA (2) An Internet-based guided self-change program for problem drinkers (3) initial results of a long-distance rehabilitation therapy platform for brain injury patients, and (4) the outcomes obtained of the adaptation of a CBT protocol supported by an intelligent e-therapy system for the treatment of childhood obesity .

09:18 [Fabiola Reyes](#), [Georgina Cardenas-Lopez](#), [Jorge Martinez](#) and [Yolanda Gonzalez](#)
On-line counselling to Mexican migrant community in USA: A programme oriented to emotional well-being
SPEAKER: [Fabiola Reyes](#)

ABSTRACT. Research on remote psychotherapy has shown promising outcomes regarding its efficacy in the treatment of non-suicidal depression, obsessive-compulsive disorder, anxiety and phobias, among others (Richards & Richardson, 2012; Botella et al., 2008; Proudfoot et al., 2004; Lange et al., 2000; Marks, 1999; Greist et al., 1998; Osgood-Hynes et al., 1998; Schneider, Schwartz, & Fast, 1995). In Mexico, positive results were found concerning the efficacy of an online cognitive-behavioural intervention for the treatment of depression (Flores, Cárdenas, Durán, & de la Rosa, 2014).

The use of this psychotherapeutic modality is increasingly appealing to both professionals and patients not only because of the empirical evidence, but also for advantages such as overcoming geographical barriers, the possibility of both synchronous and asynchronous communication, the ability to meet patient's specific needs, etc. These are precisely the sort of characteristics that make online interventions helpful in addressing psychological problems of Mexicans abroad.

Even though the number of Mexicans in the USA has decreased in recent years, they still have a significant presence in the country. In 2015, Mexicans represented 63.3% of the Hispanic population in America (Flores, 2017). Migration represents a stressful process with situations that migrants must deal with such as a language barrier, breakdown of family and social ties, feelings of loss, reduced coping resources, and adjustment to a new environment (Pumariega, Roth, & Pumariega, 2009). Evidence has shown that these post-migration challenges may aggravate pre-existing mental health problems or cause new ones (Peterson & Gong, 2009). Existing data suggest that acculturative stress may contribute towards the development of depression, grief, and anxiety, among others (Vilar & Eibenschutz, 2007). Also, it has been reported that suicide is the third leading cause of death among Hispanics between the ages of 10 and 24 (Pérez-Escamilla, 2010).

Responding to this need for psychological attention, our team started a cognitive-behavioural virtual and telephone counselling program for emotional wellbeing project (CoVIBE), provided by Mexican counsellors to the Mexican immigrant community in the USA. This initiative arose from the assumption that online tools can make psychological interventions easier for Mexicans abroad and

may compensate for cultural variables. This is because Mexican patients could interact with a professional sharing the same nationality, language and idiosyncrasies, thus fostering a more positive therapeutic relationship. **Aim:** To present outcomes about the efficacy of remote therapy in the wellbeing of Mexican community residing in the USA. **Method:** The sample included 89 patients with a mean age of 40.67 years ($SD = 11.93$), 84.3% female and 15.7% male. Most research participants were married (36.4%). The main diagnoses were anxiety (26.4%), adjustment disorder (17.2%), and posttraumatic stress disorder (16.1%). **Procedure:** Firstly, we distributed advertising materials about the CoVIBE program through the Department of Protection and Legal Affairs of the Mexican Consulate in San Bernardino. Subsequently, the Department sent us an email with a list of potential candidates for counselling, and we contacted them by phone, scheduling a date for a pre-treatment assessment. Depending on the diagnosis, patients could receive three types of intervention: crisis assistance (a one-hour session), counselling for critical incidents (1-3 one-hour sessions), and a brief psychotherapeutic intervention (5-6 one-hour sessions). Patients could choose between an internet or telephone treatment. Once patients had finished the intervention, they completed the post-treatment evaluations. General measures to assess recovery were the Beck Depression Inventory (Beck, 1961), Beck Anxiety Inventory (Beck & Steer, 2011) and Quality of Life Scale WHOQOL-BREF (WHOQOL group, 1998). **Results:** Outcomes concerning quality of life and rates of recovery from anxiety and depression symptoms will be presented at the Conference.

09:36 [Nikolai Stepanov](#), [Georgina Cardenas-Lopez](#) and [Leticia Echeverria](#)

Internet-assisted guided self-change program for adult Mexican problem drinkers: a case study

SPEAKER: [Nikolai Stepanov](#)

ABSTRACT. In Mexico, alcohol abuse represents a significant burden of disease, accounting for 6.5% of premature deaths and 1.5% of disability-adjusted life years (Gómez-Dantés et al., 2017). Unfortunately, effective treatment of alcohol abuse is limited because the resources allocated to mental health in Mexico are insufficient and inappropriately distributed (WHO, 2011).

The proportion of drinkers with less serious alcohol-related problems far outnumbers the severely dependent individuals (Sobell & Sobell, 2015). These “problem drinkers” have experienced negative consequences due to their alcohol use or are at risk of experiencing such consequences, but don’t use alcohol continuously, don’t present significant withdrawal symptoms and have periods of moderate use or abstinence. In Mexico this pattern of consumption is seen in a low alcohol intake throughout the week and a heavy episodic consumption during the weekends (National Institute of Psychiatry Ramón de la Fuente Muñiz, 2017) Despite the prevalence of problem drinkers, the majority of existing treatments for alcohol abuse tend to be extensive, intensive and costly (Sobell & Sobell, 2015).

There is considerable evidence that problem drinkers might benefit more from a less intensive treatment (Sobell & Sobell, 2005), and decades of research have shown that brief interventions can be an effective treatment for people with mild to moderate alcohol problems (Heather, 2004; Nielsen, Kaner, & Babor, 2008). One of these treatments, guided self-change (GSC), is a brief cognitive-behavioral motivational intervention, consisting of four sessions (excluding admission and assessment) aimed at advising the clients in making informed and responsible decisions regarding their drinking, and performing a functional analysis of their drinking patterns in order to identify their high-risk drinking situations and applying more adaptive coping strategies (Sobell & Sobell, 2005). It has been shown to be effective in individual and group formats, and with different populations. Thus, a wider implementation of this program would be particularly beneficial in Mexico, given its problems with the current mental health infrastructure.

Additional benefits might be obtained from an Internet-based intervention format, such as a wide array of treatment options, remote access, confidentiality, increased patient honesty and motivation, as well as cost-effectiveness (Clarke et al., 2009; Marks, Cavanagh, & Gega, 2007).

Aims: The presentation of a case study using email and telephone for the administration of GSC as a precedent for a future adaptation of said intervention to an online platform, as well as its subsequent assessment using a randomized controlled trial. **Procedure:** The case of a participant residing in San Francisco, and who contacted the Addiction Treatment and Prevention Center (UNAM) in Mexico City seeking help for an alcohol problem was analyzed. The client's characteristics, pattern of consumption, treatment procedure and outcome with a six-month follow-up were evaluated. **Results:** The participant was a 32-year-old male, married and fully employed, who sought treatment for an excessive alcohol use, resulting in marital and interpersonal problems. The subject had abstained from using alcohol for four months prior to treatment and contacted the therapist with the desire to resume a moderate consumption on social occasions. Otherwise healthy, the subject's assessment identified a problematic pattern of alcohol use (SADD score = 12). The client's main triggers for problematic drinking were identified and coping strategies were developed. The client chose as a goal a maximum consumption of four drinks per week, but suffered a relapse after two months and successfully returned to abstinence, which was maintained at a six-month follow-up. The client expressed satisfaction with the treatment modality, and no communication problems using email and telephone were reported.

09:54 [Gaspar Ayora](#), [Georgina Cardenas-Lopez](#), [Derian Torres](#) and [Pedro Gamito](#)

Evaluation of a virtual reality tele-rehabilitation platform for patients with traumatic brain injury

SPEAKER: [Gaspar Ayora](#)

ABSTRACT. Rehabilitation is a long and arduous process that should not end when the patient leaves the clinic. Rehabilitation exercises must continue at home. Nevertheless, there are not many opportunities for enduring the same tasks that are taught at the rehabilitation centers. Patients suffering from Traumatic Brain Injuries (TBI) need, in most cases, to relearn almost all daily life activities (Wang et al, 2004). The TBI has strong consequences as a neuropsychological and conduction dysfunction like deficit in the executive functions, working memory and semantical abilities (Bruns y Hauser, 2003; Ramírez-Flores & Ostrosky-Solis, 2009). Only the 40% of TBI survivors are able to return to their productive activities after their injury (VanVelzen et al, 2009).

Regarding the application of new technologies on rehabilitation, the most promising advance may reside on the use of virtual reality in combination with wideband internet connection in order to provide and back up rehabilitation training. The use of 3D (3 dimensions) virtual environments offers the possibility of real-time feedback of subject's position and progression [4], whereas the wideband technology provides mobile and remote application of the 3D virtual environments for Tele-rehabilitation. Currently, several studies are evaluating the effectiveness of virtual environments on rehabilitation training. Virtual Reality (VR) seems, during hospitalization, to promote a more intensive and supportive approach to the execution of the exercises and provides appropriate feedback to the patient. Also, exercises may be displayed with an adapting degree of difficulty, making possible the use of non-invasive forms of physiological monitoring. VR, in addition, gives to the therapist the ability to customize treatment needs, while provides the opportunity for repeated learning trials offering the ability to gradually increase the complexity of the tasks while decreasing dependency of the therapist.

First step of the study, was to adapt Gamito's group tele-rehabilitation platform (Gamito et al, 2016) according to the Mexican social context in order to provide online access to the rehabilitation settings and exercises, and to offer an immersive and user-friendly environment for the local population. This paper describes initial results of two case-studies with repeated measurements in order to assess

usability and effectivity seeking the implementation of a randomized controlled study with a sample of 24 TBI patients assigned to two groups: an experimental group, which will undergo rehabilitation exercises in the platform and a control group, which will practice using traditional procedures. An increase in working memory and attention levels of participants are expected results, which could suggest that VR applications may promote the autonomy and increase quality of life of these patients. Furthermore, the platform will help patient with brain injury to have a long-distance rehabilitation therapy overcoming geographical limits.

10:12 [Paola Barrón](#), [Rosa María Baños Rivera](#), [Cristina Botella](#), [Betzabe Sanchez](#), [Elia Oliver](#), [Emmanuel Castillo](#) and [Georgina Cardenas-Lopez](#)

Adaptation and evaluation of an ICT assisted prevention and treatment program of childhood obesity for Mexican adolescents

SPEAKER: [Paola Barrón](#)

ABSTRACT. Obesity is a major health problem that is increasing at an alarming rate among the population of all ages. In the last 10 years, the number of cases of obesity in Mexico has doubled and the number of cases of obese children between the ages of 6 and 15 has tripled (OM-C, 2013, Ponce et al., 2010). Furthermore, Mexico has the highest incidence of obesity in schoolchildren in Latin America (Ponce et al., 2010). Obesity is a chronic and multifactorial disease, associated with serious negative physical and psychological consequences, with an onset in childhood that can lead to a reduction in life expectancy if not treated in time. The treatment of obesity involves medical as well as psychological aspects; one of them is intrinsic motivation, fundamental for an effective treatment of obesity, since it helps to maintain a healthy lifestyle after the conclusion of treatment, since the maintenance of its effects represents a great challenge in the long term. For this reason, there is a need to support the development of appropriate and effective treatments aimed specifically at children, customized to their needs and ensuring treatment compliance. Technological advances can offer devices that favor constant support, increase motivation and provide continuing encouragement, thus strengthening the child in an environment that might be unfavorable for the development and maintenance of healthier habits. For this reason, a cognitive-behavioral treatment named ETIOBE was designed by Spanish researchers to encourage weight loss and a change to healthier habits. To date, the system has shown favorable results, since they indicate improvement in motivation, commitment and adherence to treatment. In collaboration with the University of Valencia and the Universtat Jaume I of Spain, the Virtual Teaching and Cyberpsychology Laboratory of UNAM carried out the adaptation and implementation of this program in secondary schools in Mexico City. ETIOBE consists of a CBT protocol supported by an intelligent e-therapy system for the treatment of childhood obesity. The intelligent factor of the system is based on the use of sensors that allow obtaining relevant patient information (contextual, physiological and psychological), and its communication and information applications are capable of transferring this data. This system has two fundamental purposes. First, it is an application that assists the clinician in facilitating the creation of a personalized intervention protocol, adapting it to the characteristics of each patient, and it provides help in the supervision and control of treatment follow-up. Second, the application provides home access to content suggested by the therapist, including some activities and interactive games that facilitate the learning of habit modification. The participants were formed by 317 first-year high school students from public schools in Mexico City. A quasi-experimental design of two groups with a pre-test and a post-test was used; group 1 received the intelligent e-therapy system program, while group 2 received all the content of the program organized in a printed booklet. In both groups the level of knowledge about diet and eating habits was evaluated before and after participating in the study. The results show that both interventions are effective in increasing knowledge. Regarding eating habits, intervention 1 is effective in reducing external and emotional eating, while intervention 2 is more effective in reducing restrictive eating. This project represents an effort to collaborate, unify technological advances and estimate the external validity of programs focused on this socially relevant issue, applying them to a major health problem in Mexican adolescents.

10:30-10:45 Coffee break

Coffee - Delfosse room

10:45-12:00 Session Orals -3: Eating disorders

CHAIR: [Eric Malbos](#)

LOCATION: [Julien-Gagnon-Walker](#)

10:45 [Marta Ferrer-Garcia](#), [Bruno Porras-Garcia](#), [Manual Moreno](#), [Paola Bertomeu](#) and [José Gutiérrez-Maldonado](#)

Embodiment in different size virtual bodies produces changes in women's body image distortion and dissatisfaction

SPEAKER: [Marta Ferrer-Garcia](#)

ABSTRACT. Introduction: Body image disturbance is considered a pervasive issue among women and is a core feature of eating disorders. Previous research provides evidence of the ability of body ownership illusions in virtual reality to produce changes in one's own body representation, especially in body size estimation. However, less information is available about changes in subjective body attitudes. This study assesses whether owning a female virtual avatar with different body sizes produces changes in body image distortion and body image dissatisfaction in women.

Method: Forty female college students were exposed to an immersive virtual environment, in which they were sequentially embodied in three avatars using synchronous visuo-tactile stimulation. The first and third avatar had the same body size as the participant, but the second avatar had a larger body size. In the larger avatar condition, the group was divided: 20 participants owned a virtual body 20% larger and the other twenty a virtual body 40% larger. Body image distortion and body image dissatisfaction were assessed before and after embodiment in each of the three avatars using a silhouette test.

Results: Mixed between-within analyses of variance showed a statistically significant effect of the variable Time (four assessment points) on body image distortion ($F(3, 38) = 2.825, p = .042, \eta^2 = 0.069$) and body image dissatisfaction ($F(3, 38) = 6.933, p < .001, \eta^2 = 0.154$). The effect of the variable Group (20% increase versus 40% increase in the larger body size avatar) and the interaction between time and group were not statistically significant. Overall, participants reported a reduction in the body image overestimation after owning the same-size avatar for the second time ($M = 8.88, SD = 12.48$) than at the other assessment points (at pre-test: $M = 13.00, SD = 17.09$; after owning the first same-size virtual body: $M = 13.75, SD = 11.14$; and the larger-size avatar: $M = 14.50, SD = 15.18$). As regards body image dissatisfaction the highest levels were recorded at pre-test ($M = 16.38, SD = 18.54$) and after owning the larger-size avatar ($M = 15.50, SD = 19.57$) and lowest levels after owning the same-size avatar for the second time ($M = 6.88, SD = 13.85$). More interestingly, the reduction in body dissatisfaction after owning the same-size avatar for the second time compared with pre-test was statistically significant ($F(1, 38) = 18.098, p < .001, \eta^2 = 0.323$).

Conclusion: This study extends the evidence available about the ability of full virtual body ownership illusions to modify the mental representation of one's own body. Owning a virtual body with different body sizes produces changes not only in size overestimation but also in body dissatisfaction; and, most importantly, inducing the ownership illusion of a larger-size virtual body reduces body dissatisfaction when subjects return to the same-size avatar, probably due to a comparison effect.

11:00 [Sara Fonseca-Baeza](#), [Giulia Corno](#), [Marta Miragall](#), [Adrián Borrego](#), [Roberto Llorens](#) and [Rosa María Baños](#)

Using Virtual Reality for assessing body dissatisfaction from egocentric and allocentric perspectives.

SPEAKER: [Giulia Corno](#)

ABSTRACT. Introduction: Body dissatisfaction (BD) may be defined as the discrepancy between the estimation of the person's own body and the estimation of the person's ideal body. It has been identified as a risk and maintenance factor for eating disorders. Several methods have been developed to assess distortions in the person's body experience (e.g., the presentation of avatars or silhouettes on a computer screen in 2D), which have shown reliability and validity to evaluate aspects related to BD. However, these methods have limitations: 1) they present a small number of figures with clear differences in terms of Body Mass Index (BMI), allowing the possibility of choosing a figure by deduction; 2) they present drawn figures that contain few details or modified photographs in 2D, that difficulty the projection of oneself into these figures; or 3) the figures are presented in a third person perspective. These limitations may be overcome using Virtual Reality (VR), which allows the presentation of more realistic 3D figures that represent the person's body and the possibility of presenting the avatar in the first person. The Allocentric Lock Theory (Riva, 2014) has emphasized the importance of analysing two spatial perspectives of the body (egocentric: first perspective and allocentric: third perspective), as the disturbances in the interconnection between both perspectives may be responsible of the BD in anorexia nervosa.

Objective: The objective of this study is to validate a new VR task that allow the presentations of 3D figures in egocentric and allocentric perspective in order to assess the BD.

Method: A total of 30 women has been estimated to be included in this within-subjects design. The eligibility criteria for the present study are: (1) age between 14 -35 years old; (2) BMI between 18.5-24.9; and (3) having normal or corrected-to-normal vision. The exclusion criteria are: (1) being currently under psychological treatment; (2) having a clinical history of eating disorders; or (3) being pregnant. Firstly, participants have to answer self-report measures related to BD (BSQ; Cooper et al., 1987 and BES; Franzoi and Shields, 1984) and eating disorders pathology (EAT-26; Garner et al., 1982 and EDI-3; Garner, 2004). Secondly, participants have to perform two VR tasks that consist in seeing 19 female bodies with BMIs ranging from 12.5 to 30.5, presented randomly in two blocks: egocentric and allocentric perspective. In the first task, participants have to indicate whether the 3D figure is thinner or fatter than their own body (estimation of the person's own body); and in the second task, participants have to indicate whether the 3D figure is thinner or fatter than their ideal body (estimation of the person's ideal body).

Results: This work is in progress, but it is expected to find significant positive Pearson's correlations between the body dissatisfaction score -obtained by the subtraction of the "estimation person's ideal" from the "estimation of the person's own body"- and BSQ and BES, both in egocentric and allocentric perspectives. Moreover, it is expected to find positive correlations between the body dissatisfaction score and EAT-26 and EDI-3, in both perspectives. Finally, it is expected to find a significant positive correlation between the body dissatisfaction scores estimated in egocentric and allocentric perspectives.

Conclusion: To our knowledge, this is the first validation of a VR task designed to assess body dissatisfaction in egocentric and allocentric perspectives. This system overcome several limitations of the current methods that assess body distortions, but also permits the presentation of the bodies in the first person perspective. Future studies should explore the potentialities of using this VR task in the assessment and treatment of body disturbances in the clinical practice.

11:15 [Bruno Porrás-García](#), [Alexandra Ghita](#), [Manel Moreno](#), [Marta Ferrer-García](#), [Paola Bertomeu-Panisello](#) and [Jose Gutiérrez-Maldonado](#)

Gender differences in attentional bias after owning a virtual avatar with an increased weight.

SPEAKER: [Bruno Porras-Garcia](#)

ABSTRACT. Introduction: Eating Disorder (ED) patients selectively attend to appearance cues in preference to other information, in a phenomenon known as Attentional Bias (AB). The over-evaluation of shape and weight is a core symptom shared by all ED sub-types. Virtual reality (VR) and the illusion of full ownership over a virtual body have been successfully used to assess and reduce body anxiety and body image disturbances in eating disorder (ED) patients and non-clinical participants. The latest VR Head Mounted Displays (HMD) offer the chance to include Eye-Tracking (ET) devices, and thus provide more objective measures of gaze behaviors towards specific body parts. This study aims to combine VR and ET technologies and use VR scenarios while measuring real-time attention patterns. Specifically, we assess gender differences in eye-gaze behaviors towards specific weight-related or non-weight related body parts when participants own a virtual avatar with different body sizes. Method: Thirty-five college students (25 women and 10 men) were exposed to an immersive virtual environment in which they were embodied in three avatars with different body sizes: first, one with the same body size as the participant; second, one larger than the participant; and finally, repetition of the avatar with the same body size as the participant. To analyze the gaze data Weight-related Areas of Interest (W-AOIs) and Non-Weight related Areas of Interest (NW-AOIs) were defined. Fixation points and complete fixation time on each AOI were recorded at the three different assessment times. Raw data from the Pupil Labs eye tracking add-on for the HTC-Vive headset were subsequently transformed into percentages for further analysis. Results: Mixed between (Gender)-within (Time) analyses of variance showed a non-statistically significant interaction between gender and time ($F(2,66) = 1,317, p = .275, \eta^2 = 0.038$) and a non-statistically significant difference in fixation points and complete fixation times ($p > .05$), over the three assessment times. However, a statistically significant gender difference was found in fixation points ($F(1,33) = 10,030, p = .003, \eta^2 = 0.233$) and complete fixation time ($F(1,33) = 13,017, p = .001, \eta^2 = 0.283$). Overall, women reported significantly higher levels of fixation points and complete fixation times in W-AOIs than men. Women showed an increasing gaze pattern towards W-AOIs at the three different assessment times, while men showed an opposite gaze pattern towards NW-AOIs at the three different times. Interestingly, the greatest differences between men and women were found at the third assessment, when they once again owned an avatar with the same body size as themselves. Conclusion: This study provides useful information about gender differences in gaze pattern behaviors while participants owned a virtual avatar with different body sizes. To our knowledge, this is the first study to compare gaze pattern behaviors between women and men using VR-based embodiment techniques and ET attentional bias assessment. The use of both technologies opens up a promising new area in the assessment or treatment of Eating Disorders and body image disturbances.

11:30 [Johana Monthuy-Blanc](#), [Michel Rousseau](#) and [Stéphane Bouchard](#)

Immersive and embodied cyberbody rating scale: A development of evaluation of body dissatisfaction in virtual reality

SPEAKER: [Michel Rousseau](#)

ABSTRACT. The aim of our research was to examine the validity of both the female and male versions of IECR comparing the performance of scores on the Immersive And Embodied Cyberbody Rating Scale with the performance of standard paper questionnaire. Agreement between virtual environment and paper questionnaire was first assessed using the Intra-class correlation (ICC). Construct validity was then assessed by correlating Dissatisfaction score with the Eating Disorder Inventory (EDI) and the Social and Physical Anxiety scale (SPAS) as well as the Body Mass Index (BMI) using the Pearson correlation. The 68 participants (55 females and 13 males with 23.2 years mean age) experimented three balanced conditions: paper questionnaire (C1), virtual reality using a third-person perspective (C2), and virtual reality using a first-person perspective (C3). Participants were immersed in virtual environments with an HP wx4600 workstation (3 GHz, 3.48 GB RAM, ASUS GeForce 8800GTX graphics card), a Vuzix HMD and an Intersense Cube3. A continuum of

seven silhouettes was used to measure Body dissatisfaction. Participants were asked to choose a silhouette representing how they currently view themselves (actual) and then one representing the silhouette they would like to look like (ideal). Body dissatisfaction being the difference between the two responses (ideal minus actual). Female participants were presented with the female version of Immersive And Embodied Cyberbody Rating Scale and male participants were administered the male version. While the agreement between VR mode and paper were moderate (ICC between 0,84 and 0.56) for the perceived actual body score, the agreement for the perceived ideal body score was lower (ICC around 0.28). Third person VR mode shows higher agreement (ICC 0.632 on Body Dissatisfaction score) with paper questionnaire than first person VR mode (ICC of 0.405). It should be noted that agreement between the two VR modes is relatively low with an ICC of 0.435 on the Body Dissatisfaction score. As expected, BMI present significant positive correlation with Body Dissatisfaction score on the paper mode and third person VR mode but the correlation was not significant for the first person VR mode. While Eating Disorder Inventory scores shows no significant correlation with any of the three conditions, Social and Physical Anxiety Scale present positive significant correlation with the three modes. The results suggest the Body Dissatisfaction Scale via Immersive And Embodied Cyberbody Rating Scale in third person VR mode exhibit good construct validity while the administration of the first person VR mode doesn't produce similar results. The top view in the first person mode displayed mostly the arms, breasts, waist and feet while the avatar only allow to measure a partial component of body image which helped the participant being more aware of their body image distortion and their difficulties to define what would be an appropriate silhouette for them. Futures studies specifically would focus on perceived actual body and perceived ideal body between different VR modes (1st or 3th person) in intervention perspective.

11:45 [Marilou Ouellet](#) and [Johana Monthuy-Blanc](#)

Excessive physical exercise and body image in eating disorders: Preliminary results from immersive and embodied cyberbody rating scale

SPEAKER: [Marilou Ouellet](#)

ABSTRACT. Anorexia nervosa and bulimia nervosa are among the most common chronic diseases in adolescents and young adults aged between 15 to 20 years old (Garner, 2004). These eating disorders (ED) have mortality rates from up to 21% (Huas, 2013), making ED one of the deadliest mental health diseases (Fichter, Quadflieg, & Hedlund, 2008). Among inappropriate compensatory behaviors as vomiting or laxative abuse used by patients, excessive physical exercise (EPE) is very worrisome for the medical team. Named "exerciser", these patients who present a large quantity of EPE and who have a compulsion to exercise have poorer prognosis than non-exerciser patients (Stiles-Shields, DeclinPsy, Lock, & Le Grange, 2015). These patients identify themselves very strongly both as "exerciser" and as anorexic or bulimic. This double identity issue highlights the need to study body image as a key construct. If other inappropriate compensatory behaviours are well controlled during hospitalization, EPE is not cared directly during the treatments because there is a lack of empirical knowledge about this behavior. Among reasons to explain this lack, we can underlying unsuitable psychometric tools that not adequately measures perceptual and affective body image dimensions. A psychometric tool that measures these dimensions in a similar context than in vivo is needed.

This study aims to qualify the nature of the links between EPE and body image in ED patients. The sample of this cross-sectional study is composed by patients aged between 12 and 26 years engaged in an intervention program at Clinique des troubles alimentaires at Centre hospitalier universitaire de Sherbrooke (Pauzé et al., 2000) or at Programme d'intervention des troubles du comportement alimentaire at Loricorps of Université du Québec à Trois-Rivières. An Immersive and Embodied Cyberbody Rating Scale (In preparation, Monthuy-Blanc et al., 2018), Physical Self-Inventory (Maïano et al., 2008) and Compulsive exercise and Quantity of exercise subscales of Exercise and eating disorder (Danielson et al., 2014) are used to measure the variables. During evaluation phase of

treatment (first three month), participants are immersed in virtual environments with an MSI GT72 6QE Dominator Pro G laptop [512 GB HDD, Latest 6th Gen, Intel® Core™ i7 processor, GeForce® GTX 980M graphics card, 17.3" Full HD (1920x1080), G-SYNC ready with 75Hz] and an Oculus Rift DK2 head mounted display. Preliminary results based on 6 patients indicate that body distortion is positively and significantly related to quantity of EPE [F(1,4)=12,25, p=0,025]. Quantity of EPE explains 75,4% of body distortion level. The other variables are not significantly related to quantity of EPE and/or compulsion to exercise.

The simultaneous evaluation of the perceptual and affective dimensions of body image with Cyberbody makes it possible to precisely identify the relation that exists with level of EPE to provide valuable avenues for intervention. More precisely, the results of this study are intended to provide targeted intervention strategies for exerciser patients. During presentation, choice of Immersive and Embodied Cyberbody Rating Scale to measure body image will be explained and the results will be discussed.

10:45-12:00 Session Orals -4: Pain and grief

CHAIR: [Philip Jackson](#)

LOCATION: [Morrice](#)

10:45 [Sylvie Le May](#), [Christelle Khadra](#), [Ariane Ballard](#), [David Paquin](#), [Jean-Simon Fortin](#), [Hunter Hoffman](#), [Isabelle Perreault](#) and [Stéphane Bouchard](#)

Projector-based virtual reality dome environment for procedural pain and anxiety in young children with burn injuries: A pilot study

SPEAKER: [Sylvie Le May](#)

ABSTRACT. Background: Virtual reality (VR) is a non-pharmacological method to distract from pain during painful procedures. However, it was never tested in young children with burn injuries undergoing wound care.

Aim: We aimed to assess the feasibility and acceptability of the study process and the use of VR for procedural pain management.

Methods: From June 2016 to January 2017 we recruited children from 2 months to 10 years old with burn injuries requiring a hydrotherapy session in a pediatric university teaching hospital in Montreal. Each child received the projector-based VR intervention in addition to the standard pharmacological treatment. Data on intervention and study feasibility and acceptability in addition to measures on pain (FLACC), baseline (Modified Smith Scale) and procedural (PBCL) anxiety, comfort (OCCEB-BECCO), and sedation (Ramsay Sedation Scale) were collected before, during, and after the procedure. Data analyses included descriptive and non-parametric inferential statistics.

Results: We recruited 15 children with a mean age of 2.2 ± 2.1 years and mean TBSA (Total Body Surface Area) of 5% (± 4). Mean pain score during the procedure was low (2.9/10, ± 3), as was the discomfort level (2.9/10, ± 2.8). Most children were cooperative, oriented, and calm. Assessing anxiety was not feasible with our sample of participants. The prototype did not interfere with the procedure and was considered useful for procedural pain management by most healthcare professionals.

Conclusions: The projector-based VR is a feasible and acceptable intervention for procedural pain management in young children with burn injuries. A larger trial with a control group is required to assess its efficacy.

11:00 [Dumoulin Stéphanie](#), [Bouchard Stéphane](#) and [Ellis Jacqueline](#)

A randomized controlled trial of the use of virtual reality for needle-related procedures in children and adolescents in the emergency department

SPEAKER: [Dumoulin Stéphanie](#)

ABSTRACT. Introduction/Problem: In 2012-2013, more than two million children visit-ed an emergency department in Canada. Venipuncture and intravenous placement are necessary components of the treatment of children in the emergency department. However, these medical procedures often provoke anxiety and distress in children, and needle insertion continues to be fright-ening for most of them. In paediatric departments, Child Life interventions, present in more than 400 children's hospitals in North America, are con-sidered to be the gold standard in non-medical pain management tech-niques. Virtual reality has also been identified as an effective tool for pain distraction in children undergoing painful medical procedures. The aim of this study was to document the efficacy of VR as a mode of distraction dur-ing a medical procedure compared to two conditions: watching television (TV, minimal control condition) and distraction provided by the Child Life (CL, gold standard control condition) program. We hypothesized that par-ticipants in the VR condition and in the standard distraction Child Life con-dition (CL) will experience less fear of pain and pain intensity during the procedure than participants in the minimal distraction condition (TV). Method/Tools. A total of 59 children aged 8-17 (35% female) were recruit-ed through the emergency department of the Children's Hospital of Eastern Ontario. Eligible volunteers were awaiting needle-related procedures (blood work, IV placement, or both) for a pending or known diagnostic. They were randomly assigned to one of the three conditions: minimal distraction condition (TV, n = 24), standard care condition (CL, n = 15), or a VR condition (VR, n = 20). The key outcome measures were Visual Analogue Scale rat-ings of pain intensity and fear of pain, administrated prior to and right after the procedure. Patient satisfaction was also measured after the intervention. The VR intervention consisted of an immersive game developed by the UQO Cyberpsychology Lab. The virtual environment featured a two-bedroom apartment with a kitchen, living room and bathroom. The children wore Vuzix Wrap 920 HMD and were asked to explore the environment and then to shoot the flies flying around the apartment. Results. Repeated measures ANOVAs were conducted with the two VAS measures (fear of pain and pain intensity). A significant reduction in fear of pain and pain in-tensity were reported in all three conditions. Repeated interaction contrast between VR and paired comparison conditions was statistically significant ($t = 2.07, p < .05$), as was the comparison between the analgesic impact of VR and TV ($t = 2.77, p < .001$). The interaction was not significant for the pain intensity ratings. The ANOVA comparing the three conditions showed a significant difference in satisfaction in the children's ratings [$F(2,59) = 6.01, p < .01$] but not in the parent's ratings [$F(2,50) = 2.68, p = .08$]. A post hoc Tuckey test revealed the children's satisfaction was significantly higher at $p < .05$ for both VR and CL compared to TV. The difference between VR and CL was not significant. The advantages of using VR in the emergency de-partment to manage pain in children are discussed.

11:15 [Mélanie Peron](#), [Katell Le Dû](#) and [Hugues Bourgeois](#)

Bliss a virtual reality application designed to improve health care and quality of life

SPEAKER: [Mélanie Peron](#)

ABSTRACT. INTRODUCTION Today in France 1/3 of the population suffers from anxiety and 20% of French people suffer from chronic conditions/pain. Many health situations and pathologies generate painful or anxiety-inducing care. The impact of solutions to relieve patients is often limited and more and more studies have proved the benefits of virtual reality to improve patient care with no side-effect nor medicine-related illness.

METHOD In 2011, after her experience as a patient relative, Mélanie Péron created l'Effet Papillon, a social enterprise which aims to improve quality of life owing to non-drug therapies. Among the solutions provided by l'Effet Papillon, you can find Bliss, a relaxing virtual reality application. After

an eight-year development for and with patients, in partnership with doctors, researchers and virtual reality specialists, the application aims to meet two specific objectives: analgesia and anxiolysis. Bliss is currently being assessed in two clinical studies: in hematology with Doctor Le Dû - osteo-bone marrow biopsies - REVEH, a phase III clinical study -Bliss versus MEOPA- and in senology with Doctor Bourgeois -micro and macro breast biopsies- SONGES, a phase II clinical study. Bliss is also common practice in painful or anxiety-inducing procedures such as punctures (ascites, pleural, lumbar, breast), osteomedullary and bone-marrow biopsies (myelograms), skin biopsies and complex dressings. With hindsight after these several months of common use, we realize the need for mobilization, awareness and training of healthcare teams to implement an innovation such as Bliss. Virtual reality being dedicated to healthcare is quite new in France and requires the support of healthcare teams in order to offer it to patients during painful or anxiety-inducing procedures. Any caregiver who does not support this kind of innovation -for whatever reason- will not propose it to patients. Therefore those patients will not benefit from it. Conversely, any caregiver who is satisfied with the solution will propose and explain it to patients. These well-informed patients will decide whether they wish to benefit from it. During 4 months, we are going to assess Bliss use on all the procedures performed on outpatients. The patient-caregiver-doctor team will be assessed through a specific self-assessment questionnaire to define the key criteria in Bliss use. RESULTS Up to now, the patients who have benefitted from it routinely during their bone marrow aspirations and biopsies show a satisfaction rate between 7.5 and 10 on a 10-point scale and would like to benefit from it again for potential future examinations. A few patient testimonies help us understand: "I was completely elsewhere, I forgot what was really happening" "I felt like I was in a bubble" "With Bliss, I barely felt anything" "Each time I use Bliss, my muscles, which are usually very painful, relax after 10 minutes and are much less tense" "We get immersed in a universe that makes us forget our body and our pain." During this congress, we will present the preliminary results from REVEH and SONGES studies, as well as the acceptability study carried out in the four major healthcare facilities where Bliss is used on a daily basis.

CONCLUSION A virtual reality application such as Bliss is a new approach to healthcare which deserves support from caregivers, doctors and patients in order to optimize this change. An assessment of virtual reality used in current practice may allow to identify its impediments in order to lift them and provide patients with an optimal use of virtual reality.

- 11:30 [*Catherine Brisebois*](#), [*Roy Marie-Josée*](#), [*Giulia Corno*](#), [*Francine Demontigny*](#), [*Rosa Banos*](#), [*Cristina Botella*](#), [*Stéphane Bouchard*](#), [*Berenice Serrano*](#) and [*Robillard Genevève*](#)
Using EMMA's virtual world to facilitate support offered to parents who experienced perinatal mortality: A pilot study
SPEAKER: [*Catherine Brisebois*](#)

ABSTRACT. Introduction/Problem: Perinatal death is a tragic experience for parents which occurs during pregnancy or shortly after birth. In Canada, perinatal mortality affect approximately 11 000 families each year. Among most common needs expressed by grieving parents (e.g. active listening and ex-pression of their pain, etc.), the quality of support offered by health professionals during this painful period is essential. A promising tool to facilitate expression and treatment of grief is the use of EMMA World. This virtual environment was developed as a tool to treat various psychological disorders such as PTSD, adjustment disorders or pathological grief. To our knowledge, no study has been published on its use for spouses suffering from the loss of their unborn child. Documenting the potential of this technology and how it is accepted by both spouses engaged in group counselling in hospitals is a prerequisite to a broader dissemination of this tool. Also, EMMA World has been used with people suffering from adjustment disorder in previous studies, but with samples composed of participants with a variety of stressors instead of only one common stressor for all participants. Aim. The goal of this study is to document the potential of using EMMA World with spouses who experienced perinatal mortality and are receiving group counselling. Method/Tools. Five woman aged between 30 and 37 years old participated in this study and were accompanied by their spouse.

Average number of weeks of pregnancy was 27.20. It was a first pregnancy for three of them. Participants were assessed using ADIS-IV semi-structured interview and questionnaires to confirm their eligibility. EMMA World was used in three weekly sessions of two hours focused on: 1) collect information about the loss and psychoeducation; 2) elaboration of meaning of loss and assimilation of acceptance techniques; 3) immersion in EMMA virtual reality world featuring different landscapes and symbolic support personalized to each participant (e.g. personal pictures, sounds or videos) to facilitate expression of emotions and thoughts, acceptance of the painful event. A trained psychotherapist conducted the intervention and the immersions with EMMA World. Validated measures of depression, anxiety and grief were taken at pre, post and 3-month follow up, and qualitative impressions from the participants was collected. Results. Given the sample size and lack of control condition, only descriptive statistics are reported. Improvement was observed on all participants, as documented by the Clinician Global Index of severity, the Beck Depression Inventory, the Edinburg Post-natal Depression Scale, the Perinatal Grief Scale and the Complicated Bereavement Scale. All participants were satisfied with their experience using EMMA World, as documented by the Client Satisfaction Scale and the qualitative impressions reported to a co-investigator (not the therapist). Discussion. Results are discussed with guidelines to implement this technology in a hospital program conducted by trained nurses.

10:45-12:00 Session Symposium 4: Using virtual reality to train cognitive abilities and assess cognitive training

CHAIR: [Benjamin Boller](#)

LOCATION: [Krieghoff](#)

10:45 [Benjamin Boller](#)

Using virtual reality to train cognitive abilities and assess cognitive training

ABSTRACT. Numerous studies have shown that cognitive training can improve cognition in healthy older adults and in persons with early signs of Alzheimer's disease. However, whether those effects transfer beyond the trained task remains a critical and challenging issue in the field of training. The ultimate goal of cognitive training is that the benefits from training generalize to real-life setting and improve the ability to perform daily life activities. One promising avenue is to use virtual reality to enrich cognitive training with realistic daily living environments and to develop tasks that are close to day life activities in order to improve the efficacy of training and transfer effects in real-life. In this symposium, five speakers will present results from studies using virtual reality to train cognitive abilities and assess cognitive training. They will discuss the advantages and the limits to use virtual reality into training and the challenge to create standardized tasks that reproduce near-realistic situations of daily living and that can be used for training or to measure transfer. Names of the five speakers and titles of their presentations are as follows: - 1. Sylvie Belleville. Virtual reality as a new approach to measure the effect of cognitive training on real-life cognition in aging. - 2. Nick Corriveau-Lecavalier. Validation of an immersive virtual reality task assessing episodic memory in older adults. - 3. Arnaud Boujut. Using a virtual car ride task to assess the transfer associated with cognitive training in older adults: Validation and design for cognitive interventions in updating and inhibition. - 4. Frédéric Banville. Using the Virtual Multitasking Test to assess the realization of intentions: a preliminary psychometric study - 5. Jenel Brûlé. Design and validation of a Virtual Reality Working Memory Training Program (VR-WORK-M): A new tool to improve Working Memory impairment following concussion.

10:57 [Nick Corriveau-Lecavalier](#), [Émilie Ouellet](#), [Benjamin Boller](#) and [Sylvie Belleville](#)

Validation of an immersive virtual reality task assessing episodic memory in older adults

SPEAKER: [Nick Corriveau-Lecavalier](#)

ABSTRACT. Virtual reality (VR) could be a promising tool for cognitive assessment and intervention. It offers the opportunity to create an ecological environment that is closer to everyday demands and that therefore may better reflect cognitive functioning than tasks traditionally used in

clinical and research contexts. VR may be particularly useful to measure memory in older adults, as this cognitive function declines with age and is one of the first symptoms of Alzheimer's disease. The goal of this study was to assess the feasibility and validity of the Virtual Shop, a fully immersive 3D VR task designed to measure episodic memory by simulating a shopping task in a small convenience store. Fifty-seven older and 20 younger adults were immersed in the Virtual Shop where they were asked to encode a shopping list of 12 familiar objects and retrieve them among semantically-related distractors by walking through the virtual environment. Part 1 addressed its applicability by measuring how participants responded (initiation time, time to complete the task, number of correct responses, errors, and objects selected and validated), and by measuring the sense of presence, the level of motivation evoked by the virtual environment vs. a traditional episodic memory task, and the occurrence and magnitude of cybersickness symptoms following immersion. Part 2 addressed its construct validity by measuring whether performance in the VR task correlated with performance on traditional measures of episodic memory (RL/RI-16; experimental immediate and delayed recall word-list recall), and whether the VR task was sensitive to the typical age-related effect on memory. Part 3 measured ecological validity by assessing whether performance in the VR task and performance on a traditional memory test correlated with scores on a self-reported questionnaire assessing memory performance in real-life shopping (MMQ-shopping score). Part 1 indicated that the rate of correct responses was well distributed with no evidence of a ceiling effect. Participants reported a high level of presence in the virtual environment. A higher level of motivation was found for the VR than for the traditional task, and negligible cybersickness symptoms occurred following immersion for both age groups. In Part 2, we found that VR memory performance is positively correlated with performance on traditional episodic memory tasks. Furthermore, older adults showed lower memory performance than younger ones on both the VR and traditional memory tasks. Finally, Part 3 indicated that performance on the VR task was negatively correlated with the degree of complaint reported on the MMQ-shopping score but that this was not the case for the traditional memory test. In summary, the study indicates that using VR is feasible in older adults, that the Virtual Shop is a valid measure of episodic memory and that it reflects everyday memory performance. Thus, VR has potential as an engaging tool to assess cognition in realistic conditions and the Virtual Shop could be a sensitive tool to reflect real-life memory in older adults. Future studies will be necessary to assess whether the task could be used to assess memory in more vulnerable or impaired populations such as those with mild cognitive impairment or Alzheimer's disease.

- 11:09 [Sylvie Belleville](#), [Bianca Bier](#), [Émilie Ouellet](#), [Nick Corriveau-Lecavalier](#) and [Benjamin Boller](#)
Virtual reality as a new approach to measure the effect of cognitive training on real-life cognition in aging
SPEAKER: [Sylvie Belleville](#)

ABSTRACT. Cognitive training improves cognition in older adults and thus has tremendous potential to promote autonomy and quality of life. The ultimate goal of cognitive training is to induce context transfer, i.e., improve real-life cognitive abilities. Unfortunately, while cognitive training improves performance on experimental tasks that are close to those practiced during the training sessions (i.e., proximal outcomes), most studies fail to observe generalization effects in real-life situations. One major challenge is that real-life transfer is most often measured with self-reported questionnaires where participants are asked to judge their ability to carry out complex activities of daily life. These questionnaires are subjective and influenced by metacognition, expectancy and mood. In this context, virtual reality has great appeal, as it can be used to design simulations, environments and scenarios that reproduce the complexity of tasks of everyday life while allowing objective performance measurement in a safe learning environment. We will present two studies that rely on virtual reality to measure cognitive training transfer in simulations that reproduce real-life cognition. Study 1 examines the effect of attentional training in 30 healthy older adults and 30 younger adults. A traditional divided attention task was used as a proximal outcome measure. Transfer to real life was measured with a self-reported attention questionnaire and in a Virtual car

ride where participants detected road signs to guide the driver while completing a verbal working memory task. Training improved performance on the proximal outcome measure and transfer was found on the Virtual car ride but not on the self-reported questionnaire. Study 2 uses strategic memory training in 40 older adults with a subjective memory complaint and examines its effect on traditional word-list learning as a proximal outcome. Transfer was measured with a self-reported memory questionnaire (ability subscale), the Virtual car ride in which participants detected road signs to guide the driver while completing word-list learning, and with the Virtual shop, where participants were presented with a shopping list of items they were asked to memorize and find in a small convenience store. Strategic memory training improved performance on the proximal outcome test. Transfer was found on the virtual reality measures but not on the ability subscale of the self-reported questionnaire. Overall, results indicate that targeted cognitive training programs can be used to improve cognition in older adults and that the positive effect of cognitive training can transfer to complex simulation tasks that reproduce real-life cognition. Both studies indicate that virtual reality measures are more sensitive to training than self-reported questionnaires. Thus, virtual reality has considerable potential as a measure of real-life cognition and can be used to provide sensitive measures of cognitive training transfer.

11:21 [Arnaud Boujut](#), [Nick Corriveau Lecavalier](#), [Samira Mellah](#), [Maxime Lussier](#), [Louis Bherer](#) and [Sylvie Belleville](#)

Using a virtual car ride task to assess the transfer associated with cognitive training in older adults: Validation and design for cognitive interventions in updating and inhibition

SPEAKER: [Arnaud Boujut](#)

ABSTRACT. Transferring benefits from cognitive training to everyday activities is a central issue for cognitive interventions. Immersive virtual reality (VR) can be used to provide a more ecological way than traditional cognitive tests to assess whether a cognitive intervention promotes transfer effects. The first objective here is to examine the validity and the convenience of using a virtual car ride to assess working memory improvements in healthy older adults following a cognitive intervention. The developed VR task is an immersive dual-task situation that could occur while being a passenger in a car. It involves (1) the detection of a visual road sign to guide the driver and (2) performing a concurrent verbal memory task. Comparisons between older and young adults provide an estimation of how sensitive the task is to aging under focused and divided attention. Correlations are calculated between the VR task performances and those from traditional memory tasks (i.e., Span task and Logical memory test) and from a working memory task (i.e., Reading Span), which combines similar outcomes (i.e., speed for semantic judgment and memory accuracy). A presence questionnaire (Witmer, Jerome & Singer, 2005) is also used to estimate the overall immersiveness of the task. The validation of this VR task aims to support our second objective, which is to compare the benefits associated with updating and inhibition interventions that are currently in progress. Previous work has shown that updating and inhibition are based on distinct brain networks, are modified by aging, and are sensitive to differences in cognitive lifestyle. In this study, we examine the correspondence between the cognitive profiles of the elderly, the training dose administered and the transfer of benefits associated with specialized training in updating or inhibition. The effects of these interventions are compared to a control intervention (general knowledge) over 12 training sessions. Cognitive evaluations (PRE-MID-POST) and transfer measures at different time points (session 1, 3, 6, 9 and 12) are compared to those of young adults without intervention. We examine whether updating and inhibition interventions modify the target cognitive function and transfer to the virtual reality dual-tasking scenario.

