

CYPSY24

June 24-26, 2019

Program of Events



LYMAN BEECHER BROOKS LIBRARY



NORFOLK STATE
UNIVERSITY

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It is our pleasure to invite you to join us at the **24th Annual CyberPsychology, CyberTherapy & Social Networking Conference (CYPSY24)**, Monday June 24 through Wednesday June 26, 2019 at Norfolk State University (NSU) in Norfolk, Virginia, USA. NSU is an Historically Black University and one of the 15 four-year public universities in Virginia.



Jointly organized by [Norfolk State University's Psychology Department](#) and in collaboration with the [Interactive Media 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 CyberPsychology, CyberTherapy, and Social Networking. CYPSY24 invites presentations across a wide variety of topics including but certainly not limited to: Social Networking, Online Behavior, Forensic Cyberpsychology (cybersecurity / cybercrime), Augmented and Virtual Reality, Ethics related to Automation and Machine Learning, Avatars, e-Health, SMART applications, IoT, and other emerging applications.

A MESSAGE FROM THE PRESIDENT

Partners in Education,

On behalf of the faculty, staff, and students of Norfolk State University, I extend warm greetings to all assembled for the 24th Annual CyberPsychology, CyberTherapy, and Social Networking Conference organized jointly by Norfolk State University's Psychology Department and the Interactive Media Institute. As you gather to share ideas, research, and critical advancements in these emerging fields, I encourage you to take full advantage of the many resources and collaborative opportunities available here at NSU.



Norfolk State University has long been a leader in the growing field of cybersecurity education, garnering highly coveted designations as a Center of Academic Excellence by the National Security Agency, and the Department of Homeland Security. The University offers bachelor's and master's degree programs in cybersecurity and information assurance. Since 2010, NSU has won 18 major cybersecurity grants and contracts totaling \$42 million, and has a history of partnering with federal agencies, laboratories, industry, and other universities resulting in designation as a Department of Defense Center of Excellence in Cybersecurity and Department of Energy Cybersecurity Consortium Leader. The University recently opened a \$5 million leading-edge facility consolidating its cybersecurity research and education. The 6,000-square-foot Cybersecurity Complex provides an enterprise-grade datacenter for cybersecurity research and experimentation, four research and training labs, workstations for 120 students, offices for 16 faculty members, and a lab dedicated to the emerging field of cyberpsychology.

NSU's Psychology Department will soon offer the first graduate degree program in cyberpsychology in the nation. A fully online program born out of NSU's Center of Excellence in Cybersecurity, the Master of Science in CyberPsychology will provide graduate students with an interactive forum to apply psychological theory through scientific practice in order to conduct empirical research. NSU will be on the forefront of studying the effects of cyberspace and various forms of digital technology on individual and group behavior. Graduates of this rigorous degree program will be prepared to work as socio-behavioral researchers in vocations including higher education, technology, social media, healthcare, law enforcement, national security, and many other areas where human behavior occurs in conjunction with technology.

Norfolk State University is proud to be at the forefront of these emerging fields of study, and stands ready to partner with each of you as we work to realize advances that will improve our world. Please enjoy the conference, and all that NSU and the City of Norfolk have to offer.

Sincerely,

Javaune Adams-Gaston, Ph.D.
President



CITY of NORFOLK

Office of the Mayor

Kenneth Cooper Alexander
Mayor

TO ALL ATTENDING THE
24TH ANNUAL CYBERPSYCHOLOGY, CYBERTHERAPY,
AND SOCIAL NETWORKING CONFERENCE
NORFOLK STATE UNIVERSITY
JUNE 24 -26, 2019

Greetings!

On behalf of the City of Norfolk, I am pleased to extend my warmest welcome to all those attending the 24th Annual CyberPsychology, CyberTherapy, and Social Networking Conference at Norfolk State University. As Mayor of Norfolk, a vibrant city of opportunity and innovation, I am a proud supporter of your efforts to explore these growing disciplines. We are honored that you have chosen Norfolk as host city for this year's conference where industry stakeholders from all over the world will exchange information and engage in conversations that will change how we think and live.

During your visit, board the Spirit of Norfolk cruise ship or the ferry, take a ride on Norfolk's light rail, rent a Pace bike or stroll our walkable downtown. Stop by our award-winning Slover Library or explore Selden Market's rotating lineup of up-and-coming retail, cuisine and visual art. Enjoy the Chrysler Museum of Art and more than 100 pieces of public art found throughout the city. Also downtown is the MacArthur Mall Center, and 10 minutes away is the new Norfolk Premium Outlets. Before you go, don't forget to relish in our city's natural attractions like The Virginia Zoological Park and the Norfolk Botanical Garden which features 40 themed gardens, beautiful backgrounds for timeless photos.

Thank you for choosing Norfolk. We are glad you are here and extend our best wishes for a productive conference.

Sincerely,

Kenneth Cooper Alexander
Mayor

Dear Conference Attendees:

I am pleased to welcome you to the 24th annual CyberPsychology, CyberTherapy & Social Networking Conference (CYPSY24), the official conference of the International Association of CyberPsychology, Training, & Rehabilitation (iACToR). CYPSY24 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) Copies of 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 cutting-edge research on how advanced technologies, such as Virtual Reality and Social Networking, impact individual and societal health and well being, as well as how the tools are used for treatment and training.

I would like to take this opportunity to extend a special "thank you" to all those who have helped make CYPSY24 possible. First, to this year's Co-Organizer and Conference Co-Chair, Professor Scott Debb and his team, you've done an excellent job in preparing a great 3-day conference for us! Many thanks also to this year's international Scientific Committee, who have helped with reviewing and choosing the great presentations for this year's scientific program. And a special thank you to Dr. Silvia Serino and Ian Miller for all their work on ARCTT as well as C&R Magazine.

This conference would not be possible without all our sponsors, and I would like to thank all of them for their generous support of our community and their continued belief in our mission. Specifically, Norfolk State University and the Norfolk State University Center of Excellence in Cybersecurity, Mary Ann Liebert, Inc. Publishers, Interactive Media Institute, Université du Québec en Outaouais, Virtual Reality Medical Center and Istituto Auxologico Italiano.

At this year's conference, we are excited to welcome our participants and speakers from 18 different countries. Thank you for taking the time to come to CYPSY24. 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.

CYPSY25 will be held in June 2020 in Milan, Italy. Please help us celebrate this milestone, our 25th anniversary conference, by attending! Professor Giuseppe Riva and I will be the co-chairs for next year. I sincerely hope that you will 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!



Professor Brenda K. Wiederhold, Ph.D., MBA, BCB, BCN
2019 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

CYPSY24 CALL FOR ABSTRACTS

It is our pleasure to invite you to join us at the 24th Annual CyberPsychology, CyberTherapy & Social Networking Conference. CYPSY24 that will take place on June 24 to 26, 2019 at Norfolk State University, in Norfolk, Virginia USA.

We have extended our call for abstracts through February 10, 2019
Please view all instructions and guidelines to submit your abstract at
<https://easychair.org/conferences/?conf=cypsy24>

Encouraged topics / keywords 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
- Ethics and autonomy
- Games for health and / or serious games
- Gaming and technology (gameplay, technologies, performing arts, law and politics, etc.)
- Human-computer interactions
- Human Performance
- 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
- Wearable computing
- Cyberpsychology and
 - Addictions (related to substance, games, gambling, sex, etc.)
 - ADHD
 - Anxiety disorders and phobias (including OCD and PTSD)
 - Autistic spectrum disorders
 - Cognitive disorders (dementia, etc.)
 - Depression and mood disorders (including bipolar disorders)
 - Developmental disorders
 - Eating disorders / Obesity
 - Health and Pain (acute and chronic illness; management of; cancer, cardiovascular, etc.)
 - Neurological diseases
 - Personality disorders
 - Schizophrenia, psychotic and / or delusional disorders
 - Sleep disorders
- Other medical, psychological or socio-cultural disorder or problem

GENERAL INFORMATION

Date: **June 24 – 26, 2019**

Venue: **Norfolk State University, Norfolk, Virginia, USA**

CYPSY24 will be held at Norfolk State University, located in Norfolk, Virginia, USA. The [university is located](#) at the south-eastern portion of Virginia, close to the North Carolina border. Norfolk is approximately 200 miles (322 km) from Washington D.C., which is less than 1 hour by plane, between 3 and 4 hours by car depending on traffic, and about 5 hours by train ([Amtrak](#)).

See the [Travel Information](#) section for more information.

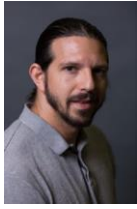
About the Conference

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 Virginia, USA. The official language is English as spoken in the United States. All presentations (unless advertised otherwise) will be in English.

CONFERENCE CHAIRS AND ORGANIZERS



Conference Co-Chair: Scott Debb, EdD, LPC



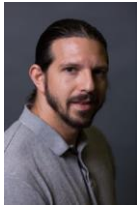
Associate Professor of Psychology
Norfolk State University
Norfolk, VA, USA



Conference Co-Chair: Brenda K. Wiederhold, PhD, MBA, BCB, BCN



Interactive Media Institute
Virtual Reality Medical Institute
San Diego, CA, USA



Local Organizer: Scott Debb, EdD, LPC



Associate Professor of Psychology
Norfolk State University
Norfolk, VA, USA

Organizing Team members from Norfolk State University, Department of Psychology:



Dr. Ernestine Duncan (Professor, Department Chair): Logistic and Administrative Support

Dr. Karen Holmes (Professor; Incoming Chair): Scientific Committee and Abstract Submissions

Dr. Erica Russell (Associate Professor): Student Volunteer Coordination

SCIENTIFIC COMMITTEE

(names are listed in alphabetical order):