11:33 [Frédéric Banville](#), [Marianne Provencher](#), [Philippe Allain](#), [Eulalie Verhulst](#), [Jean-François Couture](#) and [Paul Richard](#)

Using the Virtual Multitasking Test to assess the realization of intentions: A preliminary psychometric study

SPEAKER: [Frédéric Banville](#)

ABSTRACT. Background: Prospective Memory (PM) is represented by the management of a set of cognitive functions responsible for our ability to remember to carry out an intended action at a specific time in the future. Some researchers have shown that aging participants, particularly those with Alzheimer's disease (AD), have lower performance in prospective memory tasks compared to control subjects. Therefore, PM is a cognitive function sensitive to aging and a generally altered cognitive function in individuals with AD. Since many everyday life activities require good PM abilities, it is important to measure them in an ecological way. For this, the virtual reality (VR) technology seems to reproduce adequately day-to-day living in a realistic way. Objective: The principal aim of this presentation is to, show the preliminary psychometric data of the Virtual Multitasking Test (VMT) obtained on a young and healthy adults sample. The Virtual Multitasking Test was created to assess PM and executive functions in an ecological manner. Method: In this study, 50 young and healthy participants were recruited on a voluntary basis. After having administered a set of neuropsychological assessment to test PM in a traditional way, participants were immersed in the virtual environment. Specifically, in the VMT, participants need to prepare a meal for supper and put required items (for the recipe) near the oven while they store groceries on the counter as fast as possible. Participants must also set the table for two during the task. The virtual environment provides interruptions or unplanned events to assess how the subject reorganize or prioritize his/her action. Multiple steps were taken to ensure the good face value of the PM tasks in the VMT. Firstly, a review of the literature was performed to ensure the apparent validity of the task. Secondly, we consulted a group of experts in the field of PM to get some advice on the scoring system. Thirdly, we scripted the ongoing task to be able to have a standardized rating system. Fourthly, we have developed a rating system for PM tasks based on our review of the literature. Results: The VMT appear to be a valid and reliable measure of prospective memory. The PM tasks implanted in the VMT are interesting due to the presence of complex tasks that evaluate both PM and participants' adaptation during unexpected events. Conclusions: In our previous work, we found that healthy elderly people, compared to younger, are slower, present more cybersickness and don't navigate as well in the virtual environment especially when they wear a head-mounted display. Therefore, it will be essential to isolate variables that are age specific and those specific to the use of technology to have a really good ecological assessment on prospective memory.

11:45 [Jenel Brûlé](#), [Stéphane Bouchard](#), [Clelia Chasen](#), [Georg Northoff](#) and [Jennyfer Ansado](#)

Design and validation of a virtual reality working memory training program (VR-WORK-M): A new tool to improve working memory impairment following concussion

SPEAKER: [Jenel Brûlé](#)

ABSTRACT. Background. Working memory (WM) is a limited capacity system that allows the temporary storage and manipulation of information. Several studies have shown that 30% of patients who have suffered from mild traumatic brain injury (mTBI) or concussion continue to have WM difficulties and post-concussion symptoms three months after the incident (Niogi & Mukherjee, 2010). Objective. The aim of the study is to develop and validate a new working memory rehabilitation program in virtual reality for individuals affected by mTBI. The main advantage of using virtual reality with this population is the ability to make the environment as realistic as possible. Method. Participants. 20 healthy controls will be recruited to validate the protocol and the levels of complexity, and three patients with mTBI will be recruited to test the use of this protocol with a clinical population. Training protocol. The Virtual Working Memory Training Program (VR-WORK-M) recreates the environment of a restaurant where the participants must complete a WM task, which consists of the recreation of a series of items heard in the headphones. The objective is to simulate a business presentation. The complexity of the task is increased by adding subtasks (1 vs. 2) and distractions (1 vs. 2 vs. 3) during the WM task. Three lists of increasing difficulty add another level of complexity to the program. In total, there are 36 levels, which allows the participant to

progress at their own rhythm. There will be 16 sessions, occurring 5 times per week with 1 additional session. The validation of this program is currently underway.

11:30-12:50 Session CPB&SN: Editorial Board Meeting (CYBER Board members only)

Editorial board meeting

CHAIR: [Brenda Wiederhold](#)

LOCATION: [Hamel](#)

12:00-13:00 Lunch break (included)

Lunch - Beethoven room

13:00-14:30 Session Orals -5: Social networks - 2

CHAIR: [Anabel De La Rosa Gomez](#)

LOCATION: [Krieghoff](#)

13:00 [Yadviga Sinyavskaya](#)

Does it matter how do we interact online? Communication strategies, personality traits and social capital of SNS users.

ABSTRACT. The study aims to contribute to the discussion toward the role of personality traits in online behavior. The relationship between specific communication activity and the intentions of users to foster social connections is the main focus of current research. Considering the social networking sites (SNS) as a useful tools for social networking, it is important to clarify what type of social skills may influence social interaction and affect the social capital of individuals. In this vein, it is examined how propensity to make connections with others (PCO) as well as self-esteem and subjective well-being of users are associated with several communication strategies of SNS users. The study focuses on SNS users from typical Russian city Vologda, which are registered at the most popular SNS in Russia – Vkontakte.ru. The data on personality characteristics and communication activity from 375 respondents was obtained during online survey. Participants were asked to evaluate the likelihood to engage into several communication practices in SNS, which are considered to be related to social capital growth: relationship maintenance, initiating of new relationships, maintaining existing connections, social seeking, broadcasting, activity in online communities and commenting of online friends' posts (Ellison et al. 2011; Ellison et al. 2014, Burke et al. 2014, boyd et al., 2007). The scale of P. Totterdell was used to measure the propensity of users to make connections with friends and acquaintances as well as the propensity to join people. The scale allows to grasp what type of social ties is primary important for users. Two items of Rosenberg scale were used to evaluate the self-esteem of respondents. In addition, participants were asked to estimate the level of their psychological well-being. The main results are following: communicative activity reflects the intention of users to develop the social connections through social networks. The desire to expand the social network turns out to be one of the strongest predictor of communication activity of users in the models. Relationship maintenance – response to online friends' public help requests – is guided by the overall intention of developing social ties. Propensity to make connections with friends and acquaintances turns out to be significant predictor of online activity related to maintenance of existing social ties, as well as seeking for new connections. It turns out that men are more inclined to searching for new social ties online. The intention to learn new information by browsing the profile and updates of people with whom person has already offline connection, i.e. social-seeking, is associated with developing of weak ties rather than with deepening existing social bonds. In the opposite, broadcasting of personal information on personal page is addressed directly to friends. The activity in online communities is related to the inclination to "bridge" people, connect them to each other. By commenting of friends' public posts users aim to foster friendship as well as become visible to the friends of friend. As to relationship between online activity and self-esteem, it is found out that self-esteem is negatively associated with broadcasting

and positively both with maintenance of existing connections and activity in online communities. Responding on friends help requests is more likely for users with greater subjective well-being. To sum up, the intention to develop social connections underlies the communication practices which are related to the social capital growth. The analysis of mediation role of propensity to make connections in the relationship between online activity and social capital fostering in online social networking sites is the focus of further research.

13:15 [Martina Benvenuti](#), [Patrizia Selleri](#) and [Elvis Mazzoni](#)

Online and offline life: The functional use of the Internet during the life cycle

SPEAKER: [Martina Benvenuti](#)

ABSTRACT. Introduction/problem This contribution presents a Ph.D. research project that tries to explain the use of the Internet during the life cycle (adolescents, younger and older emerging adults, adults). The goal is to clarify when, how and under which conditions the Internet usage is functional for people. Starting from Leont'ev studies (1974, 1978, 1981) and according to Kaptelinin (1996a, 1996b) it is possible to consider the Internet as a functional organ. A functional organ can be defined as the integration between a technological artefact (e.g. Internet) and a human ability (e.g. creating relations) that allows people to obtain better and more powerful performance that are not obtainable individually without that tool (e.g. sharing photos with more people in different parts of the world at the same time) or compensate his/her lack (as for maintaining social relations with family and friends during residential displacements for university or work). Indeed, the research explores which factors (Gender, Hours per day spent Online, Online Social-Support, Number of Online Contacts (NOCs), Life Satisfaction, Job Satisfaction) lead people to a Functional Internet Use (FIU).

Method/Tools The participants are 2.130, divided in: 574 adolescents, 671 younger emerging adults, 163 older emerging adults, 722 adults. Three hypotheses were tested, by means of Correlations, ANOVA and Heyes models (2015; 2017): H1) The hours per day spent online affect FIU, through the moderation of gender and Age; H2) Online-social-support affect FIU through the mediation of NOCs, H3) Job satisfaction affect FIU through the mediation of life satisfaction and the moderation of age and gender. A cross-sectional study based on the compilation of an online self-report questionnaire was proposed. The questionnaire's distribution took place at three different times (corresponding to the three academic years of Ph.D.). Campaigns were broadcast on SNSs (Facebook, YouTube, Google +), based on the penetration of SNSs monthly use in Italy and targeted to gender and age considering the selected sample age groups. For the adolescents' sample the questionnaire was distributed in three High Schools in Italy. For the younger and older emerging adults, the questionnaire was disseminated between university students'. For the adults' sample, some meetings with the parents of children attending High Schools were organized. The questionnaire's measures include validated scales for the factors involved in FIU. The scale that measure FIU was made on purpose for this research and is not validated yet.

Results Results show that the more the age increases, the less the hours per day spent online decrease and, consequently, the FIU increases. Females and males as such affect the relation between the hours per day spent online and FIU. Males of all age groups have the highest level of Internet use (considering the hours per day) and they have the higher score of FIU compared to females (of all age groups). Online Social-Support and Job Satisfaction negative affect FIU; while, NOCs and Life Satisfaction positive affect FIU in all age groups.

Conclusions Considering the obtained results, to promote FIU and favor Internet as a functional organ, NOCs seems to play an important role for all age, but specially for the younger and older emerging adults. Since they are facing with many residential changes (e.g. going to university), having many NOCs allow them greater facilitation in finding a home, places of aggregation, etc. Concerning the adolescents, working on online social-support through NOCs could promote FIU; while for the adults, working on their life satisfaction and job satisfaction could lead to FIU.

13:30 [Neila Ramdhani](#) and [Indah Megawati Aswin](#)

Passive usage and envy predicting life satisfaction of social media user

SPEAKER: [Neila Ramdhani](#)

ABSTRACT. Life satisfaction is an individual's judgment of the standards he or she sets. Life satisfaction can be distorted by side effects. One of the emotions and negative habits that can change the satisfaction of life is the envy and over consumption of information. This study aims to determine the relationship between passive usage and envy with the life satisfaction of users of social networking sites. Three scales, namely the scales of passive usage ($\alpha = 0.785$) and envy ($\alpha = 0.804$) developed by researchers and the scale of life satisfaction of Diener, Emmons, Larsen, and Griffin (1985) with $\alpha = 0.767$. The result of regression analysis showed passive usage of social media and envy predicting life satisfaction ($r = 0.307$, $R = 0.094$). The model shows that envy is strong in predictor of life satisfaction ($b = -1.502$, $t = -6.761$, $p < 0.05$). The results of the study also reveal differences in life satisfaction level in terms of the number of updates status in the social media per day ($F = 4.317$, $p < 0.05$). Participants who update the status of 0-1 times per day have a higher level of life satisfaction compared to participants who passed the status 2-5 times, and more than 5 times per day.

13:45 [Graham Scott](#) and [Gillian Bruce](#)

Posting alcohol-related photos on Facebook: The role of timeline owners' drinking motives

SPEAKER: [Graham Scott](#)

ABSTRACT. Background Facebook user often post alcohol related pictures online (Peluchette & Karl, 2008) with these typically receiving positive feedback from online friends and peers (Beullens & Schepers, 2013) even when they feature intoxicated individuals (Ridout, Campbell, & Ellis, 2012). Despite this, such images can be viewed negatively by those outside timeline owners' peer group (Jain et al., 2014) and can be detrimental to their employability (Bohnert & Ross, 2010). To better determine why individuals share such images online, despite the knowledge that these could be potentially harmful (Peluchette & Karl, 2008), we investigated how individual differences known to drive alcohol consumption influenced photo posting behaviour. Drinking motives (DMQ-R, Cooper, 1994) are defined as being the basic psychological motivations that underlie an individual's decision to drink alcohol. According to the Motivational Model of Alcohol Use (Cox and Klinger, 1988) these represent the most proximal predictors of alcohol consumption. This study aimed to investigate how individuals' drinking motives translated to their disclosure of drinking in the pictures they share on social media. We were also interested to see how this relates to drinking behaviour.

Methods Facebook timeline owners' Drinking Motives and drinking behaviours were measured, and were investigated in relation to alcohol related photo posting behaviour online. Participants were 282 Facebook timeline owners (170 female; $M_{age} = 25.45$). 79.8% identified as British and 15.2% as European. They were recruited via adverts on social media and placed around campus, and were not compensated for participation. Participants were asked via open-ended questions how many of their profile pictures featured them with an alcoholic drink or intoxicated, either alone or with friends. They were also asked to indicate yes/no whether they shared the same categories of photo, and whether they generally shared photos of themselves (selfies) or themselves with friends. Drinking motives were measured via the DMQ: a 20-item questionnaire containing the sub-scales of Social, Coping, Enhancement, and Conformity motives. Drinking behaviour was measured via the timeline followback questionnaire (Sobell & Sobell, 1992), a diary-style measure of drinking over the previous week.

Results A series of paired-samples t-tests were carried out to determine differences in social, coping, enhancement, and conformity motives between Facebook users who shared (or not) pictures of themselves drinking or being intoxicated alone or with friends, as well as between those who shared

general selfies and photos of themselves with friends. All four motives were significantly higher for both selfie sharing, and sharing photos of themselves drinking alcohol alone. Only social and enhancement motives were higher for posting photos with groups of friends. Users who shared photos of themselves intoxicated, and with friends both drinking alcohol and intoxicated, were higher on social, coping, and enhancement motives, but not on conformity motives. Correlations revealed that social all four motives were significantly associated with timeline owners posting profile pictures featuring them of drinking alone or with friends, or being intoxicated alone. Only the social motive was associated with posting pictures of being intoxicated in a group. Additionally, we found that the sharing of any alcohol-related picture was correlated with total weekly alcohol consumption.

Conclusions In terms of motives, there is no difference between users sharing selfies with or without alcohol. This distinction manifests in the sharing of photos of different types of alcohol consumption (use vs. abuse), and the context in which it occurs (alone vs. socially). The conformity motive appears to be least relevant to online disclosures relating to alcohol. Finally, our results build on previous findings (e.g., Westgate et al., 2014) that online disclosures, specifically photo posting, is an accurate reflection of real life drinking.

13:00-14:30 Session Orals -6: Schizophrenia and addictions

CHAIR: [Willem-Paul Brinkman](#)

LOCATION: [Morrice](#)

13:00 [Alexandre Lebel](#) and [Alexandre Dumais](#)

A randomized controlled trial comparing virtual reality therapy to cognitive behavioral therapy in schizophrenia with treatment refractory hallucinations: Preliminary results

SPEAKER: [Alexandre Dumais](#)

ABSTRACT. Background: While many pharmacological and psychosocial interventions are available, many treatment-resistant schizophrenia patients continue to suffer from persistent psychotic symptoms, mainly auditory verbal hallucinations (AVH). Recently, a psychological therapy using computerized technology has shown large therapeutic effects on AVH severity by enabling patients to engage in a dialogue with a representation of their distressing voices (Cohen's $d=1.0$). These very hopeful results have been extended by our team using immersive virtual reality (VR). The results of VR therapy (VRT) in our pilot trial involving 19 schizophrenia patients with refractory AVH were clinically promising for the severity and distress related to hallucinations, illness symptomatology, depressive symptoms and quality of life. Notably, clinical improvements of our pilot remained significant at our 3-month follow-up. Such findings suggest that VRT seems to be a highly promising intervention for refractory AVH. Objective: To further research in this field, the primary goal of this randomized-controlled trial is to show that VRT is superior to a widely utilized psychotherapy, that is Cognitive behavioral therapy (CBT), for the treatment of persistent AVH in schizophrenia. Our secondary goal is to examine the effects of these interventions on beliefs about voices, illness symptomatology, mood symptoms (anxiety and depression), self-esteem, level of functioning and quality of life. Methods: This is a single-blinded randomized-controlled, single-site parallel study of VRT versus CBT. Each treatment group will include 52 randomized participants (assuming 20% attrition) of over 18 years of age hearing persecutory voices and suffering from treatment resistant schizophrenia or schizoaffective disorder. Diagnoses will be established with the Structured Interview for DSM-5. Patients will be included if they have been hearing persecutor voices that did not respond to ≥ 2 antipsychotic trials. VRT comprises of 9 weekly sessions: 1 avatar creation session and 8 therapeutic sessions, where the patients are confronted to their reproduced hallucinatory experience and are encouraged to enter in a dialogue with their virtual persecutor. CBT includes 9 weekly sessions consisting of learning modules and task assignments. Subjects will be evaluated at baseline and post-treatment to assess primary (AVH as measured with the Psychotic

Symptoms Rating Scale) and secondary outcomes. Mixed Anova analyses will be performed to measure and compare the effects of both interventions. Results: Presently, 37 patients have been recruited and 9 have abandoned the study. Our preliminary results on 28 patients show that there is no significant difference between the treatment conditions for all our measures. As expected, more participants will be required to show the superiority of VRT over CBT. However, when performing separate ANOVA analyses for each condition, VRT shows significant improvements of AVH severity after the treatment (on our primary outcome) contrarily to CBT. VRT also produced significant decreases on the beliefs that voices are omnipotent and malevolent, on psychotic symptomatology, depressive symptoms and an increase on quality of life. CBT obtained no significant improvements. Discussion: While limited by the small number of patients, such findings are nonetheless already supporting the hypothesis of the superiority of VRT on AVH. As expected, a moderate effect is found for our adapted short CBT for psychosis, though not significant at this point. The current trial will contribute to the validation of a novel innovative approach answering a fundamental clinical need.

- 13:15 [Ding Ding](#), [Willem-Paul Brinkman](#) and [Mark Neerinx](#)
Simulating the inner voice: A study of sound parameters
SPEAKER: [Ding Ding](#)

ABSTRACT. Introduction: Inner voice is estimated to occur at least a quarter of people's conscious waking life. Much research work asserts that inner voice plays various important roles in cognitive functions, such as self-regulation, self-reflection, and so on. Virtual cognitions are a stream of simulated thoughts people can hear while emerged in a virtual reality environment that intend to mimic inner voice and thus simulating the effect of an inner voice. Like virtual environment aims at replicating an environment by artificially creating sensory experiences, virtual cognitions aim at replicating thoughts by artificially creating cognitive experiences. Presenting and manipulating virtual cognitions in learning and training may be a useful intervention method to affect people's behavior and beliefs. Exposing people to virtual cognitions, presented as an inner voice, requires the simulation of such voice and therefore understanding of the underlying sound parameters. Many researchers believe that there is a relationship between people's inner and outer voice, even suggest that people's inner voice resembles the features of their own outer voice. The work presented here, therefore, explored people's perception of their simulated inner voice by considering several core sound parameters of their outer voice. Methods: Using a specially developed audio recording and modification software tool, 15 participants (11 males, 4 females) set key sound parameters to match their own voice recording with their perception of either their own inner or their outer voice. After reading aloud nine sentences, they modified seven sound parameters of the recordings: pitch, speed, echo, and volume of sound with the frequency band (20-320Hz, 320-1280Hz, 1280-5120Hz, and 5120-20480Hz). Results: The results of multilevel analyses showed participants set the speed, echo and the volume of sound with the frequency band 1280-5120Hz differently when considering inner voice or outer voice, suggesting that people's sound parameter setting is different when it comes to the type of voice. What is more, the difference in volume perception with the frequency band 1280-5120Hz was consistent across participants. Here, participants set the volume higher for outer voice than inner voice. While, for speed and echo, no consistency across participants was found, consistency was found on an individual level, i.e. an individual using the same speed and echo setting across his or her own nine voice recordings. For example, some participants selected consistently higher speed for their inner voice than outer voice, while others selected consistently the other way around. Conclusion: First, these findings indicate that people's sound perception is different between inner voice and outer voice. Second, individualization existed when considering the difference between inner and outer voice. For developers who want to simulate inner voice in a virtual environment, these findings suggested that inner voice has its own distinct characteristics compared to an outer voice. The volume setting for the frequency band of 1280-5120Hz can be based on group perception, whereas for speed and echo settings it might require individualization.

- 13:30 [Alexandra Ghita](#), [Bruno Porras-García](#), [Manuel Moreno](#), [Miquel Monras](#), [Lluisa Ortega](#), [Silvia Mondon](#), [Lidia Teixido](#), [Amadeu Obach-Vidal](#), [Toni Gual](#), [José Antonio Aznar Casanova](#), [Marta Ferrer-Garcia](#) and [José Gutiérrez-Maldonado](#)

Attentional bias assessment in patients with alcohol use disorder: An eye-tracking study

SPEAKER: [Alexandra Ghita](#)

ABSTRACT. Introduction: Alcohol use disorder (AUD) represents a general health concern with important consequences for individuals' psycho-social functioning. Many studies suggest that cognitive processes such as attentional bias (AB) have important implications in the phases of acquisition, maintenance and relapse precipitation in AUD. AB is described as an implicit selective attention of processing visual information in favor of desired cues, which may elicit craving for alcohol and facilitate drinking-related behaviors. To address the recent need to explore the applications of human-computer interaction in the field of psychology, the current study aimed to assess attentional bias towards alcohol-related images using eye-tracking technology. Specifically, we explored the first gaze towards alcohol-related images versus neutral images in patients with short-term and long-term abstinence. Method: 24 outpatients ($M = 53$, $SD = 11.65$) from the Addictive Behavior Unit of the Hospital Clinic of Barcelona participated in the study. The inclusion criteria were diagnoses of AUD and normal or corrected-to-normal visual acuity. Participants were divided according to their abstinence period, with the cut-off point being set at four months. Fourteen patients had been abstinent for less than four months ($M = 1$, $SD = 0.96$), and 10 had been abstinent for more than four months ($M = 14$, $SD = 8.17$). The self-reported abstinence period was supported by the results of urine analyses performed in all patients. Participants completed the Alcohol Use Disorder Identification Test ($M = 19.75$, $SD = 9.34$) and the Visual Attention Task (VAT). The VAT consisted of images related to alcohol consumption versus neutral images such as office objects. To record eye movement activity during the VAT, we used the EyeTribe eye-tracking technology. Results: Our data indicated a statistically significant difference between patients with short-term and long-term abstinence regarding their first fixation towards alcohol-related images and neutral images. Patients abstinent for less than four months had a tendency to look first at images related to alcohol consumption, whereas patients abstinent for more than four months were more likely to look first at neutral images, regardless of their AUDIT score. Conclusions: The results of this study show that patients with short-term abstinence had a greater AB than patients with long-term abstinence. The first gaze seems to be a sensitive parameter for differentiating between patients with low and high AB. The use of eye-tracking technology suggests that AB is important in terms of clinical assessment and should be addressed in treatment as well as in relapse prevention. We consider that the eye-tracking technology is a promising instrument for assessing current addictive behavior.

- 13:45 [Eric Malbos](#), [Baptiste Borwell](#), [Robin Cantalupi](#) and [Christophe Lançon](#)

Virtual Reality Cue Exposure for Smoking Relapse Prevention: a Comparative Trial.

SPEAKER: [Eric Malbos](#)

ABSTRACT. While intense debates focusing on drugs legalization are thriving nowadays and the use of psilocybin mushroom or cannabis for therapeutic purposes is discussed, a legal product namely tobacco is still involved in diverse chronic or lethal diseases among the smoking and non-smoking population. The real challenge lies in the prevention relapse as there are high rates of such an event to occur after smoking cessation (Hatsukami et al., 2008). Still, relapse prevention interventions have been hampered by the difficulty in recreating indoor the conditions associated with tobacco consumption in the daily life of abstinent smokers (such as drinking in bars with friends smoking etc.). These observations are suggesting the need to implement new exposure strategies. Consequently, Virtual reality, a recent immersive media allowing subjects to be exposed and interact in synthesized environments, can help patients to overcome their craving using virtual tobacco related cues. This method has been entitled virtual reality cue exposure (VRCE) and has been recently under examination as a possible alternative instrument to traditional CBT. Even though

previous researches have studied VRCE and demonstrated that artificial 3D situations can induce tobacco craving with success or lead to decrease in nicotine addiction (Garcia-Rodriguez et al., 2012, Girard et al., 2009), the efficacy of VREC on relapse prevention has yet to be analyzed. Therefore, the present clinical trial sought to investigate the effect of VRCE on smoking relapse prevention in the context of a comparative study involving VRCE and traditional CBT. 61 tobacco abstinent subjects were recruited so far. They were then randomly assigned to two groups: VRCE or CBT. The clinical protocol comprised 8 weekly sessions for both groups during which all participants were taught addiction centered psychoeducation, craving management, relaxation and cognitive restructuring, the only difference between the groups being the smoking related situations exposure procedure. While participants in the CBT group were asked to visualize such conditions, the participants in the VRCE group were immersed in a computerized world using virtual reality equipment. The virtual environments consisted of situations considered to incur high risk of tobacco relapse (Garcia-Rodriguez et al., 2012). They were created using an inexpensive game level editor and were constructed to resemble bars, restaurants, and workplaces (etc.) with smoking avatars. The relapse prevention efficacy was assessed by self-report questionnaires measuring craving as well as tobacco dependence. Other scales captured presence as well as global effects on depression, anxiety, self-esteem and quality of life. Physiological parameters included the measure of the carbon monoxide (CO) exhaled. All instruments were registered before and after the treatment procedure. 37 participants completed the program. The virtual environments generated a satisfactory level of presence and craving. Upon finishing the protocol and according to the proportion of CO exhaled, 72% of the participants maintained their tobacco abstinence. Statistical analysis of the results reveals a significant reduction of tobacco craving and dependence for both groups. In contrast no significant differences were found regarding the other scales even though an improvement in physical quality of life was observed but was not enough to reach statistical significance at this stage. Group comparison did not lead to any significant interactions for all variables. Although not significant, findings also showed a trend towards a greater in-session craving reduction in the VRCE group. This continuing clinical trial will verify if those tendencies achieve significance. The present clinical trial demonstrated that VRCE is at least as efficient as traditional CBT in terms of maintenance of tobacco abstinence, craving reduction and decrease in nicotine dependence. Improvement in technologies and methodology for future research and applications are delineated.

14:00 [Nicola Doering](#) and [Sandra Poeschl](#)

Sex technology use by heterosexual adults in Germany: Prevalence and subjective effects on sexual well-being

SPEAKER: [Sandra Poeschl](#)

ABSTRACT. Introduction For conventional sex toys (e.g., vibrators) high prevalence of use (> 50%) and positive impact on sexual well-being are established (Herbenick et al., 2010). However, we don't know much about innovative and upcoming sex technologies (e.g., sex robots). Increasing public and academic interest in sex robots goes hand in hand with a "campaign against sex robots" indicating polarized views on the impact of new sex technologies.

Research Problem Based on the Positive Technology Framework (Riva, Banos, Botella, Wiederhold, & Gaggioli, 2012) and the Positive Sexuality Framework (Williams, Thomas, Prior, & Walters, 2015), this study aimed at documenting the extent to which heterosexual adults in Germany use available innovative sex technologies (e.g., true-to-life sex dolls) and to which degree experienced users report negative and/or positive effects on their sexual well-being and life satisfaction. Additionally, we explored intention to use sex technologies that are not yet available on the mass market (e.g., sex robots).

Method In 2016, we conducted a survey study with a national online sample of N = 1.723 heterosexual adults aged 18 – 69 years residing in Germany. All participants gave informed consent. We measured life-time prevalence for three types of innovative sex technologies (true-to-life sex

dolls, sex machines, VR pornography) and intention to use for two upcoming types of sex technologies (virtual sex agents, sex robots) with a dichotomous response format (yes/no). Effects of sex technology use on sexual well-being were measured with two single items for positive/negative effects on sex life respectively (“Using sex technologies had a positive/negative effect on my sex life”; Likert scale response format: 1 = not at all to 7 = to a high degree). Sexual satisfaction was measured by items from the Multidimensional Sexuality Questionnaire (MSQ; Snell, Fisher, & Walters, 1993), and general life satisfaction with a single item measure. An a-posteriori t-test for dependent samples was computed to identify significant differences between positive and negative effects on sex-life reported by sex technology users, and a-posteriori U-tests were conducted to compare users and non-users of innovative sex technologies regarding their sexual and general life satisfaction.

Results Life-time prevalence of innovative sex technology use was 7 % (n = 117). Sex dolls represented the most popular type, followed by VR pornography, and sex machines.

Users of innovative sex technologies reported mainly positive effects (M = 5.10, SD = 1.26) as opposed to negative effects (M = 2.94, SD = 2.01) on their sex life. The positive effects outranked negative effects with a large effect size (p < .001, d = .98). Users of innovative sex technologies did not differ from non-users regarding sexual satisfaction (p = .595) and general life satisfaction (p = .170).

Intention to use future sex technology revealed considerable prevalence: Within the total sample, 26.5 % indicated that they would try sex with virtual agents, and 13 % (women: 8 %; men: 18 %) would give sex robots a chance.

Conclusion Life-time prevalence of innovative sex technology use was already noticeably high in 2016, and experienced users reported mainly positive effects that outweighed negative effects by far. Additionally, intention to use upcoming sex technologies showed a substantial prevalence. These results support the Positive Technology as well as the Positive Sexuality Framework: innovative sex technologies are adopted because users experience and/or expect mostly positive effects. Future studies should try to complement our self-report findings on sexual well-being with objective measures (e.g., medical assessment of sexual health) and with data from longitudinal studies.

13:00-14:30 Session Symposium 5: Portable devices for assessment and treatment in health settings: Some current developments and challenges

CHAIR: [Cristina Botella](#)

LOCATION: [Julien-Gagnon-Walker](#)

13:00 [Cristina Botella](#)

Portable devices for assessment and treatment in health settings: Some current developments and challenges

ABSTRACT. Chair: Cristina Botella

Symposium title: Portable devices for assessment and treatment in health settings: Some current developments and challenges

Title of presentations: -An overview of factors associated with adherence and dropout to Ecological Momentary Assessment in depression (Desirée Colombo) - Pain Monitor: How can we use ecological momentary assessment via app to improve the treatment of chronic pain? (Carlos Suso-Ribera) - Portable VR and biofeedback for mental disorders: Scoping review of research results

(Javier Fernández-Álvarez) - Understanding Human Behaviour in Daily Life: from Ecological Momentary Assessment to Computational Psychometrics (Pietro Cipresso) Abstracts: Past decades have seen a surge in the number of studies exploring the utility of portable devices, especially smartphones, in healthcare settings. Now, evidence exists for the efficacy and feasibility of mobile health (mHealth) applications for various psychological and medical conditions. Ecological validity is one of the strongest points of portable devices: assessments and interventions can be unobtrusively delivered in real-world contexts and during the flow of daily experiences, thus overcoming the pitfalls of traditional experimental settings. Additionally, repeated measurements, which have regained interest thanks to portable devices, allow us to obtain more reliable and generalizable data. For instance, portable devices can help us capture the dynamics of self-perceived thoughts, emotions, and behaviours, as well as other markers like physiological processes, which are characterized for their elusiveness and oscillation. Last but not least, portable devices can help break barriers of assessment and treatment by facilitating access to individuals with low resources or geographical difficulties. There are a wide range of portable devices that have been used in health settings, including smartphones, watches, or glasses. Thanks to these devices, new interventions for numerous health problems have been developed and proved to be feasible and efficacious. In this symposium, a representative manifestation with several examples of the use of portable devices in the treatment of very diverse health problems will be presented. This will be done with the aim to present the cutting-edge of the current state of portable devices in several health areas as well as to discuss the most relevant challenges. By doing this, we expect to provide some guidance to those who are interested in implementing mHealth in clinical or research settings. The panel will be composed by four presentations. First, the current state of ecological momentary assessment (EMA) for depression will be presented, with a main focus on factors increasing adherence and decreasing patients' dropout. Next, the utility of ecological momentary assessment using a smartphone app will be discussed in the context of patients with chronic pain. With regard to the psychophysiological realm, an overall overview of the existing portable devices in biofeedback and virtual reality with empirical evidence for the treatment of mental disorders will be presented. Finally, an overview of the application of computational psychometrics to the study of human behaviour will be proposed, focusing on the contemporary use of the experience sampling method and wearable biosensors to record psychophysiological signals.

13:18 [Desirée Colombo](#), [Pietro Cipresso](#), [Javier Fernandez Alvarez](#), [Azucena Garcia Palacios](#), [Giuseppe Riva](#) and [Cristina Botella](#)

An overview of factors associated with adherence and dropout to ecological momentary assessment in depression

SPEAKER: [Desirée Colombo](#)

ABSTRACT. BACKGROUND: Since many years, the clinical psychological field relies on the retrospective monitoring and assessment of symptoms, meeting patients at prefixed time points and in traditional face-to-face sessions. Other than being subjected to the recall bias, this retrospective approach does not allow to capture the dynamic fluctuations that typically characterize many psychological conditions, including depression. In that sense, the use of electronic devices for daily data collection, i.e. Ecological Momentary Assessment (EMA), allows to assess patients during daily life, thus in naturalistic settings and in precise moments of the day. To date, EMA has been broadly adopted for the investigation of Major Depressive Disorder (MDD); however, its application in the clinical practice is still very limited. Among the main issues, no specific guidelines have been developed. Furthermore, no validated set of questionnaires or items specific for EMA have been proposed, thus increasing the heterogeneity between studies and the difficulties in adopting these techniques in the clinical practice. Among all, one of the greater challenges in the development of EMA for depression is represented by compliance. For the intrinsic nature of the disease itself, depressed patients may be less prone to regularly complete daily ratings. Accordingly, the aim of this review is to point out factors that may influence adherence and dropout of depressed patients to EMA protocols, and to underline the desirable EMA features to increase the completion of scheduled

assessments. **METHODS:** A systematic literature search was performed in two bibliographic databases, PubMed and Web of Science, resulting in a total of 13 articles that fully met the criteria. We considered studies adopting EMAs by means of electronic devices on a sample of adult (≥ 18 years old) with a primary diagnosis of MDD, defined by a valid criterion standard. Only studies reporting dropout and compliance rates (i.e. percent of completed surveys across the duration of the study) were included. **RESULTS:** Based on the retrieved articles, we will first provide a brief general overview of the current state of the art of EMA for depression, with a main focus on dropouts and compliance rates of the selected studies. Subsequently, we will analyse the impact of different variables on adherence, including: Duration of the study, number of prompts per day, sampling method, type of device, mean age of the sample, number of items for each survey, type of questions, and participants' compensation. **DISCUSSION:** Despite the high number of studies adopting EMA for the investigation of depression and its underlying mechanisms, its application in the daily clinical practice is still very limited. Moreover, no specific protocol or guidelines have been proposed. Accordingly, we will provide important insights into how to develop an EMA for clinically depressed patients in order to increase compliance and reduce dropouts.

- 13:36 [Carlos Suso-Ribera](#), [Diana Castilla](#), [Irene Zaragoza](#), [Cristina Botella](#), [María Victoria Ribera-Canudas](#) and [Azucena García-Palacios](#)

Pain Monitor: How can we use ecological momentary assessment via app to improve the treatment of chronic pain?

SPEAKER: [Carlos Suso-Ribera](#)

ABSTRACT. The way we assess is changing dramatically thanks to information and communication technologies. Ecological momentary assessment is now more accessible, immediate, and ecological than ever, mostly as a result of the explosion of smartphones. In health settings, the use of such technologies (mHealth) is increasing in the past years. In the present study we will discuss how Pain Monitor, a smartphone app developed by our team, can improve existent treatments for pain. We have currently conducted two studies with the app. First, we tested its content validity and acceptability with 37 patients with chronic pain attending a tertiary pain unit. Next, we explored the utility of the app in a randomized controlled trial in which the usual assessment method (on site evaluation during medical appointments) was compared against daily telemonitoring using Pain Monitor. In the symposium we will discuss the benefits of using the app in front of the usual treatment, as revealed by both studies. Briefly, these include a rapid detection of undesired events (i.e., side effects of the medication, aberrant use of rescue medication, or non-response to treatment), which has important implications for patient safety and treatment effectiveness. Additionally, the app can also help make treatments more efficient by detecting that an intervention has been effective, thus eliminating the need of an onsite follow-up appointment.

- 13:54 [Javier Fernández-Alvarez](#), [Desirée Colombo](#), [Pietro Cipresso](#), [Cristina Botella](#) and [Giuseppe Riva](#)

Portable biofeedback devices for affective disorders: A systematic review

SPEAKER: [Desirée Colombo](#)

ABSTRACT. BACKGROUND: Affective disorders (AD) and the whole spectrum of mood disorders constitute a leading cause of disability worldwide. Although strenuous efforts have been made, a large body of evidence shows that prevalence rates have not changed in the last two decades but increased. Hence, new strategies should be implemented. Among the vast array of weaknesses that can explain this serious situation, the disarticulation between physiological and psychological measures and the lack of research in real-life contexts must be mentioned. In this sense, the possibility of delivering biofeedback treatments supported by portable devices is a good way to tackle the two aforementioned problems. With the aim of determining the extent to which biofeedback treatments with portables devices in affective disorders have been researched, a systematic review synthesizing the results is presented.

METHODS: Three databases were utilized (PubMed, Scopus and Web of science) to look for potential relevant articles. A combination of the following words were used for the search string: "portable"; "mobile"; "wearable"; "wireless"; "biofeedback"; "depression"; "anxiety"; "borderline personality disorder"; "affective disorder"; "trauma- and stress-related disorder". The search yielded a total of 144 records. References of relevant articles were also searched for additional studies. After duplicates removed, the remaining articles will be fully read with the aim of finding all the existing studies that examine all forms of portable device to target biofeedback techniques in affective disorders. All type of studies will be considered (from development studies to clinical trials), always that an affective disorder is targeted.

RESULTS: Only a few studies present solid evidence through rigorous clinical trials. Besides, the integration with other technologies is also a matter of concern; only 1 study integrated the biofeedback technique with a virtual reality environment and only 1 with gamified features. An overview of the utilized portable devices for the treatments of affective disorders will be presented. The characteristics of the devices, the results obtained in those studies and the main strengths and limitations are described.

DISCUSSION: Although m-health has blossomed in the last decade, biofeedback treatments through mobile devices are not still widely researched. The scarcity of clinical trials, in particular randomized control trials, hinders the possibility to further disseminate biofeedback techniques in healthcare. From the available prototypes, most of them present evidence in laboratory settings. A discussion of the current state of the technological development of portable devices for biofeedback techniques in the affective disorders realm will be outlined. In particular, suggestions for the design and implementation of portable devices for the regulation of psychophysiological processes associated with affect will be presented.

14:12 [*Pietro Cipresso, Desirée Colombo, Javier Fernandez Alvarez, Silvia Serino, Azucena Garcia Palacios, Cristina Botella, Andrea Gaggioli and Giuseppe Riva*](#)

Understanding human behavior in daily life: From ecological momentary assessment to computational psychometrics

SPEAKER: [*Pietro Cipresso*](#)

ABSTRACT. BACKGROUND: The idea of understanding human behavior is very old in human science and several attempts tried to shed new light in the field. Human behavior is by definition complex, being relational, dynamic and multidimensional, so it is crucial to define methods for modeling it with adherence to reality. Classic laboratory settings can be affordable and efficient for studying human behavior, but could embed biases in identifying real aspects of the dynamic nature that this include. On the other hand, an understanding of human behavior in daily life could be the key aspect of the intrinsic nature of the several facets composing its complexity. **METHODS:** A multi-step method is proposed to study the human behavior in daily life. First of all an ecological momentary assessment can be used by the means of experience sampling method and the contemporary use of psychophysiological signals recorded through wearable biosensors, such as a wrist recording an electrocardiogram (ECG) to extract heart rate variability indexes. These parameters can be used to infer social, cognitive and affective states in ecological settings during daily life. The conveyed signals can be computed in real-time in a connected server where also other signals and parameter of subjects' behaviors converge. A complex data fusion and computation can be used for feeding a computational psychometric model, able to continuously compute and extract new source of information, making the model more and more precise in predicting new behaviors. **RESULTS:** A sample of 10 subjects with 350 sections has been used to compute several parameters able to converge in a complex model to be tested in other 5 subjects with the purpose of behavioral forecasting. The model allowed to create a continuum between two complex scenarios identifying flow vs. stress behavior. The idea was to use the model to forecast a possible human states in new potential situations during daily life. Computational properties of the model has been deeply

examined in term of efficacy and precision. DISCUSSION: Despite several limitations, our computational model was able to predict different kind of potential behavior during daily life. The use of psychophysiological and self-reported states is able to forecast with an acceptable degree of accuracy potential human behaviors. Even if a stronger validation is deeply needed, we can confirm that this approach can constitute a valid tools for decision making and we provides several applications in various field.

14:30-14:45 Coffee break

Coffee - Delfosse room

14:45-16:00 Session Orals -7: Arts and storytelling

CHAIR: [Andrea -Gaggioli](#)

LOCATION: [Morrice](#)

14:45 [Jean-François Jégo](#) and [Camille Havas](#)

Adapting a book to a virtual reality scenography: how to keep the experience at the center?

SPEAKER: [Jean-François Jégo](#)

ABSTRACT. From time immemorial, humans exchange their experiences through stories. Today's mediums such as Virtual Reality (VR) and Augmented Reality (AR) are appropriate to create and live experiences since they are very immersive and more and more interactive. This make them convenient to learn and apprehend one's experiences or memories through to a certain intimacy and empathy (Bollmer 2017). In this article, we detail the creative process we used to revisit these mediums with the challenge of transmitting an experience to a group of visitors in the context of an art exhibition. We propose to question the immersion and interaction, and to divert their use usually intended for a single user to a group experience. At first, we describe the process of creating an adaptation of an AR book to an interactive scenographic installation for multiple visitors. The work is a story of adventure written in the first person who transcribes the experience of the author during a 3-month pilgrimage "out of the comfort zone" in Japan. This story lends itself well to the adaptation of singular experience that one can live in AR or VR. Its adaptation into an installation that allows to open the experience from a solo experience (the book) to a group experience raises two questions: —Indeed, VR with headset is a solitary experience that limits the sharing. How to preserve the immersive and interactive properties of VR in the context of an artistic exhibition for a group of visitors? —Also, how to actively engage the viewer and encourage him to appropriate this story in a singular experience but in an open context suitable for observing of the other and exchanging with them? To answer this questions, we are inspired by the concept of vicariance (Berthoz 2013) where the author defines that "every creative act implies a change of point of view offering a new perspective on things, a decentering that only vicariance is able to provoke." We propose to set up a composite scenography of several playful interactive installations (with projections, responsive objects, interactive sound...). We also refer to the concepts of enaction and embodied cognition (Rosch et al. 1991) by inviting the viewer to create memories in and through the action, including body engagement. Also, we wish to augment the experience by proposing an open scenography, where spectators can watch each other interacting and improvising. In addition, the design of the installation gives viewers the freedom to choose their level of engagement in the experience. Prior work from (Guez et al. 2017) shows the added value to add real and tangible elements in the scenography of an artistic VR installation, this creates a smooth transition between the real to the virtual world. In this way, we focus our research on a finer work of interaction with the artwork allowing the transmission of experience, memory, experience through action. In the interaction process (Dalsgaard et al. 2008) describe the viewer can oscillate between three phases: operator (he activates the installation), spectator and performer. It seems then relevant to create an interactive scenography that will allow a varied engagement of the spectators (spectator—operator—performer) without of course losing the dramaturgical coherence of the initial work. We proposed a model to adapt an AR book to an interactive multi-viewer scenography with an alternative use of the

fundamentals of VR (immersion and interaction). The immersive scenography created is open, multifaceted and focus on an engaging, sensitive, playful and participative interaction. In addition, we believe the creative process we adopt to share with the audience the book's theme—vulnerability and wonder—using VR and AR could be inspiring in a cyberpsychology context.

15:00 [John Bonnett](#)

The DataScapes project: Using letters, proteins and augmented reality as constituents for landscape art

ABSTRACT. This project has two purposes. The first is to apply the aesthetic practices promoted by the communication theorist Harold Innis. Innis was a founder of the Toronto School of Communication, one whose writings were dedicated to promoting cultural innovation through a practice he referred to as the Oral Tradition. Innis likened intellectual and artistic constructs to complex adaptive systems, systems comprised of multiple, heterogeneous parts. Innovation could be obtained, he argued, by recombining the constituent parts, jettisoning some, and adding new content and new formalisms into the resulting construction. It was this method, he argued, that enabled ancient Greece to create new genres of literature and philosophy. Our second purpose was to explore how Innis' ideas could be applied in the medium of Augmented Reality (AR). More specifically, it sought to explore how Data Art and Sonic Art could be used as constituents for AR Landscape Art. Data Art and Sonic Art respectively visualize and sonify data to produce genres of art such as Algorithmic Art and Protein Music. In our project, we incorporated these artistic forms first by constructing a virtual set, which we overlaid on top of the central traffic circle at Brock University. The set featured a 9m high floating sphere or cube which displayed the project's visual representations, and a sequence of eight floating monoliths, which were arrayed around the circumference of the traffic circle. Within the set, we displayed two works, *The Five Senses* and *Emergence*, which respectively were generated from Protein and Text Data. For the first work, we used the U.S. National Institutes of Health protein database first to locate proteins affiliated with each human sense. From that data, we generated algorithmic art and music pieces respectively affiliated with each sense. We began the process first by exporting a sequence of letters from each protein record, letters that represented the protein's constituent amino acids. Our work required that our source data be numeric in form, so each letter in our sequence was translated into a number, with A equaling 1, B equaling 2, Z equaling 26, and so on. Once we had our numeric set, the data was then imported into MusicWonk, software designed to transform numeric sets into musical notation, and export the raw music string as an audio file. The file was then transferred to music composer Erin Dempsey, who fixed aberrations in pitch, added chords to complexify the sound, and altered note duration to give the resulting pieces a sense of rhythm. Our next step was to visualize the data, a task undertaken by Brock mathematician and algorithmic artist Bill Ralph. Ralph produced algorithms designed to generate dynamic images characterized by complex topologies and mixtures of colours. The animations are driven by the algorithm proceeding sequentially through the data, and also by locating relationships between different, non-proximate strings within the data. The final task in our workflow was the generation of an Android app capable of displaying the project's art and music. Here, our aim was not only to support user perception, but also audience unity of experience. We wanted all users to see and hear the same content at the same time, user requirements that were met by computer science colleagues at Brock and Edge Hill universities. We see this project as the first step of many. Next steps will include modifying our app so viewers can incorporate their own data. We also seek to generate new art works that will be integrated into skyscapes and seascapes.

15:15 [Joohee Jun](#), [Myeongul Jung](#), [So-Yeon Kim](#) and [Kwanguk Kenny Kim](#)

Virtual embodiment: A pleasing extension of self

SPEAKER: [Joohee Jun](#)

ABSTRACT. Introduction: How are we aware of ourselves as independent individuals? Previous studies suggested that self-perception is highly related with two components: experiencing oneself as the owner of the body and experiencing oneself as the agent of actions through the body. Self-

perception would play a key role in development of therapeutic techniques for emotion related symptoms. Recent advances in technology have allowed us to experience an illusory feeling of body ownership of a virtual surrogate by generating agency over its action through motion-capture technologies. Several studies have shown that such virtual embodiment has the power to elicit perceptual, behavioral or cognitive changes related to oneself, however, its emotional effects have not been rigorously examined yet. In this study, we investigated whether the intensity of agency-induced body ownership and the facial expression of the virtual surrogate can modulate participants' emotion. Method: The experiment was designed with a 2 (synchronous and asynchronous) x 3 (happy, neutral, or angry) within-group design to investigate the effects of facial expressions in two conditions of full body ownership. In synchronous condition, the movements of the virtual body (VB) were synchronous and congruent with those of each participant in real time. In asynchronous condition, the VB movements were produced from a prerecorded animation and were asynchronous and incongruent from the motion of each participant. Each condition of motion synchrony consisted of three sub-conditions varying with facial expressions (happy, neutral, and angry). During each condition, participants were asked to move freely and look their movements. For the virtual environment, a virtual room including a mirror on a wall was implemented where participants could see the VB from the first-person perspective. The participant experienced the virtual environment through a head-mounted display and a six-camera motion-capture system was used to reflect participants' movements to the VB. Twenty participants were recruited for the experiment. To measure the intensity of body ownership and emotional responses, a seven-item body ownership illusion questionnaire (BOIQ) and self-assessment Manikin (SAM) were used. Results: Results revealed the motion synchrony presented a significant main effect on body ownership illusion, $F(1, 19) = 15.935$, $p < .005$, and $\eta^2 = .456$. Participants reported much stronger experience of body ownership and agency in synchronous condition. Motion synchrony also presented a significant effect on changes in emotional valence, $F(1, 19) = 9.664$, $p < .01$, and $\eta^2 = .337$. Participants reported more positive emotion in synchronous condition, whereas they reported more negative emotion in asynchronous condition. The facial expressions also presented a significant main effect on emotional valence, $F(2, 18) = 4.026$, $p < .05$, and $\eta^2 = .175$. Post-hoc analyses revealed that effects of synchrony were significant for all face expressions. Post-hoc analyses also showed that in synchronous condition, the emotional valence was significantly different between the happy and the angry facial expressions. No interaction effect of synchrony and facial expression was found. Discussion: The key finding of this study is that the emotional responses in valence were significantly enhanced in the synchronous condition, where participants had a stronger feeling of full-body ownership of a virtual avatar. The positive changes in emotional valence in the synchrony condition were also significantly enhanced or suppressed combining with the facial expression of the VB. Considering possible combinations of motion synchrony and facial expressions may provide an important foundation for the development of therapeutic techniques to help people having emotion-related symptoms based on the paradigm of a virtually embodied self.

15:30 [Bilal Alchalabi](#), [David Labbé](#) and [Jocelyn Faubert](#)

How does the brain encode the ownership illusion of a walking self-avatar?

SPEAKER: [Bilal Alchalabi](#)

ABSTRACT. Virtual reality (VR) has become a widespread tool with many applications in physical and motor rehabilitation. In immersive VR, a user's body can be represented as an avatar that mimics the user's movements in real-time leading to the subjective body ownership illusion. This illusion is the gradual process of perceptual illusion that artificial body parts or full bodies are perceived by healthy adults as their own, with non-conscious neural representation of the body's position and capabilities for action. It has recently been shown that inducing the ownership illusion and then manipulating the movements of one's self-avatar can lead to compensatory motor control strategies in gait rehabilitation. Therefore, inducing and maintaining a strong ownership illusion may be important to maximize this effect. The purpose of this study is to distinguish and measure first-person embodied control versus first-person observation of the gait of a self-avatar viewed in

immersive VR to establish the representation of gait embodiment in a human brain. Methods: Twelve healthy participants have been recruited for this study. During experimentations, participants stand on a treadmill, wearing motion capture markers that are traced with 12 Vicon cameras for real-time movement tracking. A gender-matched avatar is displayed in an Oculus Rift from a first-person perspective. Thirty-two electrodes are placed over the participants' heads to record EEG in an experiment that consists of 3 blocks. In block 1, participants are cued to do either take a single step forward with the leg that matches the cue direction, or to initiate walking on the treadmill. At the beginning of the block, the movements of the avatar are always the same as those executed by the participant in real time, in order to create a strong illusion of body ownership. Later in block 1, the avatar sometimes takes a step with the contralateral leg or stops walking while the participant is still walking. The difference between the expected movement and the perceived movement has specific neural signatures with different processing latencies correlating with the level of embodiment. In block 2, participants observe a replay of block 1 in first-person perspective. This block allows us to measure the difference in brain activations between mere observation of self-avatar gait and actual embodiment and control of the avatar. In block 3, participants imagine performing the move they are cued to do without actually performing the movement. The avatar responds exactly as in block 1. This is to create embodiment and to train them to control a BCI (future work). After each block, participants answer a 9-question questionnaire that includes information about body ownership, localization, and agency. For each block and each condition, brain activity will be analyzed, where the μ waves (8-12 Hz) and SMR (12-15 Hz) ERD and power spectral density will be calculated, for a single electrode and cluster analysis. ANOVA and t-test measures will be used over EEG and the questionnaires. Expected results: Preliminary results of the first 6 participants will be presented. An avatar gait embodiment level is expected to be detected with specific neural signatures that will differentiate gait embodiment and observation, as well as embodiment level between the beginning and the end of each block. This embodiment is expected to be quantified, with a lateralized effect over the sensorimotor cortex. Conclusion: When doing VR-based rehabilitation or training, this embodiment measure can be monitored for a better outcome. Also, it is a very important factor to know when developing a BCI, since the more the participant feels ownership, the more effective the results are.

15:45 [Eleonora Brivio](#), [Carlo Galimberti](#), [Andrea Gaggioli](#), [Giuseppe Leoni](#), [Tommaso Fabbri](#) and [Elisabetta Pero](#)

A new field for (transdisciplinary) cyberpsychology: Phygital environments

SPEAKER: [Eleonora Brivio](#)

ABSTRACT. The concepts of spaces and places have been present in Psychology for a long time (e.g. think of Milgram's study of Paris in 1970 or Lewin's work on psychological ecology in 1943). While often used interchangeably, these two terms have different meanings: spaces are 'abstract, unlimited [...] continuous' (Gieseeking & Mangold, 2014) and in this age may refer to the technical, digital and material characteristics of an environment (Brivio, Cilento & Galimberti, 2011), places are the concrete shape and manifestation of social norms and practices, culture and social interactions, and therefore carry a specific meaning for the people who inhabit and/or use the environments (Gieseeking & Mangold, 2014; Brivio, Cilento, & Galimberti, 2011). The advent of digital and portable technologies, ICTs, Social Networks, The Internet of things and Artificial Intelligence makes it important to revise these concepts. Indeed technologies have started to change people's perception, use and experience of places and spaces. In particular, what at first was a very clear distinction between 'real life' and 'online' environments, is right now disappearing and environments integrating both the digital and the physical sides are appearing. The portmanteau 'Phygital' (physical + digital) indicates this kind of environments, which have the following features (Gaggioli, 2017): context awareness (the environments use sensors to be aware of people and their movements and actions), embeddedness (sensors connected to wireless network reduce human intervention and make specific action automatic), and natural interaction (human-computer interaction is driven by gesture, voice, and movements). While this term was used first in 2007

(possibly to indicate other types of spaces using technology), Google Trends shows that started taking off in 2015 with 36/100 points of interests over time, reaching 100/100 points in December 2017. Interest in phygital environments started slow in the academic field: Google Scholar shows few papers from 2007 to 2013 (total of 9 papers), 28 and 25 papers for 2014 and 2015 respectively; numbers of paper has risen quickly to 60 in 2016 and 76 in 2017. Interestingly, the research areas of these publication are mainly marketing, technical/gaming papers, and urban studies, with only one short piece published in a psychology-focused paper. Marketing papers mostly focus on how to build a 'phygital' costumer experience – similarly on how technical and gaming paper focus on how to build phygital games - while urban studies articles recount experiences of new urban phygital spaces. Currently there is no scientific literature that explore phygital spaces from a psychological point of view. It is therefore necessary that professionals and researchers from different branches of psychological disciplines rally around these new environments, not just to study people within phygital places, but to help design and evaluate them in collaboration with more technical professions - such as interaction designers, UX specialists, architects, AI experts, etc. Phygital environments may also usher in a paradigmatic change from classic cyberpsychology to a transdisciplinary cyberpsychology of phygital environments. The aim of this contribution is to present this emerging field of research and the possible epistemological changes it may bring, using current phygital projects being developed (phygital library, phygital neighborhood), and finally highlight how psychologists from different fields can contribute to develop better phygital environments.

14:45-16:00 Session Orals -8: Cyberbullying

CHAIR: [Kevin Nolet](#)

LOCATION: [Julien-Gagnon-Walker](#)

14:45 [Masa Popovac](#) and [Aneel Singh Gill](#)

How severe is cyberbullying? An exploration of adults' perceptions of severity and the role of gender, age, time spent online and reported cyberbullying experiences as victims, witnesses and perpetrators

SPEAKER: [Masa Popovac](#)

ABSTRACT. Cyberbullying is a serious global concern, with increasing literature examining the prevalence rates, predictors and effects of these experiences on young people. However, less focus has been placed on adults' perceptions and behaviours in relation to cyberbullying. Considering that prevention and intervention strategies to address cyberbullying often require collaboration and buy-in from adults (e.g. teachers and parents), understanding adults' views is crucial. Moreover, establishing the experiences of cyberbullying among adults can help to extend current initiatives to counter its negative effects beyond childhood and adolescence.

The primary aim of the current study was to measure perceived severity of various types of cyberbullying among adults. Although studies have previously made attempts to explore perceived severity in various populations, they have failed to do so systematically using a conceptual framework. The current study utilised Willard's (2007) framework which outlines seven forms of cyberbullying (i.e. flaming, harassment, denigration, impersonation, outing and trickery, exclusion, and cyberthreats and stalking). Items capturing different nuances of Willard's (2007) typology were developed for the study, while others were adapted from existing scales (e.g. Hinduja & Patchin, 2009; Espelage, Low, Rao, Hong & Little, 2013). A total of 35 items were included in the measure, with participants rating severity for each on a 5-point Likert scale. The secondary aim of the study was to explore whether variables such as gender, age, time spent online or adults' personal experiences of cyberbullying as victims, witnesses and perpetrators impacted their perceptions of severity.

Data was collected through convenience sampling using an online survey. A total of 401 participants (272 females) aged 18-70 years ($M = 29.18$, $SD = 9.53$) took part in the study. Most participants were from Singapore (22.4%), the United Kingdom (20.9%), and the United States (8.2%). Principal Component Analysis of the perceived severity scale revealed four overarching factors, labelled Defamation, Harassment, Exclusion and Pestering. Cronbach's alpha for the scale was .96. Significant differences were found for mean severity ratings between all four types of cyberbullying: The findings showed that adults perceived Defamation as the most severe form of cyberbullying, followed by Harassment and Pestering. Adults rated Exclusion as least severe. Additional analyses exploring group differences showed that females had higher perceived severity of cyberbullying overall and in particular for Defamation (medium effect), Harassment (large effect) and Pestering (medium effect) compared to males. Time spent online and age of participants was not associated with perceived severity of cyberbullying. The findings also revealed that 75% of the participants had ever witnessed cyberbullying while online, 36% had ever been a victim of cyberbullying and 11% had ever perpetrated cyberbullying. Interestingly, adults' personal experiences of being a victim or witness to cyberbullying did not impact on perceived severity overall nor for any of the four types. However, perpetrators of cyberbullying rated Defamation and Exclusion as significantly more severe than adults who did not perpetrate cyberbullying. The implications of the findings are discussed in light of current literature in the area, including that Willard's (2007) typology may contain overlapping behaviours and that four core cyberbullying types may be more useful in future research. Moreover, the findings provide important insights for targeting cyberbullying in older age groups by highlighting behaviours of focus that may be useful in raising awareness.

15:00 [Cheung-Moon Cho](#) and [Hyesook Kwak](#)

Comparison between cyberbullying and traditional bullying of Korean students

SPEAKER: [Cheung-Moon Cho](#)

ABSTRACT. Distinguishing between two types of online harassment : cyberbullying and online harassment by unknowns, and comparison of these two types of online harassment and traditional bullying among Korean students

Researches which want to reveal the differences between cyber and traditional bullying, and characteristics and uniqueness of cyberbullying are rising. However, despite the increasing attention, outcomes are not consistent, some says two things are different but other says they are similar one. The purpose of this paper is to find solution to overcome this confusion in distinguishing cyberbullying and tradition bullying

Much of confusion may derive from the lack of consistency in defining and measuring cyberbullying. Does cyberbullying mean any harmful and aggressive behaviors which occur in online interpersonal interactions. How about bullying? Does bullying also mean any harmful and aggressive behavior occurring in offline interpersonal interaction?

According to Dr. Olweus(1993), "*A person is bullied when he or she is exposed, repeatedly and over time, to negative actions on the part of one or more other persons, and he or she has difficulty defending himself or herself.*" This definition indicates three factors as characteristics of bullying: unwanted negative actions, repetition over time, and imbalance of power or strength, therefore, bullying is explicitly **peer abuse** which occurs in the group living environment such as school, work, and the military. If we adopt this definition of bullying in defining cyberbullying, cyberbullying can be defined as "*A person is **cyberbullied** when he or she is exposed, repeatedly and over time, to negative actions on the part of one or more other persons in the cyberspace(via e-mail, texting, chatting, SNS, online community, etc.), while he or she has difficulty defending himself or herself.*" Therefore, cyberbullying is also **peer abuse** which occurs in the online interaction among school friends, colleagues of work and the military.

This point was already indicated by Wolak et. al.(2007), they pointed out that among various types of online interpersonal offenses, some aggressive behaviors does not meet the criteria of bullying such as power imbalance between offender and victim, and repetition of aggressive behaviors. Therefore, they suggest to use “online harassment” to describe online interpersonal offenses rather than “cyberbullying”, and to use “cyberbullying” only for very specific types of online harassment which occurs among known peers and victims have less power than aggressors.

Following the above reasons, I have distinguished two types of “online harassment” : “**cyberbullying**” and “**online harassment by unknowns**”. **Cyberbullying** is measured by the following question : “Have you ever caused any harm to **your school friends**(including younger or older friends in either same or different schools) in the cyber space?” and **online harassment by unknowns** is measured by the following question : “Have you ever caused any harm in the cyberspace to **any unknown persons**whom you met only in the cyberspace?”. **Traditional offline bullying** is measured as similar way of cyberbullying by “Have you ever caused any harm to **your school friends**(including younger or older friends in either same or different schools) in offline face to face situation?”

Social survey conducted on 1,125 Korean students from 7th grade to 12th shows that three different types of interpersonal harmful aggressive behaviors namely, traditional bullying, cyberbullying and online harassment by unknowns have unique characteristic respectively.

In the traditional bullying context, there are more victims than offenders, however, in cyberbullying, more offenders than victims. However in the case of online harassment by unknowns, victims turn out more than offenders.

Concerning the cause of aggressive behavior, “victims do something mean or wrong behaviors” and “showing off myself to the friends” are more frequently mentioned as a cause of aggressive behaviors in traditional bullying than other types of aggressive behaviors, However, “revengeing the offender who harassed me”, and “not to be an outcast from friends” are more mentioned as a cause in the cyberbullying situation.

Another difference was also found in the reaction of victims after affliction, most serious reaction such as “thought about suicide and self-injury” are most often thought about by the victims of cyberbullying than the victims of online harassment by unknowns and traditional bullying.

Furthermore, regression analysis reveals that while friend environment(association with violent friends), social tensions like tensions in friendship, lack of appropriate family and school control are significantly related to both cyberbullying and online harassment by unknowns, however psychological factor(aggressiveness) and social control of cyber space are significant only in online harassment by unknowns. This result partially confirms that different causal factors may apply to cyberbullying and online harassment by unknowns.

< Reference >

Olweus, D., *Bullying at School: What we know and what we can do*, Blackwell, Malden, MA, 1993.

Wolak J., Mitchell, K. J. and Finkelhor, D., Does Online Harassment Constitute Bullying? An Exploration of Online Harassment by Known Peers and Online-Only Contacts, *Journal of Adolescent Health* 41(2007), 51-58.

15:15 [Gordon Ingram](#) and [Ivanna Palacio](#)

“Why is everyone hating? This is actually good.” Everyday sexism in “dislikes” and comments on YouTube videos

SPEAKER: [Gordon Ingram](#)

ABSTRACT. Previous research has indicated that women suffer more sexist comments than men online. Less studied, particularly using quantitative methods, has been the everyday negativity that women experience online, in the form of wordless “Dislike” reactions and negative verbal comments. Comments on YouTube videos, in particular, are characterized by frequent flaming and trolling. However, comparing the degree of negativity received by female and male YouTubers is made difficult by variance in the types of content that they post. The current study controlled for differences in content by looking at a highly constrained video genre, namely cover recordings by both women and men of the same recent pop songs. We chose 4 hit pop songs at random from each of the past five years: 2 by female solo artists and 2 by male solo artists. We then searched for cover versions of each song on YouTube, limiting the results to videos with 10,000–100,000 views. For each of the 20 original songs we selected 20 cover versions at random, 10 by male artists and 10 by female artists, yielding 400 cover videos in total. For the comments we used a random sub-sample of 2 male and 2 female cover videos per original song, analyzing up to the oldest 100 comments on each video, yielding 4855 comments on 80 cover videos. The ratio of Likes to Dislikes for each cover video was analyzed using a nested linear mixed-effects model, specifying Original Artist Gender, Cover Artist Gender, and Number of Views as fixed effects, and Original Song as a random effect. For comment analysis, two raters labeled negative comments and comments that referred to the artist’s appearance. We then produced two further linear mixed-effects models on the percentages of comments with these labels, substituting Number of Comments for Number of Views in the fixed effects. Controlling for the random effects of the different original songs, there was a significant fixed effect of cover artist gender on the ratio of Dislikes to Likes received ($F = 11.1, p = .001$), with female cover artists receiving one Dislike for every 12.1 Likes, but male cover artists receiving Dislikes only half as frequently, once every 24.2 Likes. Unexpectedly, there was a very similar effect of original artist gender ($F = 9.74, p = .002$), with covers of “originally female” songs receiving one Dislike for every 11.9 Likes, while covers of “originally male” songs received one per 25.3 Likes. While analysis of the comments has not yet finished, currently they show a similar pattern to Dislikes: on average 7.81% of comments on female cover artists, but only 5.24% on male artists, are negative. Similarly, on average 8.20% of comments on female cover artists, but only 2.23% on male artists, refer to the artist’s appearance. This is probably the first quantitative analysis of negative value judgements received by women in YouTube video comments that attempts to control for video content. Despite the reputation that online comment sections have for being nests of trolls, overall levels of negativity were low. Nevertheless, gender differences in negativity matter because even one thumbs-down or comment such as “fucking [w]hore you sing so bad” can hurt, and it was more common for male cover artists to receive no negative comments at all. A limitation is that these findings could be specific to pop song cover videos and may not generalize to other types of material. Hence, we will also present a “work in progress” analysis of Dislikes and comments made on male and female enactments of various types of popular “challenge” videos on YouTube, in an attempt to replicate our findings for music videos.

15:30 [Graham Scott](#), [Zara Brodie](#) and [Sara Sereno](#)

Perceived victim blame for celebrities on Twitter: Impact of tweet content, volume of abuse, and dark triad personality factors

SPEAKER: [Graham Scott](#)

ABSTRACT. Background: Many celebrities utilize Twitter to generate publicity and build their brand (Marwick & Boyd, 2011), but they are increasingly the targets of trolls, and victims of online abuse (e.g., Gorton & Garde-Hansen, 2013). Trolling often involves multiple perpetrators and can relate to many different topics (Lumsden & Morgan, 2017). Consequences of online abuse are potentially serious (e.g., Hinduja & Patchin, 2010), and public sympathy is often lacking (Gahagan, Vaterlaus, & Frost, 2016) because incidents are not perceived as severe and victims are often attributed blame (Weber, Ziegele, & Schnauber, 2013). The dark triad (DT) of personality traits:

narcissism, psychopathy and Machiavellianism, positively correlate with trolling behaviour (Buckels, Trapnell & Paulhus, 2014). Specifically, individuals high in psychopathy and Machiavellianism use more profane and aggressive language (Boochever, 2012; Sumner et al. 2012). This study investigates how different categories of tweets by celebrities, the volume of abuse directed towards them, and participants' DT personality variables influence attributed victim blame (VB) and perceived incident severity.

Methods: The study utilized a 3 (Celebrity tweet: Positive, Neutral, Negative) x 2 (Volume of abuse: High, Low) within-participants design. Participants were 184 UK students (146 female; Mage=22.61). 74.5% identified as British and 22.8% as European. They were not compensated for participation. Participants viewed six screenshots of manufactured tweets by male celebrities. Each profile consisted of the celebrity's name and profile picture, one tweet, and 6 replies. Two celebrity tweets were positive, two negative, and two neutral. They were followed by either a high (four) or low (two) volume of abusive replies. For each profile, VB and perceived severity were measured (Weber, Ziegele, & Schnauber, 2013). Participants also completed a questionnaire measuring narcissism, Machiavellianism, and psychopathy (SD3: Jones & Paulhus, 2013). Prior to the main experiment, an initial norming study determined that celebrities were moderately well known, that tweets were positive, negative, or neutral, and that abusive replies were abusive and negative.

Results: ANOVAs were conducted to determine the influence of celebrity tweet and volume of abuse on VB and perceived severity. For VB, attributed blame was higher following negative than positive or neutral celebrity tweets. Incident severity was perceived as lower following negative than neutral or positive celebrity tweets, and when there was a low volume of abusive replies. Pearson's correlations were conducted to identify relationships between DT traits, and perceptions of VB and Severity. We found significant positive associations between VB and psychopathy, narcissism, and Machiavellianism; and negative associations between Severity and the DT variables reflecting small to medium effect sizes. Multiple regression analyses were conducted to determine the predictive value of the DT variables for VB and Severity. The three DT variables collectively explained 5% of the variance in VB, but none of the DT variables were significant independent predictors, despite the modest variance explained collectively. The three DT variables collectively explained 9% of the variance in VB, and psychopathy was a significant independent predictor of Severity, with those higher in the trait more likely to regard online abuse as less severe.

Conclusions: Our findings that negative tweets both increased attributed celebrity blame, and reduced the perceived severity of the abuse, suggest that celebrities are ascribed responsibility for their online behaviour, and that abusive responses to negative content are considered warranted under some circumstances. The volume of abuse itself is indicative only of severity, not blame. Participants higher in DT traits were more likely to blame the victim, and considered online abuse to be less severe, confirming these traits contribute to anti-victim judgments. Psychopathy was the only trait to solely predict lower perceptions of severity, suggesting that judgments may be driven by a lack of empathy.

15:45 [Arvin Jagayat](#) and [Becky Choma](#)

Exploring gamers' opinions on the role of women in gaming and incidents of gendered online harassment of female gamers

SPEAKER: [Arvin Jagayat](#)

ABSTRACT. A report by the European Union's Agency for Fundamental Rights (2014) revealed that 11% of women have been subject to some form of unwanted or offensive sexually explicit e-mails, text messages or advances on social networking sites – a few examples of the many gendered forms of cyber-aggression that constitute cyber violence against women and girls (cyber VAWG). The present research examined cyber VAWG through the lens of the gaming community specifically, following several highly publicized incidents of cyber aggression toward female

gamers. The research presented here are the results from exploratory analyses on qualitative open-ended questions collected as a part of a larger project. The larger project also developed a scale to measure endorsement of cyber VAWG and examined the role of sociopolitical ideologies and perceived threats as predictors of cyber VAWG (Jagayat & Choma, in prep). Two samples were recruited: undergraduate gamers from a Canadian university who received course credit and members of online gaming communities who were entered into a draw for digital gaming store credit. Participants completed measures of: ideology, ambivalent sexism, perceived threats, attitudes towards cyber VAWG, self-reported engagement in cyber VAWG, and two open-ended questions. Part-way through data collection of the online sample, a popular YouTuber streamed themselves doing the survey and archived that stream to their channel; this produced a considerably large number of responses. The online sample was split into two samples: those who completed the survey before it went 'viral' and those who completed it after. Responses to a question assessing gamers thoughts about the role of women in the gaming community (university sample n=46, online pre-viral sample n=266, online post-viral sample n=6197) and a question assessing gamers' opinions on recent news stories of female members of the gaming community experiencing harassment on social media (university sample n=35, online pre-viral sample n=217, online post-viral sample n=5522) were analyzed. Using Linguistic Inquiry and Word Count 2015 software, responses were coded into word categories pertinent to, and potentially influential of, cyber VAWG behaviour (e.g. use of 3rd person plural pronouns, analytic thinking words, and affective processing words). Thirteen word categories will be compared across samples. Correlations between the word categories, cyber VAWG attitudes, sexism, threat, and ideology will be explored. Last, the unique predictive ability of the word categories beyond typical predictors of cyber VAWG (e.g. threat, sexism, ideology) on the endorsement of and engagement in cyber VAWG will also be examined using regression analyses. Implications for future research will be discussed.

14:45-16:00 Session Orals -9: Cognitive deficits

CHAIR: [Jang-Han Lee](#)

LOCATION: [Krieghoff](#)

14:45 [Filippo La Paglia](#), [Maria Margherita Francomano](#), [Giuseppe Riva](#) and [Daniele La Barbera](#)

Educational Robotics to develop of executive functions of visual spatial abilities, planning and problem solving.

SPEAKER: [Filippo La Paglia](#)

ABSTRACT. This research aims to verify the effectiveness of educational robotic on the executive functions and in particular on the mental process of planning and problem solving. The sample consisted of 30 children, attending their fifth year at primary school. Participants were casually assigned to experimental and control group each composed of fifteen subjects: experimental group (8 males and 7 females, 10 years); control group (9 males and 6 females, 10 years). The children were divided into small groups (three or four children for each group) and each was provided with a robotic kit and it was involved in an curricular laboratory based on robotics activities (10 meetings; two hours each, once a week. The participants have to build a robot body and, subsequently, they have to plan and program different behavioral repertoire. For the intervention used LEGO Mindstorms robot assembled as a small vehicle, equipped with motor, ultrasonic sensors at the front, one pointed straight ahead, and a LED color light mounted on top. After the familiarization with the hardware and software elements of the kit, all the students were given construction and programming tasks having an increasing level of difficulty measured by the number of commands necessary for programming the robot. Incremental more difficult activities were proposed allowing the children to gradually achieve a greater competence, with an approach based on the "error-less learning" method. Each of the tasks provided opportunities for subject to program and observe the robotic toy and to reflect on the toy's movement. The dynamic actions of the toy created a "shared moment" which was highly visual and in turn provided opportunities for shared attention and group work. Programming robot actions requires, for each step, mental anticipation of the action, selection of the appropriate

robot command and continuous updating of the programming in order to obtain the goal. Before and after training we assessed these cognitive and executive functions through following tests: Frontal Assessment Battery (FAB), reduced version that includes three subtests, to investigate motor planning and executive control; Trial Making Test (TMT, Forms A, B and B-A, version for children under 15) to assess attentional skills, visuo-motor planning, sustained attention and working memory; the Tower of London (ToL) for the capacity of planning and problem solving. The main finding was a significant improvement in visuo-spatial attention and a significant effect also on robot programming skills. These data provide scientific support to the hypothesis that robotics activities are suitable in progressively improving abilities in planning and controlling complex tasks in children, fostering executive functions development.

15:00 [*Beatriz Rosa, Jorge Oliveira, Pedro Gamito, Dina Bertolo, Diogo Morais, Paulo Lopes and Helena Presas*](#)

Virtual kitchen test for divided attention in the elderly

SPEAKER: [*Pedro Gamito*](#)

ABSTRACT. Background: Divided attention is an important cognitive ability that underlies most everyday tasks. The neural correlates of divided attention are linked to the prefrontal cortex, which comprise the main region for higher order processing being also one of the first to deteriorate due to ageing. While it is important to understand the declines in divided attention, the lack of ecological validity of traditional neurocognitive tests requires the development of naturalistic tests with psychometric rigor, but that allow a better understanding of the impact of such deficits in everyday living. Thus, based on these assumptions, this study consisted of developing and testing a virtual reality test for divided attention in old-aged persons.

Methods: The sample comprised 53 elderly (Mage = 77 years) participants (44 women), mostly with low education, that were recruited in a day-care centre for old-aged persons (CSPCG) in Lisbon, Portugal. The participants were exposed to the virtual kitchen test, being performed with Google cardboard glasses and a smartphone. This test requires the participants to bake a cake by dragging seven ingredients from the kitchen cabinet to the balcony according to a pre-established order while listening to news on a radio. At the end of the task they were asked to recall three pieces of the information playing on the radio. The participants were assessed in one session with the virtual kitchen test along with traditional neurocognitive tests for general cognitive ability (Montreal Cognitive Assessment, and the Frontal Assessment Battery) and attention (D2).

Results: 57% of the sample accomplished the virtual kitchen task successfully, of which only 10% correctly recalled the three pieces of the radio information. This task took in average 3 minutes to complete. No effects of age, education or self-reported depression were found on the performance of the task. Rather, performance was associated with the D2 test for attention ($p < 0,05$). Additionally, it was observed using a moderated linear regression model that this relationship was moderated by education level, suggesting that this association is true only for people with education above basic level.

Conclusion: The overall results suggest that the virtual kitchen test is feasible to assess attention ability. The degree of difficulty was higher for the recall task, but the analysis on the distributions of these variables did not show floor effects. The results suggest also that performance of the virtual kitchen test do not resemble the D2 test in participants with lower education level. This reveals the importance of education and cognitive reserve in the assessment of attention, possibly suggesting that attention assessment in people with less education should be based on different sources of information in order to better describe the real deficits of the old-aged person.

15:15 [*Lisa Sheehy, Hillel Finestone, Frank Knoefel, Christine Yang, Martin Bilodeau, Vivian Welch, Anne Taillon-Hobson and Heidi Sveistrup*](#)

Home-based virtual reality training for adults with mild cognitive impairment: Preliminary results of a feasibility telerehabilitation study

SPEAKER: [Lisa Sheehy](#)

ABSTRACT. Context Individuals with mild cognitive impairment (MCI) are at risk for further cognitive decline and at risk of physical decline and decreased mobility. These individuals are often told to “wait and see” and can become frustrated with the lack of treatment options. However, a recent systematic review found that exercise has the potential to improve cognition in individuals with MCI. Further, individuals with MCI who report greater physical activity have a lower chance of their MCI progressing to dementia.

Virtual reality training (VRT) uses computer software to track the user’s movements and allow them to interact with a therapeutic game or activity presented on a TV screen. Virtual reality training (VRT) can incorporate both physical and cognitive exercise, is interesting and enjoyable to perform. Home-based VRT is convenient, cost-effective, easy to schedule and may be done for an unlimited period. Individuals can participate in engaging exercise daily, without the costs and inconvenience of travelling to community-based programs, especially in poor weather.

Our objective is to determine if VRT is feasible and safe for home-based exercise in individuals with MCI.

Methods Twelve participants with MCI are being recruited from the Bruyère Memory Program at Élisabeth Bruyère Hospital. Participants must not have a medical condition that precludes moderate exercise and must have a study partner.

VRT is provided using software (Jintronix, Montreal) coupled with a Kinect camera (Microsoft) which captures the movements of the participant and allows them to interact with a game. Games and activities are available to train strength, aerobic conditioning, balance, gait and cognition.

Participants attend one session at the hospital. Participants are assessed and then trained on the VRT platform. VRT game/activity selection and parameters are individualized. The researcher then installs the VRT equipment into the participant’s home and provides a second training session. Participants are requested to perform their VRT program for 30 minutes a day, 5 days a week for 6 weeks. Participants are contacted by phone or email at least once a week, to monitor progress and provide assistance. The researchers can access the Jintronix platform remotely, to monitor use of the program and change games/settings. Participants are given a logbook in which to write comments/problems/questions about the VRT program. After 6 weeks, participants are interviewed to obtain their opinions on all aspects of the program.

Outcome Measures The log books, notes from telephone conversations and interview transcripts are coded and analysed to extract themes that address the study objectives. VRT usage is obtained from the Jintronix system.

Results Four participants with MCI have participated in the study. Feasibility has been confirmed within the following themes: 1. Ability to use the technology. It was possible to set up the equipment and connect to the internet in all instances. Participants could access the software, log in and go through the VRT program. One participant was unable to log in; this issue was solved over the phone. 2. Ability to learn and progress the games. All 4 participants were able to learn the games. Two reported difficulty following the avatar at times. Progression was seen throughout the 6 weeks, except for one participant, who began with limited physical stamina. All participants reported benefit from the physical activity, including reduced fatigue, better balance and more stamina. 3. Safety. There were no adverse effects. 4. Enjoyment. All participants reported enjoying the exercise

program. Two wished to continue it beyond the study. All reported frustration with feedback and game results that did not meet their expectations. 5. Compliance. All participants completed 29-40 sessions over 6 weeks.

Conclusion Early results suggest that home-based VRT is feasible for individuals with MCI.

15:30 [Catherine Proulx](#), [Anne Cabral](#), [Nusrat Choudhury](#) and [Patricia Debergue](#)

Acceptability study of a novel immersive cognitive care platform for remediation of cognitive deficits

SPEAKER: [Catherine Proulx](#)

ABSTRACT. We introduce bWell, a clinician-centric immersive research platform for the remediation of cognitive deficits using virtual (VR) and augmented reality (AR) developed by the NRC. The goal of the platform is to provide a general “menu” of AR and VR cognitive exercises which can be adapted by clinicians to meet the specific needs of their patients.

Instead of focusing on a single pathology, bWell targets general aspects of cognition which are common to several disorders: working memory, divided and sustained attention, impulse control, sensory processing, anxiety management and executive functions. Exercises are designed from the ground up to be immersive, gamified and provide a dual-task challenge. The platform uses industry-standard game development techniques and is designed to be perceptually correct through the use of global illumination, detailed textures, and shadows. It is unique in that it is hardware-agnostic, seamlessly supporting multiple AR/VR systems ranging from low-end mobile devices to high-end consumer devices (Hololens, HTC Vive, Oculus) in order to facilitate its adoption in a clinical or home setting. Adaptive difficulty algorithms have been implemented to keep users continuously challenged without the direct intervention of the clinician.

In the current experiment, the acceptability of the bWell platform was evaluated using a cohort of twenty-six healthy adults. The goal was to measure user engagement and to evaluate the risk of cybersickness as a prerequisite to testing the system on cognitively-impaired populations, since cybersickness and acceptability of VR technology are frequent concerns for clinicians.

The platform was tested on an HTC Vive system, and three out of the seven available exercises were selected: MOLE, LAB and TENT. The MOLE exercise requires users to hit targets of a specific color that changes over time, challenging their impulse control. The LAB exercise requires users to complete two parallel “recipes” following a specific timed sequence, challenging divided attention and executive functions. The TENT exercise is an open-ended relaxation space: users can change the scenery and interact with a sensory sphere proposing a relaxing breathing pattern. All exercises use tracked remotes for interacting with the scene, as well as gaze-based navigation. A top-down non-immersive tablet version of the MOLE exercise was also created as a control. It uses the same underlying game logic with touch instead of remote interactivity.

Subjects were randomly divided in two groups: one group was to compare a single VR exercise (MOLE) with its non-immersive version to evaluate engagement; the other group was to try two different VR exercises for cybersickness assessment. All test sessions were limited to three minutes but subjects could interrupt the session at any time. Standard questionnaires for cybersickness (SSQ) and game user satisfaction (GUESS) were filled by the subjects immediately after each exercise.

Cybersickness symptoms were minor and engagement in immersive VR was high. Only one (1/26) user reported multiple symptoms that could be attributed to cybersickness, but also reported very strong engagement and desire to play again. Some users were physically unable to wear their glasses with the headset, leading to vision issues (eye strain, blurred vision). Many users also reported

sweating under the headset. These issues are not directly related to cybersickness, but might play a role in the system acceptability. None of the sessions had to be interrupted due to discomfort.

Results show that user engagement was significantly higher in the immersive version of the MOLE exercise. We obtained statistically significant differences for all components of engagement: engrossment ($P = 0.0015$), enjoyment ($P = 0.002$) and personal gratification ($P = 0.01$) as measured by the GUESS survey.

This demonstrates that the bWell platform has high user acceptability, both in terms of engagement and comfort.

15:45 [Annie Robitaille](#), [Linda Garcia](#), [Stéphane Bouchard](#), [Oliver Baus](#), [Richard Pinet](#), [Lynn McCleary](#), [Kiran Rabheru](#), [Ken Leclair](#), [Nancy Lesiuk](#) and [Elaine Wiersma](#)

Testing a VE for behaviours and dementia

SPEAKER: [Annie Robitaille](#)

ABSTRACT. Dementia is associated with behavioural changes sometimes referred to as responsive behaviours (RB). RBs are an extreme source of stress for care partners and are frequently the reason why people with dementia (PWD) are moved to a long-term care (LTC) setting.

This pilot study's objective was to evaluate the potential of using a virtual reality (VR) application to provide a realistic environment where LTC staff, care partners and students in health-care fields (e.g. nurses, physicians, and personal support workers) would gain knowledge and skills on how best to provide person-centered care in the context of responsive behaviours.

To this end, 23 healthcare professionals working with PWD, 25 care partners to PWD, 27 students in a health-related field, and 11 university or community college faculty members teaching courses relevant to gerontology and dementia tested the application.

Pre-immersion participants completed: (a) a brief socio-demographic questionnaire; (b) a questionnaire regarding previous experience with RBs and VR; (c) the Immersive Tendencies Questionnaire (ITQ; Witmer and Singer 1998); and (d) the Simulator Sickness Questionnaires (SSQ; Kennedy et al. 1993). Just prior to immersion, participants viewed a seven-minute video narrating the life course of the immersion's main person of interest, a PWD. Once immersed in the VR using an HTC VIVE, participants found themselves in an elevator arriving on the fifth floor of a LTC home. Participants then proceeded to a bedroom where they practiced navigating in the VE, and accommodated to the sensations associated with VR immersion. They then proceeded to a large common dining room and walked to the table where the PWD was sitting with his grand-daughter. Participants then sat down on a physical chair. The dining room was lively with various noises (e.g. loud conversations, PA announcements, television, clinking dishes) and with the PWD exhibiting signs of frustration. For the following 10 minutes, participants were to (a) observe the interaction between the PWD and his grand-daughter; and (b) be attentive to the impact of the environmental stimuli on the PWD. Once the scenario complete, participants filled out (a) the SSQ (Kennedy et al. 1993); (b) the Independent Television Commission Sense of Presence Inventory (ITC-SOPI; Lessiter et al. (2001); (c) a questionnaire regarding the quality of the grand-daughter's interaction with the PWD; and (d) a questionnaire regarding the quality of the application, its usefulness, usability, and potential as a training tool.

Results suggest that this type of VR application was judged to be clinically relevant and of potential use as a training tool to help users better address responsive behaviors. During immersion, participants felt present and emotionally engaged. Many participants identified the inability to

interact with the virtual persons as a shortfall, and few reported mild to moderate levels of simulator sickness.

The investigators see the development and testing of a more complex interactive version of this VE (i.e. scenarios that will vary depending on actions by the user) as a next step in making this a clinically relevant training tool.

16:15-17:15 Session Keynote -2: The future fabrics of reality: Integrating cognitive neuroscience and mixed reality technology for human characterization

Mariano Alcaniz

LOCATION: [Julien-Gagnon-Walker](#)

17:45-19:15 Session Demos: Cyberarium

Open demos from conference presenters (Hôpital Van Gogh, IN VIRTUO, kelencontent, Strongest Families, TAO Connect, Thought Technology Ltd, Outaouais Tourism and more.

LOCATION: [Delfosse & Suzor-Coté](#)

JUNE 28th 2018 Program

07:00-08:00 Yoga class (only for those staying at the hotel)

Traditional Hatha yoga class with master Michael Hutkins and morning run

Location: Le Jardin (outside, close to the hotel reception) or in the hotel gym on a rainy morning (room card required to enter)

LOCATION: [See registration desk](#)

09:00-10:00 Session Orals -10: Online experiences

CHAIR: [France Talbot](#)

LOCATION: [Krieghoff](#)

09:00 [Nicola Doering](#) and [M. Rohangis Mohseni](#)

Does Internet and smartphone use promote or reduce social well-being? Results from a national online survey

SPEAKER: [M. Rohangis Mohseni](#)

ABSTRACT. Introduction: Outcomes of private internet and smartphone use on social well-being have been a controversial issue in both public and academic debates. On the one hand, mediated interpersonal communication is acknowledged for improving social connectedness (e.g., Valkenburg & Peter, 2007). On the other hand, mediated interpersonal communication is blamed to increase social isolation (e.g., Turkle, 2011).

Problem: Against this backdrop, the present study assessed both negative and positive outcomes of internet and smartphone use on social well-being in a balanced way. It was examined if private internet and smartphone use is globally reducing or promoting social well-being (RQ1), and which specific negative (RQ2) and positive (RQ3) outcomes of private internet and smartphone use are recognized to what extent.

Method: N = 2,000 participants aged 18-69 years (51% male; age: M = 42.71, SD = 13.32) took part in a national online survey in Germany. Participants gave informed consent, provided sociodemographic information, and completed two single item measures assessing the recognized global negative and positive impact of internet and smartphone use on their social well-being (“Altogether, my private internet and smartphone use has a negative/positive effect on my social relations.”; Likert scale response format: 1 = “not at all” to 7 = “to a great extent”). The recognition of specific negative outcomes (e.g., “Internet and/or smartphone use replaces meetings with friends.”) and positive outcomes (e.g., “Via internet and/or smartphone, I keep in touch with long-distance friends.”) were measured with two self-constructed one-dimensional scales (negative: 13 items, Cronbach’s $\alpha = .921$; positive: 15 items, Cronbach’s $\alpha = .903$, Likert scale response format: 1 = “not at all” to 5 = “totally agree”). Items were based on previous research (e.g., Burke, Marlow, & Lento, 2010; Caplan, 2002, 2005). Data analysis was conducted with SPSS 24.

Results: Regarding RQ1 that compared negative and positive outcome on a global level, the global positive outcome significantly outweighed the negative (positive: M = 4.13, SD = 1.55; negative: M = 2.31, SD = 1.44; $t(1999) = 38.61$, $p < .001$, $d = .86$). Regarding RQ2 that asked for specific negative outcomes, users most often recognized that their internet and smartphone use more and more frequently replaced meetings with friends (M = 2.08, SD = 1.12), made contacts more superficial (M = 2.05, SD = 1.12), created stress due to constant communication affordances (M = 1.88, SD = 1.06), and interrupted meetings with friends (M = 1.76, SD = 1.00). Regarding RQ3 that asked for specific positive outcomes, users responded that internet and smartphone helped them to stay in contact with long-distance friends (M = 3.64, SD = 1.34), to maintain friendships better (M =

3.09, SD = 1.24), to have more contact with one's family (M = 2.99, SD = 1.37), and to revive former friendships (M = 2.94, SD = 1.31). A comparison of the two scales' mean values also showed that the specific positive effects (M = 2.48, SD = 0.85) on social well-being were significantly stronger than the specific negative effects (M = 1.71, SD = 0.74; $t(1999) = 43.39$, $p < .001$, $d = 0.97$).

Conclusion: Cultivating friendships seems to be the most important goal of private internet and smartphone use. In accordance with the Positive Technology approach (Riva et al., 2012) users recognize that internet and smartphone can impede as well as support the cultivation of friendships. Nevertheless, the social benefits of private internet and smartphone use seem to supersede the social costs by far, at least when it comes to subjective evaluations. Experimental and longitudinal studies are necessary to validate these subjective impressions.

09:15 [Neil Coulson](#)

Living with Meniere's disease and use of online peer support groups: Findings from an asynchronous online interview study

ABSTRACT. Ménière's disease is a condition of the inner ear that can lead to sudden onset of a range of unpleasant and distressing symptoms including (but not limited to): vertigo, tinnitus, ear pressure and hearing loss. In recent years, a number of online support groups have been established to support the ongoing needs of individuals living with this disease (notably through asynchronous discussion forums). However, there has been very little research attention devoted to understanding the online experiences of individuals who use this increasingly popular source of online support. The aim of this study was to explore the experiences of individuals who participate in Ménière's disease online forums with a view to understanding their motives for participation, perceive benefits and/or disadvantages and in particular how participation can impact on daily living and illness management. Following advertising of the study on a number of Ménière's disease online discussion forums, a total of 26 individuals (15 females, 11 males aged 17 to 67 years, mean = 46.8) participated in this online asynchronous structured interview study. Participants reported having been living with Ménière's disease for between 3 months and 20 years, with a mean duration of 6.6 years. The majority (n=22) of participants were from the United Kingdom with the remainder coming from the USA (n=2), Australia (n=1) and Morocco (n=1). On average, participants accessed their online support discussion forum 3 times per week. Responses to a series of open-ended questions were analysed using thematic analysis as per the guidelines set out by Braun & Clarke, (2006). The findings suggested motives for participation included: to learn new information about the disease, to find others in a similar situation, to find emotional support, feeling lonely, to share experiences, to seek advice, to support others, experiencing new symptoms or referred by a health professional. A number of potential advantages were described by the participants: mutual support through information provision and emotional support, reading about the experiences of others and a reduction in perceived isolation. Conversely, several potential disadvantages were noted including: concerns about the credibility and/or accuracy of medical information exchanged online, negative behaviour online, difficulties in forming relationships online, a focus on negative experiences. Respondents were mixed in terms of any potential impact on daily living as a result of participation with the forum with about half explaining that it had made no difference at all. In contrast, others reported that through participation they felt more knowledgeable and confident in their ongoing interactions with health professionals. For some individuals, participation appeared to be linked to an improvement in well-being and ability to cope with the disease on a day to day level. Overall, the findings of this qualitative interview study suggest that participation may bring with it a number of positive benefits and provide new opportunities for individuals living with Ménière's disease to connect with each other. In addition, for those who experience isolation, participation may serve to alleviate this negative state. In future studies, there is a need to explore using a more longitudinal design how participation may impact on both the illness experience as well as the development and implementation of coping strategies. In addition, future work may usefully consider whether the medical information exchanged between individuals is inaccurate or not. Moreover, regardless of

whether this information was deemed inaccurate, little is known about how group participants may act on information provided within online support forums.

09:30 [Jessica Nicole Rocheleau](#) and [Krystelle Shaughnessy](#)

Context matters: The role of social anxiety and online privacy concern on university students' social networking site experiences

SPEAKER: [Jessica Nicole Rocheleau](#)

ABSTRACT. Introduction: The use of social networking sites (SNSs) is pervasive in contemporary society. Research suggests that social anxiety (SA; the need to conceal self-attributes in social situations) and online privacy concern (OPC; the desire to control access to personal information online) limit people's engagement in SNS activities involving personal information disclosure. Although related to different cognitions, these two anxieties may elicit similar emotions and behaviours in online SNS contexts. However, personal information disclosure on SNSs occurs in a variety of contexts with different features that may mitigate or exacerbate OPC- and SA-related fears. Thus, the extent to which people high in SA and/or OPC report similar or different emotions, cognitions, and behaviours online may depend on the specific SNS context they are engaging in. The purpose of this study was to investigate the extent to which OPC and/or SA predicted OPC- and SA-related cognitions, emotions, and behaviours during three different SNS contexts: 1) signing up, 2) creating a profile, and 3) interacting with another person on a SNS.

Methods: Online, participants (N = 324) first completed the Social Phobia Inventory (Connor et al, 2000) and an OPC questionnaire (adapted from Buchanan, Paine, Joinson & Reips, 2007). After, they read a scenario description for the first SNS context (i.e., signing up for a SNS). Next, participants rated their level of anxiety and willingness to share personal information in this context. They also completed measures assessing their level of privacy risk and control over personal information during this activity. We used the same order of questionnaires following the second (i.e., profile) and third (i.e., social interaction) context descriptions, except that we added a Brief Fear of Negative Evaluation scale (Carleton et al., 2007).