- Nathan Appel, PhD** National Institute on Drug Abuse (NIDA), Bethesda, Maryland, USA 
- Christina Botella, PhD** Universitat Jaume, Castelló de la Plana, Castellón, Spain 
- Willem-Paul Brinkman, PhD** Delft University of Technology, Delft, Netherlands 
- Stéphane Bouchard, PhD** Université du Québec en Outaouais, Gatineau, Canada 
- Andrew Campbell, PhD** The University of Sydney, Sydney, Australia 
- Darlene Colson, PhD** Norfolk State University, Norfolk, Virginia, USA 
- Scott Debb, EdD** Norfolk State University, Norfolk, Virginia, USA 
- Chris Fullwood, PhD** University of Wolverhampton, Wolverhampton, United Kingdom 
- Andrea Gaggioli, PhD** Università Cattolica del Sacro Cuore di Milano, Italy 
- Luciano Gamerini, PhD** University of Padova, Padova, Veneto, Italy 
- Pedro Gamito, PhD** Universidade Lusófona de Humanidades e Tecnologias, Lisbon, Portugal 
- Karen Holmes, PhD** Norfolk State University, Norfolk, Virginia, USA 
- Hitoshi Kaneko, PhD** Nagoya University, Nagoya, Aichi, Japan 
- Linda K. Kaye, PhD, CPsychol, SFHEA** Edge Hill University, Ormskirk, United Kingdom 
- José Gutierrez Maldonado, PhD** University of Barcelona, Barcelona, Spain 
- Thomas Parsons, PhD** University of North Texas, Denton, Texas, USA 
- Susan Persky, PhD** National Institutes of Health (NIH), Bethesda, Maryland, USA 
- Wendy Powell, PhD** Tilburg University, Tilburg, Netherlands 
- Brad Ridout, PhD** The University of Sydney, Sydney, Australia 
- Giuseppe Riva, PhD** Università Cattolica del Sacro Cuore, Milano, Italy 
- Dan Romer, PhD** University of Pennsylvania, Philadelphia, Pennsylvania, USA 
- Michael Roy, MD, MPH, FACP, COL (Ret.)** Uniformed Services University, Bethesda, MD, USA 
- Anna Spagnoli, PhD** University of Padova, Padova, Veneto, Italy 
- Stefan Stieger, PhD** Karl Landsteiner University, Krems an der Donau, Austria 

AWARDS AND HONORS

At the 24th Annual CyberPsychology, CyberTherapy & Social Networking Conference (CYPSY24), 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 22nd 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. Past recipients can be found [here](#). *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.*

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 (USD) sponsored by University du Québec en Outaouais. Further information about the award, including eligibility criteria and the application process are available [here](#). Past recipients can be found [here](#).

Young Minds Student Poster Research Awards

To showcase outstanding achievements in a student poster presented at the CYPSY Conference, the Young Minds Research awards, sponsored by Mary Ann Liebert, Inc. publishers, are presented to two 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 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. Winners will be presented with a cash award and certificate of achievement.

KEYNOTE SPEAKERS



Dr. Gráinne Kirwan is a chartered psychologist in the British Psychological Society and a lecturer, researcher and author with multiple books examining cybercrime and online behaviour. Working at the Institute of Art, Design and Technology in Ireland, her interests focus on the interaction between psychology and technology, especially in relation to online interactions. Dr. Kirwan is a member of the editorial board of the international journal ‘Cyberpsychology, Behavior, and Social Networking’, as well as a reviewer for several other peer reviewed academic journals. She led the development team of the MSc in Cyberpsychology at IADT.



Dr. David S. Stargel is the Deputy Chief Scientist of the 711th Human Performance Wing of the Air Force Research Laboratory, Air Force Materiel Command, at Wright-Patterson Air Force Base, in Ohio. The Wing is comprised of over 2000 personnel spread over 8 operating locations with an annual budget in excess of \$300M. Dr. Stargel is the primary science and technology advisor to the Chief Scientist of the Human Performance Wing. In this position he provides technical vision and strategy for science and technology planning. Prior to this, Dr. Stargel served as the chief for the Engineering and Information Sciences Branch in the Air Force Office of Scientific Research (AFOSR), in Arlington, Va, outside of Washington DC. He was also the program officer for the Multi-Scale Structural Mechanics Portfolio, which has an office staff of 200 people and an annual working budget of \$400 million that supports over 5,000 worldwide basic research projects. Dr. Stargel graduated summa cum laude with a bachelor's degree in Civil Engineering from Florida A&M University, and upon graduation, was selected for the USAF Palace Knight program and began his career with the United States Air Force in September of 1993. Dr. Stargel earned a Masters degree in Mechanical engineering and a doctorate in Mechanical Engineering from the University of Maryland at College Park in 2005.

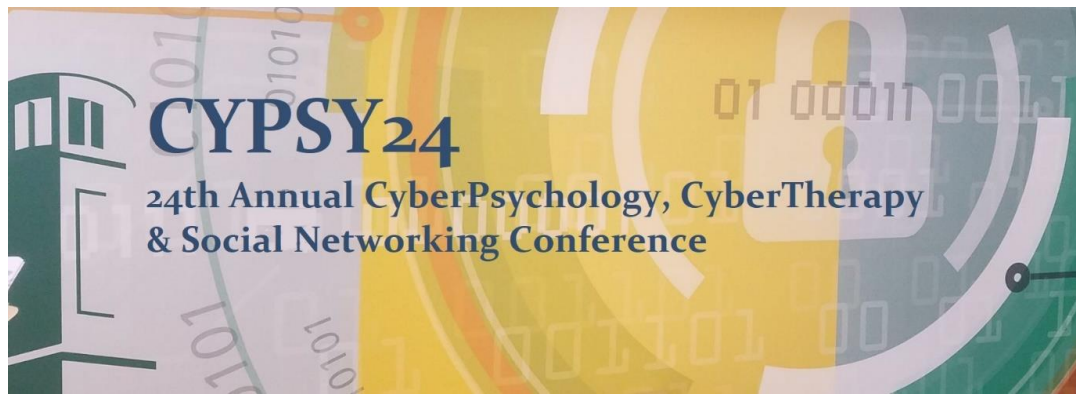
Keynote Speaker Abstracts:

Dr. Gráinne Kirwan: Forensic Cyberpsychology: A Transferable Discipline?

Forensic cyberpsychology has recently experienced a surge in popularity in both fiction and popular science media but this portrayal is rarely based on empirical evidence and is often comparable to the glamorised presentation of offender profiling which has been evident for decades. The reliability of these portrayals is exacerbated by the lack of scientific verification of the applicability of offline forensic psychology to online settings. The similarities and differences between online and offline offenders, victims, law enforcement, and other actors in this field have yet to be determined, and the question remains as to if the forensic psychology of offline offences and offenders translates directly to cybercrime or if these circumstances require a different skillset and perspective on the topic. This talk considers how existing knowledge and theory in forensic psychology may or may not enhance our understanding of cybercrime, with particular focus on how the psychology of online offending may differ significantly from offline equivalents.

Dr. David S. Stargel: Human-Machine Communication for Enhanced Decision Making


Advances are being made in the areas of artificial intelligence (AI) and machine learning (ML) for analyzing large amounts of data. Even with these significant improvements in data sciences, AI methodologies still fall short of making meaning and understanding from novel data to enable robust decision making. The ability of humans to use insight from past experiences to solve original problems far exceeds that of current AI and ML techniques. However, their capacity to process data has remained constant over the years. Human decision making is limited by three primary factors: available Information, cognitive processing power and time. Fully exploiting available information to improve decision quality of cyber operators will require the merger of the computational power of machines and the meaning-making ability of humans to work as a joint system. One challenge that must be addressed for realizing this synergistic relationship is the transmission of information between humans and machines. Since machines and humans represent knowledge differently, communication between these entities will require the appropriate transformation of data from the sender to the receiver for preserving the integrity and intent of the information. This presentation will discuss emerging technologies and tools to enhance decision making for cyber operators.



PROGRAM OF EVENTS*

**Subject to change*

Monday, June 24th – NSU Main Campus: Nursing & General Education Building (NGE)

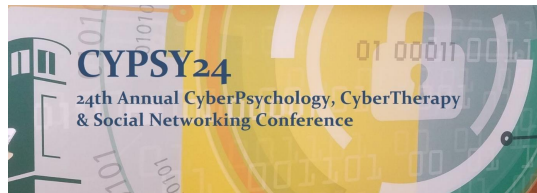
Time	Event
13:00	<p>Registration Opens: NGE 1st & 2nd Floor Lobby</p> <p>Coffee/Tea: Outside of NGE 205</p> <p><i>Exhibitor tables will be located outside of NGE 318</i></p>
15:00 – 15:30	<p>Opening Remarks: NGE 205</p> <ul style="list-style-type: none"> - Dr. Brenda K. Wiederhold (CEO IMI; President, VRMC) & Dr. Scott M. Debb (NSU Associate Professor of Psychology) - Dr. Javaune Adams-Gaston (President, NSU) - Dr. Leroy Hamilton Jr. (Provost, NSU) & Cassandra Newby-Alexander (Dean, NSU College of Liberal Arts) - Kurt Krause (President & CEO, Visit Norfolk)
15:30 – 17:00	<p>Keynote Address 1 (NGE 205)</p> <p>Forensic Cyberpsychology: A Transferable Discipline?</p> <p>Dr. Grainne Kirwan</p>  <p>(Lecturer of Psychology, Institute of Art, Design & Technology, Dún Laoghaire, Ireland)</p>
19:00 – 21:00	<p>Gala Dinner 1</p> <p>Spirit of Norfolk (meet in Town Point Park, just west of the Waterside District restaurants) 333 Waterside Dr, Norfolk, VA 23510</p> <p>Please arrive no later than 6:30pm to ensure your space on the boat</p> <p><i>* Preregistration is required!</i></p>

Tuesday, June 25th – NSU Main Campus: Nursing & General Education Building (NGE)