Results: Bivariate correlations revealed few similarities and several differences in people's SNS experiences related to their level of OPC and SA. For example, higher OPC—but not higher SA—coincided with significantly greater privacy risk in all SNS contexts. We conducted separate 3 (OPC: low, moderate, high) x 3 (SA: low, moderate, high) x 3 (Context: sign-up, profile, social interaction) ANOVAs for anxiety, willingness, and each of the cognitions. The results indicated that participants' anxiety, cognitions, and willingness significantly differed between the SNS contexts. These differences were more consistent than those due to OPC or SA group. In fact, OPC and SA did not predict willingness in any of the SNS contexts. Participants high in OPC reported significantly greater anxiety and privacy risk than those moderate and low in OPC; the latter group also reported significantly greater control than people high in OPC. There was a significant interaction between SA-group and SNS context for anxiety. Participants low in SA reported significantly lower anxiety in the profile context than those high and moderate in SA. Participants high in SA reported significantly greater anxiety than participants moderate in SA followed by those low in SA in the social interaction context. Additionally, overall, the SA groups significantly differed in fear of negative evaluation, such that participants high in SA reported more fear of negative evaluation followed by those moderate and then low.

Conclusions: OPC and SA are distinct fears that may deter people from participating in online social activities. However, SNS users' concerns about and intentions to disclose personal information online may depend more on aspects of the disclosure context (e.g., anonymity, asynchronicity, privacy) than individual characteristics, such as OPC and SA. We will discuss the implications of our findings for the development of cognitive-behavioral models of OPC and SA that include online contexts; exposure-based psychotherapies for SA; and SNS design recommendations.

09:45 [Jessica Nicole Rocheleau](#), [Kelsey Bowie](#) and [Krystelle Shaughnessy](#)

Too scared to share? An investigation of social networking site users' personal information concerns

SPEAKER: [Jessica Nicole Rocheleau](#)

ABSTRACT. Introduction: The use of social networking sites (SNS) holds the potential to enhance users' social capital and psychological well-being. Through these platforms, users are able to build and maintain relationships by disclosing personal details to others online. However, SNS users conceal aspects of their identity during online social activities due to online privacy concern (OPC) and social anxiety (SA). Researchers have theorized that there are three different types of personal information that people may disclose or conceal on SNSs: self-identifying (e.g., name, date of birth), access (e.g., location, address), and expressive (e.g., personal interests, opinions). However, there is little research demonstrating the validity of this framework for users' reported concerns about personal information online. Moreover, researchers have yet to investigate the extent to which OPC, SA, and their affective and behavioural outcomes predict users' concerns about sharing different types of personal information on SNSs. The purpose of this study was to investigate SNS users' concerns about sharing different personal information and how it relates to key psychological factors influencing self-disclosure online.

Method: University students (N = 324) completed an online survey regarding their concerns about sharing personal information online. Participants first completed an OPC questionnaire (adapted from Buchanan, Paine, Joinson & Reips, 2007) and the Social Phobia Inventory (Connor et al, 2000). Next, participants completed the Information Sensitivity Scale that was developed for the current study. The measure included a list of 29 types of personal information that people can disclose in online activities or social interactions. Participants rated their level of concern about disclosing each type of personal information online. Finally, participants were asked to imagine that they were customizing a personal SNS profile, and to rate their level of anxiety and willingness to share personal identifying information (e.g., name, phone number) and personal characteristic information (e.g., preferences, hobbies) in this context.

Results: An exploratory factor analysis of the Information Sensitivity Scale supported a four-factor solution representing subgroups of personal information: favourable qualities (e.g., sense of humour, agreeable opinions), unfavourable qualities (e.g., failures, controversial opinions), personal access (e.g., address, phone number), and indicators of social status (e.g., age, achievements). We conducted multiple linear regressions to evaluate the role of OPC, SA, anxiety and willingness in predicting participants' concerns about disclosing each subgroup of personal information. All of the models were statistically significant ($p < .001$), accounting for 20 – 28% of the variance. Higher SA predicted significantly greater concern about showing favourable ($\beta = .34, p < .001$) and unfavourable qualities ($\beta = .37, p < .001$) during online social activities. Higher OPC predicted significantly greater concern about sharing favourable qualities ($\beta = .20, p < .001$), personal access information ($\beta = .26, p < .001$), and indicators of social status ($\beta = .32, p < .001$). Greater willingness to disclose personal characteristic information predicted significantly lower concern about showing indicators of social status ($\beta = -.16, p = .005$). Higher anxiety while sharing personal characteristic information was related to significantly greater concern of disclosing favourable qualities ($\beta = .17, p = .005$); greater anxiety over personal identifying information predicted significantly greater concern about personal access information ($\beta = .21, p = .001$).

Conclusion: Our findings suggest that SNS users categorize personal information based on the implications of its disclosure on their social (favourable qualities, unfavourable qualities, indicators of social status) and personal (personal access information) identity online. The extent of these concerns was related to online anxieties, such as OPC and SA. Our findings extend current

understanding of factors impacting SNS users' self-disclosure and relationship quality online.

09:00-10:00 Session Orals -11: Intellectual disabilities and autism

CHAIR:

Claude Normand

LOCATION: Morrice

09:00 Julia Parish-Morris, Rita Solórzano, Vijay Ravindran, Vibha Sazawal, Sinan Turnacioglu, Ashley Zitter, Judith Miller and Joseph McCleery

Immersive Virtual Reality to Improve Police Interaction Skills in Adolescents and Adults with Autism Spectrum Disorder: Preliminary Results of a Feasibility and Safety Trial

SPEAKER: Julia Parish-Morris

ABSTRACT. Introduction.

Can immersive virtual reality applications, propelled by commercial interests, turn into life-saving interventions for adolescents and adults with autism spectrum disorder (ASD)? Civilian fatalities at the hands of police are more common in the United States than any other developed country, and these fatalities disproportionately affect people with disabilities (Perry & Carter-Long, 2016). Police departments have aimed to heighten their own autism awareness and safety protocols via training videos, in-person seminars, and informational pamphlets. However, given that 1 in 5 adults with ASD will be stopped and questioned by police before age 21 (Rava, Shattuck, Rast, & Roux, 2016), it is critical to prepare individuals with ASD themselves for police interactions. Existing text-based curricula and educational videos targeted at individuals with ASD rarely involve active participation, reducing generalizability to actual encounters with police. Training that involves direct practice (role-playing) in a simulated real-world situation – such as next-generation mobile immersive virtual reality (VR) – has significant potential to improve police interaction skills more effectively than traditional didactic approaches. Here, we report preliminary results from an ongoing safety and feasibility trial that lays the groundwork for a randomized controlled clinical trial to assess the efficacy of using immersive VR to improve police interaction skills in individuals with ASD (Phase I of an NIH-funded Small Business Technology Transfer project, NIMH 1R44MH115539-01).

Method/Tools.

Floreo, Inc. developed a unique product that pairs a human user and a human monitor, in real time, in the context of a mobile immersive virtual environment that includes interactive police officers and background distractors (Police Safety Module; PSM). Verbal participants with ASD aged 12 to 60 years engaged with Floreo PSM displayed via iPhone in a lightweight head mounted display (HMD). A trained monitor on a linked iPad facilitated one VR session (approximately 8 total minutes of VR, with breaks every 2 minutes; a 3-session safety and feasibility trial will begin in January 2018). After participating, participants rate their experience via the System Usability Scale (SUS), and report any side effects in a qualitative interview.

Results.

Sixteen participants (mean age=16 years, range=12-37 years) with IQs in the average range (mean IQ=102, range=88-120) consented to take part in 1 session of Floreo PSM. All 16 participants were able to complete the entire session, including wearing the HMD, suggesting that immersive VR is highly feasible in this population. There have been no serious adverse effects. One participant reported a mild side effect after the session (headache) that resolved by the time researchers followed up the next day. Critically, inconsistent/contradictory responses in a large percentage (36%) of participants indicated that the initial SUS needed to be modified. Examination of the data showed a

strong association between inconsistent/contradictory responses on the SUS and autism symptom severity (Social Communication Questionnaire; Rutter, Bailey, & Lord, 2003), such that individuals with higher SCQ scores were more likely to respond inconsistently than participants with fewer symptoms. The new SUS-ASD was developed with advice from an independent panel of expert clinical psychologists and researchers, and will be valuable for other groups interested in collecting technology usability ratings from adolescents and adults with ASD.

Conclusion.

The initial results of this ongoing Phase I clinical trial suggest that Floreo PSM is safe and feasible for use in verbal adolescents and adults with ASD. Final results of both 1-session and 3-session usability and side effect trials will be reportable by June, 2018. The innovative mobile VR technology used in Floreo PSM could be applied to a variety of social and behavioral needs in ASD, thus holding promise as an inexpensive, flexible, scalable platform for future social and community skills interventions.

09:15 [*Claudine Jacques*](#), [*Viviane Cloutier*](#) and [*Stéphane Bouchard*](#)

The Decoding of Social Interactions Task in VR for autism spectrum: Development of an intervention protocol and pilot testing

SPEAKER: [*Stéphane Bouchard*](#)

ABSTRACT. Autism spectrum encompass a variety of symptoms and clinical features. Of them is a potential deficit in social cognition, as expressed by difficulties detecting social cues, integrating social norms in context, understanding social interactions, engaging in nuanced social behavior, and social withdrawal (APA, 2013; Forgeot D'arc et al. 2016). Intervention programs designed for people with autism spectrum (AS) often include social skills training. However, it remains difficult to reproduce or role play complex social interactions and at the same time be actively engaged in coaching people with AS to facilitate skills generalization. Building on people with AS strengths in perception and information processing (Mottron et al. 2013), the Decoding Social Interaction Task in VR (DSITinVR) task was developed to be used by mental health professionals to immersed people with AS in five complex social interactions. The first (a party) and last (customers commenting on the physical appearance of a waitress in a bar) social interactions have been used as opportunities to measure how users immersed in virtual reality (VR) (in the case, people with AS) freely decode social interactions. The other three immersions in VR (ordering food in a restaurant, dealing with an intrusive stranger in a bar, and at a bus stop) are used for social skills training. Users are coached by a mental health professional in decoding the social interactions and their contexts, interpret virtual human's emotions and intentions, explore a variety of actions to perform, and decide on which behavior and actions should be applied and practice by the user. All immersions were conducted in a fully immersive and wireless 6-wall CAVE-Like system. A pilot test was conducted to document the acceptability and potential of the DSITinVR task for people suffering from AS. Three adult's males diagnosed with AS disorder without intellectual disability participated in the pilot study. Pre and post application of the program, participants completed validated self-rating tools of social skills documenting pro-social and less efficient social behaviors (also completed independently by their parents), the Social Interaction Self-Statement Test assessing positive and negative thoughts about social interactions, and a behavioral rating of participant's ability to decode social interactions in the first and last immersions in VR. During the training in social skills in VR, users and the professional could take as long as they need and note were systematically written and drawn to visualize the decoding sequence. Results revealed that parents observed an overall increase in pro-social behaviors and a decrease in non-functional social behaviors. Behavioral ratings by the interviewer also suggest an increase in participant's ability to decode social interactions. However, participants noted the opposite, with no change or a worsening of their abilities to behave efficiently in social interactions, a worsening of their thoughts about social interactions. It is hypothesized that participants in the pilot study became more aware of the challenges associated with decoding social

interactions, leading to potentially observable changes in behavior and increased sensitivity to potential inadequacies in social interactions. Based on the assessment of AS persons, parents and interviewer, suggestions for modifying the program are proposed, including more immersions dedicated to social skills training, planned practice of skills between sessions, and reframing increase in awareness to avoid sensitization.

09:30 [Neila Ramdhani](#), [Ria Stefani](#) and [Alifa Syamanta](#)
Mindfulness for Tackling Online Gaming Addiction
SPEAKER: [Neila Ramdhani](#)

ABSTRACT. Online gaming gives the players much fun that it can make them addicted to it. They find it difficult to control their impulses to play, causing problems related to decreased effectiveness of life. Two studies were done to test the use of mindfulness techniques for improving ability to control impulses. For these current studies, thirty young online gamers, consisting of 27 boys and 3 girls, joined mindfulness training. Eight of them being students aged 14-15 years old were involved in Study 1 and twenty-two students aged 19-21 years old were involved in the mindfulness training of the study 2. The training was delivered in eight sessions, each of which took two hours. Before and after the training, the participants were measured with online gaming addiction scale and self-control scale. The Manova test showed that mindfulness training could decrease online gaming addiction and improve self-control.

09:00-10:00 Session Symposium 6: Immersive cybersexuality: Fundamental research and forensic applications

CHAIR: [Patrice Renaud](#)

LOCATION: [Julien-Gagnon-Walker](#)

09:00 [Patrice Renaud](#)

Immersive cybersexuality: Fundamental research and forensic applications

ABSTRACT. In conjunction with the increasing and diversifying effect due to its anchorage in social media, a VR revolution is in march in all spheres of human activity, especially that of the sexual life. According to Market Watch: “By 2025, such adult content (i.e. synthetic pornography) is forecast to be a \$1 billion business, the third-biggest virtual-reality sector, after videogames (\$1.4 billion) and NFL-related content (\$1.23 billion)” (Booton, 2015). We do not know yet how this will affect our lives but burning questions lurk there: How different from standard pornography is interactive sexual intercourse as mediated by VR? Is there anything like a sexual presence and if so, how can it be measured? Do women and men respond in the same way to virtual sexuality? How does immersive VR will affect the shaping of sexual behavior in the future? Will we be facing the arrival of new VR-related paraphilias? How can we optimally harness this set of technologies to better understand and possibly help sex offenders control themselves? Our symposium comprises four presentations in line with what precedes. First, Sarah Michelle Neveu (Quebec University in Outaouais, Quebec University in Montreal, Philippe-Pinel Institute of Montreal) will help us better understand how CGC-based sexual preference assessment can be used to draw distinct profiles for child molesters and rapists. Second, Joanne-Lucine Rouleau (University of Montreal, Philippe-Pinel Institute of Montreal) will give a talk on how her team developed a series of CGC-based scenarios mimicking the standardized Quinsey audio stimuli for the assessment of child molesters, as well as how an audio-visual strategy is better than a simple audio one in assessing child molesters sexual preferences, using penile plethysmography and eye-tracking in a combined fashion. Thirdly, Jean-Pierre Guay (University of Montreal, Philippe-Pinel Institute of Montreal) will give us a talk about how his team is using VR to study predatory behaviors and especially how possible effects of the dark triad of personality on victim selection can be probed in immersion. Finally, Sara St-Pierre Côté (École des Technologies Supérieures, Philippe-Pinel Institute of Montreal) will address the question of sexual presence and how female and male interactors might differ in the experience of thereof.

09:12 [Sarah Michelle Neveu](#)

Triangulating on deviant sexual preferences by using penile plethymography, eye-tracking and qEEG in virtual immersion

ABSTRACT. Deviant sexual preference is the risk factor the most related to prediction of sexual recidivism. The use of virtual reality to assess deviant sexual preference has been investigated in the last ten years at the Virtual Reality Applications in Forensic Psychiatry Lab (VRAFP), at the Philippe-Pinel Institute in Montréal. A multimethod approach is now used, where several variables are simultaneously studied (penile response, cerebral response with qEEG and perceptuo-motor markers), while sex offenders view synthetic virtual characters depicting children and adults. The goal of the presentation is to first present the rationale behind a multimethod approach to evaluate deviant sexual arousal with two models (Extended mind theory and Integrated theory of sexual offending). During the second part of the presentation, results on penile response, perceptuo-motor markers and cerebral responses will be presented. Data collected so far points to the direction of distinct responses according to deviant sexual preferences, i.e. distinct cerebral activity during sexual response when preferred virtual stimuli are shown. The general purpose of this study is to find correlates of deviant sexual preferences that goes beyond the penile response. This study is an example of an integration of research and clinic in a maximum-security facility, where neurosciences and virtual reality are used in fundamental and clinical approaches.

09:24 [*Joanne-Lucine Rouleau, Shawn Marschall-Levesque and Patrice Renaud*](#)

2) Disentangling The Effects of Audio and Visual Dimensions of Sexual Stimuli as Used in the Assessment of Child Molesters with Penile Plethysmography.

SPEAKER: [*Joanne-Lucine Rouleau*](#)

ABSTRACT. The presence of sexual interests towards children remains one of the foremost factors predicting the risk of sexual recidivism and one of the diagnosis criteria for pedophilic disorder. To accomplish this, PPG depends on the ability of stimuli (e.g., visual or audio) to generate erectile responses. This dependence constitutes one of PPG's strengths and weaknesses, since rigorous ethical norms are applied to the use of real images of children and therefore, some of the stimuli currently used, have difficulty in generating valid results caused by a significant rates of invalid PPG profiles. In order to reduce the number of invalid profile, we combined standard audio stimuli with images of computer-generated characters in order to create a new set of audiovisual stimuli capable of producing stronger penile responses than both the audio or visual stimuli presented individually. This modality is composed of eight stimuli, including two neutral stimuli (N), one adult female stimulus (AdultF), one adult male stimulus (AdultM), one sexual assault without violence stimulus against a female child (GNV), one sexual assault without violence stimulus against a male child (BNV), one rape of a female child stimulus (GRape) and one rape of a male child stimulus (BRape). Each of the eight stimuli are composed of six images presented in the first person showing the sexual and non-sexual interactions taking place in the stories. While these images are presented, an audio track is played narrating in the second person the events taking place in the story. Each stimulus is 90 seconds long followed by a 30 second span where no stimuli (audio or visual) are presented. Erectile responses from two groups of participants (sexual offenders against children and non-offenders) were recorded and compared, while they were presented with three blocks of stimuli (audio, visual and audiovisual). To be included in the offender group participants had to have been convicted or had to have admitted to having sexual contact with a 13-year-old or younger child while being at least 16 years old and at least five years older than their victim. Participants in the non-offender group were recruited using an advertisement in a local newspaper. No history of sexual assault, either as the perpetrator or victim, was reported in the comparison group. In this presentation, our results in targeting the increase in the number of valid profiles in the phallometric assessment (PPG) of child molesters will be depicted. Three modalities (audio, visual and audiovisual) were compared using two groups (15 child molesters and 15 control participants). The discriminant validity was promising with a significant interaction between groups and stimuli types showing that the clinical group reacted more strongly to the deviant stimuli while the comparison

group reacted to the non-deviant stimuli $F(4,84) = 9.78, p < .001$. Classification accuracy analysis, using ROC curves, showed that the visual and audiovisual stimuli presented excellent discrimination ($AUC = .83$ and $AUC = .89$) while the audio stimuli did not reach significance ($AUC = .69$). Finally, by comparison to the audio modality, the audiovisual modality resulted in a significantly increase in mm change and in more valid profiles. Our results also suggest that the audiovisual stimuli using computer generated characters are good and ethical alternative to conventional visual stimuli. This study also emphasise the importance of new technologies as a means of enhancing tools already known, whilst maintaining rigorous ethical norms. In conclusion, outcomes of this research, support the use of the audiovisual modality in the assessment of child molesters while warranting and justifying further studies on this important matter.

09:36 [Jean-Pierre Guay](#), [Tarik Boukhalfi](#), [Stéphane Cyr-Desjardins](#), [Marie-France Paquette](#) and [Patrice Renaud](#)

Gloomy corners and dark triad: The development of a virtual reality scenario for studying predatory processes in offenders

SPEAKER: [Jean-Pierre Guay](#)

ABSTRACT. In the field of violent crime and sexual offences, criminal premeditation and victim selection play an important role in the criminal process and explanatory theories regarding the offending process (Proulx, et al., 1999a; Proulx, et al., 1999b). Although much work focuses on criminal premeditation and predation, we know little about the general mechanisms of criminal predation, or more specifically, on the detection of criminal opportunities and the mechanisms used by sexual and violent offenders to identify targets (Black, Woodworth & Porter, in press). Unfortunately, most of the sparse knowledge we have about the psychological processes in general and criminal processes and actions in particular comes from self-reported recollections of past crimes or hypothetical scenarios of potential criminal situations (Baumeister, Vohs, & and Funder, 2007; Exum, Turner & Hartman, 2011). The main objective of this study was to develop a better understanding of the factors influencing perceived vulnerability with virtual reality, especially the possible effects of the dark triad of personality on victim selection. A better understanding of the mechanisms by which offenders identify potential targets could allow for the development of more effective prevention strategies as well as methods to discourage potential offenders.

09:48 [Sara Saint-Pierre Cote](#), [David R Labbe](#), [Sylvain Chartier](#) and [Patrice Renaud](#)

First steps toward an objective measurement of sexual presence in males and females

SPEAKER: [Sara Saint-Pierre Cote](#)

ABSTRACT. Introduction: The ARViPL laboratory has developed innovative tools to assess sexual preferences in a forensic context. This set of technologies places participants in an immersive 3D cube (CAVE-like system), into a virtual experience, where characters with customizable anatomy are used to draw sexual preferences profiles. This method, although already used for forensic assessment purposes, presents significant technological limitations and needs improvement. The main limitations of the technology, in its current configuration, are a lack of portability, complex analysis of results that requires qualified personnel to interpret the data, as well as a use limited to male individuals.

Objective: The project aims 1) to optimize the use of sexual preference assessment technology through virtual reality using a light and portable head mounted display (HMD) system 2) an automation of the data processing and analysis, 3) the development and testing of sexual stimuli designed for female participants. It also aims 4) at comparing sexual presence (SP) between male and female participants.

Methods: Experimental design: This project is divided into three phases. Since the target population will be non-deviant and the current tool is used to evaluate pedophiles, the first part of this project requires the development of new virtual environments (VE) / characters. This phase will be completed by a validation, which will aim to determine if the developed tools generate a state of sexual arousal/presence in males and females. To reach this goal, we will develop an objective measurement

of the SP on women using, among other things, vaginal photoplethysmography. In the second phase, we will evaluate the effects of three levels of immersion on the SP of men and women. In order to achieve this, the VE / avatar / animation combination, selected in the previous phase, will be integrated into three visualization devices (HMD, CAVE, 2D projection). Finally, the last phase is an automation of data processing and analysis through learning algorithms. A method related to the artificial neural-network technique for pattern recognition will be used. It will identify the presence of specific psychophysiological models linked to the SP level. Support vector machines, a technique for solving classification and statistical regression problems, will be used. Measurements: The logic of the approach consists of a triangulation of psychophysiological measures (oculometry, sexual plethysmography and EEGq). Immersive video-oculography is used to measure patterns of saccades and ocular fixations, as well as visuomotor dynamics in virtual immersion. Plethysmography values can help us quantify sexual arousal and EEGq is used to assess electrical activity in different brain regions. This electrical activity will allow for the identification and location of specific rhythms, defining a given psychological state. Analysis: Repeated measures MANOVA analyzes will be carried out for the validation of the device design and to verify the presence of differences of SP between the three different levels of immersion.

Results: Preliminary results of the objective measurement of the SP will be presented.

Conclusion: In conclusion, the HMD integration should facilitate the use of the device in a diversity of clinical contexts. The automation should allow a greatly simplified interpretation of the results for the operator, in addition to a real-time visualization of the patient's reactions. This real-time feature would allow us to tailor the virtual experience in reaction to the patient's psychophysiological responses. Thus, this tool would not only enable the diagnosis of sexual deviancy but also open the door to an innovative treatment technique.

10:00-11:00 Coffee break

Coffee break combined with poster session - Delfosse & Suzor-Côté room

10:00-11:00 Session Ps2: Poster session

LOCATION: [Delfosse & Suzor-Coté](#)

10:00 [Cynthia Acca](#) and [Noel Schepers](#)

How to combine 360° pictures and virtual reality in exposure and response therapy for obsessive compulsive disorder: A case study

SPEAKER: [Noel Schepers](#)

ABSTRACT. Studies have demonstrated a good efficiency of virtual reality technologies in treating anxiety and obsessive compulsive disorders. According to the literature exposure via virtual reality shows an efficiency comparable to that of classic exposure methods, as used in cognitive-behavioural therapy.

With the development of very mobile technologies (smartphone-based helmets, mainly), a question arises around the advantages and limitations of these techniques in practical therapy.

360 degree images allow for clear pictures to be created, directly related to the patient's difficulties, and for individualizing the therapeutic targets. This technology however does not provide the same full scope of interactions and navigation a true virtual reality environment would offer.

Our approach is essentially exploratory. It aims at identifying the possibilities and limitations provided by these technologies and their combination, through a case study from our clinical practice (an obsessive compulsive patient).

The patient with whom we have tried our method is 44 years-old and has been diag-nosed with obsessive compulsive disorders (according to DSM-5), her main pattern of obsession being tragedy and misfortune (for herself and those around her). These obsessions go together with mental and behavioural compulsions (aimed at averting the tragedies). She is also showing avoidance to all stimuli evoking death. She has been followed for about 18 months within our therapeutic programme designed for OCD treatments. In this programme we have already done psychoeducation, as well as in vivo exposures with reply prevention following a hierarchy established with her cooperation. Death has already been addressed in the context of the exposure but remains a major obstacle for the patient.

An immersion test with a non activating environment for the patient has been done in order to ensure she is receptive to this technology. A neutral picture has been shown to her, a picture taken with the same camera as the one used for the therapeutic targets. The following material has been used: Giroptic Camera 360 Cam, Archos VR Glasses helmet, Huawei P10 smartphone. Results are still being collected. According to our clinical observations, 360° pictures individualize the exposures, while VR might generalize them. This could show the complementarity of the technologies in order to achieve the therapeutic objectives. The following question arises: Is the combination of these technologies the key to better sustain the benefits of therapeutic gains in the long run?

10:00 [David Roberts](#) and [Alan Barrett](#)

A simple and commodity technology solution to enhance exposure therapy after mass causality incidents: 360 video on phones in hand and headset

SPEAKER: [David Roberts](#)

ABSTRACT. Mass causality incidents can suddenly leave large numbers needing treatment for post-traumatic stress disorder (PTSD). Those needing treatment are not restricted to immediate victims but include bystanders, responders and families. Exposure therapy is the most evidenced treatment for PTSD, yet treatment outcome, including drop-out rate, is largely dependent on engagement. Too little engagement limits learning, excise engagement might retraumatise. Virtual Reality Exposure Therapy (VRET) has been hailed as potentially more engaging to resistant populations and being delivered via a computer, offers an alternative method of controlling stimuli. Yet its efficacy is proving harder to demonstrate in treatment of PTSD than it is in phobia. Our standpoint is that current technologies and practice might encourage clients to “go it alone” too quickly, by replacing view of therapist and real surrounding by simulation from the outset. Furthermore, to respond to treatment needs of mass causality incidents, tailoring of stimuli, deployment, training and use all need to be timely, routine and scalable. The UK has had five mass causality incidents in the past year: a major fire in a tower block; and four terror attacks. The Manchester Resilience Hub has been set up to support victims of the Manchester Arena bombing. Given scale of need it is looking for more efficient methods of delivering exposure therapy, especially for those who prove resistant to conventional treatment. This paper describes a novel approach to VRET and its appraisal by this team for potential use with this cohort. The approach attempts to better fit the way therapists currently work with clients than that provided by conventional VRET. It also provides a solution that is far cheaper, can be deployed in a clinic or hospital with tailored stimuli very quickly and requires little training, setup or maintenance. The approach delivers surround pictures and videos of the trauma site on mobile phones that can be held in the hand or put within head mounted displays. It allows level of engagement to be managed through graduating that of immersion and emotive nature of stimuli across a course of treatment. Through such an approach, the client might stay grounded in safety offered by view of present environment and therapist until ready to “go it alone” in the headset.

10:00 [Filippo La Paglia](#), [Marco Daino](#), [Danilo Guarino](#), [Salvatore Zichichi](#), [Giuseppe Riva](#), [Brenda Wiederhold](#) and [Daniele La Barbera](#)

Virtual Reality environments to reduce dental anxiety.

SPEAKER: [Filippo La Paglia](#)

ABSTRACT. Dental procedural pain and anxiety are problems that hit a conspicuous part of the population and may lead to a decrease of frequency of dental care. This is a problem that hits not only the patient, who, avoiding the figure of the dentist, goes to the attention of the professional when the situation is often desperate, but even the dentist, who has to face a certain resistance from the patient while doing his work. Some professionals use hypnosis to reduce the levels of anxiety and/or pain in the patient who is about to undergo dental care, but the hypnotizability must count on a high level of imagination from the patient, and even the operator has to be very skilled in inducing dissociation from the anxiogenic situation. The aim of this study is to demonstrate that, through the use of virtual reality (VR), it is possible to accomplish good results in terms of dissociation and, consequently, to reduce the levels of anxiety in the subjects who are about to be operated by the dentist. The Virtual Reality has been demonstrated to be capable to produce this results, by “distracting” the individual from the surroundings, and thus obtaining a decrease of the anxiety feelings. To achieve dissociation from the annoying stimuli associated with the dental care procedures and consequently reduce the intensity of the anxiety, a group of 7 patients have been requested to wear a VR headset in which was displayed an immersive virtual 3D world, during the intervention of the dentist. The training consisted in the exploration of a virtual environment, that has been created with the specific purpose to elicit relaxation and pain distraction. The intensity of anxiety has been assessed before and after the treatment through the registration of heart rate and through the use of the following tests: the Dental Anxiety Scale of Corah, Subjective Units of Distress Scale, State-Trait Anxiety Inventory and Beck Depression Inventory-II. Also, heart rate has been specifically registered even during the treatment, to monitor the progresses in the relaxation process of the subject. After the training has been outlined how, in all the patients, the perception of the anxiety has decreased significantly, therefore partial results are encouraging and demonstrate how useful and safe can the VR treatment be even in this specific field.

10:00 [Sonia Mor](#), [Soledad Quero](#), [Carla Soler](#), [Cintia Tur](#) and [Cristina Botella](#)

An Internet-based self-applied treatment program for flying phobia: Study protocol for a randomized controlled trial

SPEAKER: [Cristina Botella](#)

ABSTRACT. Introduction: Flying Phobia (FP) is a common and disabling disorder, showing a prevalence rate around 2.5% of the adult population. The treatment of choice for FP is in vivo exposure; however, it presents difficulties in its application, such as low treatment acceptance by patients, the limited access to the feared stimulus, among others. The use of computer-assisted exposure programs for evoking phobic stimuli configurations can help in this task and overcome some of its limitations. Virtual reality has proven its efficacy in treating FP. Furthermore, NO-FEAR Airlines, an Internet-based self-applied treatment program that allows people with FP to be exposed to images and sounds related to their phobic fears on a standard personal computer, also has proved its efficacy in reducing the symptoms of patients with FP in a recent study. Moreover, the program was effective with and without therapist guidance. However, in this study the degree of immersion and sense of presence of the images was not taken into account. Thus, this work presents the protocol study describing the plan to conduct a randomized controlled trial (RCT) to determine the efficacy of this program using two procedures to carry out the exposure: fixed images versus navigable images and, compared to a waiting list control group. Method: A three-armed simple-blind RCT recruiting a minimum of 60 participants will be conducted. Participants will be randomized into 3 experimental conditions: 1) NO-FEAR Airlines with fixed images (N = 20); 2) NO-FEAR Airlines with navigable images (N = 20), and 3) Waiting list control group (N = 20). Four moments of evaluation will be included: pre-treatment, post-treatment and two follow-up periods (3- and 12-

month). The treatment protocol has 3 therapeutic components: psychoeducation, exposure and overlearning. Exposure is conducted through 6 scenarios that are composed by images and real sounds related to the flight process. The study is in process of registration at clini-caltrials.gov. Conclusions: We expect that the present work advances in the knowledge of how the degree of immersion of the system can affect the sense of presence and the reality judgment. Differences in treatment efficacy will also be explored as well as the participant's satisfaction with treatment. The present study would also contribute to improve the dissemination and adherence of evidence-based treatments.

10:00 [Raúl Durón](#) and [Georgina Cardenas-Lopez](#)
Exposure therapy for acute stress disorder
SPEAKER: [Raúl Durón](#)

ABSTRACT. Acute Stress Disorder (ASD) was recognized as a disorder in the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders. From the revised edition of the DSM-IV, it was identified through symptoms of posttraumatic stress disorder (PTSD). This first diagnosis describes stress responses within the first month after experiencing a traumatic event, where symptoms associated with PTSD are included, specifically symptoms of re-experiencing, avoidance and activation. The main difference considered among the diagnostic criteria for both disorders, in addition to the elapsed time, are some dissociative symptoms included in ASD.

A more recent model for ASD is described in DSM-V, which is classified in the Trauma and Stress-related Disorders category. The proposed changes are focused on categories or diagnostic criteria, which highlights the fact that they are no longer necessary the characteristic dissociative symptoms, which were emphasized in the DSM-IV. Under the new definition, it is required to have at least 9 of the 14 intrusive symptoms described in criterion B, where the symptoms associated with the previous four clusters (re-experiencing, avoidance, activation and dissociative symptoms) are included; for example, individuals who experienced a traumatic event can experience a number of stress responses as a result of trauma, where they may or may not present dissociative symptoms. From this approach, there have been several studies conducted to identify in what grade ASD can predict PTSD related symptomatology. Although most studies showed that most cases with ASD developed PTSD in the future, it was also found that not all individuals who had PTSD had previously showed ASD. In recent studies, it was found that by downplaying dissociative symptoms, significantly increases the power of prediction of ASD over PTSD, also, through the diagnosis of DSM-V for ASD, there is a greater ability to identify those individuals who are at risk of developing PTSD, and it suggests that the new diagnostic criteria for ASD is very useful to offer early interventions and prevent the development of PTSD.

As part of the most effective psychological treatments for trauma-related disorders, several rigorous controlled studies have found that cognitive-behavioral therapy, predominantly the exposure technique, constitutes the most appropriate therapeutic intervention. Thus, the program of prolonged exposure developed by Foa and Rothbaum (1998), being the intervention with more empirical evidence, is to relieve the traumatic event, or to evoke associated memories through different stimuli, to achieve an emotional processing of it.

In the last two decades exposure therapy using Virtual Reality (VR) has increased significantly, particularly in the treatment of different anxiety and trauma-related disorders. The therapeutic goals of these programs are based on behavioral therapy, which focuses on exposing the patient to virtual environments that simulate feared situations in real life; through these programs, systematic exposure to stimuli related with relevant feared situations that cause significant anxiety is performed. One of the most studied application fields of VR within the psychological treatments has been focused in trauma-related disorders, directed toward PTSD.

The present paper describes the initial results of the implementation and evaluation of a cognitive-behavioral program by using the exposure technique for ASD in earthquake victims, where it is expected that the proposed treatment serves as an early intervention preventing the development of PTSD in people at risk. The treatment program consisted in a cognitive-behavioral therapy composed of 6 to 8 weekly sessions, focused on prolonged exposure. As an auxiliary to the tasks of in vivo exposure, virtual environments simulating areas of Mexico City were used, in which situations that the participants avoided were presented. In the paper we present the preliminary data of case studies, in which the participants were evaluated before and after the treatment with follow-up measures, in addition anxiety measures during the exposure sessions are presented. As there were no virtual environments focused on earthquakes, there were important limitations to conduct the exposure sessions, so the component of exposure to traumatic memories was applied by imagination, being the traditional technique. Considering the limitations and the positive initial results, it is expected to propose the development of new earthquake-related virtual environments to conduct exposure therapy in ASD.

10:00 [*Dennis Wood*](#), [*Brenda Wiederhold*](#) and [*Mark Wiederhold*](#)

Virtual Reality Graded Exposure Therapy for the Treatment of Combat-Related Posttraumatic Stress Disorder: A Case Report 3 Years Post Combat Deployment

SPEAKER: [*Dennis Wood*](#)

ABSTRACT. Post Traumatic Stress Disorder (PTSD) is a significant problem in warriors returning from combat in Iraq and Afghanistan and also for combat veterans who have left the military. One recent study completed by the National Institute of Health, in 2009, identified 11% of Afghanistan veterans and 20% of veterans returning from Iraq as being diagnosed with PTSD. Several reports have recommended that the Department of Defense (DoD) and the Veterans Administration (VA) should aggressively develop early intervention strategies and treatments for preventing and treating PTSD.

Virtual Reality Graded Exposure Therapy with arousal control (VR-GET) is a promising, patient centered “strategy” and intervention that has been evaluated in active-duty service members as an early intervention treatment for warriors, diagnosed with combat-related PTSD and having been successfully treated within months of having returned to the United States from the combat theater. VR-GET utilizes three laptop computers to “expose” a participant to various computer-game grade combat environments where the participant engages in combat and the participant “moves” through the combat environments with the assistance of a hand held device. While “immersed” in the combat environment, the participant’s breath rates, heart rates, skin conductance and peripheral temperatures are monitored. Utilizing the principles of Exposure Therapy, the outcome of VR-GET is for the participant to gain control over their intrusive thoughts and feelings and for the participant to learn to tolerate events of stimuli that are associated with startles responses, hyper-arousability, nightmares and/or intrusive anxiety.

In this report, we describe the outcome, of only the second treatment case, of VR-GET for the treatment of combat-related PTSD, in a warrior who experienced no treatment for his PTSD during the multiple years following his return from his last combat duty. Utilizing VR-GET, this warrior was able to decrease his PTSD severity by 31% as measured by the PCL-5.

Keeping in mind the limitations inherent in the report of single case clinical studies, with the possibility that Virtual Reality Therapy and VR-GET can assist with reducing combat-related PTSD symptom severity many years after a combat tour or combat tours, VR-GET needs to be assessed more inclusively. Such an assessment may lead to the inclusion of Virtual Reality Therapy and VR-GET as being “strategies” that DOD and VA could adopt to improve the mental health care engagement and treatment for veterans needing services for PTSD. Lastly, during CYPY23, VR-

GET treatment limitations and treatment insights, gained from our discussion with our participant, will be presented.

10:00 [*Caroline A. Page*](#), [*Genevieve Robillard*](#) and [*Stephane Bouchard*](#)

The use of virtual reality for exposure in group: A 3-month follow-up study

SPEAKER: [*Caroline A. Page*](#)

ABSTRACT. Results from a pilot study on the use of virtual reality (VR) to treat snake phobia demonstrated that exposure is an effective therapeutic tool applicable to group settings. VR has demonstrated efficacy rates comparable to in vivo exposure and offers an interesting alternative to treat snake phobia. This study aimed at verifying if the skills acquired when treated in a group setting environment were retained after 3 months following exposure. A total of 6 participants who met the diagnostic criteria for snake phobia completed 8 two-hour cognitive-behavioural treatment sessions. During the exposure session, participants were randomly immersed one at a time in VR for 10 minutes while the others watched the client and the virtual environment projected on a large screen. All participants rated their anxiety levels (%) every 5 minutes. Fear, avoidance of snakes and self-efficacy were measured before and after each session. Questionnaires were also administered after 3 months of exposure. Immersion in VR demonstrated significant positive changes within session even when not immersed in VR. Overall, treatment was also associated with a significant improvement in phobic symptoms for 5 participants. Even though this study was completed with a limited number of participants, it deserves duplication as acquired skills were retained for 5 participants after 3 months of initial exposure.

10:00 [*Claudie Loranger*](#), [*Catherine Brisebois*](#) and [*Tin Ngo-Minh*](#)

Practicing mindfulness using virtual reality simulations of potentially stressful daily activities: An innovative approach to the treatment of first episode psychosis

SPEAKER: [*Claudie Loranger*](#)

ABSTRACT. Context: Recent studies have revealed virtual reality (VR) is safe and can be useful in the treatment of psychosis, in combination with other therapeutic approaches such as pharmacotherapy. The main therapeutic applications of VR for people presenting psychotic features focus on social skills training, AVATAR therapy or cognitive behavior therapy combined with VR that facilitates cognitive restructuring, exposure or cognitive training. The possibilities afforded with VR are multiple and other applications also deserve considerations. One example is mindfulness-based interventions, which shows a growing interest and support. Objective: The long term goal of this research is to propose a treatment program that would allow people presenting first episodes of psychosis to practice mindfulness skills in virtual environments depicting progressively challenging day to day activities and stressors. The more humble aim of the current project is to assess the acceptability and feasibility of a few sessions combining mindfulness-based interventions for schizophrenia and immersions in VR. For this poster, we will present the treatment manual and results from our pilot patients. Method: The sample consist of five participants suffering from schizophrenia recruited from a first episode psychosis clinic. The mindfulness-based intervention program proposes five 60-minute sessions. Participants are invited to practice mindfulness skills in a virtual restaurant depicting everyday life situations that can be challenging for patients suffering from schizophrenia. The therapist: (a) coaches and supports the participants in learning the skills before the immersion, (b) helps the patient through guided-mastery techniques to apply the skills in progressively challenging VR immersions, (c) provides post-immersions feedback to improve patient's awareness of the situation and how to apply the skills, and (d) facilitates generalisation through examples of how to apply the skills between sessions. To document acceptability and feasibility, measures of cybersickness, treatment satisfaction, working alliance, psychological distress and recovery are gathered throughout the application of the program. Patients' and therapist's impressions are systematically collected after each session. For this descriptive case study, analyses will consist only in reporting descriptive results. No inferential analyses will be conducted given nature of the study protocol. Discussion: This study is required to provide empirical

data from patient's experience to guide the development of a VR-assisted mindfulness-based intervention for schizophrenia. Results will facilitate modification of the program and preparation of grant proposals for efficacy and effectiveness studies were the impact of the proposed intervention on psychotic symptoms will be rigorously assessed.

10:00 [Priscila Palomo](#), [Daniela R. de Oliveira](#), [Javier Garcia Campayo](#), [Bruno Pereira Nunes](#), [Ausias Cebolla](#), [Rosa Baños](#) and [Marcelo Demarzo](#)

Feasibility and preliminary efficacy of an immersive technology (virtual reality) mindfulness protocol to improve the quality of life of patients with multimorbidity in primary care: A randomized controlled study protocol

SPEAKER: [Rosa Baños](#)

ABSTRACT. Abstract. In the last decades, mainly in Primary Care (PC), Brazil has witnessed a significant increase in the prevalence of patients with multimorbidity. Multimorbidity refers to the presence of multiple chronic condition or diseases in a single person. One of the main consequences is the poor health-related quality of life. In the last decade, mindfulness-based interventions (MBI) have showed to be an evidence-based approach to increase quality of life and promote mental health in patients with specific chronic conditions such as depression, anxiety and chronic pain. In parallel, recently, the number of clinical centers that use immersive technology, such as virtual reality, has grown, aiming to improve their medical treatment efficacy. Our hypothesis is that MBI in association with immersive technology may contribute to a better quality of life and mental health of patients with Multimorbidity (MM). Objective: to verify the feasibility and preliminary efficacy of the application of MBI enhanced by immersion technology - virtual reality (VR) - to improve the quality of life of patients with MM in PC through two innovative studies: Study 1- A pilot controlled (waiting-list) and randomized study will validate a Mindfulness-based Health Promotion (MBHP) program delivered with VR (MBHP-RV) in a non-clinical population (college students recruited from the Universidade Federal de Sao Paulo (UNIFESP); and Study 2- a randomized controlled clinical trial will evaluate the efficacy of MBHP-RV in patients with MM recruited from PC facilities in city of Sao Paulo, Brazil; with 3 experimental groups: a) patients with MM under usual care (TAU) (control group), versus b) patients with MM treated with MBHP-VR (TAU + MBHP-VR), versus c) patients with MM Multimorbidity treated with face-to-face MBHP (TAU + MBHP). As a primary outcome, quality of life will be assessed (SF-36), and as a secondary outcome depression and anxiety symptoms will be assessed (HADS). Mindfulness level will be considered as an explanatory variable. The relevance of this study is explained by the fact that multimorbidity are very common in the population notably in major adults and PC patients, with increasing costs and an absence of efficacious approaches for this complex public health challenge.

10:00 [Alba López-Montoyo](#), [Soledad Quero](#), [María Beltrán-Ruíz](#), [Alberto Barceló-Soler](#), [Yolanda López Del Hoyo](#) and [Javier García-Campayo](#)

A brief mindfulness-based psychological intervention for depression in primary care: Study protocol of a randomized controlled trial

SPEAKER: [Soledad Quero](#)

ABSTRACT. Introduction: Depressive disorders are an important public health problem. In 2020 these disorders will become the second cause of disability in the world. Different studies have reported that depression prevalence in Spanish Primary Care is between 13.9 and 29% and a 60% of depressed people are attended in primary care. Although only 5-10% of the patients are referred to mental health services, these are collapsed. The main problem in offering psychotherapy in primary care is the lack of time. Also, empirical support protocols are long, consisting of at least 12 to 16 weekly sessions. For this reason, brief psychotherapies seem to be an alternative that have proven to be effective. Furthermore, a number of systematic reviews have shown that Internet-based treatments are efficacious. Meta-analyses studies have also revealed that these protocols produce higher effect sizes compared to control groups and, that they are as efficacious as face-to-face traditional treatments. Mindfulness-based interventions, specifically, have shown efficacy in reducing anxious

and depressive symptoms. This work presents the protocol study describing the plan to conduct a randomized controlled trial (RCT) to compare the effectiveness of a Brief Mindfulness Intervention applied in two different ways (group format face to face condition and individually applied Internet-based condition) versus a treatment as usual (TAU) condition for mild to moderate depression. A secondary objective is to compare both mindfulness-based interventions (face to face versus online application). Method: The RCT will recruit 120 participants who will be randomly allocated to one of three conditions: a) TAU + mindfulness-based face to face intervention (n=40), b) TAU group (n=40) and c) TAU + mindfulness Internet-based intervention (n=40). Assessment will be administered at pretreatment, post treatment and two follow-up periods (6 and 12 months). The primary outcome measures will be the change in the Patient Health Questionnaire and the Beck Depression Inventory. The Brief Mindfulness protocol has 4 modules: 1) getting to know mindfulness, 2) establishment of formal and informal mindfulness practice, 3) thought management, body scan practice and values, and 4) self-compassion. The study has been registered at [clinicaltrials.gov](https://clinicaltrials.gov/ct2/show/study/NCT03034343): NCT03034343 (January 24, 2017). Conclusions: Although there are several studies that have studied mindfulness-based interventions for depressed people, this will be the first study testing brief interventions in primary care and including two treatment conditions: online and face to face. This will allow a pilot comparison between both forms of intervention. We expect to provide efficacy data of the face to face brief intervention and its online application in comparison with TAU group. The pre-sent study would be an improvement for dissemination of evidence-based treatments for depression and could also be a way to reduce costs in primary care.

10:00 [Berenice Serrano-Zarate](#) and [Anabel de La Rosa Gomez](#)

Adaptation of mindfulness-based stress reduction program for telepsychotherapy: A case series in Mexican population

SPEAKER: [Berenice Serrano-Zarate](#)

ABSTRACT. In recent years, studies have been increased to evaluate the effectiveness of mindfulness techniques for the treatment of several psychological disorders. Likewise, various adaptations of this third wave cognitive behavior therapy have been made, whether in the number of sessions, the target audience, the modality, etc. The results reported in the literature show that mindfulness techniques have been effective in the treatment of psychological problems derived from stress and anxiety, among others; nevertheless, the application format has been carried out mainly in face-to-face therapy, and there are still few studies that report its effectiveness in internet-assisted treatments (telepsychotherapy). That is why the aim of this study was to validate an adaptation of mindfulness-based stress reduction (MBSR) program for its application in telepsychotherapy. Volunteers of Mexican nationality, who requested psychological assistance for different problems related to stress and anxiety participated. Changes before and after the intervention were evaluated with the Five Facet Mindfulness Questionnaire, Mindful Attention Awareness Scale, Beck Anxiety Inventory, Beck Depression Inventory and Quality of Life Index. The opinion about the intervention was also evaluated. The intervention consisted of one day of intensive practice and eight sessions adapted to be carried out in telepsychotherapy with the support of a specific online platform, which consists of an evaluation system and an interface for videoconference and chat. The evaluation and psychological intervention was carried out through a virtual office. The therapists received training for the adaptation of the MBSR program to the online modality and received supervision from a therapist with training and experience in that program. The results showed positive changes in the variables evaluated, validating the effectiveness of the intervention. We conclude that the use of technologies such as Internet is an effective tool for the adaptation of face-to-face treatment protocols and the integration of third wave of cognitive behavior therapies in the field of cyberpsychology, allowing these new therapeutic approaches to reach more people. In addition, in this study some limitations were identified which will be discussed.