Time	Event
08:30	Registration Continues: NGE 3 rd Floor
Concurrent Sessions	
	<div>Session 1A: NGE 316</div> <div> 1. Influence of age and personality on young adolescents' exposure to and reporting of online risks <i>Gordon Ingram</i> </div> <div> 2. Effects of Cyberbullying Victimization on negative thoughts and relationship <i>Yeoju Chung</i> </div> <div> 3. Empathy in simulated teletherapy sessions: The role of attitudes and telepresence <i>Frédéric Grondin, Andréanne Simard, Alexane Baribeau-Lambert, Andrée-Anne Beaudoin-Julien, Anna Lomanowska, & Phillip Jackson</i> </div>
	<div>Session 1B: NGE 318</div> <div> 1. Evaluation of cybersickness in a passive walking virtual reality cognitive exercise <i>Anne Cabral, Nusrat Choudhury, Catherine Proulx, Rola Harmouche, Elicia Kohlenberg, & Patricia Debergue</i> </div> <div> 2. Using the VR buffet to disentangle the influence of guilt on child feeding <i>Susan Persky, Charlotte Hagerman, Rebecca Ferrer, & William Klein</i> </div> <div> 3. Interactive immersive virtual environments cause relaxation and enhance resistance to acute stress <i>Stefan Liszio & Maic Masuch</i> </div>
	<div>Session 1C: NGE 320</div> <div> 1. Traffic accidents: Studying driver's fatigue behavior by means of a VR driving simulator and physiological parameters <i>Pedro Gamito, André Lourenço, Carlos Carreiras, & Pedro Mendes Jorge</i> </div> <div> 2. Usability & security: Next-gen graphical authentication schemes <i>Jeremiah Still</i> </div> <div> 3. Assessment of executive functions in a virtual reality environment: Pilot study in Mexican population <i>Gaspar Ayora, Irene Alice Chicchi Giglioli, Georgina Cardenas Lopez, & Mariano Alcañiz</i> </div>
09:00 – 10:15	
10:15 – 11:00	Social Networking Break: Coffee & Tea (NGE 324) Poster Session A (3 rd Floor NGE)
Concurrent Sessions	
	<div>Session 2A: NGE 316</div> <div> 1. The cultural and psychological factors underlying online social capital and psychological well-being <i>Heyla Selim & Graham Scott</i> </div> <div> 2. Engaging in phygital at work: Human resources discourse to promote augmented reality acceptance in organizations <i>Ilaria Vergine, Eleonora Brivio, Tommaso Fabbri, Andrea Gaggioli, Giuseppe Leoni, & Carlo Galimberti</i> </div> <div> 3. Social media and sex: A baseline study of adolescent sexual risk behaviors <i>Sean-L Pennington, Sybil Rosado, M. Parker, C. Smith, & A. Helm</i> </div>
	<div>Session 2B: NGE 318</div> <div> 1. The Advent of Cyberneuropsychology: Impacts of technology on the brain and society <i>Dustin Weissman</i> </div> <div> 2. Cognitive behavioral immersion: treating addiction and inducing positive affect with virtual reality <i>Noah Robinson & Steve Hollon</i> </div> <div> 3. Investigating the impact of smartphone use and dependency on inhibitory control <i>Rachel Warsaw, Andrew Jones, Carl Roberts, Matt Field, & Suzanne Gage</i> </div>
	<div>Session 2C: NGE 320</div> <div> 1. Factors that affect youths' justification of cyber-harassment <i>Seda Gökçe Turan</i> </div> <div> 2. Kids Helpline Circles: Phase 2 findings from participant action research in the development of a secure national mental health social network <i>Andrew Campbell, Brad Ridout, Krestina Amon, Brian Collyer & John Dalgleish</i> </div> <div> 3. Online suicide games: A form of digital self-harm or a myth? <i>Maria Bada & Richard Clayton</i> </div>
11:00 – 12:15	

12:15 – 13:30	Buffet Lunch: NGE 205		
	*Liebert Invited CYBER Editorial Board Luncheon: NGE 309		
Concurrent Sessions			
13:30 – 14:45	Symposium 1: Online CBT for anxiety and post-traumatic stress disorders: NGE 314	Session 3A: NGE 316	Session 3B: NGE 318
	1. Internet-based CBT for test anxiety <i>Sara Freedman & Tzvi Richman</i>	1. Distinguishing the relative impact of PTSD and TBI on i-Pad-measured cognitive function <i>Michael Roy, Doren Walker, Patricia Taylor, Annabel Raboy, Zena Kirby, Kerri Dunbar, Thomas Oliver, & Melissa Guerra</i>	1. Friends who game together, stay together: A self-determination theory approach to the impact of multiplayer video gaming on social well-being <i>Yemaya Halbrook, Aisling O'Donnell, & Rachel Msetfi</i>
	2. The role of working alliance in the CBT of panic disorder with agoraphobia and generalized anxiety disorder delivered in telepsychotherapy <i>Stéphane Bouchard, Genevieve Robillard, André Marchand, Geneviève Belleville, Stéphanie Watts, Frédéric Langlois, Patrick Gosselin, & Michel G. Dugas</i>	2. Virtual reality air travel training (VR-ATT) in children along the autism spectrum - A pilot study <i>Ian Miller, Brenda Wiederhold, Catherine Miller, & Mark Wiederhold</i>	2. A point-light avatar and different perspectives control the feeling of embodiment <i>Chang-Seop Kim, Myeongul Jung, & Kwanguk Kim</i>
	3. RESILIENT – An online multidimensional treatment to promote resilience after a disaster: Who participated? <i>Jessica Lebel, Geneviève Belleville, Vera Békés, Marie-Christine Ouellet, Charles Morin, Nicolas Bergeron, Tavis Campbell, Sunita Ghosh, Stéphane Bouchard, Stéphane Guay, & Frank MacMaster</i>	3. Virtual reality: An important tool in women's healthcare <i>Brenda K Wiederhold, Jose Luis Mosso, & Mark D Wiederhold</i>	3. NPCs matter: Preliminary evidence for the relationship between video game play and more positive attitudes towards minorities within the framework of intergroup contact theory <i>Agnieszka Mulak & Mikolaj Winiewski</i>
	4. RESILIENT – An online multidimensional treatment to promote resilience after a disaster: Preliminary results from a randomized controlled trial <i>Geneviève Belleville, Marie-Christine Ouellet, Jessica Lebel, Vera Békés, Charles M. Morin, Nicolas Bergeron, Tavis Campbell, Sunita Ghosh, Stéphane Bouchard, Stéphane Guay, & Frank P. MacMaster</i>		
14:45 – 15:30	Social Networking Break: Coffee & Tea (NGE 324)		
	Poster Session B (3 rd Floor NGE)		