10:00 [Geneviève Belleville](#), [Stéphane Guay](#), [Stéphane Bouchard](#), [Sunita Ghosh](#), [Tavis Campbell](#), [Marie-Christine Ouellet](#), [Nicolas Bergeron](#), [Charles M. Morin](#), [Laura Serrano](#) and [Frank P. MacMaster](#)

**RESILIENT - An online multidimensional treatment to promote resilience after a disaster:
Study protocol**

SPEAKER: [Geneviève Belleville](#)

ABSTRACT. Background. The wildfires on May 1, 2016 in Fort McMurray, Alberta (Canada), destroyed approximately 2,400 homes and buildings and led to massive displacement of approximately 88,000 people. Many individuals faced direct or potential threat to their life or health, or significant losses, and many months later, families were still living through ongoing adversity and uncertainty as they adapted to new or temporary homes, schools and workplaces. Alberta Health Services estimated in August 2016 that mental health staff in the city had received 20,000 referrals since May, compared to 1,200 referrals each year. The overarching aim of this project is to understand the needs of the Fort McMurray population in terms of mental health and to widely disseminate evidence-based tools to promote resilience. More specifically, with this study protocol, we will assess the efficacy of an online self-help intervention targeting post-traumatic resilience on specific symptoms (post-traumatic stress disorder [PTSD], insomnia, depression). Participants and Procedure. 1,510 phone surveys have been conducted in May-July 2017 to assess the prevalence of PTSD, insomnia and depression in the evacuees from the Fort McMurray wildfires (T0). After the survey, 697 participants expressed interest to participate in the longitudinal arm of the study, which will include four in-depth assessments with online questionnaires (T1 to T4) and a diagnostic interview (T1 only). A period of six months will separate all four times of assessment. Participants with post-traumatic stress symptoms (expected $n = 150$) will be randomised either to the treatment condition ($n = 75$) or to a waitlist control condition ($n = 75$) after completion of T2. Participants assigned to the 12-week intervention will complete one additional assessment after having completed the treatment (T2.5). Treatment Description. The treatment is a therapist-assisted self-help online cognitive-behaviour therapy focusing on post-traumatic stress, sleep and mood. It includes 12 sessions of evidence-based psychotherapeutic components, such as psychoeducation about PTSD, sleep and depression; relaxation and mindfulness exercises; prolonged exposure to avoided situations and memories; sleep management strategies (restriction of time in bed, stimulus control, sleep hygiene education); behavioural activation; problem-solving strategies; and cognitive restructuring. Access to the online intervention will last 12 weeks. In order to favour engagement, a small portion of material will be unlocked each week, and access to one module will be accessible after the completion of a previous one. As interaction and feedback has been demonstrated as essential for engagement with online treatment material, the platform will also offer (1) interactive tools (e.g., sleep diary, self-assessments, tools to plan and self-monitor exercises) accessible and useable anytime, and (2) brief regular weekly contacts with a therapist by e-mail or phone, according to the participant's preference. Data Analyses. Primary outcomes will be post-traumatic, depressive and insomnia symptom severity, measured with validated self-report questionnaires. Secondary outcomes will include cognitive, behavioural and social indicators, as well as general mental health and post-traumatic growth. Several probable moderators of treatment will be examined, including sociodemographic characteristics (e.g., sex/gender, age, ethnicity, identification as a member of a First Nation, income), level of exposure, and continuing stressors (e.g., damages and losses, insurance claims). Foreseen Impacts. If found effective in reducing symptoms, the results of this study have the potential to impact positively the Fort McMurray community. Indeed, a direct and concrete deliverable of this research project will be to provide the community with an extended (at least two years) and free access to the online intervention specifically tailored to this population's needs. Thereafter, the intervention platform will continue to be hosted on the Laval University servers, allowing for development and improvements, and thus making it readily available in case of another disaster in Canada.

10:00 [Jiwoong Heo](#) and [Kwanguk Kim](#)

The sparse peripheral LED HMD can extend our FoV in the visual search task

SPEAKER: [Kwanguk Kim](#)

ABSTRACT. Introduction: The head mount display (HMD) is an important equipment for virtual reality therapy, and we can use it to measure human's behaviors. However, the current HMD has a smaller field of view (FoV) than human's perceptual abilities. Recently, a sparse peripheral display HMD was suggested to extend the FoV of HMD, and it based on a concept that only a central area of vision required high resolutions and peripheral areas are not. Within line of this idea, we suggested a light emitting diode (LED) based sparse peripheral display HMD, and optimized it for visual search tasks.

Implementation: Eighty LEDs (each right and left side had 40 LEDs) were integrated to the Oculus CV1 (Oculus), and Mini Skinny NeoPixel Digital RGB LED Strip (Adafruit) was used for peripheral area visions. The FoV of HMD was extended from 90° horizontal and 80° vertical to 270° horizontal and 130° vertical. An Arduino Mega (Arduino) was used to control and communication between LEDs and desktop via serial communication. The position of LEDs was tightly matched with VR coordination (Unity) and a color value was also calibrated between the LED and Oculus displays.

Study 1: Thirty-one participants (mean age = 23.65, SD=3.21, female=16) were recruited for this study. We conducted a visual search task that suggested in our previous study (Jang et al., 2016). Eighty-five targets appeared randomly in the polar coordinate system around 240 horizontal and 60 vertical degrees visual area. Participants were asked to press two buttons according to target's colors. Dependent measures were response time and accuracy. Participants performed three conditions including full sparse LED HMD (40 LEDs per eye), 7 sparse LED HMD (per eye), and original HMD conditions. All conditions were counterbalanced across participants. Result suggested that there was significant main effect of response time on conditions ($F(2, 60) = 112.539, p < 0.001, n_2 = 0.790$), and post hoc analysis suggested the full sparse LED HMD had significant shorter response time than the 7 sparse LED HMD ($p < 0.05$), and the 7 sparse LED HMD had shorter response time than the original HMD condition ($p < 0.0001$). The accuracy was not significant different across conditions ($p = 0.415$), and we couldn't find any time-accuracy trade off.

Study 2: Second study was designed to determine optimal numbers of LED for the sparse peripheral LED HMD. There conditions were included 7 sparse LED HMD, 3 sparse LED HMD, and 1 sparse LED HMD. Twenty-five participants (mean age = 23.36, SD=1.98, female=7) were recruited for Study 2. We also found a significant main effect of response time ($F(2, 48) = 5.349, p < 0.01, n_2 = 0.182$), and post hoc analysis suggested that 1 sparse LED HMD had longer response time than 3 and 7 sparse LED HMD (all $ps < 0.01$). However, 3 sparse LED HMD was not significantly different with 7 sparse LED HMD ($p = 0.891$). The accuracy was not significant different across conditions ($p = 0.837$) as well.

Discussion: Two experiments suggested that the sparse peripheral LED HMD didn't required lots of LEDs for the visual search task. We compared 40, 7, 3, and 1 sparse peripheral LED HMDs, and result suggested that 3 sparse peripheral LED HMD may have the best efficacy than other conditions. Our result suggested that only few LEDs can extend our visual field of HMD in the visual search task, and it may have an impact on virtual reality therapy that required a wider FoV. However, we need to extend our visual search task to other types of task in following studies.

10:00 [Yasin Farmani](#), [Siqi Luo](#) and [Robert Teather](#)

A Longitudinal Pilot Study of Presence in Immersive VR

SPEAKER: [Siqi Luo](#)

ABSTRACT. We present a longitudinal pilot study of presence, comparing low- and high-fidelity virtual environments. We measured presence levels using a presence questionnaire, heart rate, and skin temperature over four sessions. We found no significant difference due to environment fidelity,

nor any change in presence over four sessions. Subjective feedback suggests that that using the same tasks in multiple sessions frustrates users, so may also affect participants' presence assessment.

10:00 [Myeongul Jung](#), [Joohee Jun](#) and [Kwanguk Kim](#)

How much changes make people think their avatar to be changed ?

SPEAKER: [Myeongul Jung](#)

ABSTRACT. Introduction: Some pioneers suggested that a virtual avatar can be used to treat patients with eating disorders, and it can correct participants' distorted body image. The distorted body image refers a gap between ideal and perceived body sizes. However, research on this issue has been limited to studies with predefined or standard avatars because of limitation of VR methodologies, and we are not aware how much body changes of virtual avatar can be recognized by healthy adults. To address this issue, the aim of current study was to find perceptually noticeable differences of virtual avatar in healthy adults, and examined potential differences between standard avatars and body size matched avatars.

Method: Twenty-six participants were recruited (M=24.69; SD=1.69) for current study. The experiment was 2 x 2 within subject experiment design: with matched or unmatched body size of avatar; and with increasing or decreasing body size of avatar. In the size-matched condition, a virtual avatar was created based on each participant's height, shoulder width, belly and pelvis sizes. In the size-unmated condition, standard avatars were used. The measurement of size perception was divided into two blocks: increasing and decreasing, in each block the avatar's body sizes were randomly suggested from 0% to +-10% with 2% interval. The virtual environment was a small room with a mirror. Participants used a head mounted display to look around an environment and could see the virtual avatar's body through the mirror. During the VR experiences, participants were asked to observe the virtual avatar in the mirror. To find out the cutoff points of recognizable difference of avatar, participants were asked to answer Yes or No whether they think the avatar's body size was changed or not.

Pilot Results and Discussion: A key finding of current study was that the noticeable difference of virtual avatar in healthy adults was 5.00% (SD = 1.86) changes. People surely perceive the avatar's size changes more than this changes, and they can't recognize smaller changes than this point. These tendencies were same whether avatars were matched with actual sizes or not, and also maintained whether avatar sizes were increased or decreased (all ps > .20). The current results will be an important baseline values of developing programs for people with distorted body perception, and should have follow up studies for people with body image distortion disorders.

10:00 [Reza Ghasemaghaei](#), [Ali Arya](#) and [Robert Biddle](#)

User Study of Emotional Visualization Dashboard for Educational Software

SPEAKER: [Reza Ghasemaghaei](#)

ABSTRACT. This paper describes a user study on the MADE Dashboard, our proposed data visualization dashboard that supports educators to inspect and reflect on the emotional states of students using web learning applications. Our goal was to support the system designer, and indirectly also teachers and students. Our dashboard follows affective learning models, and monitors online learner emotions. It uses an open source library that supports tracking of facial features and detection of emotions in real time, identifying six different emotions. We present a user study to determine whether the data visualization graph can be interpreted properly.

10:00 [Joel Gagnon](#), [Guillaume Raymond](#), [Véronique Pinard](#), [Flavie Cossette-Côté](#) and [Frédéric Dionne](#)

A web-based acceptance and commitment therapy program to reduce academic procrastination

SPEAKER: [Joel Gagnon](#)

ABSTRACT. Procrastination is a persistent problem that affects many university students and is associated with a range of negative outcomes. Despite the ubiquity of academic procrastination, effective interventions to help students deal with their dilatory behaviors are scarce and traditionally offered in a face-to-face format. Standard interventions delivered face-to-face have major downsides such as large resource commitments and the inability to reach a large number of students. Low-cost interventions such as web-based interventions could potentially provide effective alternatives to reach a larger number of students. The purpose of this research is twofold. First, to investigate the efficacy of a Web-based Acceptance and Commitment Therapy (ACT) program to reduce academic procrastination among university students. Second, to study the acceptability and feasibility of the program. The program took place over a period of eight weeks during the Fall 2017 semester. Prior to the program, participants were randomly assigned to either the unguided group or the guided group. Participants from the unguided group had access to all the modules on Day 1 and received only one introductory email at the beginning of the program. Participants from the guided group were given access to a new module each week and received weekly emails. The program included eight modules which were comprised of information about different aspects of procrastination. In addition, each module had brief videos and exercises that participants were invited to complete. Data were collected at the beginning of the program and immediately after the program. Data regarding the acceptability and feasibility of the program were collected after the program. The preliminary sample is comprised of 19 university students (unguided group, $n = 10$; guided group, $n = 9$) in Québec (Canada). A mixed ANOVA that examined the effect of the intervention groups (unguided vs guided) and time (pre- vs post-intervention) on academic procrastination was conducted. There was no statistically significant interaction between the intervention groups and time on academic procrastination. The main effect for the intervention groups: $F(1, 16) = 4.55, p < .05, \eta^2_G = .18$ indicated a significant difference between the unguided group ($M = 31.22, SD = 6.33$) and the guided group ($M = 37.56, SD = 6.27$) on academic procrastination. The main effect for time: $F(1, 16) = 9.73, p < .05, \eta^2_G = .14$, indicated a significant difference between pre-intervention ($M = 37.11, SD = 7.61$) and post-intervention ($M = 31.67, SD = 8.04$) on academic procrastination. Regarding the acceptability and feasibility of the program, results revealed that, in both groups, participants completed on average 6 out of 8 modules. Moreover, an average system usability score of "A" was reported by participants across groups. Findings are discussed in relation to past studies on the efficacy of ACT program to reduce academic procrastination. Limitations of the present study, encountered obstacles, and future developments to enhance the quality of the program and the participant's engagement in the program are then discussed.

10:00 [Anabel De La Rosa-Gómez](#), [Berenice Serrano-Zarate](#), [Alicia Flores-Elvira](#) and [Ximena Durán-Baca](#)

Mobile application for training in clinical skills in online psychology students

SPEAKER: [Anabel De La Rosa-Gómez](#)

ABSTRACT. Online Psychology students need a professional training that provides them skills and efficiency for dealing with emotional health problems. One of the most challenging and crucial skills that trainers should teach to new therapists is to establish a functional therapeutic relationship with patients. Some authors suggest that a "therapeutic presence" is a predictor of an effective therapeutic relationship (McDonough-Means, Kreitzer, & Bell, 2004). Mindfulness is a meditation practice that involves bringing the practitioner's awareness completely to the present moment without judging or evaluating that experience (Kabat-Zinn, 1990). In recent years, numerous therapists have been exploring the theoretical and practical connections between mindfulness and the therapeutic relationship (Hick & Bien, 2008), including applications in family therapy (Gehart & McCollum, 2008; Lysack, 2008), Acceptance and Commitment and cognitive-behavioral approach (Wilson & Sandoz, 2008). In this sense, the main purpose of this research was the design, development and evaluation of a mobile application for the training of clinical competences (emotional and cognitive empathy, psychological well-being and sense of presence) based on mindfulness techniques. The

training program of the app has a five months extension and is grounded in a professional skills model. A pilot study was carried out with 10 undergraduate online psychology students of the last year. The results of the cognitive therapy scale (ETC), by Beck and Young (1980), showed that the participants improved their clinic skills after they accomplish the training program. Likewise, the results of the non-parametric test of Wilcoxon showed differences between the evaluation before and after the training program ($z = 2,20$; $p = ,027$). Regarding the satisfaction with the training program, the students considered that it is an innovative training scenario for the development of their clinical skills. Thus, it is pertinent to propose a promising alternative to the lack of professional practice scenarios and, in this way, to get students involved in real scenarios linked to their interests or to the curricular structure itself. In this sense, new perspectives of research and technological development are opened for practical teaching.

10:00 [Kevin Ojha](#), [Nada Abou Seif](#) and [Anna Lomanowska](#)

Social dynamics of online chat in a live-streaming video platform

SPEAKER: [Anna Lomanowska](#)

ABSTRACT. The Internet has become an important medium through which individuals seek social support. Much research has focused on the use of various social media application for seeking and providing social support, however, less is known about how newer online platforms may be used for this purpose. Live-streaming video applications, such as Twitch.tv or YouTube Live, have recently gained substantial popularity as online media connecting video content streamers and viewers in synchronous interactions. The goal of the present study was to examine the dynamics of social interactions in one of the most popular live-streaming platforms, Twitch.tv, to determine the features that may facilitate the exchange of social support in this context. Three hundred stream channels were randomly selected from the top ten most popular video game titles on Twitch.tv. Samples of chats of 20 min duration were extracted from the live streams of these channels and analyzed for the rate of message posting, message word count, messages directed at other users and the streamer, and the frequency of emotes in messages. A subset of the samples of chat were also analyzed for the message topics (gaming, real-life, community, social support). The above features of the chats were compared against the number of viewers of the stream, active participants of the chat, and the sex of the streamer. The number of stream viewers and active participants was positively correlated with the rate of chat messages and the number of messages directed specifically at another user and at the streamer (@ messages), but negatively correlated with the message word count. Chats from female streamers contained more emotes and messages directed at the streamer than chats from male streamers. The proportion of gaming-related messages was significantly higher in High viewership streams (> 300 viewers) compared to Low viewership streams (< 300 viewers), whereas the proportion of messages related to real-life topics was significantly higher in Low viewership streams. Furthermore, messages on the topic of social support were significantly more frequent in Low than in High viewership streams. Considering the popularity of live-streaming platforms, particularly among the video gaming community, the results of the present study have implications for understanding which features of this online medium may promote social support among users.

10:00 [Jason Feinberg](#), [Jerome Short](#), [Diane Lameira](#), [Maria Larrazabal](#), [Madeline Brawley](#), [Shereen Ayoubi](#), [Bendu Jackson](#) and [Juan Barrios](#)

Meta-analysis of mobile health interventions for depression and well-being

SPEAKER: [Jason Feinberg](#)

ABSTRACT. Mobile health (mHealth) interventions offer an opportunity for many more people to receive treatment for depression in the United States (Mohr, Burns, Schueller, Clarke, & Klinkman, 2016). Importantly, a recent meta-analysis found that mHealth interventions reduced depressive symptoms significantly more than control conditions (Firth et al., 2017). However, psychological well-being is more than the absence of psychopathology; it also includes increased psychological resources (e.g., positive affect, self-acceptance; Sin & Lyubomirsky, 2009).

The current study reviewed research on mHealth interventions to assess their effectiveness in reducing depression and increasing well-being. The review occurred between March 2017 and December 2017 using a combination of the search terms “well-being, depression, and smartphone.” Studies meeting the following criteria were included in analyses: 1) conducted between 2008 (when smartphone apps were developed) and December 2017; 2) randomly assigned participants to a smartphone app or a control group; 3) tested a smartphone app containing empirically-supported treatment components; 4) measured both depression and well-being before and after using the app; and 5) provided pre- and post-means and standard deviations for the intervention and control groups.

We identified 5545 studies with our search terms; 12 studies were selected based on their titles and abstracts; a total of five studies met eligibility criteria and were included in the current study. Of the five eligible studies, two studies compared a smartphone app to a no-treatment control group. Howells et al. (2016) compared a mindfulness-based app to a list-making control app and reported that the mindfulness app significantly reduced depression in comparison to the control app ($2p = .03$) but not well-being ($2p = .003$). Roepke et al. (2015) compared two versions of a smartphone app (cognitive behavioral therapy and CBT + positive psychology therapy) to a waitlist control and found that both versions of the app significantly reduced depressive symptoms compared to a waitlist control (Cohen’s $d = .67$), and that there were no significant differences between the two interventions in reducing depression. Effect sizes were not reported for well-being in this study, but HLM analyses indicated that well-being did not increase significantly for any condition.

Three of the studies compared two treatments for depression. Hoa Ly et al. (2014) compared smartphone-based behavioral activation (BA) to smartphone-based mindfulness. They found that both BA and mindfulness significantly improved depression and there were no significant between-group differences for depression (Cohen’s $d = .25$) or well-being (Cohen’s $d = .05$). Hoa Ly et al. (2015) compared a blended treatment of four face-to-face BA sessions plus a smartphone app between sessions to a full BA intervention of ten face-to-face sessions in a non-inferiority trial. They reported that both the blended treatment and the full BA treatment significantly improved depression and that the blended treatment was similar to the full BA treatment for depression (Cohen’s $d = .10$) and well-being (Cohen’s $d = .03$). Ivanova et al. (2016) compared a blended internet and smartphone intervention with Acceptance and Commitment Therapy (ACT) components with and without therapist guidance. They reported that guided ACT improved depression at a higher rate than unguided ACT (Cohen’s $d = .23$).

These results generally support the findings reported by Firth et al. (2017) that smartphone apps reduce depression symptoms. Additionally, these results provide initial evidence that smartphone apps also increase well-being. However, these results should be interpreted cautiously based on the small sample of studies reviewed and the lack of studies comparing an active treatment to a no treatment control group. Therefore, the lack of studies reviewed here suggest a need for further exploration of smartphone apps in improving both depression and well-being.

10:00 [Jason Feinberg](#) and [Jerome Short](#)

Evaluation of digital placebo effects in college students

SPEAKER: [Jason Feinberg](#)

ABSTRACT. Depression is a debilitating and costly mental health disorder that goes largely untreated in the U.S. (González et al., 2010). One possible solution for reducing this treatment gap is the development and dissemination of technology-based interventions for depression. For example, internet CBT (iCBT) has been found to be an acceptable, efficacious, and cost-effective alternative to traditional therapies (e.g., Andersson & Cuijpers, 2009; Hedman et al., 2014; Bergman Nordgren et al., 2014). Since the development of mobile phone applications in 2008, mobile-based or mHealth interventions have become a topic of interest in depression treatment research. A recent meta-analysis demonstrated that these interventions reduced depression symptoms when compared to

control conditions (Firth et al., 2017). However, little is known about how mHealth interventions reduce depressive symptoms. Torous and Firth (2016) proposed that something inherent about using technology may explain how technological interventions produce change, calling this phenomenon the “digital placebo effect.” However, to our knowledge, no study has formally tested this proposed concept in a randomized controlled trial.

Therefore, the current study seeks to explore the digital placebo effect in improving depression by randomizing participants to one of four conditions: 1) using the positive psychology-based smartphone application Happify daily for three weeks; 2) completing positive psychology interventions without using an app for three weeks; 3) using the mood-tracking app Daily Mood Tracker, which does not have any positive psychology components, for three weeks; or a 4) waitlist control for three weeks. This methodology will allow conclusions to be drawn about whether the active ingredients of the intervention produces depression symptom reduction, or whether something inherent about using an app produces these changes. Additionally, having a waitlist control group will demonstrate whether Happify, which has not been formally tested in an RCT previously, reduces symptoms of depression. Positive psychology interventions (PPIs) lend themselves well to this methodology because they are simple, require few materials, and do not require a trained clinician (Lyubomirsky & Layous, 2013). Therefore, the PPIs offered in Happify were easily translated to a format that did not require the use of an app. In this study, participants that completed positive psychology interventions without using an app were sent a single-page document in which they were instructed to complete PPIs in a similar way as they would if they were using the app Happify (i.e., the same frequency, duration, and context). Potential moderators and mediators of depression symptom reduction and well-being improvement were also assessed in this study. Therefore, a pre-test assessed demographics, initial depression symptom severity and levels of well-being, and personality characteristics. Daily surveys measured mood, depression, well-being, and whether participants completed the assigned tasks. Depressive symptoms and well-being were also assessed at post-test and at a 1-month follow-up. During the post-test, participants also provided quantitative and qualitative data about their satisfaction with the app.

Participants were recruited from a pool of undergraduate students enrolled in psychology courses at a large, ethnically diverse, public university in Virginia, USA. They were offered class credit as an incentive for participating. The first wave of recruitment and participation began in February 2018 and will be ongoing until May 2018; the second wave will occur in August 2018. In the first wave, 110 participants signed up for the study. Preliminary data from these 110 participants will be analyzed and reported at the conference in June 2018.

10:00 [Natasha Parent](#) and [Jennifer Shapka](#)

Feeling Isolated Amplifies the Relationship between Covert Aggression and Cyberbullying
SPEAKER: [Natasha Parent](#)

ABSTRACT. Background: As cyberbullying becomes an increasingly pervasive issue among adolescents, more research is needed to better understand its associated risk factors. The current study examined the relationship between aggression, resistance to peer influence, school belonging, and cyberbullying. Two Research Questions guided this work: 1) Are aggression, resistance to peer influence, and school belonging associated with cyberbullying? 2) Does school belonging moderate the relationship between covert aggression and cyberbullying?

Methods: 728 students (47 % girls) from the Lower Mainland of British Columbia aged 11 to 14 years (mean age= 12.43) participated in this research. The majority (70%) of participants were born in Canada with 39% being of Asian descent. Participants self-reported information regarding demographic background, online activity (10 items), school belonging (8 items), aggression (12 items), and the resistance to peer influence scale (20 items). Hierarchical Linear Regression analyses were used to explore the relationship between the dependent variable, cyberbullying, and the

independent variables; average hours spent online, resistance to peer influence, school belonging, and covert aggression. The first model (Block 1) included average hours online and the demographic information of gender and ethnicity. Following this, the variable “true to self” from the resistance to peer influence scale, school belonging, and covert aggression were included (Block 2). The interaction between school belonging and covert aggression was examined in the final step (Block 3).

Results: In Block 1, average hours online ($\beta = .134$, $p = 0.017$) and gender ($\beta = -.109$, $p = 0.05$) were significantly associated with cyberbullying, accounting for 3.1% of the variance, $F(3, 724) = 3.419$, $p = 0.018$. In Block 2, after controlling for demographic variables (Block 1), the variable “true to self” from the resistance to peer influence scale ($\beta = -.142$, $p = 0.011$) and covert aggression ($\beta = .209$, $p < 0.001$) were significantly related to cyberbullying, accounting for 19.3% of the variance, $F(3, 721) = 20.990$, $p < .001$. In Block 3, the interaction of covert aggression and school belonging ($\beta = .282$, $p = 0.46$) was positively associated with cyberbullying, accounting for 20.3% of the variance, $F(1, 720) = 3.996$, $p = 0.046$.

Significance: Findings indicate that being male and spending more time online is positively associated with cyberbullying. Additionally, over and above demographic factors, covert aggression is positively associated with cyberbullying, such that adolescents who score higher in terms of covert aggression are more likely to be involved in cyberbullying. Contrarily, being true to oneself is negatively related to cyberbullying, suggesting that adolescents who are more “true to self” may be less likely to engage in cyberbullying. Lastly, the relationship between covert aggression and cyberbullying is moderated by school belonging, such that for adolescents who feel isolated, thus with low school belonging scores, covert aggression is more likely to lead to cyberbullying. As such, future research should examine the potential buffering effect of school belonging on the relationship between covert aggression and cyberbullying to help inform policy and prevention programs.

10:00 [*Juliette Laurendeau-Martin, Frédérick Morasse, Evelyn Vera-Estay and Miriam H. Beauchamp*](#)
Measuring moral reasoning with virtual reality : A validation study
SPEAKER: [*Juliette Laurendeau-Martin*](#)

ABSTRACT. Introduction : Social cognition refers to the cognitive processes that are used to perceive, process and understand social cues. Social cognition includes a wide range of abilities, such as moral reasoning (MR), defined as how individuals think about the moral dilemmas and conventions that govern social interactions. Traditional measures of MR have typically relied on written scenarios; however, efforts to improve the ecological validity of such assessments have led to the design of the the Socio-Moral Reasoning Aptitude Level (So-Moral) task, a visual, computer-based tool using static images of real actors. While this task is effective in the assessment of MR in both clinical and normative populations, it lacks the dynamism, immersion and emotional engagement afforded by advanced technologies such as virtual reality (VR). VR is particularly relevant to the study of MR because it allows participants to react, feel, think and behave as they would in physical reality. Thus, combining the So-Moral with VR has the potential to increase ecological validity by providing experimental conditions that are reasonably similar to those in a real-world environment. The aim of this study was to validate a VR version of the So-Moral task. Hypothesis : It was expected that the So-Moral-VR task would produce similar moral maturity levels as the original computer version, and that moral maturity would be positively associated with sense of presence and immersion. Method : 30 individuals aged between 12 and 25 years ($M=17.7$, $SD=3.6$, 13 males) completed both versions of the So-Moral task (computer and VR). Participants were presented with 9 or 10 dilemmas, depending on the version, and were asked to explain how they would react and why, if they were in that situation. Moral morality level was assessed for each dilemma based on a validated cognitive-developmental scale from 0 to 5. Participants also completed sense of presence and immersive tendencies questionnaires. Statistical analyses : Correlation and

regression analyses will be performed to investigate the association between moral morality in the So-Moral-VR task, sense of presence and immersion.

10:00 [Marie-Claude Bouchard-Aubin](#), [Julie Bouchard](#), [Sébastien Gaboury](#), [Kevin Chapron](#) and [Justine Dolbec](#)

NAO humanoid robot for cognitive screening in elderly

SPEAKER: [Julie Bouchard](#)

ABSTRACT. Neurocognitive disorders such as Alzheimer disease affect each year a large number of Canadians aged over 65 years old. Screening and diagnosing those diseases at an early stage are essentials to implement intervention that could preserve autonomy and life quality as long as possible for affected elderly. Healthcare professional (doctors, nurses, psychologist, etc.) are overwhelmed with technical tasks but technology might be useful to make more efficient the time they spent with patients. The possibility of using a small humanoid robot, the NAO robot, for cognitive screening in elderly is tested through the present study. This possibility has never been explored in previous research, but others studies show that NAO robot is an effective platform to maximise collaboration and acceptance with elderly. A widely used screening test (Mini-mental state evaluation, MMSE) was implemented into the NAO robot. Scores of 36 participants (13 men / 23 women) aged 65 and over, on the MMSE taken two times: 1) with NAO and 2) with human, evaluated one weeks apart (order balanced) were compared. Perceptions and comments of participants concerning the interaction with the NAO robot were taken to look at modifications that can be made for the technology to be more functional. Participants indicated relatively high levels comfort and confidence ($M=7,5/10$) with the NAO robot but less than with human ($M=9,39/10$). Non-parametric tests have been used to compare results obtained from NAO robot and from human administrator. Results shows a significant difference between groups ($p = 0,000$) and a moderately strong correlation between them ($r = 0,58$, $p = 0,000$). Influencing factors (such as age, sex, reluctance to use technology, the performance level at the MMSE, the educational level, etc) are explored to understand results and maximise its functioning.

10:00 [Sébastien Isere](#), [Hélène Forget](#) and [Stéphane Bouchard](#)

Psychophysiological effects of virtual reality immersion on elderly people

SPEAKER: [Sébastien Isere](#)

ABSTRACT. In recent decades, an increasing number of studies in psychology and neuropsychology have used Virtual Reality (VR) technologies with different populations. Nevertheless, the scientific literature about VR applications among elderly populations is scarce. There are several explanations for this gap. Elderly people present some psychophysiological differences that may influence their experience with VR, such as anxiety due to lesser familiarity with new technology, cognitive changes in normal aging and age effects on proprioceptive and sensorimotor skills, which are involved in cybersickness symptoms. However, the majority of studies on VR-based cognitive assessments and VR-based psychological interventions made no distinction between young adult and elderly populations, in terms of the type of technology used and duration of immersion. The aim of this study is to compare psychophysiological changes in a sample of elderly and adult subjects during a VR task. A minimum of 40 subjects (elderly: $n = 15$, 65-85 years; adult: $n = 25$, 18-35 years) will participate in the study. Each group will have a fully immersive experience (in a CAVE-like system, 6-wall immersive room) and a partially immersive one (using HTC VIVE technology). Participants will explore a virtual apartment and execute some tasks (e.g., reading, moving objects, answering questions, etc.) for 15 minutes. Psychophysiological measures (i.e., cortisol level, skin conductivity and heart rate) and self-reported data (i.e., cybersickness, anxiety, familiarity with technology) will be collected before, during and after the task. We hypothesize that VR immersion will produce different psychophysiological effects on elderly people than on younger adults, and that these differences will negatively influence their experience. The results of this study will help to adapt and increase the effectiveness of VR-based

cognitive assessments, VR-based psychological interventions and future research protocols addressing elderly populations.

10:00 [Mieko Ohsuga](#), [Shiho Jyoko](#), [Yuma Tada](#) and [Jun Ishikawa](#)

Mental support system for hematopoietic stem-cell transplant patients isolated in a protective environment

SPEAKER: [Mieko Ohsuga](#)

ABSTRACT. After transplantation of hematopoietic cells, patients require care in a sterile environment to prevent infection. Patients are isolated from the outside world during this period. Medical staff can enter the room to care for the patients and to provide medication; however, even close family members must interact with patients through glass. This situation adds a lot of stress to the patients who are not only anxious about the prognosis but also suffer from the adverse effects of this isolation. For this reason, we planned to develop a mental support system for such patients. As the first step in the development of this system, we interviewed patients in order to accurately grasp their needs, and to be able to create a patient-oriented system rather than a technology-oriented system. The participants were three men in their twenties, fifties, and sixties, and one woman in her forties who had transferred to a class-7 clean room after spending several weeks in a class-5 room. Patients reported that they did not feel like doing anything because of poor physical condition and a lack of vitality for a while after transplant. Before interviewing, we were considered developing a gaming exercise system aiming at both early rehabilitation and distraction from hardship. However, patients said that even if such a system existed, they would not be motivated to use it. When they regained their energy a little, they moved into the class-7 room and had to undergo monotonous rehabilitation therapies. We found that the system we were considering was unnecessary in the sterile room, but in demand after exiting the room. The system required shortly after a medical procedure needs to be more passive, and must not require much energy to use. As such, we proposed interactive videos as an alternative, and asked for comments. We found that this approach was relatively acceptable to patients. The content patients wanted to experience differed widely depending on their mental and physical conditions, life histories, family relationships, interests, and so on. Based on the findings, we developed a system in which patients can manipulate the interactive video, which is either projection mapped on the wall of the ward or presented via head mounted display (HMD) using their own smartphone. Projection mapping can be expected to have the effect of making a patient feel an increased sense of space around them, and a feeling of release. Using the HMDs can provide a sense of immersion, there is a possibility that this could be accepted by the younger generation. However, the HMD can also make its wearer feel restrained. We prepared two kinds of contents. One involved presenting a pre-shot 360-degree video of a scenic spot such as the sea and the mountains, a grassy field with animals, or a crowded street in the city. The patient can look around and zoom in and out with a simple operation. The other type of content involved sharing experiences with people outside the ward. An image from the 360-degree camera taken by the other person is sent to a nearby PC. The screen of this PC and obtained voice is shared with a PC in the ward through the network. Placing the captured image in the virtual space makes it possible to look around and zoom in and out, thereby enabling patients to be virtually present with family, and to participate in family activities like shopping or traveling. Before deploying the developed system to patients, the medical staff evaluated it. As most staff members supported the usefulness of this system, we plan to deploy it to patients as soon as ethics review approval is obtained.

10:00 [Li Xu](#), [Manqing Huang](#), [Hang Chu](#), [Shasha Pang](#), [Mark D. Wiederhold](#), [Brenda K. Wiederhold](#), [Li Yan](#) and [Jin Zeng](#)

Non-immersive Virtual Reality for Spatial-Frequency and Temporal-Frequency Dependent Binocular Imbalance Assessment in Adults

SPEAKER: [Li Xu](#)

ABSTRACT. Introduction: To examine and analyze the binocular imbalance status of adults, we examined and quantified the binocular imbalance parameters using a novel non-immersive virtual

reality system and two different binocular integration stimulus models with different spatial-frequency and temporal-frequency domains. Methods: A retrospective study was conducted to collect subjects with corrected visual acuity greater than 0.8 and without ocular diseases through clinic assessments in Guangdong General Hospital since November 2017. 97 subjects (46 female, 51 male) completed the binocular visual function assessment using a non-immersive virtual reality system. The data of corneal opia, refractive status, and binocular imbalance status were obtained and analyzed by SPSS24.0. Results: We found that the population having binocular imbalance gradually decreased with the increase of spatial frequency in the subjects in the non-immersive virtual reality environment ; Under the condition of contrast balance, the subjects more easily manifested a binocular unbalanced state in the horizontal model than the vertical model. In the temporal-frequency model, 29.29% of subjects showed binocular balance, 70.10% showed binocular imbalance, 62.89% showed severe binocular imbalance in the high temporal-frequency condition; while 17.53% of subjects showed binocular balance, 81.46% showed binocular imbalance, and 65.78% showed severe binocular imbalance in the low temporal-frequency condition. The VR is more sensitive for the low temporal-frequency binocular integration stimulus. Conclusion: In the non-immersive virtual reality environment, the binocular balance status of the subjects is not uniformly the same, and there is a large proportion of subjects having binocular imbalance. Our results indicated that the binocular integration stimulus model with different spatial frequencies and different temporal frequencies can detect the binocular imbalance status more accurately, providing a powerful new tool for the diagnosis and analysis of clinical binocular abnormalities.

11:00-12:30 Session Orals -12: Telepsychotherapy

CHAIR: [Anne-Marie -Etienne](#)

LOCATION: [Morrice](#)

11:00 [Genevieve Robillard](#), [Stephane Bouchard](#), [Michel Dugas](#), [André Marchand](#), [Patrick Gosselin](#), [Frédéric Langlois](#) and [Geneviève Belleville](#)

Barriers of treatment perceived by GAD patients after receiving CBT treatment delivered face-to-face versus in videoconference

SPEAKER: [Genevieve Robillard](#)

ABSTRACT. Introduction/Problem: In vast countries such a Canada, the United States and Australia, access to evidence-based treatment is a significant challenge, especially for people living in rural areas. Videoconference technologies has proven its effectiveness as a tool to deliver psychotherapies, especially in the form of cognitive-behavior therapy (CBT), to people suffering from various anxiety disorders. This study is part of a broader multisite randomized trial assessing the effectiveness of CBT for generalized anxiety disorder (GAD) delivered face-to-face (FF) or by videoconference (VC). The present study focuses on patients' perception of barriers related to access to CBT treatment. To assess patients' perceptions, our team has developed a self-report questionnaire (Index des Barrières Reliées au Traitement – IBRT) that was inspired by Lingley-Pottie and al. (2011) and Kazdin et al. (1997) scales. It includes 39 items divided in three common and well-documented themes: (a) judgment from the therapist; (b) accessibility and commodity; and (c) stressors and obstacles to treatment. The aim of this study is to compare perceptions of GAD patients about potential barriers to access CBT when delivered FF or using VC systems. Method. A total of 117 adult patients with a primary diagnosis of GAD (mean age = 41.75, s.d. = 15.64), located in five large urban areas, were included in the study. They were randomly assigned to one of the two conditions and received 15 individual weekly sessions of CBT (FF=65; VC=52) delivered according to a standardized and validated manual for GAD. The ADIS-IV semi-structured clinical interview and questionnaires were administered to confirm GAD diagnosis and eligibility to the study. After the first and fifth sessions, motivation and satisfaction toward their treatment was measured. Following the last treatment session, participants completed the IBRT. Outcome measures were administered at pre and post-treatment, and at the 6- and 12-month follow-ups. Results. Outcome

measures must be presented, but very briefly, as it is important to ensure the treatment was effective. Treatment efficacy was assessed with repeated measures ANOVAs and showed a significant improvement on all measures for both conditions, with VC being superior on occasions and never inferior to FF on measures of GAD severity, the Penn State Worry Questionnaire, the WHO Quality of life, the Beck Depression Inventory, etc. Independent t-tests were performed for the total score and the subscales of the IBRT and confirmed no significant different difference between the groups (with difference of very small sizes). Repeated measures of ANOVAs revealed a significant increase in motivation and satisfaction ($p < .001$) no difference between conditions. Also, significant correlations were found with residualized change scores of improvement on the Penn State, with treatment being more effective when patients are satisfied ($r = -.537, p < .001$) and motivated toward their therapy ($r = -.255, p < .01$) at session 5. A positive correlation between the IBRT and Penn State is suggesting that the treatment is more effective when less barriers are reported on the IBRT ($r = .218, p < .05$). Discussion. Telepsychotherapy seem to be a very promising solution to access mental health services offered by skilled professionals, especially for CBT programs to treat anxiety disorders. Systematic efforts have been conducted to document for whom and under which circumstances VC should be recommended or not, and results are in favor of a widespread dissemination of this treatment modality.

11:15 [*Gabrielle Marcotte-Beaumier*](#), [*Stéphane Bouchard*](#) and [*Michel J. Dugas*](#)

Interaction Effect of Telepresence and Therapeutic Alliance on Treatment Outcome in Telepsychotherapy for Generalized Anxiety Disorder

SPEAKER: [*Gabrielle Marcotte-Beaumier*](#)

ABSTRACT. Context. Bordin (1979) conceptualizes the working alliance as an agreement between the patient and the therapist on general goals and specific therapeutic tasks of the treatment, as well as the therapeutic bond between them. Previous meta-analyses have shown a relationship between therapeutic alliance and treatment efficacy in general. Cognitive and behaviour changes specific to each anxiety disorder also contribute to predict treatment outcome, over and above the role of the therapeutic alliance. In e-health, several authors suggest that the sense of presence also has an impact on the working alliance in videoconference. But the interplay between telepresence, working alliance and treatment outcome has not yet been experimentally tested. Aim. We examined the moderation effect of telepresence and working alliance on the treatment outcomes following a Cognitive-Behavioural Therapy (CBT) delivered in videoconference for Generalized Anxiety Disorder (GAD). We also examined the mediating role of intolerance of uncertainty on the relationship between working alliance and treatment efficacy. Method. Treatment involved 15 weekly sessions delivered across remote sites to 41 adults diagnosed with GAD. A manualized treatment was offered based on a validated CBT program recommended by the NICE guidelines. Therapists were trained and supervised regularly and therapy was delivered individually (i.e., point-to-point videoconference). Treatment efficacy was confirmed with standard repeated measures ANOVAs comparing pre- to post-treatment and to follow-up. The *Telepresence in Videoconference Scale* and the *Working Alliance Inventory* were completed by participants after the fifth session. The degree of change in intolerance of uncertainty from pre- to post-treatment was assessed with the *Intolerance of Uncertainty Scale*. The *Penn State Worry Questionnaire* was completed by participants at the pre- and post-treatment and at the 6-month follow-up to assess the degree of change in GAD symptoms. Moderation and mediation analyses were performed using multiple regressions. In order to test the moderation model, we performed multiple regression analyses between the change in GAD symptoms, as the predicted variable, and the telepresence, the working alliance and the interaction term (Telepresence x Therapeutic Alliance) as the predictor variables. Results. Results support the interaction effect of telepresence and working alliance to predict treatment outcomes ($\beta = -.56, p < .01$). A closer look at the interaction revealed that working alliance predicts treatment outcomes when the strength of the telepresence is rated as average ($t = -2.81, p < .01$) and the role of the alliance is even stronger when telepresence is rated as high ($t = -3.33, p < .01$). The analyses also document the role of intolerance of uncertainty as the primary predictor of change in the CBT of

GAD when delivered in videoconference. Conclusion. Results support the importance of telepresence to support the contribution of working alliance to generate a therapeutic change during a CBT delivered in videoconference. Results should be replicated with other mental disorders and other psychotherapeutic approaches.

- 11:30 [Maxine Berthiaume](#), [Stéphane Bouchard](#), [Catherine Brisebois](#) and [Geneviève Robillard](#)
The Validation of a Telepresence Scale for Psychotherapy Delivered in Videoconference
SPEAKER: [Maxine Berthiaume](#)

ABSTRACT. The use of video communications has become increasingly popular as technology has improved. In recent years, therapists have begun to offer telepsychotherapy by videoconference to meet with clients. However, very few scales have been developed to assess clients' sense of presence during psychotherapy delivered in videoconference. The Telepresence in Videoconference Scale (TVS) was developed and tested over the years, but its psychometric properties have not been formally documented. The aim of this study was to examine the reliability and factor structure of the TVS. Telepresence can be defined as the feeling of being there, in another location, created by the use of video communications technology. A total of 157 participants completed the scale following a videoconference session with a psychotherapist, within the context of four studies. The scale inquired about the participants' experience during the videoconference (e.g. their interactions with the therapist, whether they felt like they were physically present and actively participating during the session, etc.). The TVS was first submitted to an exploratory factor analysis using the Principal Components method and a Varimax rotation. The KMO and Bartlett test confirmed the factorability of the database (KMO = .72, $X^2 = 648.65$, $p < .001$). The number of factors to extract was decided based on the convergence of three criteria: minimum eigenvalue, scree-test, and interpretability of the factor structure. Some items were removed in the process, to produce the final 7-item version of the TVS. Three factors were found: "Physical Presence" (items 1, 2, and 3 of the scale), "Interaction" (items 4 and 5), and "Absorption" (items 6 and 7 of the final version of the scale). All items loaded clearly ($> .70$) on only one factor and the final factor solution explaining 84.86% of the variance. Inter-item correlations and Cronbach's alpha were conducted to measure the internal consistency of the scale ($\alpha = .80$). Discriminant validity and convergent validity were assessed with the Immersive Tendencies Questionnaire ($r = .0$, ns) and the Distance Communication Comfort Scale ($r = -.25$, $p < .01$ for comfort with face to face communications, $r = .17$, $p < .05$ for telephone communications, and $r = .42$, $p < .01$ for videoconference communications). The average score was 57.18% (SD = 21.07) and differences were found between genders only on the Absorption subscale, with males feeling more absorbed than females ($t(153) = 2.67$, $p < .01$). The correlation with age was non-significant ($r = .15$). In conclusion, the results suggest that this revised version of the Telepresence in Videoconference Scale is a reliable and valid tool to measure clients' sense of presence during a videoconference session with a therapist. Future research could examine whether this scale may be used in different contexts and with different populations.

- 11:45 [Milou Feijt](#), [Yvonne De Kort](#), [Joyce Westerink](#) and [Wijnand Ijsselstein](#)
Enhancing empathic interactions in mental healthcare: Opportunities offered through social interaction technologies
SPEAKER: [Milou Feijt](#)

ABSTRACT. Therapeutic rapport is considered a fundamental part of the therapeutic interaction process, and highly related to successful therapeutic outcomes. Rapport can be defined as "the spontaneous, conscious feeling of harmonious responsiveness that promotes the development of a constructive therapeutic alliance" (Sadock, Sadock, Ruiz, & Kaplan, 2007, p.1). An integral part of therapeutic rapport is empathy, which is especially linked to nonverbal communication behavior, that is, the variety of communicative behaviors that do not carry linguistic content. These include eye contact, gaze direction, head nods, facial expressions, more general bodily behavior (e.g., postural

position, postural synchrony, social touch) and paralinguistic cues (e.g., intonation, fluency, loudness, stress patterns).

With the introduction of communication technologies in psychotherapeutic practice, many practitioners have doubts whether mediated interactions sufficiently support the expression and reception of empathy, and the consequent development and maintenance of therapeutic rapport. Despite empirical findings that mediated communications may allow for similar levels of therapeutic rapport as unmediated settings, at least from the perspective of clients, therapists still report that ‘something’ is missing. This feeling seems to originate in having access to fewer social cues in mediated interaction. In addition, technological issues and risk of distraction may negatively impact the feeling of closeness and rapport. The aim of the current paper is to review and explore in what ways novel communication technologies can be used to improve empathy in therapeutic interactions, and ameliorate some of the associated perceived drawbacks of mediated settings.

In general, in order to support and enhance empathic interactions in mediated settings, two different approaches can be distinguished. One approach is to support or simulate face-to-face interactions as closely as possible, thereby attempting to overcome limitations imposed by the medium (e.g., supporting eye contact, or conveying gesture awareness). A second, complementary approach is to use unique affordances of the medium to transform the interaction into something that could add value above and beyond what would be possible in an unmediated encounter. This type of approach was argued for by Hollan and Stornetta already 25 years ago in their key 1992 CHI paper “Beyond being there”.

When applying this second approach to establishing empathic interactions in a clinical context, there are a variety of opportunities being offered by technologies currently used or proposed in psychotherapeutic settings. These opportunities arise as a consequence of the development of various new sensors and actuators for measuring and representing social and affective cues. In addition, the mediated nature of the interaction allows for the control and transformation of the communicated social and affective cues. Technology can add additional relevant information during therapy that would normally be unavailable, even in a face-to-face setting. One example is social biofeedback, which can make implicit socio-emotional information explicit. Indeed, first exploratory studies have shown that using physiological feedback as a communication cue significantly enhances empathic interaction. Another example is virtual reality, which offers the possibility to create shared virtual environments, which enables novel transformations that may augment the interaction, such as non-zero sum gaze.

In short, improving the use of social interaction technologies in therapeutic settings can be approached in two complementary ways: by ameliorating or repairing shortcomings in the communication technology, and/or by extending or enriching the current gamut of mediated social interaction. In a full paper, we will elaborate on the various possibilities with a more systematic review. Irrespective of the approach, the eventual goal is to support and enhance empathic interactions and rapport in therapeutic settings, and thereby improve current mental healthcare practice, which will benefit both professionals and clients.

12:00 [Lise Haddouk](#), [Stéphane Bouchard](#), [Eleonora Brivio](#), [Carlo Galimberti](#) and [Alain Trognon](#)
Assessing presence in videoconference telepsychotherapies: A complementary study on breaks in telepresence and intersubjectivity co-construction processes
SPEAKER: [Lise Haddouk](#)

ABSTRACT. Context:

Assessing the efficacy of online psychotherapies is an important issue in telepsychology. Our first study aimed to compare the efficacy of telepsychotherapies in videoconference in two different

theoretical frameworks: cognitive-behavior therapy and psychodynamic. It also aimed to focus on telepresence as an indicator of intersubjectivity co-constructed online. The specific goal of the project is to assess acceptance of the technological setting by patients and its influence on the interactions between patients and psychologists. Previous researches show that telepresence predicts the strength of the therapeutic relationship and suggest that telepresence should predict intersubjectivity. We propose an analysis of videorecordings of psychotherapy sessions to explore if a low level of telepresence / intersubjectivity would be an indicator of the breaks in acceptance of the telepsychotherapy setting, and if there are “communicational regularities” related to these breaks.

Methods :

We approached the problem from the phenomenology of breaks in acceptance. We considered that breaks in acceptance of the setting were easier to identify than overall acceptance; as acceptance involves factors that vary based on various reasons (psychotherapeutic method, mental state of the patient, etc), but breaks or ruptures in acceptance can be measured in session and are most likely to be caused by events occurring during the session. We took 4 cases from a sample of adult subjects who were not suffering of a psychotic disorder and expressed breaks in acceptance of the setting in videoconference telepsychotherapy. 2 cases were taken from CBT and 2 others from psychodynamic telepsychotherapies. The therapists selected the cases and all therapy sessions were videorecorded. We analysed the first sessions of videoconference telepsychotherapies. One external judge then watched the sessions and selected the segments considered to be significant in terms of breaking of intersubjectivity, therapeutic alliance, and likely breaking telepresence. We used items from the telepresence in videoconference scale in hetero evaluation to analyse the selected segments, in order to assess physical presence and social presence. As we wanted to find “communicational regularities” that were independent of the therapeutical approach, we looked at verbal and non-verbal interactions rather than the use of specific psychotherapeutic methods. This led us to the observation of the intersubjective level of the interactions, with the enonciative co-presence dimension.

Results :

Codification of the therapy sessions is still in progress and will be completed in six weeks. Preliminary impressions from the coders confirm we will be able to define and understand better some reasons of the breaks in acceptance of videoconference telepsychology. We will consider the fact that breaks in telepresence and working alliance also mean a continuation of the relationships in another framework (i.e., a return to non mediated traditional face-to-face psychotherapy communication settings). Working on the limits of telepsychotherapy framework can be useful to enhance quality of interactions with the media and the setting itself. It will also help to understand the different levels of interactions between users and their links with telepresence.

Conclusion :

This study on breaks in acceptance and their motivations is the first step towards a better evaluation of the level of acceptance of the technological setting by patients and its influence on the interactions between patients and psychologists. The results of this study are useful to guide future projects on the co-creation of shared subjectivity in telepsychotherapy. These results might also be helpful to improve the quality of videoconference telepsychotherapies, for example in the creation of guidelines and quality standards.

12:15 [France Talbot](#), [Josée Leblanc](#), [Vanessa Fournier](#), [Nickolai Titov](#), [Blake F. Dear](#), [Heather Hadjistavropoulos](#) and [Thomas Hadjistavropoulos](#)

Feasibility open trials of a self-guided Internet-based CBT for anxiety and depression among French-speaking young adults: Lessons learned

SPEAKER: [France Talbot](#)

ABSTRACT. Anxiety and depression are highly prevalent mental health problems and chronic conditions. Despite the availability of evidence-based psychological treatments, access to these treatments remains a challenge. Access to traditional psychological care is particularly problematic for young adults. This age group has the highest prevalence rates of anxiety and depression, but also the lowest rate of utilization of traditional mental health services.

Evidence-based Internet-delivered cognitive-behavioural therapy (iCBT) can be an option to increase access to treatment. It may also be a more youth-friendly approach than traditional face-to-face psychological services. Over two decades of research support iCBT. While guided iCBT has received more support than self-guided iCBT, a few recent randomized controlled trials have revealed no significant differences between these two modes of delivery. Limited empirical evidence is nevertheless available on the efficacy of iCBT among young adults. Furthermore, access to iCBT has been very limited for several linguistic communities. To facilitate access to iCBT, translating available evidence-based iCBT programs into multiple languages has been advocated by the International Society for Research on Internet Interventions. Preliminary data suggest that it can be a highly cost-efficient strategy compared to developing new iCBT programs.

This study is the first phase of a research program conducted at the Telepsychotherapy Transformational Research Unit in New Brunswick, Canada. It aims to assess the feasibility of an evidence-based iCBT program for young adults, the Mood Mechanic Course, when translated into French and delivered in a self-guided format using weekly standardized emails. The Mood Mechanic Course is a transdiagnostic program delivered over eight weeks. It is comprised of five lessons, do-it-yourself guides and additional resources on various topics. A single group pre-post design with a 3-month follow-up was used. Feasibility outcomes included treatment adherence, attrition, treatment acceptability and preliminary efficacy. Primary outcome measures were the Patient Health Questionnaire 9-item (PHQ-9) and the Generalized Anxiety Disorder 7-item scale (GAD-7). The broader domains of resilience and life satisfaction were also assessed.

Twenty-seven participants, aged 18 to 25, were recruited in New Brunswick and included in the analyses. A first group (n = 11) was recruited among the general population. As a result of problems encountered in relation with adherence and attrition, methodological changes were made and a second group recruited among undergraduate students at the Université de Moncton (n = 16). More encouraging results were obtained. Outcome data will be analyzed using linear mixed-effect models and recovery rates calculated.

Findings from this study will ensure that all procedures are in place before proceeding with a roll out of this study among New Brunswick's French communities (Phase II) followed by the course's dissemination in the province with the original English version added (Phase III). This project involves a strong team of international as well as national experts. Not accessing mental health services when in need can have devastating consequences, especially at a young age. The translation of available evidence-based iCBT programs and their delivery in a self-guided format may help to bridge this gap so that young adults from different linguistic communities who face barriers in accessing psychological care can get the timely and effective help they need.

11:00-12:30 Session Orals -13: Cyberpsychology and the brain

CHAIR: [Cristina Botella](#)

LOCATION: [Julien-Gagnon-Walker](#)

11:00 [Godson Ahamba](#), [David Roberts](#) and [Peter Eachus](#)

Comparing neural responses in immersive virtual reality displays and non-immersive screens

SPEAKER: [Godson Ahamba](#)

ABSTRACT. The aim of this study is to compare neural responses to antisocial behaviour evoked by virtual humans in an immersive virtual reality (VR) display and those evoked in a non-immersive display. N=20 participants undertook a between subject design experiment. The experimental task requires participants to hold conversations with a friendly virtual human confederate and a confrontational virtual confederate, thereby triggering neural responses in participants. The task is conducted using a virtual reality head mounted display in condition 1, and a non-immersive screen display in condition 2. In both conditions, the perspective scale and distance of the virtual confederates are kept constant. Neural response to the conversational stimuli are measured using the functional near infrared spectroscopy (fNIRS) device. The study focuses on four regions of interest (ROIs) within the prefrontal cortex (pfc) which include the left and right dorsolateral pfc (ldlfc, rdlpfc) and the left and right medial pfc (lmpfc, rmpfc). Quantitative data for condition 1 have been analysed using a paired sample t-Test and reported. Although the findings from this analysis showed increased activity around all ROIs as the conversation changes from the friendly to confrontational virtual confederate except the ldlpfc, data exclusion was high as a result of the difficulty of combining a HMD with other wearables such as the fNIRS. This findings shall be compared with the results of a corresponding analysis of condition 2. Our findings could potentially help with decision making in subsequent studies of this kind.

11:15 [*Thomas Parsons, Michael Barnett, Timothy McMahan and Brendan Rooney*](#)

Neuropsychological assessment of age differences in memory performance using a virtual environment grocery store with environmental distractors

SPEAKER: [*Thomas Parsons*](#)

ABSTRACT. Introduction/Problem Distractions found in everyday life can disrupt activities of daily living in older adults. The conflicting evidence related to aging participants' reports of everyday memory functioning and results from traditional paper-and-pencil memory assessments may reflect the limited ecological validity of traditional memory assessments. Virtual reality-based neuropsychological assessments proffer the potential to address the limited ecological validity of pen-and-paper measures of memory.

Method/Tools To compare the performance of younger and older age cohorts on an episodic memory task with real world distractors, a newly developed virtual reality measure of memory, the Virtual Environment Grocery Store (VEGS), was administered to 19 older adults and 25 young adults. The VEGS includes a number of cognitive memory (episodic and prospective memory) tasks. Before the participant was immersed in the VEGS, they took part in a learning task (encoding phase) and a familiarization task. Immediate recall performance was recorded verbatim by a microphone and was logged for each of the immediate recall trials (Trials 1–3). Following the encoding and familiarization phases, the participant was informed that they were going to need to drop off a prescription once the VEGS protocol starts. They were also told that they needed to remember to go to the coupon machine after two minutes of shopping (VEGS Time-Based Prospective Memory). Furthermore, they were instructed that after they dropped off their prescription, they were to shop for items from the list that they learned earlier. After 10 min, the virtual pharmacist announced the participant's prescription number. At that time, the participant needed to return to the virtual pharmacist and clicked on her to end the simulation (VEGS Event-based Prospective Memory score). At the completion of the VEGS, the participant was asked to perform free (VEGS Long Delay Free Recall) and cued delayed recall (Long Delay Cued Recall).

Results Participants included 19 older adults (Mean Age = 77.05; Standard Deviation = 7.12; Mean Education 15.89 years; Standard Deviation = 1.49; Mean Full Scale IQ = 107.58; Standard Deviation = 7.19) and 25 young adults (Mean Age = 21.08; Standard Deviation = 4.81; Mean Education 14.92 years; Standard Deviation = 2.76; Mean Full Scale IQ = 103.52; Standard Deviation = 8.82). Analysis of variance between younger and older-aged cohorts revealed that the older aged group

performed significantly worse than the younger aged group on all measures of episodic memory: VEGS Short Delay Free Recall ($F = 25.28$; $p < .001$); Long Delay Free Recall ($F = 17.46$; $p < .001$); Long Delay Cued Recall ($F = 9.76$; $p = .003$). Moreover, analyses of variance between younger and older-aged cohorts revealed that the older aged group performed significantly worse than the younger aged group on prospective memory (time-based prospective memory $F = 9.34$; $p = .004$; event-based prospective memory $F = 37.81$; $p < .001$) and all measures of everyday shopping activities: # of times looked shop list ($F = 20.41$; $p < .001$) and Shopping List Items Picked Up ($F = 4.10$; $p < .05$).

Conclusion The VEGS has the advantage over traditional measures of providing objective measurement of individual components of memory in simulations of everyday activities that include everyday distractors. While traditional paper-and-pencil assessments are performed in sterile laboratory environments, the VEGS assesses episodic memory and in the presence of real-world distractors. Moreover, the findings suggest that there are significant differences between groups on all measures. This suggests that the VEGS is sensitive to age related differences in memory performance.

11:30 [Philippe Charbonneau](#), [Mohamed Amir Chitour](#), [Thomas Robert](#), [Sara Saint-Pierre Cote](#), [Rachid Aissaoui](#) and [David R. Labbe](#)

Evaluating the impact of a virtual self-avatar on spatiotemporal gait parameters

SPEAKER: [Philippe Charbonneau](#)

ABSTRACT. Introduction: The study of gait and its rehabilitation has of frequently been done using a treadmill rather than over-ground walking because of space constraints and the requirements of motion capture technologies. It has generally been recognized that some kinematics and temporal differences exist between treadmill and overground walking. These differences may be in part due to the stationary nature of treadmill walking, leading to an absence of optical flow. To compensate for this absence, different studies have explored the use of immersive virtual reality (VR), so that the user sees himself walking through a virtual environment (VE). Immersive VR, using a head-mounted display (HMD), prevents a user from seeing his own body in the virtual environment. Recently, studies have used embodiment of real-time self-avatars as a method to provide a user with visual feedback of his movements in gait rehabilitation. To our knowledge, no study has measured the impact of embodying a self-avatar, which inevitably has some system latency, on gait patterns. **Methodology:** In this study, we quantified the spatiotemporal gait parameters of 11 healthy participants in 6 different conditions. In the 1st condition, participants walked overground in a 50-meter long hallway. In the 2nd condition, they walked on a treadmill at a self-selected comfortable pace, without any VR feedback. In the 3rd condition, they walked on the treadmill while viewing a VE through an HMD. The VE was a replica of the physical laboratory the participants were in and they were not moving this VE (as if they were walking on a virtual treadmill). In the 4th and 5th conditions which were presented in randomized order, the participants walked in a virtual hallway, which was the replica of the physical hallway from condition 1, with (condition 4) and without a real-time self-avatar (condition 5). Through all conditions, participants wore inertial sensors (XSens) on their pelvis and lower limbs. Prior to the walking trial, they performed a series of calibration movements. Mean cadence, step length, gait cycle duration and step width were computed for each participant and for each condition. Between each condition with VR, participants answered a simulator sickness questionnaire (SSQ) and a presence questionnaire. Conditions were compared using paired T-Tests. **RESULTS:** When comparing the overground condition to the treadmill without visual feedback, results are in accordance with previous literature: participants have a smaller step length, higher step width, slower cadence and a longer gait cycle duration on the treadmill. Viewing a virtual replica of the laboratory through an HMD did not lead to any significant changes in the studied gait parameters. Viewing the dynamic VE where participants walked along a virtual corridor also did not results in any significant changes, compared with treadmill gait without visual feedback. The addition of the real-time self-avatar lead to significant differences in cadence and gait cycle

duration. In fact, the participants had a reduced cadence and a longer gait cycle duration even though they walked at the same speed in both conditions. Conclusion: The results found in this study show that there is a potential difference and impact on gait when a user walks with a self-avatar compared to when his does not have one. The next step will be to examine the kinematic data collected during the experiment to obtain more information about the impact of the self-avatar on gait.

11:45 [Andrew Hodrien](#), [Adam Galpin](#), [David Roberts](#) and [Laurence Kenney](#)

Exploring the impact of control method on embodiment of a myoelectric prosthesis using Immersive Virtual Reality

SPEAKER: [Andrew Hodrien](#)

ABSTRACT. Prosthesis embodiment, the feeling of a prosthesis being 'part of' the user, is reported by some prosthesis users, whereas others feel their prosthesis is a 'foreign' object to just use as a tool. The former relates to a feeling of body ownership which goes beyond a change in 'body schema', the unconscious spatial representation of the body. Embodiment is believed to be influenced by a variety of factors, such as the feeling of agency.

Myoelectric prostheses are electrically powered and controlled via electrodes measuring electromyographic (EMG) signals from muscle within the user's remaining limb. The difficulty in controlling such prostheses has been noted by users as reasons for prosthesis rejection, and may influence prosthesis embodiment.

The delay between intended and actual hand movement includes a fixed (electromechanical delay in the hand) and variable amount (reliability of electrodes picking up the EMG signal), introducing uncertainty over how the hand will behave, likely influencing embodiment. Further to this, embodiment is likely to be influenced by the control method of the prosthesis in general, as the hand is controlled by muscles not normally used to open or close an anatomical hand. As encouraging prosthesis embodiment has been proposed as a goal of rehabilitation, designers of prostheses need to understand the impact of such factors.

A version of a body ownership technique, the virtual hand illusion (VHI) or rubber hand illusion (RHI), involves visuo-motor stimulation (i.e., a person moving their hand and seeing the virtual/rubber hand move), which if synchronised, encourages a feeling of ownership over the hand. Research has shown the RHI effect (despite being less vivid) is still possible with modality-mismatched feedback (known as sensory substitution), for example, replacing touch with vibration. Whilst this utilised the traditional visuo-tactile stimulation RHI (e.g., feeling and seeing paintbrush strokes on hands), it is anticipated an equivalent effect may occur with visuo-motor stimulation, as with a prosthetic hand being opened with muscles flexes.

An Immersive Virtual Reality study was conducted to explore the impact of the above outlined control method on virtual prosthesis embodiment, by comparing between opening and closing a virtual prosthesis via myoelectric prosthetic hand and an anatomical hand. This involved a novel approach in testing prosthesis embodiment by using a myoelectric hand displayed virtually. VR provides controllability in assessing several questions in embodiment research.

The experiment included a head-mounted display (Oculus Rift) with myoelectric prosthetic hand or actual hand movements motion tracked (Leap Motion) and presented virtually. Thirty-one anatomically-intact participants opened and closed a virtual prosthesis (60 hand movements for a period of 2mins+) controlling a myoelectric prosthesis in one condition, and using their own hand in another condition, with a virtual threat applied to the hand at the end. Embodiment was measured via a slightly adapted questionnaire traditionally used in RHI/VHI research along with skin conductance responses.

For both control conditions, questionnaire scores of ownership, agency, and overall embodiment were significantly higher than respective control questions scores, along with significant skin conductance responses from a threat to the virtual prosthesis, suggesting the presence of all measures. Body ownership scores were positively correlated with agency, but no correlation with skin conductance scores, suggesting a relationship for the former but none for the latter. Comparing between conditions, only the ownership score was significantly higher in the hand condition compared to prosthesis condition. In addition, qualitative responses to questions collected during the experiment help inform interpretation of the statistical findings.

Aside from furthering knowledge on prosthesis embodiment, the findings of this study are being used to inform a follow-up experimental VR study, a plan of which was presented at the CyberPsychology conference 2017.

12:00 [Berenice Serrano-Zarate](#), [Audrée St-Onge](#) and [Stéphane Bouchard](#)

Tactile illusions in immersive virtual reality environments: An exploratory study regarding its usefulness in psychological treatments

SPEAKER: [Berenice Serrano-Zarate](#)

ABSTRACT. Virtual reality (VR) is defined as a technology that allows the simulation of different real-life situations. The usual process of information processing denotes that much of what we explicitly perceive is based on our previous experiences and the meaning that the brain gives to stimuli. This perceptual illusion could explain why users respond to VR stimuli as if they were real, and VR treatments are effective. For example, more than sixty clinical trials show that immersions in VR can be used to treat different anxiety disorders. The aim of this work was to study the perceptual experience without real stimulation of the sense of touch, while the participants interact with an object within a VR environment. Our hypothesis is based on the fact that the familiarity and emotional charge of VR objects facilitates and / or increases tactile illusions. Thirty volunteers participated with a mean age of 26.34, SD = 8.80 in a range of 19 to 52 years old, of which the 40% are women. The inclusion criteria were being over 18 years old, being francophone (the study was conducted in French), not suffering from severe transportation problems, not experiencing severe phobic fears, and giving a written consent. The study was approved by the Ethics Committee of Université du Québec en Outaouais (UQO). An experimental design of repeated measures was used, where 24 VR objects corresponding to two types of stimuli were presented twice in two random orders for each participant: (a) family stimuli, associated with an affective load (e.g., a cat or a tarantula) or (b) familiar and neutral stimuli (e.g., an orange). The study was carried out in the Cyberpsychology Lab of UQO and an immersive six-walled VR CAVE system was used. Participants were first asked to fill in the pre-experimentation assessment, which included socio-demographic, health status, phobic fears, cybersickness, and immersive tendencies measures. Later we will ask them to "try to touch" the VR objects with his / her dominant hand as if these were real (e.g., caress a cat); It was also possible to walk around the VR object and watch it from every angle. Next, we evaluated sensations perceived by the sense of touch after the interaction (e.g., perception of hardness, roughness, temperature) and the emotions associated with each object. Finally, sense of presence and cybersickness were evaluated. The experiment was carried out in a single session, and lasted 60 minutes, with a maximum time of exposure to the VR environment of 30 minutes. Differences between the different types of stimuli were identified, therefore the results suggest that the illusionary perception of touching VR family objects, especially those that may have an emotional charge for the person (e.g., a spider that provokes anxiety), are capable of activate avoidance and anxiety reactions very similar to those that would activate the real objects. These findings agree with some others reported in previous studies in literature. Therefore, our hypothesis is confirmed. Additionally, the participants reported a high degree of sense of presence ($M = 70.87$, $SD = 25.43$), and did not manifest significant side effects (cybersickness) of the use of VR. Finally, mention that the results obtained could contribute to explore the potential of VR environments

currently used in psychological treatments in order to potentiate its use and exploit all their qualities.

11:00-12:30 Session Orals -14: Cybercrime

CHAIR: [Patrice Renaud](#)

LOCATION: [Krieghoff](#)

11:00 [Helen Jones](#), [John Towse](#) and [Timothy Harrison](#)

The role of psychology in understanding email fraud susceptibility

SPEAKER: [Helen Jones](#)

ABSTRACT. Recent public surveys indicate that awareness about the concept of phishing attacks and the associated risks is increasing, and yet the evolution of more sophisticated and targeted attacks means that the negative impacts associated with these remain. Many attackers are moving away from traditional phishing attack types, such as the Nigerian 419 scam, with attention now concentrated on social engineering, whereby emails are tailored to a specific recipient or group of recipients, for example employees of a large corporation. A range of deceptive and persuasive tactics mean that even the most security conscious recipient can be led to divulge confidential information or download an infected file. At the cornerstone of each successful attack, regardless of the email type, there is a human decision. Computer science approaches to this issue tend to focus predominantly on detecting fraudulent emails before they reach the user, but the continually advancing sophistication and believability of the emails being developed and circulated means that such technological solutions are often short lived. It is therefore important to consider the decision making processes involved at the point when the email reaches the user. Here, we report two studies that consider the potential for psychological markers of email response behaviour, in order to understand why multiple users can receive the same email, and yet only a small proportion will respond and become victims of fraud.

Study 1 ($N = 224$) considered the role of cognitive factors such as self-control, working memory, and inhibition as predictors of email response behaviour, using an explicit email legitimacy judgment task. Multiple linear regression analyses demonstrated the significant role of inhibition, cognitive reflection, and sensation seeking in email decision-making. In addition, a time pressure manipulation on email responses showed that rapid response led to a decrease in judgment accuracy. In order to build upon these findings, we designed a second study, which involved a three-hour office simulation, allowing assessment of email response behaviour in a more naturalistic environment ($N = 51$). Participants were required to complete a number of day-to-day administrative tasks, such as letter writing and purchase orders, as well as managing a personal email inbox. This set-up meant that participants remained naïve to the purpose of the experiment, having been told that this was examining task management behaviour. Across the duration of the simulation, each participant received five phishing emails and ten legitimate emails. These were designed for the purpose of the experiment, but were based closely on actual emails received by the research team in order to make them more realistic. Response behaviour to each of the phishing emails was recorded, with different levels of response (from opening the email to downloading a suspicious attachment) indicating the extent of a participant's susceptibility. Those cognitive factors found to have a significant influence in Study 1 were assessed, as were a number of situational factors, including time pressure and priming about phishing. Results replicated those from Study 1, with multiple linear regression analyses demonstrating the significant influence of cognitive reflection and sensation seeking in predicting response behaviour. Our situational manipulations of time pressure and priming elicited null results, which in itself raises interesting questions about the applied implications of these findings. The findings emphasise the need to move away from generic warning messages about the presence of phishing as a way of educating users. Together, the two studies reported help to characterise a cognitive profile of those users most at risk to deceptive emails, as well as highlighting how situational influences may affect this risk.

11:15 [Arica-Ann Norzagaray](#)

Exploratory Analysis of the Relationship Between Country Personality Traits and Cybercrime Output

ABSTRACT. Cybersecurity is a concern not only for the United States but for countries around the world. Many security companies regularly report cybercrime and attacks, ranking countries with the most cybercrime output. Previous research lacks how specific countries can be grouped under different typologies with cybercrime profiles. The purpose of this study is to address this gap by determining if there is a relationship between the Big 5 Personality Traits -Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness using the NEO-PI-R and total cybercrime output (spam, fraud, malware, and digital piracy). Archival datasets were used for the present study. The first dataset was derived from multiple open source locations consisting of reports, websites, spam email archives, and other sources between the years of 2012 to 2014. The final sample consisted of 190 countries and were separated into nine categories: four were cybercrime-related and included two digital piracy measures, three fraud measures, one spam variable, and one malware variable. An additional two non-cybercrime measures were derived from the World Bank website, GDP per million and percent of internet users per capita. The second dataset consisted of country aggregate personality traits derived from 51 cultures representing six continents on the NEO-PI-R. The sample consisted of college students who volunteered to participate anonymously and the majority were native-born citizens of their countries. For the purpose of this study, the datasets were reduced to only 49 countries. The reduction was made due to the limitation of the number of countries in both datasets. Additionally, spam, malware, piracy, and fraud were totaled to account for one measure of cybercrime. Typical demographics were not reported due to the information not provided in the archival datasets. Countries were then ranked on each measure of the Big Five Personality Traits to determine if they fell outside one standard deviation from the mean. Those countries who fell one standard deviation above the mean (Neuroticism = 51.6; Extroversion = 52.1; Openness = 51.6; Agreeableness = 51.1; and Conscientiousness = 51.7) were classified as being high on that measure of personality trait, and those who fell one standard deviation below the mean (Neuroticism = 48.2; Extroversion = 47.2; Openness = 47.9; Agreeableness = 47.8; and Conscientiousness = 47.7), were classified as being low on that measure of personality trait. Pattern recognition was used to determine if there was a relationship between the highest and lowest countries cybercrime output and personality traits. Additionally, GDP and net users were correlated with the highest and lowest ranking countries of outbound cybercrime. Results showed the top cybercrime country output were from the United States, Canada, the United Kingdom, and Australia, who scored high on Extraversion and are identified as being an individualist country. Brazil and Argentina also scored high on Extraversion and are identified as a collectivist country. Germany, Czech Republic, and Spain scored high on Agreeableness and are identified as being an individualist country, while India is identified as a collectivist country. According to the data, the lowest cybercrime country output was from Ethiopia, Lebanon, Nigeria, and Philippians, who scored low on Agreeableness and are identified as being a collectivist country, while Estonia is identified as an individualist country. Ethiopia, Nigeria, Uganda, Botswana, and Indonesia scored low on Extraversion and are identified as being a collectivist country. In addition, Botswana, Ethiopia, and Nigeria also scored low on Conscientiousness. Ethiopia and Nigeria are countries known for ransomware and kidnapping however, the data does not reflect this. Caution is warranted because the dataset did not account for ransomware. Additionally, due to IP address rerouting, the country source of cybercrime may not reflect the true location of cybercrime.

11:30 [Helen Jones](#) and [Wendy Moncur](#)

Designing for trust in online crowdfunding investment

SPEAKER: [Helen Jones](#)

ABSTRACT. In an increasingly shared economy, whereby we are reliant on peers in a range of scenarios, from financial support to holiday rentals, we often come to trust the opinions and veritas of complete strangers. The type of information and support gathered in these scenarios might previously have come from well-known organisations, such as the banks or Government, but recent events such as the global financial crash in 2008 have led to a vast decrease in institutional trust. In the financial sector, this has resulted in the emergence of alternative methods for gaining monetary backing in business ventures, such as a focus on peer-to-peer lending and crowdfunding. In crowdfunding, campaigners gather small monetary pledges from numerous funders, and in return the funders receive either a reward (most commonly a pre-order version of the product being developed), or an ongoing equity stake in the company seeking funding. The research presented here investigates how users make investment decisions around crowdfunding, given the risk and uncertainty associated with this, which means that trust is a prerequisite of investment. Unfortunately, deceptive users sometimes take advantage of the natural human inclination to trust others and attempt to elicit personal or financial information from trusting users for their own gain, through false identities or illegitimate business practise. This research aimed to identify how a potential funder develops the trusting relationship that leads to investment in a complete stranger, with little knowledge of their legitimacy or competence to complete the project.

Across two studies a number of consistent factors key to investment likelihood, and trust building were highlighted. Data from 11 semi-structured interviews elicited information about the importance of social influence factors such as social proof and item scarcity. Further quantitative data collection from a larger online survey of crowdfunding users replicated these findings, as well as providing additional insights into the role of individual differences between users, such as impulsivity and disposition to trust, on investment behaviour. Insights from these initial studies were then used to inform an interdisciplinary collaboration to develop a technological security tool that would enhance secure connectivity between funders and campaigners in crowdfunding.

One core finding from our initial research was the importance of a campaigner's social media presence to perceptions of their legitimacy. Researching a crowdfunding campaigner on social media gives potential funders additional assurance that they are reputable and trustworthy, based on the number of followers and the way they interact with others through platforms such as Facebook and Twitter. Based on this, a security tool was developed that triangulates archival social media data across different platforms, using machine learning techniques to produce what is effectively a 'social credit score'. This demonstrates the legitimacy of a campaigner based on the consistency and longevity of their social media activity, providing assurance that they did not, for example, set up a Facebook account yesterday for the sole purpose of running a fraudulent crowdfunding campaign. A prototype of this tool was tested, with participants being asked to make investment decisions on mock crowdfunding projects. A between subjects design was employed, so half of the participants had access to the tool whilst the other half simply had access to the web. The investment decisions that participants made demonstrate the effectiveness of the tool in improving accurate decision making about campaigner legitimacy, providing added assurance on top of the typical due diligence that a funder would normally perform themselves.

12:30-13:30 Lunch break (included)

Beethoven room

13:30-15:00 Session Orals -15: Cyber addictions

CHAIR: [Dennis Wood](#)

LOCATION: [Morrice](#)

13:30 [Diogo Morais](#), [Pedro Gamito](#), [Jorge Oliveira](#), [Pedro Rosa](#), [Ana Prioste](#), [Barbara Gonzalez](#) and [Mauro Bianchi](#)

Social network use and sexual orientation as factors for psychological adjustment, cyberbullying and Internet addiction

SPEAKER: [Diogo Morais](#)

ABSTRACT. Introduction: Internet and particularly Online Social Networks (OSN), are becoming increasingly more relevant in our everyday lives. Using many different social networking sites/apps has been reported as having an impact on psychological adjustment, namely on dimensions such as depression, anxiety and stress. This paper reports on a study aimed at learning the effect of OSN on psychological adjustment and the impact of these three dimensions on “internet addiction” (IA) and cyberbullying (CB). Method: The sample consisted of 660 adult participants with a mean age of 29.99 years ($SD = 12.78$) and 66.5% women. 91.2% reported being heterosexual, and 85.6% white Caucasians. 65.2% stated accessing OSN several times a day (2.6% had no access) and 87.5% declared having basic to intermediate computer experience. The protocol was administered through GoogleDocs in a snowball sampling procedure through direct contact by chat or email. Results: Facebook users reported significantly higher values of IA and CB than non-users, but results were not statistically significant for depression, anxiety and stress. Twitter, Instagram and Snapchat users showed significantly higher results of depression, anxiety, stress, CB and IA. LinkedIn seems to have no effect on any of the outcome measures. When compared to participants that use less than three OSN, users of at least three OSN reported significantly higher results of depression, stress, anxiety, IA and CB, while claiming significantly lower results of perceived competence, autonomy and perception of self. Overall, the frequency of OSN access shows significant results for depression, stress, anxiety, IA and CB. Sexual orientation showed significant results for IA, CB, depression, anxiety and stress, with heterosexuals reporting significantly higher values in all dimensions. Discussion: Higher frequency of OSN use negatively impact on psychological adjustment, IA and CB. Moreover, results suggest that having access to multiple OSN simultaneously, is also a major factor in psychological adjustment, IA and CB. These results should be taken in consideration by relevant stakeholders, and future research should be conducted with a sample of teenagers, as this cohort is particularly at risk.

13:45 [Jon Elhai](#)

Fear of missing out: Testing relationships with negative affectivity, online social engagement, and problematic smartphone use

ABSTRACT. The "fear of missing out" (FOMO) is a newer personality-related construct defined by apprehension of being absent from other people's rewarding experiences, and the desire to persistently stay connected with others' experiences, including through digital means. Several recent studies have found inverse relationships between FOMO and perceived quality of life and well-being. Additional studies have found strong relationships between FOMO and depression and anxiety severity. Finally, FOMO has demonstrated relationships with in-person and online social engagement, and increased and excessive internet and smartphone use. We set out to further test FOMO's relationships with three categories of variables: negative affectivity, social engagement, and problematic smartphone use (PSU). We used an internet web-based survey with 296 undergraduate participants from the Midwestern United States, administering self-report surveys of FOMO (the FOMO scale), frequency and types of smartphone use, problematic smartphone use (PSU) (using the Smartphone Addiction Scale), proneness to boredom (Boredom Proneness Scale-Short Form), and scales of negative affectivity including depression, anxiety, stress (Depression Anxiety Stress Scale-21; DASS-21), and rumination (Ruminative Thought Style Questionnaire). We conducted bivariate analyses to explore correlates of FOMO scores. We also tested for mediation to explore the hypothesis that negative affectivity variables mediate relationships between levels of FOMO and PSU. Mediation testing was conducted using the cross-product of direct paths approach, with the Delta method, and bootstrapping standard errors. Finally, we conducted a confirmatory factor analysis of the FOMO scale to assess its factor structure, using weighted least squares estimation with a mean- and variance-adjusted chi-square, treating items as ordinal (with a polychoric

covariance matrix, and probit factor loadings), and assessing measurement invariance based on gender. Results demonstrated that FOMO scores were related to demographic characteristics (younger age, female gender, and Caucasian race), but with small effect sizes. FOMO was related to all measures of negative affectivity, social use of a smartphone, as well as frequency of and PSU. Tests of mediation indicated that each negative affectivity construct mediated relationships between FOMO and PSU. Finally, results supported a single-factor latent construct for FOMO, but men and women participants yielded a different pattern of factor loadings. Negative affectivity may be a key mechanism by which FOMO may drive PSU. Gender-related social connectedness differences characterize FOMO.

14:00 [Yasser Khazaal](#), [Nektaria Varfi](#) and [Stephane Rothen](#)

About possible determinants of addictive cybersex

SPEAKER: [Yasser Khazaal](#)

ABSTRACT. Background: Rising concerns have been reported related to problematic cybersex or cybersex addiction. Objective: The aim of this study was to assess potential links between cybersex addiction and several psychological and psychopathological factors, including sexual desire, mood, self-esteem, attachment style, and impulsivity, by taking into account the age, sex, and sexual orientation of cybersex users. Methods: An online survey was conducted in which participants were assessed for sociodemographic variables and with the following instruments: Compulsive Internet Use Scale adapted for cybersex use, Sexual Desire Inventory, Short Depression-Happiness Scale, Self-Esteem Scale, and UPPS-P scale for impulsivity. Attachment style was assessed with the Experiences in Close Relationships-Revised questionnaire (Anxiety and Avoidance subscales). Results: A sample of 145 subjects completed the study. Cybersex addictive use was associated with male gender, depressive mood, higher levels of sexual desire, and avoidant attachment style, but not with impulsivity. Conclusion: Addictive cybersex use is a function of avoidant attachment, sexual desire, and depressive mood.

14:15 [Maria Panagiotidi](#), [Paul Overton](#) and [Tom Stafford](#)

Cognitive predictors of problematic mobile phone use

SPEAKER: [Maria Panagiotidi](#)

ABSTRACT. The majority of previous studies on excessive mobile phone use have been focused on personality traits and have used self-reports. The link between cognition and problematic mobile phone use has been neglected. The aim of this study was to empirically investigate this relationship. 60 participants (36 females) completed the Mobile Phone Problem Usage Scale (MPPUS; Bianchi & Philips, 2005) and a number of cognitive tasks measuring cognitive control, task switching, response inhibition, and working memory. Performance on cognitive tasks was negatively correlated with self-reported symptoms of problematic mobile phone use. No relationship between working memory, response inhibition, and problematic use was found. Cognitive control and task switching were the best predictors of problematic mobile phone use. Our results suggest that future research should further explore the link between cognition and problematic technology use.

14:30 [Maria Panagiotidi](#) and [Paul Overton](#)

The relationship between attention deficit hyperactivity symptoms and excessive mobile phone use

SPEAKER: [Maria Panagiotidi](#)

ABSTRACT. The aim of this study was to examine the contribution of inattention and hyperactivity, as well as overall ADHD symptoms, to smartphone addiction and problematic mobile phone use. A sample of 273 adult volunteers completed the Adult ADHD Self-Report Scale (ASRS), the Mobile Phone Problem Usage Scale (MPPUS, Bianchi & Philips, 2005), and the Smartphone Addiction Scale (SAS, Kwon et al., 2013). A significant positive correlation was found between the ASRS and both scales. More specifically, Inattention symptoms and age predicted smartphone addiction risk

and problematic mobile phone use. Our results suggest that there is a positive relationship between ADHD traits and problematic mobile phone use. In particular, younger adults who report more inattention symptoms could be at higher risk of developing smartphone addiction.

13:30-15:00 Session Orals -16: eHealth in general

CHAIR: [Pietro Cipresso](#)

LOCATION: [Krieghoff](#)

13:30 [Irene Alice Chicchi Giglioli](#), [Elena Parra](#), [Carla de Juan](#) and [Mariano Alcañiz Raya](#)

Serious games for behavioral assessment of executive functions

SPEAKER: [Mariano Alcañiz Raya](#)

ABSTRACT. The present study is a part of a larger project based on a generalist model of assessment and treatment for mental disorders. According to the Grawe's Consistency Model, people during the lifespan attempt to satisfy four basic psychological needs (attachment, self-esteem, orientation and control, and maximization of pleasure/distress minimization), in accordance with their past experiences, motivations and goals, and an enduring nonfulfillment could bring to the development of one or more mental disorder. In order to evaluate the validity of the model in various mental disorders, the project proposes an immersive serious game (SG) that uses stealth assessment (SA) as a method of evaluation. SA allows developing and measuring multiple psychological constructs, capturing behaviors in real time during the game experience. A narrative storytelling, settled in a spaceship with six avatars, has been created for leading participants in the play and various distress situations have been developed for eliciting needs-related behaviors. One of our project hypotheses is that if the subject has a higher physical and social presence than the traditional assessment, he will behave as he was in real life. Actually, the traditional measures as paper and pencil tests (PP) or self-reports present some limitations as the social desirability bias that can lead to incorrect reports about belief, attitudes, and behaviors or self-reports involve that subject has conscious knowledge about himself but it is not always so. Games developed with SA could provide dynamic behavioral measures of various psychological constructs more accurately than traditional assessment. Within the consistency model, an essential component of human behavior is represented by the cognitive domain that is supported by the executive functions (EFs), a set of processes including goal setting, monitoring, planning, and cognitive-behavioral flexible control. Attention, working memory, cognitive flexibility, reasoning, problem solving, and planning represent the core EFs components. Traditionally, many standardized questionnaires and tasks are used to assess EFs. As mentioned before, these tests are easy to administer, score, and interpret but present some limitations in terms of generalizability of behaviors in real life. Specifically, various studies showed that low scores on traditional measures, do not inevitably entail poor behaviors in real life and vice-versa. In order to have more closely corresponding in context and behaviors to real life, the present study aimed to examine EF performance in run using computerized contextualized SG. Seven games were designed, each one according to one of the standard tasks. Five of these tasks were aimed to measure attention (Dot Probe, Go/NoGo, Stroop, Trail Making Tasks) while two of the games were designed to measure cognitive flexibility (Wisconsin Card Sorting Test). 354 healthy subjects (177=women and 177=men; Mean Age=39.72, SD=8.90) performed the attention and cognitive flexibility game assessment, together with standard cognitive tests. Psychological PP measures for attention (Attentional Control Scale), impulsivity (Barratt Impulsivity Scale), and for cognitive flexibility (Cognitive Flexibility Scale) were also administered. During the SG, correct answers and time of reactions were collected. Our findings showed good correlations on reaction times between the standard tests and SG-based EF battery, suggesting its potential use for behavioral assessment. On the other, the absence of correlation with specific standard tasks on correct answers needs further investigation, with also mental disorder samples, for better defining SG-based EF battery sensitivity toward EF components. The seven games will include in the immersive narrative storytelling game for improving the ecological validity and the generalization of the results.

13:45 [Erin Leigh Courtice](#), [Krystelle Shaughnessy](#), [Jessica Nicole Rocheleau](#), [Rebeca Reyes](#), [Thomas Huijbregts](#), [Rini Singh](#), [Sarah Kipping](#) and [Sanaz Riahi](#)

Findings from the implementation of a mobile digital health platform as an adjunct to patients' mental healthcare using a longitudinal, mixed-methods design

SPEAKER: [Erin Leigh Courtice](#)

ABSTRACT. Background. Researchers and clinicians have written about the potential for mobile technologies to improve mental healthcare delivery and patient engagement with care (e.g., Clough & Casey, 2015, Prentice & Dobson, 2014). However, there is currently little research examining barriers, facilitators, or benefits for providers who are implementing these new tools as adjuncts to mental healthcare service delivery in clinical care settings. Additionally, little is known about how individual differences in online privacy concern (OPC; the desire to maintain control over their personal information online to prevent unauthorized use or distribution of this information) and technology adoption propensity (TAP; the likelihood of acceptance and use of new technologies) may impact healthcare providers' and their patients' use of these tools. For instance, some researchers suggest that individual levels of OPC and/or TAP may be related to individual use of new technology, thus impacting the use of these tools. The purpose of this study was to (i) explore clinical providers' perceived facilitators and barriers to implementing a mobile patient engagement platform as an adjunct to treatment with their patients, and (ii) to examine the extent to which OPC and TAP predicted their attitudes towards and use of the platform.

Methods. We recruited clinical care providers from a tertiary mental healthcare setting, who were involved in implementing a mobile digital health platform as an adjunct to treatment-as-usual with their patients. Participants completed a longitudinal survey (delivered at 4 times; N=28), a paper survey (n=17), and/or an in-person focus group (n=7). The paper surveys and focus groups assessed providers' self-reported attitudes (positive and negative) towards and use of the platform with patients (using 7-point Likert scales), as well as their perceived facilitators, barriers, and benefits to using the platform (using researcher-coded, open-ended response questions). On the longitudinal surveys, participants reported on their overall OPC (Internet Users' Information Privacy Concerns [IUIPC] scale; Malhotra, Kim, & Agarwal, 2004) and TAP (TAP index; Ratchford, 2010), as well as their self-reported attitudes (positive and negative) towards and use of the platform with patients (using 7-point Likert scales).

Results. First, we conducted thematic analyses with data from the focus groups and descriptive statistics with data from the longitudinal and surveys. Our findings from this set of analyses suggested that participants experienced the following key facilitators to using the platform: technology-related factors (e.g., platform features), human factors (e.g., individual characteristics), and instructional factors (e.g., feeling supported using the platform). These results also indicated that participants experienced the following key barriers to using the platform: technology-related factors (e.g., platform implementation challenges), human factors (e.g., fear of technology), and institutional factors (e.g., existing workload). Second, we conducted regression analyses to examine the extent to which providers' level of OPC and TAP predicted their attitudes towards and use of the platform. Findings indicated that neither OPC nor TAP were predictors of participants' use of the platform with their patients, although descriptive statistics indicate that both constructs may still play a role.

Conclusion/Impact. Our findings suggest that a variety of individual, technological, and institutional factors can support or hinder the successful implementation of new mobile, digital health technologies as an adjunct to treatment-as-usual in healthcare settings. The implications of these findings for tech-developers, decision-makers, healthcare practitioners, and patients will be discussed.

14:00 [Stefan Liszjo](#), [Linda Graf](#) and [Maic Masuch](#)

The relaxing effect of virtual nature - Immersive technology provides relief in acute stress situations

SPEAKER: [Stefan Liszto](#)

ABSTRACT. INTRODUCTION Research on attention restoration theory brought evidence on the recreational effect of natural environments on humans (White et al., 2013). Since virtual reality (VR) creates a compelling illusion of being present in the virtual world (Heeter, 1992), it is reasonable to use this technology to expose humans to such restorative environments (Berto, 2014). This approach can provide relief from everyday stress but is especially valuable for those suffering from acute stress and emotional strain whose access to nature is limited, for instance due to health-related issues or certain working environments (Anderson et al., 2017).

The purpose of the present study is to investigate the possibility to elicit positive feelings and provide relief from distress using VR and natural virtual environments (VE) during acute stressful situations (e.g. medical treatments). Furthermore, we explore whether a high level of immersion increases the recreational effect of natural VEs.

METHOD We developed a VR version of the commonly used Trier Social Stress Test (Kirschbaum, Pirke & Hellhammer, 1993) as a standardized instrument to evoke acute cognitive and social stress. In a preliminary study (N = 47) we compared our VR-TSST to the original real-world protocol to ascertain efficacy and validity of our method. We observed a significant increase of physiological stress (heart rate variability, HRV; cortisol) and psychological stress (anxiety, affect) compared to a baseline measurement. Thus, we consider our VR-TSST to be a reliable and efficient stress induction method. In the main study, subjects were stressed using our VR-TSST. A second stress induction was announced at the end of the VR-TSST to keep the stress level constant. Subsequently, subjects were randomly assigned to one of three conditions: participants in the VR group were exposed to a realistic simulation of an underwater environment shown on a head-mounted display (high immersion). The desktop group experienced the same VE on a non-immersive desktop screen (low immersion). Subjects in the control group were not exposed to the VE but were left waiting without medial distraction (no immersion). Objective (HRV, cortisol) and subjective (self-report) stress indicators were measured. Questionnaires were used to assess anxiety (State-Trait Anxiety Inventory), affect (Positive and Negative Affect Schedule), immersion (Game Experience Questionnaire), and presence (Igroup Presence Questionnaire).

RESULTS A total of 62 healthy subjects aged 18 - 48 years (M = 22.6, SD = 5.36) participated in the study. HRV changed significantly in all three groups over the course of the experiment with higher values (indicating low stress) during baseline and relaxation phase and lower values (indicating high stress) during the stress induction phase. Further, in the VR condition significantly higher HRV values were measured in the relaxation phase than the desktop and the control conditions. Mean cortisol levels decreased during the post-induction phase about 27.66% in the VR group, 28.74% in the desktop group, and 18.18% in the control group. Although these differences were not significant, we found a medium effect size (.70). Subjective measures showed similar tendencies. A significant decrease of anxiety and negative affect was observed in all groups in the relaxation phase. The VR group reached the lowest scores and differed significantly from desktop and control group. The mean positive affect score was highest in the VR group. Desktop and control group did not differ significantly in neither of the observed variables. Additionally, immersion and anxiety were negatively correlated, while immersion and positive affect were positively correlated.