Concurrent Sessions		
Session 4A: NGE 316	Session 4B: NGE 318	Session 4C: NGE 320
<p>1. Virtual reality in interventional treatments in Pain Clinic National Medical Center, November 20, ISSSTE, first experience <i>José Luis Mosso, Brenda Wiederhold, Mark Wiederhold, Dejanira Mosso, & Patricia Canseco</i></p> <p>15:30 – 16:45</p> <p>2. Expectations of the self in virtual reality: A qualitative analysis of individuals' experiences when creating virtual avatars <i>Swati Pandita, Lee Humphreys, & Andrea Stevenson Won</i></p> <p>3. Virtual reality mobile-based biofeedback: Development and usability test of an application <i>Javier Fernández-Álvarez, Pietro Cipresso, Michelle Semonella, Desirée Colombo, & Giuseppe Riva</i></p>	<p>1a. Personality and cybersecurity behaviors: The role of the “Big Five” <i>Charlotte Dawson, Alex Shappie, & Scott Debb</i></p> <p>1b. Confirmatory factor analysis to analyze Instagram Questionnaire factor structure fit across cultural settings <i>Daniel Schaffer & Scott Debb</i></p> <p>2. Effects of autobiographical self-referencing on presence and emotions in immersive storytelling: An exploratory study <i>Andrea Gaggioli, Stefano Magoniand, & Alice Chirico</i></p> <p>3. Transcending the lab: Using storytelling and theatre practices to support self-transcendent experiences in virtual reality <i>Alexandra Kitson, Ekaterina Stepanova, Ivan Aguilar, Natasha Wainwright, & Bernhard Riecke</i></p>	<p>1. Interpersonal online risks: Exploring the dual systems model, personality and the fear of missing out <i>Masa Popovac & Anna Eldred</i></p> <p>2. #Eating disorders and Instagram: What emotions do you express? <i>Clelia Malighetti, Alice Chirico, Simona Sciara, & Giuseppe Riva</i></p> <p>3. Advancing an understanding for managing police operations in response to cyberstalking and cyber harassment <i>Melanie Pitchford, Niamh McNamara, Emma Short, James Barnes, & Ellie Myers</i></p>
<p>17:00 – 17:30</p>	<p>Awards Ceremony & CYPSY24 Updates (NGE 205)</p> <p>Presented by Dr. Brenda K. Wiederhold (Conference Co-Chair, IMI, VRMC)</p>	
<p>19:00 – 21:00</p>	<p>Gala Dinner 2</p> <p>Saltine (meet inside the restaurant, located in the Hilton Main, downtown Norfolk) <i>100 E Main St, Norfolk, VA 23510</i></p> <p>Please arrive no later than 6:45pm to ensure proper seating at the restaurant</p> <p><i>* Preregistration is required!</i></p>	



June 25, 2019 Program: Detailed Information

09:00—10:15 (Session 1A)

1. **Influence of age and personality on young adolescents' exposure to and reporting of online risks**

Gordon Ingram

ABSTRACT: Young people's exposure to various forms of risk on the Internet, including interactions with strangers, inappropriate material, and cyberbullying and other kinds of online conflict, is an increasing social concern. Consistent findings are that exposure to online risks increases with age through adolescence (Livingstone & Smith, 2014) and is associated with personality characteristics such as sensation-seeking (Baumgartner, Sumter, Peter, & Valkenburg, 2012). However, it has been much less common to look at how adolescents' own reporting to adults of the risks that they face varies with age and personality, even though effective communication about online risks is vital to helping young people confront them. Research on online risks in Colombia and most other Latin American countries (as well as low-and-middle-income countries in general) is also lacking. The current study aimed to address these omissions using a survey of 203 Colombian young adolescents (101 female, 84 male), almost all aged between 12-15 years and in 7th or 9th grade. The survey

http://psicologiauniandes.qualtrics.com/jfe/form/SV_daiAO2TRwc1t1it) was administered at two public secondary schools in Bogotá, Colombia, serving mainly low-to-middle-income working families.

Hypotheses were pre-registered at <http://aspredicted.org/blind.php?x=6ci7z7>. Age-related hypotheses were that exposure to online risks and online conflicts would rise between 7th and 9th grade, while reporting of risk exposure to adults would fall. For the hypotheses relating to personality, a short but comprehensive Big Five personality test, the TIPI (Gosling, Rentfrow, & Swann, 2003), was administered. Openness to experience was postulated to be associated with more exposure to online risks, conscientiousness with less exposure to online risks and more reporting to adults, extraversion with more reporting of online incidents (especially to peers), agreeableness with fewer arguments and conflicts online, and neuroticism with more concern about online risks. Results supported all of the age-related hypotheses: 9th-graders were exposed to significantly more online risks and participated in significantly more online conflicts than 7th-graders, while reporting such incidents significantly less often to adults (both parents and teachers). However, the only personality-based hypothesis to be firmly supported was that extraversion would be associated with more reporting of online risks experienced. There was also a marginally significant correlation between openness to experience and exposure to online risk, which did not remain significant following Bonferroni correction. Multiple regressions also showed that demographic factors (age and gender) taken together explained significantly more of the variation in online risk exposure, conflict participation and risk reporting than did personality factors. Complementing results from studies in many other countries (Livingstone & Smith, 2014), these findings from Colombia support the idea that children reliably go through a phase of increased exposure to online risks and conflicts in early-to-middle adolescence. The more novel finding that this increase in risk was accompanied by a reduction in reporting of such incidents to adults is concerning. Interventions against online risks could perhaps utilize the tendency of adolescents to talk their problems over with peers, since unlike reporting to adults this did not decrease between 7th and 9th grade. While more

specific personality features such as sensation-seeking may be important, broad personality factors (the “Big Five”) did not seem very useful for explaining exposure to online risks and conflicts, at least for this population.

2. **Effects of Cyberbullying Victimization on negative thoughts and relationship**

Yeoju Chung

ABSTRACT: In Korea, 35.7% of adolescents were reported as cyberbullying victims (Chung & Kim 2012). So researchers have studied what cyberbullying victim experience causes. The purpose of this study was to develop and verify cyberbullying victimization model consisted of cognitive change and behavioral action of cyberbullying victims. In this research, 1,105 students (11-19 years, male 51.2%, female 48.2%) in South Korea participated in this study. The research scales for this study were Cyberbullying victimization scale, Cyberbullying cognitive change scale and Cyberbullied adolescents’ behavioral response scale. After setting the full mediation model, then we verified the equation model through analysis of model fit and parameter estimated value. First, cyberbullying victimization influenced on aggressive response to the bullies mediated by negative conceptualization, negative assessment of other people, and negative thoughts about results. This model was validated statistically (CFI=.948, NFI=.937, TLI=.935, RMSEA=.065). Second, cyberbullying victimization influenced on asking for help mediated by worry about relationship, internalization and thoughts about results. This model was validated statistically (CFI=.925, NFI=.910, TLI=.911, RMSEA=.064). How cyberbullying victims evaluate and interpret the experience influences their behavior. Therefore, it is necessary to deal with how the victim perceives or responds to the experience of cyberbullying, and to intervene in changing the dysfunctional emotions or behaviors caused by cyberbullying damage. Counseling may help cognitive restructuring of cyberbullying damage, and it can be a therapeutic intervention for cyberbullied clients.

3. **Empathy in simulated teletherapy sessions: The role of attitudes and telepresence**

Frédéric Grondin, Andréanne Simard, Alexane Baribeau-Lambert, Andrée-Anne Beaudoin-Julien, Anna Lomanowska, & Phillip Jackson

ABSTRACT: Therapists and clients are increasingly adopting teletherapy, defined as the use of communication technologies, such as videoconference, to conduct clinical sessions. Evidence suggests that teletherapy through videoconference (VC) compares favorably to face-to-face treatments (F2F) in terms of effectiveness and strength of the therapeutic alliance. However, other clinical variables, such as empathy and its facilitators, have seldom been studied in teletherapy. 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 ingredient of successful therapy. Available data suggest that empathy is hindered in teletherapy, though no study has yet compared empathic ratings of both clients and therapists between VC and F2F sessions. Certain aspects of the clients’ and the therapists’ experience of teletherapy could impact empathy. Interactants’ attitudes regarding the value of teletherapy and their comfort level could contribute to how critical they may be during VC sessions. This mindset could impact telepresence, or the feeling of ‘being together’ in teletherapy sessions. The present study compared empathic ratings of participants who played the role of therapists or clients in simulated clinical sessions across VC and F2F. The influence of attitudes and telepresence on empathic ratings was also investigated. Methods.

University students with counseling experience and training were recruited and randomly assigned to the role of therapist or client and paired in dyads. Fourteen dyads have been recruited so far (25 females; Age in years: 25.46 ± 5.47 ; University years completed: 4.13 ± 2.16). The clients chose a personal theme of discussion from a list, avoiding extreme cases of personal distress. Each dyad completed two twenty-minute simulations of clinical sessions in VC and F2F settings in a counterbalanced order. Questionnaires were used to assess empathy, attitudes, affectivity, and telepresence. Attitudes were assessed prior to the experiment, while empathy and telepresence were measured after each session. Negative and positive affectivity were measured pre- and post-session to assess the emotional impact of each session on clients. Results. Paired t-tests indicated that VC interactions featured lower mean empathic ratings than F2F interactions, achieving marginal statistical significance for clients, $t(12) = -1.56$, $p = .07$, $d = .61$, and statistical significance for counselors $t(12) = -1.97$, $p < .05$, $d = .78$. Clients' post-session negative affectivity significantly decreased from baseline levels in both F2F, $t(13) = 2.76$, $p < .05$, $d = 1.04$, and VC sessions, $t(12) = 2.88$, $p < .05$, $d = 1.17$, suggesting that VC interactions offered some benefits to clients. However, positive affectivity levels of clients increased significantly in the F2F condition, $t(13) = -3.56$, $p < .05$, $d = 1.35$, but not in the VC setting, $t(12) = -.68$, $p = .26$, $d = .30$. Telepresence, attitudes, and empathy were included in a mediation analysis pooling all participants ($n = 28$). Telepresence fully mediated the link between attitudes and empathy with an effect size of the indirect effect of $-.47 \pm .25$, 95% CI $[-1.02, -.026]$ using 5000 bootstrap samples. Participants who attributed greater discomfort to VC were more likely to report lower telepresence, which was linked to decreased levels of empathy in VC. Conclusion. This study is the first to experimentally compare empathic ratings in dyads of participants playing the roles of clients or therapists across VC and F2F settings. The results support the importance of targeting prior (negative) attitudes and increasing telepresence as potential facilitators of empathy in teletherapy. A replication of these results with actual therapists and clients is warranted as the simulated context of this study could have more readily impacted telepresence and empathy during VC sessions.