CONCLUSION Natural virtual environments can be used to enhance mood and well-being. Our results highlight that deeper immersion facilitates relaxation. Thus, especially when access to nature is limited, VR is as an effective solution to reduce acute stress and anxiety.

14:15 [Eric Spero](#), [Ali Arya](#) and [Robert Biddle](#)

TextMap: A multi-dimensional textbook format

SPEAKER: [Ali Arya](#)

ABSTRACT. Despite the growing use of various material such as video tutorials, textbooks are still a major component in education. Traditional printed books suffer from a linear structure and non-interactive nature. This makes them particularly ineffective as textbooks, especially for millennials used to interactive systems, searchable content, intelligent tools, and other digital era facilities. Electronic books have seen a significant growth thanks to portable formats such as EPUB and PDF, and services such as Amazon Kindle. Their advantages include easy search, translation, annotation, and similar tools. As course material, e-books and their web-based alternatives have options such as multimedia content, embedded quizzes, links, and some level of interactivity. While helpful, these do not solve some of the major issues with textbooks: • Despite navigation tools, the structure is still fairly linear and imposes a certain way of thinking to students. • Level of details is fixed, and the reader has no option other than skipping sections. • It is hard to see all related content without over-complicating the pages.

The fundamental reason for many of these design issues is that e-books are designed to mimic the structure of printed textbooks with added digital functionality. In a sense, they are “digitized” products as opposed to “digital” ones. A truly “digital book” allows readers to navigate in a multi-dimensional space of information and have an experience customized to their needs. Even when students have access to online content and multimedia material such as those in e-books and similar products, they still want to be able to use the tool they preferred, at the level and pace they were comfortable with, and follow a logical order that would fit their thought process. Previous attempts at electronic textbooks have not been successful in replacing print textbooks. Efforts have been made at organizing a hierarchical structure of content. Bruslovsky’s InterBook broke a domain down into constituent domain concepts and represented the concept structure with a concept map. While the notions of hierarchy and a web of content nodes was appealing and helpful, the system did not define a proper structure for these conceptual connections and was not customizable. Maps are among the most used and popular apps on mobile devices and desktop computers. They provide a visual and easy-to-use approach to navigating that has become familiar for the majority of users, especially the younger generation. We borrow the notion of conceptually-linked content units from InterBook, and the ideas of spatial dimensions and layers from digital maps, to propose a multi-dimensional layered structure for presenting educational content. Our proposed method defines the content as a series of concept units (nodes) that are connected to each other in three dimensions: • Causality shows where a concept has been originated and where it can be used. The relationship along this dimension is of the type “is used in” or “results in”. • Taxonomy shows how each concept is linked to its superset and subset classes and types. The relationship along this dimension is of the type “is a”. • Partonomy shows how each concept is linked to other concepts based on ownership. The relationship along this dimension is of the type “belongs to”.

In addition to these dimensions, we propose to use layers as a way of accessing different types of information: • Units form the base layer • Questions are the first layer of interaction • Notes created and shared by the reader • Discussions for collaboration • Assignments and exams providing formal submissions

The proposed system is being developed and tested for two pilot courses on psychology and computer programming, and early results have been promising.

13:30-15:00 Session Orals -17: VR for anxiety disorders

CHAIR:

[Giuseppe Riva](#)

LOCATION: [Julien-Gagnon-Walker](#)

13:30 [*Pamela Quintana, Stéphane Bouchard, Beatriz Rey, Berenice Serrano Zárate, Alejandro Rodriguez and Cristina Botella*](#)

Validation of a virtual environment for generalized social anxiety disorder in a sample from two different cultures

SPEAKER: [*Pamela Quintana*](#)

ABSTRACT. The effectiveness of in virtuo exposure for the treatment of social anxiety disorder (SAD) of performance type has been demonstrated in several studies. However, few studies have validated virtual environments with participants who have a generalized SAD and even less with a sample coming from two different cultures. Thus, considering the lack of research on this phenomenon, this doctoral study aimed to validate a virtual environment involving social interactions with adults suffering from a generalized social anxiety disorder coming from Canada and Spain. The research hypothesis proposed that the virtual environment developed for the treatment of SAD (experimental environment) would induce a higher level of anxiety than a controlled environment (i.e, visit of an apartment without social stimuli) in people with SAD compared to non-socially anxious participants (NSA). The exploratory research question investigated the difference in the level of anxiety between Canadians and Spanish participants in an experimental environment. The research was conducted under the supervision of Stéphane Bouchard, professor and associate researcher at the Cyberpsychology Laboratory of the University of Quebec in Outaouais and Cristina Botella, professor and associate researcher at the Labpsitec of the University of Jaume I (UJI) in Spain. The sample of this research consisted of 69 participants, including 15 Canadians with social anxiety disorder (SAD), 17 Canadians non-socially anxious (NSA), 16 Spanish with SAD, and 21 Spanish NSA. These participants were immersed in two virtual environments: (a) a scene free of stimuli that could generate social anxiety (control scenario); and (b) a scene where participants had to interact with a virtual character while performing four tasks considered anxiety triggering for individuals with SAD (experimental scenario). The four tasks were based on the social interaction subtypes established by Holt et al. (1992): (a) informal interaction/intimacy, (b) formal interaction/ performance, (c) self-assertion, and (d) being observed. The main variable of this study was the anxiety measured by the State-Trait Inventory for Cognitive and Somatic Anxiety, Visual Analogue Scales of Anxiety, and the variability in heart rate and in skin conductance. The data was collected before, during and after the experimental immersion. Mixed type repeated variance analysis were conducted on the self-reported questionnaires and the physiological measures. The results showed that the virtual environment developed for the treatment of SAD induced a higher level of anxiety than a controlled environment among participants with SAD compared with the NAS group. The level of anxiety was significantly higher for the participants with SAD for every task performed in the experimental virtual environment compared to the one reported at the controlled immersion. The heart rate was significantly higher during the informal and the self-assertion interaction compared to the physiological measures taken during the controlled immersion. In terms of anxiety responses, no significant differences were found between Canadian and Spanish participants. Minor differences between Canadian and Spanish participants were present in regards to descriptive, controlled and exploratory variables. These differences didn't interfere with the capacity of generating anxiety in a sample presenting generalized social anxiety versus non-anxious persons. In sum, these results allowed us to validate a new exposure tool able of generating an anxiety response in individuals with a SAD from Canada and Spain.

13:42 [*Alain Hajjar, Stéphane Bouchard and Claudie Loranger*](#)

Using virtual reality to outperform exposure in vivo : A clinical study with acrophobia sufferers

SPEAKER: [*Alain Hajjar*](#)

ABSTRACT. Introduction: The scientific literature has demonstrated for decades that exposure to an anxiety-provoking situation reinforces the subject's belief about their ability to cope with it, which reduces the anxiety felt during subsequent encounters with the same stimulus. The more the

exposure task disconfirms the perceived threat, the more patients become confident in their abilities to face that same situation again. A few decades after this discovery, we find ourselves today with a tool that allows creating artificial and controlled environments with which an individual can interact: virtual reality (VR). From this comes the possibility of facing fears through exposure in contexts that would be too dangerous, too expensive, unethical or simply unachievable within the realm of traditional in vivo exposure-based therapy. VR also allows conducting exposure to situations that strongly disconfirm feared expectations but would not be feasible in vivo.

Objective: This study aims to evaluate the benefits of a virtual reality treatment including an exposure task, possibly more anxiety-provoking for subjects with a phobia of heights, which would be infeasible in vivo. More specifically, acrophobic participants will expose themselves to jumping from a high cliff and experiencing a fall in virtual reality. Being able to decide when to jump or not should allow experiencing control over falling (or not), which should increase the effectiveness of the treatment.

Method: The brief treatment of five sessions involves mainly a pre-assessment of acrophobia and other DSM-5 disorder symptoms, psychoeducation about height phobia and its treatment, gradual exposure therapy in virtual environments and a final post-assessment. The exposure took place during two therapy sessions of 120 minutes each. Participants were randomly assigned to a Jump and no Jump conditions. In the Jump condition, participants were exposed to the same stimuli as the other participants, but they were also encouraged to jump repeatedly over the platform and into the void. All immersions were conducted in a fully immersive 6-wall CAVE-Like system and exposure was always gradual. The height of the platform was controlled by the therapist, present with the patient in the virtual environment. Subsequently, there will be a debriefing and re-evaluation period with each subject. Outcome was measured pre and post with questionnaires assessing fear of height and a behavioral avoidance test conducting using a firefighter ladder in a climbing wall theme park.

Results: Repeated measures of variance analysis (ANOVAs) will soon be performed to test if the Condition X Time interaction is statistically significant. We predict that the symptoms of acrophobia will be reduced in both groups as a result of exposure and that this improvement will be more pronounced for participants who jumped in virtual reality than those in the control group. Preliminary results are promising.

Conclusion: The study is underway and we hope that the proposed exposure approach will increase the effectiveness of virtual reality in the treatment of anxiety disorders.

13:54 [Noémie Tardif](#), [Charles-Etienne Therrien](#) and [Stephane Bouchard](#)

Mechanisms underlying virtual reality-based exposure for spider phobia: Replication and extension

SPEAKER: [Charles-Etienne Therrien](#)

ABSTRACT. Introduction/Problem: The proposed study aims at replicating and expanding re-sults from a previous study on predictors of change and documenting the ad-vantages of adding tactile and haptic feedback in a single exposure session con-ducted in virtual reality (Côté & Bouchard, 2009). It was predicted that change in the severity of spider phobia according to the Fear of Spiders Questionnaire (FSQ) would be significantly predicted by change in dysfunctional beliefs toward spiders and self-efficacy, over and above the variance explained by heart rate and presence during exposure. Aims. The study had two aims: (a) replicating and expanding re-sults from Côté and Bouchard (2009) on predictors of change; and (b) document-ing the advantages of adding tactile and haptic feedback in a single exposure ses-sion conducted in VR. Method/Tools, Participants (N = 59) were randomly as-signed to one of three experimental conditions: a) presentation of visual stimuli only, b) presentation of visual and tactile stimuli, and c) presentation of visual, tac-tile and haptic feedback stimuli. Of the 59 study participants, 41 were immersed in VR using the NVIS nVisor Sx

head-mounted display and touched or crushed the virtual spider with a 5DT data glove. The rest of the experiment was carried out using a HTC Vive head-mounted display and a Leap Motion hand-tracking sensor due to technical difficulties. To simulate the shape and texture of the virtual spider, a spider was printed in 3D to be touched by participants. It was also possible to crush the virtual spider using a Novint Falcon force feedback device, resulting in a haptic stimulation with three-dimensional feedback that allowed the user to feel roughly the sensations of crushing a spider. Socio-demographic variables and immersive tendencies were measured prior to the experiment. To measure the impact of intervention, multiple questionnaire related to fear of spiders (FSQ), beliefs (SBQ) and self-efficacy (PSE-SQ towards spiders and a BAT using a tarantula were administered at pre-post. The average heart rate during the entire immersion in VR was measured by an electrocardiogram using products from Thought Technology (Polar belt, a ProComp+ and the Infinity software). Results. A standard multiple regression was conducted to predict change on the FSQ using the following predictors: beliefs about spiders, beliefs about one's own behavior when facing spiders, perceived self-efficacy, disgust, presence and heart rate. Only changes in beliefs about spiders and in perceived self-efficacy significantly predicted the reduction in fear of spiders. This result enhances our understanding of the treatment mechanisms involved in exposure conducted in VR. ANOVAs show that the participants in the three experimental conditions reported a significant improvement in their clinical condition, but it did not differ with regards to the experimental condition. Conclusion. It cannot be concluded that haptic feedback stimulation is more effective in its current form and in a very brief intervention than the other two sensory modalities to improve the outcome of the exposure session.

14:06 [Audrée St-Onge](#), [Pamela Quintana](#) and [Stéphane Bouchard](#)

Measuring the effect size of the effect of experimenter's physical presence in the room on social anxiety during an immersion in virtual Reality

SPEAKER: [Audrée St-Onge](#)

ABSTRACT. Context. Conducting exposure in virtual reality (VR) has been shown to be an effective therapeutic tool in the treatment of social anxiety disorder (SAD). Previous studies have documented that individuals suffering from SAD feel anxious while immersed in a virtual social scenario. However, the contribution of having the therapist physically in the room during immersions dedicated to exposure to social stimuli may contribute to the anxiogenic effect of the procedure. Aim. The study has two goals: (a) assess if the experimenter's presence in the same room as the participant immersed in VR increases the level of anxiety in an immersion designed to induce social anxiety; and (b) document the effect size of this manipulation before conducting a decisive experiment. Our expectations were that the presence of the experimenter during the immersion would increase anxiety, and this increase in anxiety would be higher for people diagnosed with SAD when compared to people not suffering from social anxiety (NSA). Methodology. Twenty participants aged between 18 and 65 years old (10 NSA; 10 SAD) were assessed using semi-structured ADIS-IV interview to confirm their eligibility to participate in one of the two conditions. All participants were immersed alone in a control virtual environment without social stimuli (an empty virtual apartment) using the same technology as in the experimental immersion. For the second and experimental immersion in VR, they were randomly assigned to one of the following two conditions: (a) the experimenter was physically visible and present with the participant in the 6-wall CAVE-Like immersive room during the immersion, or (b) the experimenter was physically in another room during immersion, leaving the participant alone in the 6-wall CAVE-Like immersive room during the immersion. During the experimental immersion, participants were asked to approach a cat in the virtual apartment and perform four tasks: informal greetings and talking about something mundane, calling the cat by name and asking to get closer, ordering the cat to leave the room and say something assertive, and looking for an object while being observed by the cat. A cat was selected as the social stimuli to avoid problems with finding a credible virtual human that do not have any features that could biased positively or negatively the participants. Plus, it has been used and well accepted by participants in a previous study. The four tasks performed in VR were selected

to tackle the main domains of social anxiety as recommended by Holt et al (1992, formal interaction, informal interaction, assertiveness and being observed). Average heart rate and skin conductance were measured during the entire immersion in VR and several questionnaires were administered (e.g., Liebowitz, SUDS, Focus of Attention, ITC-SOPI, SSQ). The main dependent variables were the mean heart rate and STICSA-state anxiety. Results. Repeated measures ANOVAs revealed an impact of the immersion in the experimental condition on self-report ($\eta^2 = .20$) and physiological ($\eta^2 = .11$) measures of anxiety, and very small effect-sizes of the impact of the presence or absence of the experimenter in the room ($\eta^2 = .005$ for the subjective and $\eta^2 = .01$ for the physiological measures). Based on these results, calculations for the expected sample size required to detect a statistical difference at $\alpha = .05$, with a power of .80 was found to be more than 600 participants. Conclusion. Having the experimenter present and visible when performing social tasks in VR do not seem to play a very large impact on user's anxiety. Methodological recommendations are proposed but, given the small effect sizes, conducting a large scale experimental investigation may not be worth the efforts.

14:18 *Cidalia Silva, Bouchard Stéphane and Bélanger Claude*

Children's Perception of Phobogenic Stimuli in Virtual Reality

SPEAKER: *Cidalia Silva*

ABSTRACT. Mental health, youth and numeric technologies have been the object of recently news and discussions headlines. There has been a growing interest in treatments involving virtual reality (VR) exposure for a number of anxiety disorders and phobias. Contrary to expectations, some studies suggest that conducting exposure in VR is more frightening for phobic children than it is for phobic adults (Garcia-Palacios, Botella, Hoffman, & Fabregat, 2007; St-Jacques, Bouchard, & Bélanger, 2010). Prior results suggests that children show more apprehension about virtual aversive stimuli, expecting them to be more dangerous, disgusting and big than about a neutral, non-threatening virtual stimulus (Silva et al., 2018). In attempt to analyze to what extent anxiety and phobic fear predict apprehension of virtual phobogenic stimuli, 38 school-aged children participate in this study. After completing specific and general anxiety measures (see the results section for details), children who never experiment VR's immersion were invited to visit a virtual apartment. A pre-recorded audio message introduced and informed participants about VR and its utility in the treatment of children's anxiety disorders, specifically in exposure treatment for spider phobia. After this message and before entering the virtual apartment, participants answered several questions displayed in the HMD. The questions assess the expected size, dangerousness, disgust and behaviors of both a virtual spider (experimental stimulus) and a virtual rabbit (control stimulus), that were described as being used in VR for exposure-based therapy. Participants were told that they would find these stimuli behind the door of the apartment they would be visiting in the following minutes. Once the data was collected, participants were allowed to visit the virtual apartment for five minutes. When they got to the kitchen, participants could approach a virtual spider crawling on the counter. Before leaving the virtual immersion, one last question was displayed in the HMD asking participants to rate how afraid they were of this virtual spider. Results confirmed that apprehension about the virtual spider was significantly higher than apprehension about the virtual rabbit [$t(37) = 5.94, p < .000$]. The correlations between apprehension of the virtual spider and the clinical measures are all significant. In order to test whether general anxiety measures or specific phobic-fear measures would best predict participants' higher apprehension about virtual spiders, a residualized change score was obtained for the difference in apprehension between the rabbit and the spider. The multivariate regression was significant [$F(4,36) = 3.63, p < .05, R^2 = .56, \text{Adjusted } R^2 = .23$]. Only the specific measure of arachnophobia, using the Fear of Spiders Questionnaire, was a significant predictor ($\beta = .43, t = 2.34, p < .05, \text{part correlation} = .34$) of stronger apprehension about virtual spiders. Non-significant contributions were found for the Anxiety Control Questionnaire ($\beta = -.12, t = -.64, \text{ns}, \text{part correlation} = -.09$) and the SCARED ($\beta = -.05, t = -.25, \text{ns}, \text{part correlation} = -.04$). In sum, results confirmed that apprehension about feared virtual stimuli was significantly related to

anxiety, and more particularly to phobic anxiety specific to the virtual stimuli. Results are discussed in terms of clinical interest and children's cognitive development.

14:30 [Sara Freedman](#) and [Ehud Dayan](#)

Virtual reality for treating combat related PTSD

SPEAKER: [Sara Freedman](#)

ABSTRACT. Background: Effective treatments exist for chronic posttraumatic stress disorder (PTSD), however a significant proportion of patients do not undertake treatment, others dropout of standardized treatments, and still others – up to 40% - do not respond to treatment. In recent years, Virtual Reality has been increasingly utilized in PTSD treatment, and its appeal and effectiveness in refractory patients make it an important treatment strategy. Method: Forty patients with combat related PTSD will be assessed via clinical interviews before and after treatment, using the CAPS to ascertain PTSD status, and the MINI to examine DSM5 psychiatric disorders. After assessment, patients are randomized to one of two conditions: Prolonged Exposure Therapy, or Virtual Reality Exposure Treatment, using the Virtual Gaza world. Qualitative interviews regarding the experience of using VR will be assessed in patients and therapists before and after therapy. Patients sign informed consent, and are able to leave the study at any point. Results: The effects of treatment for the first patients to undergo this treatment will be presented, including their qualitative data. Conclusions: It is likely that VR Gaza will be an effective way to treat chronic combat related PTSD. Clinical implications will be discussed.

14:42 [Sara Freedman](#) and [Ehud Dayan](#)

Early intervention for preventing posttraumatic stress disorder: An Internet based virtual reality treatment

SPEAKER: [Sara Freedman](#)

ABSTRACT. Background: Posttraumatic Stress Disorder (PTSD) is a common and distressing possible outcome following traumatic event exposure, with wide-reaching long-term consequences. Most people who exhibit symptoms shortly following trauma exposure will recover naturally, therefore the optimal time for intervention may be shortly after exposure. Many symptomatic people avoid treatment; the Internet as a delivery method for interventions may help in overcoming these barriers to treatment. This randomized controlled trial used a specially designed platform that allowed internet based treatment, using Virtual Reality (i-VR) and examined whether i-VR CBT was more effective at reducing PTSD symptoms than the Waitlist Control. Method: 1000 adult patients, aged 18-65 who came to a Level I Emergency Room following a motor vehicle accident (MVA) were recruited. Patients were assessed in three stages – an initial telephone contact, online questionnaires, and a clinical interview by telephone. Patients who reported PTSD symptoms were randomized to either iVR or waitlist control. iVR involved five sessions of cognitive behavioural therapy, and included in-vivo exposure, imaginal exposure using Virtual Reality, and cognitive therapy. Patients were then assessed again following treatment and at six months follow up. The study received IRB approval from Hadassah Hospital (HMO 0056-013); ClinicalTrials.gov identifier is NCT01760213. Patients signed informed consent, and were able to leave the study at any point. Patients still symptomatic at the end of the research were referred to the Outpatient Psychiatry Department, Hadassah Hospital. Results: The first phase of this project was the development of the iVR environment, and its initial testing. This phase, which took around one year, included the development of the intervention, its implementation on the computers used by the patients and the therapists, and its recognition in the Helsinki Ethics Approval. RCT: 1000 patients who came to the Hadassah ER following a motor vehicle accident were initially assessed by the research team. The majority (N=730, 73%) did not fit inclusion criteria. 270 continued to the next stage of assessment, online questionnaires, however the majority dropped out at this stage (59%). Most of those who filled out the questionnaires (75%) had sufficient symptoms of PTSD to be invited for a full clinical interview by telephone. 67 subjects were invited to the clinical interview. N=31 (46%) declined to participate. N=22 (62%) did not have PTSD, or had PTSD related to a prior event, or had other

exclusion criteria (e.g. suicidality). N=14 (39%) had PTSD and were suitable for the RCT. Treatment in the RCT: Three subjects were treated in a pilot. A further 14 were randomized to the two arms of the study. Follow Up: All subjects completed follow up assessments; some subjects did not complete all the follow up assessments, but all have at least one follow up assessment. The treatment group showed greater symptom improvement than the control group – their PTSD scores were 50% lower than pre-treatment, as opposed to 37%. This difference was not significantly different, probably due to the extremely small groups. Conclusions: A high number of subjects were not interested in participating in the project, and this together with those who did not have access to email, reduced the potential pool of subjects. The number of patients treated by iVR was smaller than anticipated, however the treatment was highly acceptable. iVR treatment led to significant symptom reductions; these were not greater than natural recovery, but this lack of statistical significance is likely due to the small numbers of patients treated. Since the trend is in the right direction, this system needs to be further examined in a larger population, as well as with patients suffering from chronic PTSD.

15:00-15:15 Coffee break

Coffee break - Delfosse room

15:15-15:30 Awards ceremony

Delivery of Student Poster Awards, New Investigator Award, and Excellence in Research Award

CHAIR: [Brenda Wiederhold](#)

LOCATION: [Julien-Gagnon-Walker](#)

15:30-15:45 Closing talks

Closing remarks and thanks from Brenda Wiederhold, Stéphane Bouchard and other dignitaries.

CHAIR: [Brenda Wiederhold](#)

LOCATION: [Julien-Gagnon-Walker](#)

18:30-22:00 Gala dinner

Gala dinner (pre registration required / not in the hotel)

LOCATION: [Soif Bar à Vin](#)

Gala Dinner (June 28th 2018)

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Cost: 80\$

Space is limited to 75 people only.

Index of all authors



- Abou Seif, Nada
- Acca, Cynthia
- Aguilar, Ivan
- Ahamba, Godson
- Aissaoui, Rachid
- Alcañiz Raya, Mariano
- Alchalabi, Bilal
- Allain, Philippe
- Almeida, Yuri
- Amon, Krestina
- Ansado, Jennyfer
- Arya, Ali
- Aswin, Indah Megawati
- Aunos, Marjorie
- Ayora, Gaspar
- *Social dynamics of online chat in a live-streaming video platform*
 - *How to combine 360° pictures and virtual reality in exposure and response therapy for obsessive compulsive disorder: A case study*
 - *A framework for studying transformative experiences through virtual reality*
 - *Comparing neural responses in immersive virtual reality displays and non-immersive screens*
 - *Evaluating the impact of a virtual self-avatar on spatiotemporal gait parameters*
 - *Serious games for behavioral assessment of executive functions*
 - *How does the brain encode the ownership illusion of a walking self-avatar?*
 - *Using the Virtual Multitasking Test to assess the realization of intentions: A preliminary psychometric study*
 - *Inside-out: Conceptual design and prototype of a system for the automatic generation of emotional metaphors in virtual reality*
 - *A desire to belong affects Instagram behaviour and perceived social support*
 - *#InstaFollow: Types of Instagram followers affects users' image sharing behaviours*
 - *Kids Helpline Circles: Findings from participant action research in the development of a secure national mental health social network*
 - *Design and validation of a virtual reality working memory training program (VR-WORK-M): A new tool to improve working memory impairment following concussion*
 - *User Study of Emotional Visualization Dashboard for Educational Software*
 - *TextMap: A multi-dimensional textbook format*
 - *Personalizing the Exergame Experience: A Personality Tailoring Approach*
 - *Passive usage and envy predicting life satisfaction of social media user*
 - *Technologies Promoting Efficient Parenthood Practices for People With Intellectual Disability*
 - *Evaluation of a virtual reality tele-rehabilitation platform for patients with traumatic brain injury*

Index of all authors

- Ayoubi, Shereen • *Meta-analysis of mobile health interventions for depression and well-being*
- Aznar Casanova, José Antonio • *Attentional bias assessment in patients with alcohol use disorder: An eye-tracking study*

B

- Baillargeon, Melissa • *Loneliness and Types of Facebook Use in Emerging Adults*
- Ballard, Ariane • *Projector-based virtual reality dome environment for procedural pain and anxiety in young children with burn injuries: A pilot study*
- Ballard, Ariane • *Decreasing recurrent pain and anxiety in medical procedures with a pediatric population: A pilot study protocol*
- Banville, Frédéric • *Using the Virtual Multitasking Test to assess the realization of intentions: A preliminary psychometric study*
- Barceló-Soler, Alberto • *A brief mindfulness-based psychological intervention for depression in primary care: Study protocol of a randomized controlled trial*
- Barnett, Michael • *Neuropsychological assessment of age differences in memory performance using a virtual environment grocery store with environmental distractors*
- Barrett, Alan • *A simple and commodity technology solution to enhance exposure therapy after mass causality incidents: 360 video on phones in hand and headset*
- Barrios, Juan • *Meta-analysis of mobile health interventions for depression and well-being*
- Barrón, Paola • *Adaptation and evaluation of an ICT assisted prevention and treatment program of childhood obesity for Mexican adolescents*
- Baus, Oliver • *Testing a VE for behaviours and dementia*
- Baños, Rosa • *An innovative protocol to manipulate the negative body image of obese patients through the "Machine to be another" and its influence on physical activity: a randomized controlled study*
- Baños, Rosa • *Feasibility and preliminary efficacy of an immersive technology (virtual reality) mindfulness protocol to improve the quality of life of patients with multimorbidity in primary care: A randomized controlled study protocol*
- Baños, Rosa • *Adaptation and evaluation of an ICT assisted prevention and treatment program of childhood obesity for Mexican adolescents*
- Baños, Rosa • *Enhancing mental well-being during pregnancy: A pilot study to assess the feasibility of a web-based positive psychology intervention*
- Baños, Rosa • *Using EMMA's virtual world to facilitate support offered to parents who experienced perinatal mortality: A pilot study*

Index of all authors

- Baños, Rosa María
- *Using Virtual Reality for assessing body dissatisfaction from egocentric and allocentric perspectives.*
- Beauchamp, Miriam H.
- *Measuring moral reasoning with virtual reality : A validation study*
 - *Measuring social skills with virtual reality: A validation study focussing on moral reasoning*
- Beaunoyer, Elisabeth
- *Virtual communities for health purposes in the elderly: Challenges to implementation and evaluation*
- Belleville, Geneviève
- *RESILIENT - An online multidimensional treatment to promote resilience after a disaster: Study protocol*
 - *Barriers of treatment perceived by GAD patients after receiving CBT treatment delivered face-to-face versus in videoconference*
- Belleville, Sylvie
- *Validation of an immersive virtual reality task assessing episodic memory in older adults*
 - *Virtual reality as a new approach to measure the effect of cognitive training on real-life cognition in aging*
 - *Using a virtual car ride task to assess the transfer associated with cognitive training in older adults: Validation and design for cognitive interventions in updating and inhibition*
- Beltrán-Ruíz, María
- *A brief mindfulness-based psychological intervention for depression in primary care: Study protocol of a randomized controlled trial*
- Benvenuti, Martina
- *Online and offline life: The functional use of the Internet during the life cycle*
- Bergamin, Per
- *Group decision making in multi-user virtual reality and video conferencing*
- Bergeron, Nicolas
- *RESILIENT - An online multidimensional treatment to promote resilience after a disaster: Study protocol*
- Bermúdez I Badia, Sergi
- *Inside-out: Conceptual design and prototype of a system for the automatic generation of emotional metaphors in virtual reality*
- Berthiaume, Maxine
- *The Validation of a Telepresence Scale for Psychotherapy Delivered in Videoconference*
- Bertolo, Dina
- *Virtual kitchen test for divided attention in the elderly*
- Bertomeu, Paola
- *Embodiment in different size virtual bodies produces changes in women's body image distortion and dissatisfaction*
- Bertomeu-Panisello, Paola
- *Gender differences in attentional bias after owning a virtual avatar with an increased weight.*
- Bherer, Louis
- *Using a virtual car ride task to assess the transfer associated with cognitive training in older adults: Validation and design for cognitive interventions in updating and inhibition*

Index of all authors

- Bianchi, Mauro
- *Social network use and sexual orientation as factors for psychological adjustment, cyberbullying and Internet addiction*
- Biddle, Robert
- *The influence of expectations on usability and visual appeal in a web environment*
 - *User Study of Emotional Visualization Dashboard for Educational Software*
 - *TextMap: A multi-dimensional textbook format*
- Bier, Bianca
- *Virtual reality as a new approach to measure the effect of cognitive training on real-life cognition in aging*
- Bilodeau, Martin
- *Home-based virtual reality training for adults with mild cognitive impairment: Preliminary results of a feasibility telerehabilitation study*
- Boller, Benjamin
- *Using virtual reality to train cognitive abilities and assess cognitive training*
- Boller, Benjamin
- *Validation of an immersive virtual reality task assessing episodic memory in older adults*
 - *Virtual reality as a new approach to measure the effect of cognitive training on real-life cognition in aging*
- Bonnett, John
- *The DataScapes project: Using letters, proteins and augmented reality as constituents for landscape art*
- Boon, Susan D.
- *Getting Even on Social Media: Prevalence of Online Revenge Behaviors Between Friends, Romantic Partners, Coworkers, and Family Members*
- Borrego, Adrián
- *Using Virtual Reality for assessing body dissatisfaction from egocentric and allocentric perspectives.*
- Borwell, Baptiste
- *Virtual Reality Cue Exposure for Smoking Relapse Prevention: a Comparative Trial.*
- Botella, Cristina
- *Using EMMA's virtual world to facilitate support offered to parents who experienced perinatal mortality: A pilot study*
 - *Validation of a virtual environment for generalized social anxiety disorder in a sample from two different cultures*
- Botella, Cristina
- *An Internet-based self-applied treatment program for flying phobia: Study protocol for a randomized controlled trial*
 - *Adaptation and evaluation of an ICT assisted prevention and treatment program of childhood obesity for Mexican adolescents*
 - *Portable devices for assessment and treatment in health settings: Some current developments and challenges*
 - *An overview of factors associated with adherence and dropout to ecological momentary assessment in depression*
 - *Pain Monitor: How can we use ecological momentary assessment via app to improve the treatment of chronic pain?*

Index of all authors

- *Portable biofeedback devices for affective disorders: A systematic review*
- *Understanding human behavior in daily life: From ecological momentary assessment to computational psychometrics*
- Bouchard, Julie
- *NAO humanoid robot for cognitive screening in elderly*
- Bouchard, Stéphane
- *The decoding of social interactions in task VR for autism spectrum: Development of an intervention protocol and pilot testing*
- *The use of virtual reality for exposure in group: A 3-month follow-up study*
- *Psychophysiological effects of virtual reality immersion on elderly people*
- *RESILIENT - An online multidimensional treatment to promote resilience after a disaster: Study protocol*
- *Projector-based virtual reality dome environment for procedural pain and anxiety in young children with burn injuries: A pilot study*
- *Barriers of treatment perceived by GAD patients after receiving CBT treatment delivered face-to-face versus in videoconference*
- *A randomized controlled trial of the use of virtual reality for needle-related procedures in children and adolescents in the emergency department*
- *Interaction Effect of Telepresence and Therapeutic Alliance on Treatment Outcome in Telepsychotherapy for Generalized Anxiety Disorder*
- *Using EMMA's virtual world to facilitate support offered to parents who experienced perinatal mortality: A pilot study*
- *The Validation of a Telepresence Scale for Psychotherapy Delivered in Videoconference*
- *Immersive and embodied cyberbody rating scale: A development of evaluation of body dissatisfaction in virtual reality*
- *Design and validation of a virtual reality working memory training program (VR-WORK-M): A new tool to improve working memory impairment following concussion*
- *Assessing presence in videoconference telepsychotherapies: A complementary study on breaks in telepresence and intersubjectivity co-construction processes*
- *Tactile illusions in immersive virtual reality environments: An exploratory study regarding its usefulness in psychological treatments*
- *Validation of a virtual environment for generalized social anxiety disorder in a sample from two different cultures*
- *Using virtual reality to outperform exposure in vivo : A clinical study with acrophobia sufferers*

Index of all authors

- *Mechanisms underlying virtual reality-based exposure for spider phobia: Replication and extension*
 - *Measuring the effect size of the effect of experimenter's physical presence in the room on social anxiety during an immersion in virtual Reality*
 - *Children's Perception of Phobogenic Stimuli in Virtual Reality*
 - *Decreasing recurrent pain and anxiety in medical procedures with a pediatric population: A pilot study protocol*
 - *Testing a VE for behaviours and dementia*
 - *NAO humanoid robot for cognitive screening in elderly*
- Bouchard-Aubin, Marie-Claude
- Boujut, Arnaud
- *Using a virtual car ride task to assess the transfer associated with cognitive training in older adults: Validation and design for cognitive interventions in updating and inhibition*
- Boukhalfi, Tarik
- *Gloomy corners and dark triad: The development of a virtual reality scenario for studying predatory processes in offenders*
- Bourgeois, Hugues
- *Bliss a virtual reality application designed to improve health care and quality of life*
- Bowie, Kelsey
- *Too scared to share? An investigation of social networking site users' personal information concerns*
- Brawley, Madeline
- *Meta-analysis of mobile health interventions for depression and well-being*
- Brinkman, Willem-Paul
- *EHealth4MDD: a database of e-health systems for the prevention and treatment of major depressive disorder*
 - *Simulating the inner voice: A study of sound parameters*
- Brisebois, Catherine
- *Practicing mindfulness using virtual reality simulations of potentially stressful daily activities: An innovative approach to the treatment of first episode psychosis*
 - *Using EMMA's virtual world to facilitate support offered to parents who experienced perinatal mortality: A pilot study*
 - *The Validation of a Telepresence Scale for Psychotherapy Delivered in Videoconference*
- Brivio, Eleonora
- *Assessing presence in videoconference telepsychotherapies: A complementary study on breaks in telepresence and intersubjectivity co-construction processes*
 - *A new field for (transdisciplinary) cyberpsychology: Phygital environments*
- Brodie, Zara
- *Perceived victim blame for celebrities on Twitter: Impact of tweet content, volume of abuse, and dark triad personality factors*
- Bruce, Gillian
- *Posting alcohol-related photos on Facebook: The role of timeline owners' drinking motives*

Index of all authors

- Brûlé, Jenel
- *Design and validation of a virtual reality working memory training program (VR-WORK-M): A new tool to improve working memory impairment following concussion*
- Burger, Franziska
- *EHealth4MDD: a database of e-health systems for the prevention and treatment of major depressive disorder*
- C**
- Cabral, Anne
- *Acceptability study of a novel immersive cognitive care platform for remediation of cognitive deficits*
- Cameirao, Monica
- *Inside-out: Conceptual design and prototype of a system for the automatic generation of emotional metaphors in virtual reality*
- Campbell, Andrew
- *Kids Helpline Circles: Findings from participant action research in the development of a secure national mental health social network*
- Campbell, Tavis
- *RESILIENT - An online multidimensional treatment to promote resilience after a disaster: Study protocol*
- Cantalupi, Robin
- *Virtual Reality Cue Exposure for Smoking Relapse Prevention: a Comparative Trial.*
- Cardenas-Lopez, Georgina
- *Psychological interventions in Mexico supported by e-Health technologies*
 - *On-line counselling to Mexican migrant community in USA: A programme oriented to emotional well-being*
 - *Internet-assisted guided self-change program for adult Mexican problem drinkers: a case study*
 - *Evaluation of a virtual reality tele-rehabilitation platform for patients with traumatic brain injury*
 - *Exposure therapy for acute stress disorder*
 - *Adaptation and evaluation of an ICT assisted prevention and treatment program of childhood obesity for Mexican adolescents*
- Carrillo, Alba
- *Enhancing mental well-being during pregnancy: A pilot study to assess the feasibility of a web-based positive psychology intervention*
- Castilla, Diana
- *Pain Monitor: How can we use ecological momentary assessment via app to improve the treatment of chronic pain?*
- Castillo, Emmanuel
- *Adaptation and evaluation of an ICT assisted prevention and treatment program of childhood obesity for Mexican adolescents*
- Cebolla, Ausias
- *Feasibility and preliminary efficacy of an immersive technology (virtual reality) mindfulness protocol to improve the quality of life of patients with multimorbidity in primary care: A randomized controlled study protocol*
- Chan, Gerry
- *Personalizing the Exergame Experience: A Personality Tailoring Approach*

Index of all authors

- Chapron, Kevin
- *NAO humanoid robot for cognitive screening in elderly*
- Charbonneau, Philippe
- *Evaluating the impact of a virtual self-avatar on spatiotemporal gait parameters*
- Chartier, Sylvain
- *First steps toward an objective measurement of sexual presence in males and females*
- Chasen, Clelia
- *Design and validation of a virtual reality working memory training program (VR-WORK-M): A new tool to improve working memory impairment following concussion*
- Chebbi, Brahim
- *Gross motor skills assessment using Microsoft Kinect*
- Chicchi Giglioli, Irene Alice
- *Serious games for behavioral assessment of executive functions*
- Chiquet, Sandra
- *Group decision making in multi-user virtual reality and video conferencing*
- Chirico, Alice
- *Transformative experience design: Using virtual reality, brain-based technologies and the language of arts to support self-transcendent experiences*
 - *Inside-out: Conceptual design and prototype of a system for the automatic generation of emotional metaphors in virtual reality*
 - *The continuum of self-transcendence: Flow experience and the emotion of awe*
- Chitour, Mohamed Amir
- *Evaluating the impact of a virtual self-avatar on spatiotemporal gait parameters*
- Cho, Cheung-Moon
- *Comparison between cyberbullying and traditional bullying of Korean students*
- Choi, Changyeol
- *The effects of motion and appearance synchronizations on the cybersickness of human-avatar interaction*
- Choma, Becky
- *Exploring gamers' opinions on the role of women in gaming and incidents of gendered online harassment of female gamers*
- Choudhury, Nusrat
- *Acceptability study of a novel immersive cognitive care platform for remediation of cognitive deficits*
- Chu, Hang
- *Non-immersive Virtual Reality for Spatial-Frequency and Temporal-Frequency Dependent Binocular Imbalance Assessment in Adults*
 - *Improving the Visual Acuity and Visual Performance in Glaucoma Patients with an Augmented Reality Push-pull Model*
 - *Dynamic Stereopsis in Children with Cataracts after Cataract Surgery*
 - *The Relationship between Amblyopia, Spatial Resolution and Binocular Visual Perception Eye Position in a Pediatric Population*
- Chénier, Julianne
- *Learning to fly in virtual reality: The effects of targeted memory reactivation during REM sleep on procedural learning*

Index of all authors

- Cipresso, Pietro
- *Understanding human behavior in daily life: From ecological momentary assessment to computational psychometrics*
- Cipresso, Pietro
- *An overview of factors associated with adherence and dropout to ecological momentary assessment in depression*
 - *Inside-out: Conceptual design and prototype of a system for the automatic generation of emotional metaphors in virtual reality*
 - *Portable biofeedback devices for affective disorders: A systematic review*
- Claude, Bélanger
- Cloutier, Viviane
- *Children’s Perception of Phobogenic Stimuli in Virtual Reality*
 - *The decoding of social interactions in task VR for autism spectrum: Development of an intervention protocol and pilot testing*
- Collyer, Brian
- *Kids Helpline Circles: Findings from participant action research in the development of a secure national mental health social network*
- Colombo, Desirée
- *An overview of factors associated with adherence and dropout to ecological momentary assessment in depression*
 - *Portable biofeedback devices for affective disorders: A systematic review*
 - *Understanding human behavior in daily life: From ecological momentary assessment to computational psychometrics*
- Corno, Giulia
- *Enhancing mental well-being during pregnancy: A pilot study to assess the feasibility of a web-based positive psychology intervention*
 - *Using Virtual Reality for assessing body dissatisfaction from egocentric and allocentric perspectives.*
 - *Using EMMA’s virtual world to facilitate support offered to parents who experienced perinatal mortality: A pilot study*
- Corriveau-Lecavalier, Nick
- Corriveau-Lecavalier, Nick
- *Validation of an immersive virtual reality task assessing episodic memory in older adults*
 - *Virtual reality as a new approach to measure the effect of cognitive training on real-life cognition in aging*
 - *Using a virtual car ride task to assess the transfer associated with cognitive training in older adults: Validation and design for cognitive interventions in updating and inhibition*
- Cossette-Côté, Flavie
- *A web-based acceptance and commitment therapy program to reduce academic procrastination*
- Coulson, Neil
- *Living with Meniere’s disease and use of online peer support groups: Findings from an asynchronous online interview study*
- Courtice, Erin Leigh
- *Findings from the implementation of a mobile digital health platform as an adjunct to patients’ mental healthcare using a longitudinal, mixed-methods design*

Index of all authors

- Couture, Jean-François
- Cyr-Desjardins, Stéphane
- *Using the Virtual Multitasking Test to assess the realization of intentions: A preliminary psychometric study*
 - *Gloomy corners and dark triad: The development of a virtual reality scenario for studying predatory processes in offenders*

D

- Daino, Marco
- Dagleish, John
- Davies, Jim
- Dayan, Ehud
- de Juan, Carla
- De Kort, Yvonne
- de La Rosa Gomez, Anabel
- De La Rosa-Gómez, Anabel
- Dear, Blake F.
- Debb, Scott
- Debergue, Patricia
- Demarzo, Marcelo
- Demontigny, Francine
- Dery, Johanne
- *Virtual Reality environments to reduce dental anxiety.*
 - *Kids Helpline Circles: Findings from participant action research in the development of a secure national mental health social network*
 - *Transcending time and space for human connection, mixed reality & imagination addressing isolation on Earth and deep space exploration*
 - *Virtual reality for treating combat related PTSD*
 - *Early intervention for preventing posttraumatic stress disorder: An Internet based virtual reality treatment*
 - *Serious games for behavioral assessment of executive functions*
 - *Enhancing empathic interactions in mental healthcare: Opportunities offered through social interaction technologies*
 - *Adaptation of mindfulness-based stress reduction program for telepsychotherapy: A case series in Mexican population*
 - *Mobile application for training in clinical skills in online psychology students*
 - *Feasibility open trials of a self-guided Internet-based CBT for anxiety and depression among French-speaking young adults: Lessons learned*
 - *Information security awareness and African American college students: An exploration of attitudes and behaviors*
 - *Acceptability study of a novel immersive cognitive care platform for remediation of cognitive deficits*
 - *Feasibility and preliminary efficacy of an immersive technology (virtual reality) mindfulness protocol to improve the quality of life of patients with multimorbidity in primary care: A randomized controlled study protocol*
 - *An innovative protocol to manipulate the negative body image of obese patients through the "Machine to be another" and its influence on physical activity: a randomized controlled study*
 - *Using EMMA's virtual world to facilitate support offered to parents who experienced perinatal mortality: A pilot study*
 - *Decreasing recurrent pain and anxiety in medical procedures with a pediatric population: A pilot study protocol*

Index of all authors

- Ding, Ding
- *Simulating the inner voice: A study of sound parameters*
- Dionne, Frédérick
- *A web-based acceptance and commitment therapy program to reduce academic procrastination*
- Doering, Nicola
- *Does Internet and smartphone use promote or reduce social well-being? Results from a national online survey*
 - *Sex technology use by heterosexual adults in Germany: Prevalence and subjective effects on sexual well-being*
- Dolbec, Justine
- *NAO humanoid robot for cognitive screening in elderly*
- Dugas, Michel
- *Barriers of treatment perceived by GAD patients after receiving CBT treatment delivered face-to-face versus in videoconference*
 - *Interaction Effect of Telepresence and Therapeutic Alliance on Treatment Outcome in Telepsychotherapy for Generalized Anxiety Disorder*
- Dumais, Alexandre
- *A randomized controlled trial comparing virtual reality therapy to cognitive behavioral therapy in schizophrenia with treatment refractory hallucinations: Preliminary results*
- Dupont, Marie-Ève
- *The STORM projet: Using video game to promote completion of morning routine for children with attention deficit hyperactivity disorder and autism spectrum disorder*
- Durán-Baca, Ximena
- *Mobile application for training in clinical skills in online psychology students*
- Durón, Raúl
- *Exposure therapy for acute stress disorder*
- E**
- Eachus, Peter
- *Comparing neural responses in immersive virtual reality displays and non-immersive screens*
- Echeverria, Leticia
- *Internet-assisted guided self-change program for adult Mexican problem drinkers: a case study*
- Elhai, Jon
- *Depression and emotion regulation predict objectively measured smartphone use*
 - *Fear of missing out: Testing relationships with negative affectivity, online social engagement, and problematic smartphone use*
- Espinoza, Macarena
- *Enhancing mental well-being during pregnancy: A pilot study to assess the feasibility of a web-based positive psychology intervention*
- Etchemendy, Ernestina
- *Enhancing mental well-being during pregnancy: A pilot study to assess the feasibility of a web-based positive psychology intervention*

F

Index of all authors

- Fabbri, Tommaso • *A new field for (transdisciplinary) cyberpsychology: Phygital environments*
- Farmani, Yasin • *A Longitudinal Pilot Study of Presence in Immersive VR*
- Farrell, Vivienne • *The influence of expectations on usability and visual appeal in a web environment*
- Faubert, Jocelyn • *How does the brain encode the ownership illusion of a walking self-avatar?*
- Feijt, Milou • *Enhancing empathic interactions in mental healthcare: Opportunities offered through social interaction technologies*
- Feinberg, Jason • *Meta-analysis of mobile health interventions for depression and well-being*
• *Evaluation of digital placebo effects in college students*
- Fernandez Alvarez, Javier • *An overview of factors associated with adherence and dropout to ecological momentary assessment in depression*
- Fernández-Alvarez, Javier • *Portable biofeedback devices for affective disorders: A systematic review*
• *Understanding human behavior in daily life: From ecological momentary assessment to computational psychometrics*
- Ferrer-Garcia, Marta • *Embodiment in different size virtual bodies produces changes in women's body image distortion and dissatisfaction*
• *Gender differences in attentional bias after owning a virtual avatar with an increased weight.*
• *Attentional bias assessment in patients with alcohol use disorder: An eye-tracking study*
- Finestone, Hillel • *Home-based virtual reality training for adults with mild cognitive impairment: Preliminary results of a feasibility telerehabilitation study*
- Flores-Elvira, Alicia • *Mobile application for training in clinical skills in online psychology students*
- Fonseca-Baeza, Sara • *Using Virtual Reality for assessing body dissatisfaction from egocentric and allocentric perspectives.*
- Forget, H el ene • *Psychophysiological effects of virtual reality immersion on elderly people*
- Fortin, Jean-Simon • *Decreasing recurrent pain and anxiety in medical procedures with a pediatric population: A pilot study protocol*
- Fortin, Jean-Simon • *Projector-based virtual reality dome environment for procedural pain and anxiety in young children with burn injuries: A pilot study*
- Fournier, Vanessa • *Feasibility open trials of a self-guided Internet-based CBT for anxiety and depression among French-speaking young adults: Lessons learned*

Index of all authors

- Francomano, Maria Margherita
- *Educational Robotics to develop of executive functions of visual spatial abilities, planning and problem solving.*
- Freedman, Sara
- *Virtual reality for treating combat related PTSD*
 - *Early intervention for preventing posttraumatic stress disorder: An Internet based virtual reality treatment*
- G**
- Gaboury, Sébastien
- Gaggioli, Andrea
- *NAO humanoid robot for cognitive screening in elderly*
 - *Transformative experience design: Using virtual reality, brain-based technologies and the language of arts to support self-transcendent experiences*
 - *Inside-out: Conceptual design and prototype of a system for the automatic generation of emotional metaphors in virtual reality*
 - *Understanding human behavior in daily life: From ecological momentary assessment to computational psychometrics*
 - *The continuum of self-transcendence: Flow experience and the emotion of awe*
 - *A new field for (trandisciplinary) cyberpsychology: Phygital environments*
- Gagnon, Joel
- *A web-based acceptance and commitment therapy program to reduce academic procrastination*
- Galimberti, Carlo
- *Assessing presence in videoconference telepsychotherapies: A complementary study on breaks in telepresence and intersubjectivity co-construction processes*
 - *A new field for (trandisciplinary) cyberpsychology: Phygital environments*
- Galpin, Adam
- *Exploring the impact of control method on embodiment of a myoelectric prosthesis using Immersive Virtual Reality*
- Gamito, Pedro
- *Evaluation of a virtual reality tele-rehabilitation platform for patients with traumatic brain injury*
 - *Social network use and sexual orientation as factors for psychological adjustment, cyberbullying and Internet addiction*
 - *Virtual kitchen test for divided attention in the elderly*
- Garcia, Linda
- *Testing a VE for behaviours and dementia*
- Garcia Campayo, Javier
- *Feasibility and preliminary efficacy of an immersive technology (virtual reality) mindfulness protocol to improve the quality of life of patients with multimorbidity in primary care: A randomized controlled study protocol*
 - *A brief mindfulness-based psychological intervention for depression in primary care: Study protocol of a randomized controlled trial*
- Garcia Palacios, Azucena
- *An overview of factors associated with adherence and dropout to ecological momentary assessment in depression*

Index of all authors

- *Pain Monitor: How can we use ecological momentary assessment via app to improve the treatment of chronic pain?*
- *Understanding human behavior in daily life: From ecological momentary assessment to computational psychometrics*
- Ghasemaghaei, Reza
 - *User Study of Emotional Visualization Dashboard for Educational Software*
- Ghita, Alexandra
 - *Gender differences in attentional bias after owning a virtual avatar with an increased weight.*
 - *Attentional bias assessment in patients with alcohol use disorder: An eye-tracking study*
- Ghosh, Sunita
 - *RESILIENT - An online multidimensional treatment to promote resilience after a disaster: Study protocol*
- Gonzalez, Barbara
 - *Social network use and sexual orientation as factors for psychological adjustment, cyberbullying and Internet addiction*
- Gonzalez, Yolanda
 - *On-line counselling to Mexican migrant community in USA: A programme oriented to emotional well-being*
- Gosselin, Patrick
 - *Barriers of treatment perceived by GAD patients after receiving CBT treatment delivered face-to-face versus in videoconference*
- Graf, Linda
 - *The relaxing effect of virtual nature - Immersive technology provides relief in acute stress situations*
- Grondin, Frédéric
 - *Empathy in computer-mediated interactions: A conceptual framework*
- Grundy, John
 - *The influence of expectations on usability and visual appeal in a web environment*
- Gual, Toni
 - *Attentional bias assessment in patients with alcohol use disorder: An eye-tracking study*
- Guarino, Danilo
 - *Virtual Reality environments to reduce dental anxiety.*
- Guay, Jean-Pierre
 - *Gloomy corners and dark triad: The development of a virtual reality scenario for studying predatory processes in offenders*
- Guay, Stéphane
 - *RESILIENT - An online multidimensional treatment to promote resilience after a disaster: Study protocol*
- Guitton, Matthieu J.
 - *Virtual communities for health purposes in the elderly: Challenges to implementation and evaluation*
- Gutiérrez-Maldonado, José
 - *Embodiment in different size virtual bodies produces changes in women's body image distortion and dissatisfaction*
 - *Gender differences in attentional bias after owning a virtual avatar with an increased weight.*
 - *Attentional bias assessment in patients with alcohol use disorder: An eye-tracking study*



Index of all authors

- Haddouk, Lise
- *Assessing presence in videoconference telepsychotherapies: A complementary study on breaks in telepresence and intersubjectivity co-construction processes*
 - *Sexual cyberaddictions: Compulsive online pornography use as symptom of addictive personality disorder*
- Hadjistavropoulos, Heather
- *Feasibility open trials of a self-guided Internet-based CBT for anxiety and depression among French-speaking young adults: Lessons learned*
- Hadjistavropoulos, Thomas
- *Feasibility open trials of a self-guided Internet-based CBT for anxiety and depression among French-speaking young adults: Lessons learned*
- Hajjar, Alain
- *Using virtual reality to outperform exposure in vivo : A clinical study with acrophobia sufferers*
- Harrison, Timothy
- *The role of psychology in understanding email fraud susceptibility*
- Harrisson, Anne-Helene
- *Loneliness and Types of Facebook Use in Emerging Adults*
- Havas, Camille
- *Adapting a book to a virtual reality scenography: how to keep the experience at the center?*
- Heo, Jiwoong
- *The sparse peripheral LED HMD can extend our FoV in the visual search task*
- Herrero, Rocio
- *Enhancing mental well-being during pregnancy: A pilot study to assess the feasibility of a web-based positive psychology intervention*
- Hodrien, Andrew
- *Exploring the impact of control method on embodiment of a myoelectric prosthesis using Immersive Virtual Reality*
- Hoffman, Hunter
- *Projector-based virtual reality dome environment for procedural pain and anxiety in young children with burn injuries: A pilot study*
 - *Decreasing recurrent pain and anxiety in medical procedures with a pediatric population: A pilot study protocol*
- Huang, Manqing
- *Non-immersive Virtual Reality for Spatial-Frequency and Temporal-Frequency Dependent Binocular Imbalance Assessment in Adults*
- Huijbregts, Thomas
- *Findings from the implementation of a mobile digital health platform as an adjunct to patients' mental healthcare using a longitudinal, mixed-methods design*
- Hupin, Mathilde
- *Decreasing recurrent pain and anxiety in medical procedures with a pediatric population: A pilot study protocol*
- Hébert-Ratté, Roxanne
- *Facebook user profiles, personality and adjustment in early adulthood*

Index of all authors

I

- Ijsselstein, Wijnand • *Enhancing empathic interactions in mental healthcare: Opportunities offered through social interaction technologies*
- Ingram, Gordon • *Who tweets what on Twitter? Gender differences in the use of Twitter compared to Facebook*
• *“Why is everyone hating? This is actually good.” Everyday sexism in “dislikes” and comments on YouTube videos*
- Isere, Sébastien • *Psychophysiological effects of virtual reality immersion on elderly people*
- Ishikawa, Jun • *Mental support system for hematopoietic stem-cell transplant patients isolated in a protective environment*

J

- Jackson, Bendu • *Meta-analysis of mobile health interventions for depression and well-being*
- Jackson, Philip • *Empathy in computer-mediated interactions: A conceptual framework*
• *Changing the order of facial action units in pain expressing avatars affects the perceived realism and pain level*
- Jacqueline, Ellis • *A randomized controlled trial of the use of virtual reality for needle-related procedures in children and adolescents in the emergency department*
- Jacques, Claudine • *The decoding of social interactions in task VR for autism spectrum: Development of an intervention protocol and pilot testing*
- Jagayat, Arvin • *Exploring gamers’ opinions on the role of women in gaming and incidents of gendered online harassment of female gamers*
- Janssen, Anna • *#InstaFollow: Types of Instagram followers affects users’ image sharing behaviours*
- Jones, Helen • *The role of psychology in understanding email fraud susceptibility*
• *Designing for trust in online crowdfunding investment*
- Jun, Joohee • *How much changes make people think their avatar to be changed ?*
• *The effects of motion and appearance synchronizations on the cybersickness of human-avatar interaction*
• *Virtual embodiment: A pleasing extension of self*
- Jung, Myeongul • *How much changes make people think their avatar to be changed ?*
• *Virtual embodiment: A pleasing extension of self*

Index of all authors

- Jyoko, Shiho
- *Mental support system for hematopoietic stem-cell transplant patients isolated in a protective environment*
- Jégo, Jean-François
- *Adapting a book to a virtual reality scenography: how to keep the experience at the center?*
- 
- Keep, Melanie
- *A desire to belong affects Instagram behaviour and perceived social support*
 - *#InstaFollow: Types of Instagram followers affects users' image sharing behaviours*
- Kenney, Laurence
- *Exploring the impact of control method on embodiment of a myoelectric prosthesis using Immersive Virtual Reality*
- Khadra, Christelle
- *Decreasing recurrent pain and anxiety in medical procedures with a pediatric population: A pilot study protocol*
- Khadra, Christelle
- *Projector-based virtual reality dome environment for procedural pain and anxiety in young children with burn injuries: A pilot study*
- Khazaal, Yasser
- *About possible determinants of addictive cybersex*
 - *Smartphone apps and games for mental health: Opportunities and challenges for the near future*
- Kim, Hyunjeong
- *The empirical study on the simulator sickness due to incorrect IPD problem*
- Kim, Ji-Young
- *The effect of early attentional bias modification on attentional bias toward food-cues of binge eater*
- Kim, Kwanguk
- *How much changes make people think their avatar to be changed ?*
 - *The sparse peripheral LED HMD can extend our FoV in the visual search task*
 - *The effects of motion and appearance synchronizations on the cybersickness of human-avatar interaction*
 - *Virtual embodiment: A pleasing extension of self*
- Kim, Mingyu
- *The effects of motion and appearance synchronizations on the cybersickness of human-avatar interaction*
- Kim, So-Yeon
- *Virtual embodiment: A pleasing extension of self*
- Kipping, Sarah
- *Findings from the implementation of a mobile digital health platform as an adjunct to patients' mental healthcare using a longitudinal, mixed-methods design*
- Kitson, Alexandra
- *A framework for studying transformative experiences through virtual reality*
 - *Going beyond: Lucid dreaming as a lens into transformative experience design for virtual reality*

Index of all authors

Knoefel, Frank • *Home-based virtual reality training for adults with mild cognitive impairment: Preliminary results of a feasibility telerehabilitation study*

Kwak, Hyesook • *Comparison between cyberbullying and traditional bullying of Korean students*

L

La Barbera, Daniele • *Virtual Reality environments to reduce dental anxiety.*
• *Educational Robotics to develop of executive functions of visual spatial abilities, planning and problem solving.*

La Paglia, Filippo • *Virtual Reality environments to reduce dental anxiety.*
• *Educational Robotics to develop of executive functions of visual spatial abilities, planning and problem solving.*

Labrecque, Geneviève • *The TASA program: Using the iPad as a tool to promote the autonomy of adults with trisomy 21*

Lachapelle, Yves • *Supporting digital inclusion of people with intellectual disability or autism spectrum disorder: The inclusive technologies action plan #PTI2022 !*
• *Core actions recommendations for inclusive technologies of people with ID/ASD : A charter and an action plan for inclusive technologies !*
• *Use of the social robot among children with autism spectrum disorder in school and social services organizations : A pilot study*

Lameira, Diane • *Meta-analysis of mobile health interventions for depression and well-being*

Langlois, Frédéric • *Barriers of treatment perceived by GAD patients after receiving CBT treatment delivered face-to-face versus in videoconference*

Lançon, Christophe • *Virtual Reality Cue Exposure for Smoking Relapse Prevention: a Comparative Trial.*

Larrazabal, Maria • *Meta-analysis of mobile health interventions for depression and well-being*

Laurendeau-Martin, Juliette • *Measuring moral reasoning with virtual reality : A validation study*

Le Dû, Katell • *Bliss a virtual reality application designed to improve health care and quality of life*

Le May, Sylvie • *Projector-based virtual reality dome environment for procedural pain and anxiety in young children with burn injuries: A pilot study*
• *Decreasing recurrent pain and anxiety in medical procedures with a pediatric population: A pilot study protocol*

Index of all authors

- Lebel, Alexandre
- *A randomized controlled trial comparing virtual reality therapy to cognitive behavioral therapy in schizophrenia with treatment refractory hallucinations: Preliminary results*
- Leblanc, Josée
- *Feasibility open trials of a self-guided Internet-based CBT for anxiety and depression among French-speaking young adults: Lessons learned*
- Leclair, Ken
- *Testing a VE for behaviours and dementia*
- Lee, Jang-Han
- *Home-based attentional bias modification training in obese individuals with binge eating*
 - *The effect of early attentional bias modification on attentional bias toward food-cues of binge eater*
- Lee, Jong Ho
- *The empirical study on the simulator sickness due to incorrect IPD problem*
- Lee, Mooah
- *The effect of early attentional bias modification on attentional bias toward food-cues of binge eater*
- Lemieux, Vincent
- *Virtual comic Korkifaipo: An application of virtual reality in ED primary prevention context*
- Leoni, Giuseppe
- *A new field for (transdisciplinary) cyberpsychology: Phygital environments*
- Lesiuk, Nancy
- *Testing a VE for behaviours and dementia*
- Li, Li
- *Dynamic Stereopsis in Children with Cataracts after Cataract Surgery*
- Liszio, Stefan
- *The relaxing effect of virtual nature - Immersive technology provides relief in acute stress situations*
- Llorens, Roberto
- *Using Virtual Reality for assessing body dissatisfaction from egocentric and allocentric perspectives.*
- Lomanowska, Anna
- *Social dynamics of online chat in a live-streaming video platform*
- Lomanowska, Anna
- *Empathy in computer-mediated interactions: A conceptual framework*
- Lopes, Paulo
- *Virtual kitchen test for divided attention in the elderly*
- Loranger, Claudie
- *Using virtual reality to outperform exposure in vivo : A clinical study with acrophobia sufferers*
- Loranger, Claudie
- *Practicing mindfulness using virtual reality simulations of potentially stressful daily activities: An innovative approach to the treatment of first episode psychosis*
- Lu, Yan
- *Improving the Visual Acuity and Visual Performance in Glaucoma Patients with an Augmented Reality Push-pull Model*
- Luo, Siqi
- *A Longitudinal Pilot Study of Presence in Immersive VR*

Index of all authors

- Lussier, Maxime
- *Using a virtual car ride task to assess the transfer associated with cognitive training in older adults: Validation and design for cognitive interventions in updating and inhibition*
- Lussier-Desrochers, Dany
- *Core actions recommendations for inclusive technologies of people with ID/ASD : A charter and an action plan for inclusive technologies !*
 - *The STORM projet: Using video game to promote completion of morning routine for children with attention deficit hyperactivity disorder and autism spectrum disorder*
 - *Use of the social robot among children with autism spectrum disorder in school and social services organizations : A pilot study*
 - *The TASA program: Using the iPad as a tool to promote the autonomy of adults with trisomy 21*
 - *Technologies Promoting Efficient Parenthood Practices for People With Intellectual Disability*
- López Del Hoyo, Yolanda
- *A brief mindfulness-based psychological intervention for depression in primary care: Study protocol of a randomized controlled trial*
- López-Montoyo, Alba
- *A brief mindfulness-based psychological intervention for depression in primary care: Study protocol of a randomized controlled trial*
- Löfgren Mårtenson, Lotta
- *Particip@tion on Internet? Young people with intellectual disabilities and identification processes on Internet*
- M**
- MacMaster, Frank P.
- *RESILIENT - An online multidimensional treatment to promote resilience after a disaster: Study protocol*
- Malbos, Eric
- *Virtual Reality Cue Exposure for Smoking Relapse Prevention: a Comparative Trial.*
- Marchand, André
- *Barriers of treatment perceived by GAD patients after receiving CBT treatment delivered face-to-face versus in videoconference*
- Marcotte-Beaumier, Gabrielle
- *Interaction Effect of Telepresence and Therapeutic Alliance on Treatment Outcome in Telepsychotherapy for Generalized Anxiety Disorder*
- Marie-Josée, Roy
- *Using EMMA's virtual world to facilitate support offered to parents who experienced perinatal mortality: A pilot study*
- Marschall-Levesque, Shawn
- *Disentangling The Effects of Audio and Visual Dimensions of Sexual Stimuli as Used in the Assessment of Child Molesters with Penile Plethysmography.*
- Martineau, Annie
- *The STORM projet: Using video game to promote completion of morning routine for children with attention deficit hyperactivity disorder and autism spectrum disorder*

Index of all authors

- Martinez, Jorge
- *On-line counselling to Mexican migrant community in USA: A programme oriented to emotional well-being*
- Massé, Line
- *The STORM projet: Using video game to promote completion of morning routine for children with attention deficit hyperactivity disorder and autism spectrum disorder*
- Mast, Fred W.
- *Group decision making in multi-user virtual reality and video conferencing*
- Masuch, Maic
- *The relaxing effect of virtual nature - Immersive technology provides relief in acute stress situations*
- Mazzoni, Elvis
- *Online and offline life: The functional use of the Internet during the life cycle*
- McCleary, Lynn
- *Testing a VE for behaviours and dementia*
- McCleery, Joseph
- *Immersive Virtual Reality to Improve Police Interaction Skills in Adolescents and Adults with Autism Spectrum Disorder: Preliminary Results of a Feasibility and Safety Trial*
- McMahon, Timothy
- *Neuropsychological assessment of age differences in memory performance using a virtual environment grocery store with environmental distractors*
- Mellah, Samira
- *Using a virtual car ride task to assess the transfer associated with cognitive training in older adults: Validation and design for cognitive interventions in updating and inhibition*
- Mercier, Joanie
- *Loneliness and Types of Facebook Use in Emerging Adults*
- Miller, Judith
- *Immersive Virtual Reality to Improve Police Interaction Skills in Adolescents and Adults with Autism Spectrum Disorder: Preliminary Results of a Feasibility and Safety Trial*
- Miragall, Marta
- *Using Virtual Reality for assessing body dissatisfaction from egocentric and allocentric perspectives.*
- Mohseni, M.
Rohangis
- *Does Internet and smartphone use promote or reduce social well-being? Results from a national online survey*
- Molin, Martin
- *Particip@tion on Internet? Young people with intellectual disabilities and identification processes on Internet*
- Molinari,
Guadalupe
- *Enhancing mental well-being during pregnancy: A pilot study to assess the feasibility of a web-based positive psychology intervention*
- Moncur, Wendy
- *Designing for trust in online crowdfunding investment*
- Mondon, Silvia
- *Attentional bias assessment in patients with alcohol use disorder: An eye-tracking study*
- Monras, Miquel
- *Attentional bias assessment in patients with alcohol use disorder: An eye-tracking study*
- Monthuy-Blanc,
Johana
- *Immersive and embodied cyberbody rating scale: A development of evaluation of body dissatisfaction in virtual reality*

Index of all authors

- *Excessive physical exercise and body image in eating disorders: Preliminary results from immersive and embodied cyberbody rating scale*
 - *Virtual comic Korkifaipo: An application of virtual reality in ED primary prevention context*
- Mor, Sonia
- *An Internet-based self-applied treatment program for flying phobia: Study protocol for a randomized controlled trial*
 - *Patients' attitudes and adherence towards an Internet-based intervention for adjustment disorders*
- Moraes, Arina
- Morais, Diogo
- *Gross motor skills assessment using Microsoft Kinect*
 - *Social network use and sexual orientation as factors for psychological adjustment, cyberbullying and Internet addiction*
 - *Virtual kitchen test for divided attention in the elderly*
- Morasse, Frédérick
- *Measuring moral reasoning with virtual reality : A validation study*
 - *Measuring social skills with virtual reality: A validation study focussing on moral reasoning*
- Moreno, Manual
- *Embodiment in different size virtual bodies produces changes in women's body image distortion and dissatisfaction*
 - *Gender differences in attentional bias after owning a virtual avatar with an increased weight.*
 - *Attentional bias assessment in patients with alcohol use disorder: An eye-tracking study*
- Morin, Charles M.
- *RESILIENT - An online multidimensional treatment to promote resilience after a disaster: Study protocol*
- Moser, Ivan
- *Group decision making in multi-user virtual reality and video conferencing*
- N**
- Nam, Gieun
- *Home-based attentional bias modification training in obese individuals with binge eating*
- Navarro, Jessica
- *An innovative protocol to manipulate the negative body image of obese patients through the "Machine to be another" and its influence on physical activity: a randomized controlled study*
- Neerincx, Mark A.
- *EHealth4MDD: a database of e-health systems for the prevention and treatment of major depressive disorder*
 - *Simulating the inner voice: A study of sound parameters*
- Neveu, Sarah
Michelle
- *Triangulating on deviant sexual preferences by using penile plethymography, eye-tracking and qEEG in virtual immersion*
- Ngo-Minh, Tin
- *Practicing mindfulness using virtual reality simulations of potentially stressful daily activities: An innovative approach to the treatment of first episode psychosis*

Index of all authors

- Nielsen, Tore • *Learning to fly in virtual reality: The effects of targeted memory reactivation during REM sleep on procedural learning*
- Noel, Melanie • *Decreasing recurrent pain and anxiety in medical procedures with a pediatric population: A pilot study protocol*
- Normand, Claude • *The TASA program: Using the iPad as a tool to promote the autonomy of adults with trisomy 21*
- Northoff, Georg • *Design and validation of a virtual reality working memory training program (VR-WORK-M): A new tool to improve working memory impairment following concussion*
- Norzagaray, Arica-Ann • *Exploratory Analysis of the Relationship Between Country Personality Traits and Cybercrime Output*



- Obach-Vidal, Amadeu • *Attentional bias assessment in patients with alcohol use disorder: An eye-tracking study*
- Ohsuga, Mieko • *Mental support system for hematopoietic stem-cell transplant patients isolated in a protective environment*
- Ojha, Kevin • *Social dynamics of online chat in a live-streaming video platform*
- Oliveira, Jorge • *Social network use and sexual orientation as factors for psychological adjustment, cyberbullying and Internet addiction*
• *Virtual kitchen test for divided attention in the elderly*
- Oliver, Elia • *Adaptation and evaluation of an ICT assisted prevention and treatment program of childhood obesity for Mexican adolescents*
- Ortega, Lluisa • *Attentional bias assessment in patients with alcohol use disorder: An eye-tracking study*
- Ouellet, Marie-Christine • *RESILIENT - An online multidimensional treatment to promote resilience after a disaster: Study protocol*
- Ouellet, Marilou • *Excessive physical exercise and body image in eating disorders: Preliminary results from immersive and embodied cyberbody rating scale*
- Ouellet, Émilie • *Validation of an immersive virtual reality task assessing episodic memory in older adults*
• *Virtual reality as a new approach to measure the effect of cognitive training on real-life cognition in aging*
- Overton, Paul • *Cognitive predictors of problematic mobile phone use*
• *The relationship between attention deficit hyperactivity symptoms and excessive mobile phone use*



- Page, Caroline A. • *The use of virtual reality for exposure in group: A 3-month follow-up study*

Index of all authors

- Palacio, Ivanna
- *“Why is everyone hating? This is actually good.” Everyday sexism in “dislikes” and comments on YouTube videos*
- Palomo, Priscila
- *Feasibility and preliminary efficacy of an immersive technology (virtual reality) mindfulness protocol to improve the quality of life of patients with multimorbidity in primary care: A randomized controlled study protocol*
 - *An innovative protocol to manipulate the negative body image of obese patients through the "Machine to be another" and its influence on physical activity: a randomized controlled study*
- Panagiotidi, Maria
- *Cognitive predictors of problematic mobile phone use*
 - *The relationship between attention deficit hyperactivity symptoms and excessive mobile phone use*
- Pang, Shasha
- *Non-immersive Virtual Reality for Spatial-Frequency and Temporal-Frequency Dependent Binocular Imbalance Assessment in Adults*
 - *Improving the Visual Acuity and Visual Performance in Glaucoma Patients with an Augmented Reality Push-pull Model*
 - *Dynamic Stereopsis in Children with Cataracts after Cataract Surgery*
 - *The Relationship between Amblyopia, Spatial Resolution and Binocular Visual Perception Eye Position in a Pediatric Population*
- Paquette, Marie-France
- *Gloomy corners and dark triad: The development of a virtual reality scenario for studying predatory processes in offenders*
- Paquette, Tyna
- *Learning to fly in virtual reality: The effects of targeted memory reactivation during REM sleep on procedural learning*
- Paquin, David
- *Projector-based virtual reality dome environment for procedural pain and anxiety in young children with burn injuries: A pilot study*
 - *Decreasing recurrent pain and anxiety in medical procedures with a pediatric population: A pilot study protocol*
- Parent, Natasha
- *Feeling Isolated Amplifies the Relationship between Covert Aggression and Cyberbullying*
- Parish-Morris, Julia
- *Immersive Virtual Reality to Improve Police Interaction Skills in Adolescents and Adults with Autism Spectrum Disorder: Preliminary Results of a Feasibility and Safety Trial*
- Park, Ji Hyung
- *The empirical study on the simulator sickness due to incorrect IPD problem*
- Parra, Elena
- *Serious games for behavioral assessment of executive functions*
- Parsons, Thomas
- *Neuropsychological assessment of age differences in memory performance using a virtual environment grocery store with environmental distractors*

Index of all authors

- Paulin, Mélanie
- *Getting Even on Social Media: Prevalence of Online Revenge Behaviors Between Friends, Romantic Partners, Coworkers, and Family Members*
- Pereira Nunes, Bruno
- *Feasibility and preliminary efficacy of an immersive technology (virtual reality) mindfulness protocol to improve the quality of life of patients with multimorbidity in primary care: A randomized controlled study protocol*
- Pero, Elisabetta
- *A new field for (transdisciplinary) cyberpsychology: Phygital environments*
- Peron, Mélanie
- *Bliss a virtual reality application designed to improve health care and quality of life*
- Perreault, Isabelle
- *Projector-based virtual reality dome environment for procedural pain and anxiety in young children with burn injuries: A pilot study*
 - *Decreasing recurrent pain and anxiety in medical procedures with a pediatric population: A pilot study protocol*
- Picard-Deland, Claudia
- *Learning to fly in virtual reality: The effects of targeted memory reactivation during REM sleep on procedural learning*
- Pinard, Véronique
- *A web-based acceptance and commitment therapy program to reduce academic procrastination*
- Pinet, Richard
- *Testing a VE for behaviours and dementia*
- Poeschl, Sandra
- *Sex technology use by heterosexual adults in Germany: Prevalence and subjective effects on sexual well-being*
- Popovac, Masa
- *How severe is cyberbullying? An exploration of adults' perceptions of severity and the role of gender, age, time spent online and reported cyberbullying experiences as victims, witnesses and perpetrators*
- Porras-Garcia, Bruno
- *Gender differences in attentional bias after owning a virtual avatar with an increased weight.*
- Porras-Garcia, Bruno
- *Embodiment in different size virtual bodies produces changes in women's body image distortion and dissatisfaction*
 - *Attentional bias assessment in patients with alcohol use disorder: An eye-tracking study*
- Poulin, François
- *Facebook user profiles, personality and adjustment in early adulthood*
- Presas, Helena
- *Virtual kitchen test for divided attention in the elderly*
- Prioste, Ana
- *Social network use and sexual orientation as factors for psychological adjustment, cyberbullying and Internet addiction*
- Proulx, Catherine
- *Acceptability study of a novel immersive cognitive care platform for remediation of cognitive deficits*

Index of all authors

- Provencher, Marianne
- *Using the Virtual Multitasking Test to assess the realization of intentions: A preliminary psychometric study*
- Prpa, Mirjana
- *A framework for studying transformative experiences through virtual reality*
- Pépin-Beauchesne, Laurence
- *Use of the social robot among children with autism spectrum disorder in school and social services organizations : A pilot study*
- Pépin-Beauchesne, Laurence
- *The STORM projet: Using video game to promote completion of morning routine for children with attention deficit hyperactivity disorder and autism spectrum disorder*

Q

- Quero, Soledad
- *An Internet-based self-applied treatment program for flying phobia: Study protocol for a randomized controlled trial*
 - *A brief mindfulness-based psychological intervention for depression in primary care: Study protocol of a randomized controlled trial*
 - *Patients' attitudes and adherence towards an Internet-based intervention for adjustment disorders*
- Quesnel, Denise
- *A framework for studying transformative experiences through virtual reality*
- Quintana, Pamela
- *Validation of a virtual environment for generalized social anxiety disorder in a sample from two different cultures*
 - *Measuring the effect size of the effect of experimenter's physical presence in the room on social anxiety during an immersion in virtual Reality*

R

- R Labbe, David
- *First steps toward an objective measurement of sexual presence in males and females*
 - *Evaluating the impact of a virtual self-avatar on spatiotemporal gait parameters*
 - *Decreasing recurrent pain and anxiety in medical procedures with a pediatric population: A pilot study protocol*
 - *How does the brain encode the ownership illusion of a walking self-avatar?*
- R. de Oliveira, Daniela
- *Feasibility and preliminary efficacy of an immersive technology (virtual reality) mindfulness protocol to improve the quality of life of patients with multimorbidity in primary care: A randomized controlled study protocol*
- Rabheru, Kiran
- *Testing a VE for behaviours and dementia*
- Rachyla, Iryna
- *Patients' attitudes and adherence towards an Internet-based intervention for adjustment disorders*

Index of all authors

- Ramdhani, Neila
- *Mindfulness for Tackling Online Gaming Addiction*
 - *Passive usage and envy predicting life satisfaction of social media user*
- Ravindran, Vijay
- *Immersive Virtual Reality to Improve Police Interaction Skills in Adolescents and Adults with Autism Spectrum Disorder: Preliminary Results of a Feasibility and Safety Trial*
- Raymond, Guillaume
- *A web-based acceptance and commitment therapy program to reduce academic procrastination*
- Renaud, Patrice
- *Immersive cybersexuality: Fundamental research and forensic applications*
 - *2) Disentangling The Effects of Audio and Visual Dimensions of Sexual Stimuli as Used in the Assessment of Child Molesters with Penile Plethysmography.*
 - *First steps toward an objective measurement of sexual presence in males and females*
- Renaud, Patrice
- *Gloomy corners and dark triad: The development of a virtual reality scenario for studying predatory processes in offenders*
- Rey, Beatriz
- *Validation of a virtual environment for generalized social anxiety disorder in a sample from two different cultures*
- Reyes, Fabiola
- *On-line counselling to Mexican migrant community in USA: A programme oriented to emotional well-being*
- Reyes, Rebeca
- *Findings from the implementation of a mobile digital health platform as an adjunct to patients' mental healthcare using a longitudinal, mixed-methods design*
- Riahi, Sanaz
- *Findings from the implementation of a mobile digital health platform as an adjunct to patients' mental healthcare using a longitudinal, mixed-methods design*
- Ribera-Canudas, María Victoria
- *Pain Monitor: How can we use ecological momentary assessment via app to improve the treatment of chronic pain?*
- Richard, Marie-Claude
- *Loneliness and Types of Facebook Use in Emerging Adults*
- Richard, Paul
- *Using the Virtual Multitasking Test to assess the realization of intentions: A preliminary psychometric study*
- Ridout, Brad
- *Kids Helpline Circles: Findings from participant action research in the development of a secure national mental health social network*
- Riecke, Bernhard
- *Transformative experience design: Using virtual reality, brain-based technologies and the language of arts to support self-transcendent experiences*
 - *A framework for studying transformative experiences through virtual reality*

Index of all authors

- *Going beyond: Lucid dreaming as a lens into transformative experience design for virtual reality*
- Riva, Giuseppe
 - *Virtual Reality environments to reduce dental anxiety.*
 - *An overview of factors associated with adherence and dropout to ecological momentary assessment in depression*
 - *Inside-out: Conceptual design and prototype of a system for the automatic generation of emotional metaphors in virtual reality*
 - *Portable biofeedback devices for affective disorders: A systematic review*
 - *Understanding human behavior in daily life: From ecological momentary assessment to computational psychometrics*
 - *Educational Robotics to develop of executive functions of visual spatial abilities, planning and problem solving.*
- Robert, Thomas
 - *Evaluating the impact of a virtual self-avatar on spatiotemporal gait parameters*
- Roberts, David
 - *A simple and commodity technology solution to enhance exposure therapy after mass causality incidents: 360 video on phones in hand and headset*
 - *Comparing neural responses in immersive virtual reality displays and non-immersive screens*
 - *Exploring the impact of control method on embodiment of a myoelectric prosthesis using Immersive Virtual Reality*
- Robillard, Genevieve
 - *The use of virtual reality for exposure in group: A 3-month follow-up study*
 - *Barriers of treatment perceived by GAD patients after receiving CBT treatment delivered face-to-face versus in videoconference*
 - *Using EMMA's virtual world to facilitate support offered to parents who experienced perinatal mortality: A pilot study*
 - *The Validation of a Telepresence Scale for Psychotherapy Delivered in Videoconference*
- Robitaille, Annie
 - *Testing a VE for behaviours and dementia*
- Rocheleau, Jessica
 - *Context matters: The role of social anxiety and online privacy concern on university students' social networking site experiences*
 - *Too scared to share? An investigation of social networking site users' personal information concerns*
 - *Findings from the implementation of a mobile digital health platform as an adjunct to patients' mental healthcare using a longitudinal, mixed-methods design*
- Nicole
 - *Validation of a virtual environment for generalized social anxiety disorder in a sample from two different cultures*
- Rodriguez, Alejandro
 - *The TASA program: Using the iPad as a tool to promote the autonomy of adults with trisomy 21*
- Romero-Torres, Alejandro

Index of all authors

- Rooney, Brendan
- *Neuropsychological assessment of age differences in memory performance using a virtual environment grocery store with environmental distractors*
- Rosa, Beatriz
- *Virtual kitchen test for divided attention in the elderly*
- Rosa, Pedro
- *Social network use and sexual orientation as factors for psychological adjustment, cyberbullying and Internet addiction*
- Rosay, Océane
- *Sexual cyberaddictions: Compulsive online pornography use as symptom of addictive personality disorder*
- Rothen, Stephane
- *About possible determinants of addictive cybersex*
- Rouleau, Joanne-Lucine
- *2) Disentangling The Effects of Audio and Visual Dimensions of Sexual Stimuli as Used in the Assessment of Child Molesters with Penile Plethysmography.*
- Rousseau, Michel
- *Immersive and embodied cyberbody rating scale: A development of evaluation of body dissatisfaction in virtual reality*
- S**
- Saint-Pierre Cote, Sara
- *First steps toward an objective measurement of sexual presence in males and females*
 - *Evaluating the impact of a virtual self-avatar on spatiotemporal gait parameters*
- Samson-Richer, Arnaud
- *Learning to fly in virtual reality: The effects of targeted memory reactivation during REM sleep on procedural learning*
- Sanchez, Betzabe
- *Adaptation and evaluation of an ICT assisted prevention and treatment program of childhood obesity for Mexican adolescents*
- Sazawal, Vibha
- *Immersive Virtual Reality to Improve Police Interaction Skills in Adolescents and Adults with Autism Spectrum Disorder: Preliminary Results of a Feasibility and Safety Trial*
- Schepers, Noel
- *How to combine 360° pictures and virtual reality in exposure and response therapy for obsessive compulsive disorder: A case study*
- Scott, Graham
- *Posting alcohol-related photos on Facebook: The role of timeline owners' drinking motives*
 - *Perceived victim blame for celebrities on Twitter: Impact of tweet content, volume of abuse, and dark triad personality factors*
- Selim, Heyla
- *Can Twitter act as a tool of psychological resistance in high-risk contexts? The use of #StopEnslavingSaudiWomen among Saudi Arabian women*
- Selleri, Patrizia
- *Online and offline life: The functional use of the Internet during the life cycle*

Index of all authors

- Sereno, Sara
- *Perceived victim blame for celebrities on Twitter: Impact of tweet content, volume of abuse, and dark triad personality factors*
- Serino, Silvia
- *Understanding human behavior in daily life: From ecological momentary assessment to computational psychometrics*
- Serrano, Laura
- *RESILIENT - An online multidimensional treatment to promote resilience after a disaster: Study protocol*
- Serrano-Zarate, Berenice
- *Mobile application for training in clinical skills in online psychology students*
 - *Adaptation of mindfulness-based stress reduction program for telepsychotherapy: A case series in Mexican population*
 - *Using EMMA's virtual world to facilitate support offered to parents who experienced perinatal mortality: A pilot study*
 - *Tactile illusions in immersive virtual reality environments: An exploratory study regarding its usefulness in psychological treatments*
 - *Validation of a virtual environment for generalized social anxiety disorder in a sample from two different cultures*
- Shapka, Jennifer
- *Feeling Isolated Amplifies the Relationship between Covert Aggression and Cyberbullying*
- Shaughnessy, Krystelle
- *Context matters: The role of social anxiety and online privacy concern on university students' social networking site experiences*
 - *Too scared to share? An investigation of social networking site users' personal information concerns*
 - *Findings from the implementation of a mobile digital health platform as an adjunct to patients' mental healthcare using a longitudinal, mixed-methods design*
- Sheehy, Lisa
- *Home-based virtual reality training for adults with mild cognitive impairment: Preliminary results of a feasibility telerehabilitation study*
- Shi, Wei
- *Dynamic Stereopsis in Children with Cataracts after Cataract Surgery*
- Short, Jerome
- *Meta-analysis of mobile health interventions for depression and well-being*
 - *Evaluation of digital placebo effects in college students*
- Silva, Cidalia
- *Children's Perception of Phobogenic Stimuli in Virtual Reality*
- Simonato, Isabelle
- *The TASA program: Using the iPad as a tool to promote the autonomy of adults with trisomy 21*
- Singh, Rini
- *Findings from the implementation of a mobile digital health platform as an adjunct to patients' mental healthcare using a longitudinal, mixed-methods design*

Index of all authors

- Singh Gill, Aneel
- *How severe is cyberbullying? An exploration of adults' perceptions of severity and the role of gender, age, time spent online and reported cyberbullying experiences as victims, witnesses and perpetrators*
- Sinyavskaya, Yadviga
- *Does it matter how do we interact online? Communication strategies, personality traits and social capital of SNS users.*
- Soler, Carla
- *An Internet-based self-applied treatment program for flying phobia: Study protocol for a randomized controlled trial*
- Solórzano, Rita
- *Immersive Virtual Reality to Improve Police Interaction Skills in Adolescents and Adults with Autism Spectrum Disorder: Preliminary Results of a Feasibility and Safety Trial*
- Sorbring, Emma
- *Particip@tion on Internet? Young people with intellectual disabilities and identification processes on Internet*
- Spero, Eric
- *TextMap: A multi-dimensional texbook format*
- St-Onge, Aurée
- *Tactile illusions in immersive virtual reality environments: An exploratory study regarding its usefulness in psychological treatments*
- St-Onge, Aurée
- *Measuring the effect size of the effect of experimenter's physical presence in the room on social anxiety during an immersion in virtual Reality*
- Stafford, Tom
- *Cognitive predictors of problematic mobile phone use*
- Stapleton, Christopher
- *Transcending time and space for human connection, mixed reality & imagination addressing isolation on Earth and deep space exploration*
- Stefani, Ria
- *Mindfulness for Tackling Online Gaming Addiction*
- Stepanov, Nikolai
- *Internet-assisted guided self-change program for adult Mexican problem drinkers: a case study*
- Stepanova, Ekaterina
- *A framework for studying transformative experiences through virtual reality*
- Stojmenovic, Milica
- *The influence of expectations on usability and visual appeal in a web environment*
- Strahm, Sebastian
- *Group decision making in multi-user virtual reality and video conferencing*
- Stéphanie, Dumoulin
- *A randomized controlled trial of the use of virtual reality for needle-related procedures in children and adolescents in the emergency department*
- Suso-Ribera, Carlos
- *Pain Monitor: How can we use ecological momentary assessment via app to improve the treatment of chronic pain?*
- Sveistrup, Heidi
- *Home-based virtual reality training for adults with mild cognitive impairment: Preliminary results of a feasibility telerehabilitation study*

Index of all authors



- Syamanta, Alifa
- *Mindfulness for Tackling Online Gaming Addiction*
- Tada, Yuma
- *Mental support system for hematopoietic stem-cell transplant patients isolated in a protective environment*
- Taillon-Hobson, Anne
- *Home-based virtual reality training for adults with mild cognitive impairment: Preliminary results of a feasibility telerehabilitation study*
- Talbot, France
- *Feasibility open trials of a self-guided Internet-based CBT for anxiety and depression among French-speaking young adults: Lessons learned*
- Tardif, Noémie
- *Mechanisms underlying virtual reality-based exposure for spider phobia: Replication and extension*
- Teather, Robert
- *A Longitudinal Pilot Study of Presence in Immersive VR*
- Teixido, Lidia
- *Attentional bias assessment in patients with alcohol use disorder: An eye-tracking study*
- Tessier, Marie-Hélène
- *Changing the order of facial action units in pain expressing avatars affects the perceived realism and pain level*
- Therrien, Charles-Etienne
- *Mechanisms underlying virtual reality-based exposure for spider phobia: Replication and extension*
- Tiamyu, Mojisola
- *Depression and emotion regulation predict objectively measured smartphone use*
- Titov, Nickolai
- *Feasibility open trials of a self-guided Internet-based CBT for anxiety and depression among French-speaking young adults: Lessons learned*
- Torres, Derian
- *Evaluation of a virtual reality tele-rehabilitation platform for patients with traumatic brain injury*
- Towse, John
- *The role of psychology in understanding email fraud susceptibility*
- Tremblay, Line
- *Gross motor skills assessment using Microsoft Kinect*
- Triberti, Stefano
- *Inside-out: Conceptual design and prototype of a system for the automatic generation of emotional metaphors in virtual reality*
- Trognon, Alain
- *Assessing presence in videoconference telepsychotherapies: A complementary study on breaks in telepresence and intersubjectivity co-construction processes*
- Tur, Cintia
- *An Internet-based self-applied treatment program for flying phobia: Study protocol for a randomized controlled trial*
 - *Patients' attitudes and adherence towards an Internet-based intervention for adjustment disorders*

Index of all authors

- Turnacioglu, Sinan
- *Immersive Virtual Reality to Improve Police Interaction Skills in Adolescents and Adults with Autism Spectrum Disorder: Preliminary Results of a Feasibility and Safety Trial*



- Varfi, Nektaria
- *About possible determinants of addictive cybersex*
- Velez-Quintero, Luis Eduardo
- *Inside-out: Conceptual design and prototype of a system for the automatic generation of emotional metaphors in virtual reality*
- Vera-Estay, Evelyn
- *Measuring moral reasoning with virtual reality : A validation study*
 - *Measuring social skills with virtual reality: A validation study focussing on moral reasoning*
- Verhulst, Eulalie
- *Using the Virtual Multitasking Test to assess the realization of intentions: A preliminary psychometric study*
- Vieira, Tatiana
- *Inside-out: Conceptual design and prototype of a system for the automatic generation of emotional metaphors in virtual reality*
- Villeneuve, Annie-Claude
- *The STORM projet: Using video game to promote completion of morning routine for children with attention deficit hyperactivity disorder and autism spectrum disorder*
 - *Technologies Promoting Efficient Parenthood Practices for People With Intellectual Disability*
- Vincent, Annick
- *The STORM projet: Using video game to promote completion of morning routine for children with attention deficit hyperactivity disorder and autism spectrum disorder*



- Wang, Bing
- *The Relationship between Amblyopia, Spatial Resolution and Binocular Visual Perception Eye Position in a Pediatric Population*
- Welch, Vivian
- *Home-based virtual reality training for adults with mild cognitive impairment: Preliminary results of a feasibility telerehabilitation study*
- Westerink, Joyce
- *Enhancing empathic interactions in mental healthcare: Opportunities offered through social interaction technologies*
- Whitehead, Anthony
- *Personalizing the Exergame Experience: A Personality Tailoring Approach*
- Wiederhold, Brenda
- *Virtual Reality Graded Exposure Therapy for the Treatment of Combat-Related Posttraumatic Stress Disorder: A Case Report 3 Years Post Combat Deployment*
 - *Virtual Reality environments to reduce dental anxiety.*

Index of all authors

- Wiederhold, Brenda K.
- *Non-immersive Virtual Reality for Spatial-Frequency and Temporal-Frequency Dependent Binocular Imbalance Assessment in Adults*
 - *Improving the Visual Acuity and Visual Performance in Glaucoma Patients with an Augmented Reality Push-pull Model*
 - *Dynamic Stereopsis in Children with Cataracts after Cataract Surgery*
 - *The Relationship between Amblyopia, Spatial Resolution and Binocular Visual Perception Eye Position in a Pediatric Population*
- Wiederhold, Mark
- *Virtual Reality Graded Exposure Therapy for the Treatment of Combat-Related Posttraumatic Stress Disorder: A Case Report 3 Years Post Combat Deployment*
 - *Non-immersive Virtual Reality for Spatial-Frequency and Temporal-Frequency Dependent Binocular Imbalance Assessment in Adults*
 - *Improving the Visual Acuity and Visual Performance in Glaucoma Patients with an Augmented Reality Push-pull Model*
 - *Dynamic Stereopsis in Children with Cataracts after Cataract Surgery*
 - *The Relationship between Amblyopia, Spatial Resolution and Binocular Visual Perception Eye Position in a Pediatric Population*
- Wiersma, Elaine
- *Testing a VE for behaviours and dementia*
- Wong, Dorothy
- *A desire to belong affects Instagram behaviour and perceived social support*
- Wood, Dennis
- *Virtual Reality Graded Exposure Therapy for the Treatment of Combat-Related Posttraumatic Stress Disorder: A Case Report 3 Years Post Combat Deployment*
-  Xu, Li
- *Non-immersive Virtual Reality for Spatial-Frequency and Temporal-Frequency Dependent Binocular Imbalance Assessment in Adults*
-  Yan, Li
- *Non-immersive Virtual Reality for Spatial-Frequency and Temporal-Frequency Dependent Binocular Imbalance Assessment in Adults*
 - *Improving the Visual Acuity and Visual Performance in Glaucoma Patients with an Augmented Reality Push-pull Model*
 - *Dynamic Stereopsis in Children with Cataracts after Cataract Surgery*

Index of all authors

- Yang, Christine
- *The Relationship between Amblyopia, Spatial Resolution and Binocular Visual Perception Eye Position in a Pediatric Population*
 - *Home-based virtual reality training for adults with mild cognitive impairment: Preliminary results of a feasibility telerehabilitation study*



- Zaragoza, Irene
- *Pain Monitor: How can we use ecological momentary assessment via app to improve the treatment of chronic pain?*
- Zeng, Jin
- *Non-immersive Virtual Reality for Spatial-Frequency and Temporal-Frequency Dependent Binocular Imbalance Assessment in Adults*
- Zhi, Ying
- *The Relationship between Amblyopia, Spatial Resolution and Binocular Visual Perception Eye Position in a Pediatric Population*
- Zichichi, Salvatore
- *Virtual Reality environments to reduce dental anxiety.*
- Zitter, Ashley
- *Immersive Virtual Reality to Improve Police Interaction Skills in Adolescents and Adults with Autism Spectrum Disorder: Preliminary Results of a Feasibility and Safety Trial*