09:00—10:15 (Session 1B)

1. Evaluation of cybersickness in a passive walking virtual reality cognitive exercise

Anne Cabral, Nusrat Choudhury, Catherine Proulx, Rola Harmouche, Elicia Kohlenberg, & Patricia Debergue

ABSTRACT: bWell is an interactive immersive research platform targeting cognitive assessment and remediation, developed at the National Research Council Canada. One of the objectives of the platform is to develop with and respond to the needs of clinical research institutions by providing a toolkit of exercises that can be adapted for specific disorders and populations. In an earlier study, it was shown that the bWell platform was well tolerated by healthy adults under short exposures in static scenes. Recently, feedback from collaborators showed that there is a common need for scenes with the user being passively displaced while seated. In response, we have developed a passive nature stroll virtual reality (VR) scene for seated users. The exercise imposes a walking pace and encourages active guided head movement through a cognitive task. In this work we have evaluated the usability of the developed exercise under long exposures and several challenging motion conditions for different user

characteristics. Eighteen healthy adults have been enrolled for the study. In the experiment, users were seated and wearing an HTC Vive Pro headset. They performed a continuous attention task by responding to visual targets appearing in front of them. This setup makes it possible to evaluate cybersickness in the specific context of a cognitively challenging task. It also encourages the users to actively rotate their heads (140 degrees) to follow the targets which appear along an arc. The experiment was divided into three blocks to allow comparison of the different movements. In the first block, users advance in a straight line at a constant velocity while performing the attention task. In the second block, users walk along a sinusoidal path, with a constant linear velocity and a sinusoidal angular velocity and acceleration while performing the attention task. In the third block, users follow the straight path with a constant velocity but do not perform an attention task: they are free to look around at the environment. All subjects ($n=18$, $f=4/m=14$, ages=33-62) attempted each of the three blocks, in semi-randomized order, for a duration of 8 minutes per block. MSSQ scores ranged from 0 to 32 (0-96th percentiles). All trials were conducted during the same session, with a short break (100-270 seconds) in between trials to complete the Simulator Sickness Questionnaire (SSQ). Discomfort was also evaluated every minute for the duration of each block with the Fast Motion Sickness Scale (FMS) (a 20 point Likert scale). Early results indicate that the system is generally well tolerated. Significant symptoms were rare, and only reported when angular acceleration was present. Only one trial had to be interrupted (block 2). Cybersickness symptoms resolved quickly in between blocks of the experiment (on average, 70% of symptoms resolved within less than 3 minutes). In all blocks, a correlation between the MSSQ and the presence of cybersickness symptoms (total $r = 0.37$) is observed. With regards to the severity of the symptoms, no obvious link has been observed: even subjects who reported a high susceptibility to motion sickness tolerated scenarios with a constant velocity (maximum SSQ score = 5). These findings extend the design possibilities for VR-based cognitive exercises to include more challenging motion patterns, including passive displacement and angular visual scanning. It also gives the opportunity to use these kinds of exercises with a more vulnerable population. The design and results stemming from this usability study will allow us to move towards a model with adaptive and dynamic scene adjustments which take into account patient susceptibility as well as health condition.

2. **Using the VR buffet to disentangle the influence of guilt on child feeding**

Susan Persky, Charlotte Hagerman, Rebecca Ferrer, & William Klein

ABSTRACT: Introduction: One important predictor of adult obesity is eating behavior during childhood. Accordingly, parents often express guilt about their feeding practices. Although guilt is an aversive experience, it can motivate individuals to improve their behavior to rectify perceived wrongdoing. Although parental guilt is ubiquitous and considered inherent to parenting, and that strong theoretical hypotheses exist as to the nature of the relationship between guilt and feeding behavior, no research has explored how this guilt might influence parents' child feeding behavior. Part of the difficulty in studying parent feeding behavior hinges on the research methods available. Child feeding research is typically uses self-report instruments, asking parents what they intend to feed their child in the future or what they have fed them in the recent past. These measures are subject to retrospective and other biases. As such, behavioral measures are the gold standard for this research, however, the use of real food is costly, wasteful, and typically conducted in a sterile laboratory environment. To address these shortcomings, our group developed a tool wherein parents create a meal for their child using an

immersive VR buffet simulation that provides precise information on their feeding choices, alongside information about the behavioral process through which choices were made. In past work we have validated the VR buffet, demonstrating that parents' serving size choices are highly correlated with real serving sizes. This study examined relationships among parental guilt related to child feeding, parents' feeding behavior in the VR buffet, and parent intentions to improve child feeding in the future. We also assessed parent BMI as a potential moderator in these relationships. Method: Participants were 190 parents (126 mothers) with a biological child between 4 and 7. Parents completed a baseline questionnaire, then came for a study visit in the lab. After receiving a message about healthy feeding practices, parents reported their levels of guilt about child feeding. They then chose food for their child in the VR buffet, and subsequently reported their intentions to improve feeding in the future. Results: Guilt was not associated with the number of healthy foods chosen in the VR buffet. Greater guilt was associated with more servings of unhealthy food, but only among parents with higher BMI (+1 SD, $b=.32$, $p=.010$), not among those with lower BMI (-1 SD, $b=-.04$, $p=.758$). Parents with greater guilt, had greater intentions to increase the amount of fruit and vegetables they feed their child in the next six months. Greater feeding guilt was associated with greater healthy feeding intentions among parents who chose a large amount of unhealthy in the buffet (+ 1 SD, $b=.43$, $p<.001$), but not those who chose a small amount of unhealthy foods (-1 SD, $b=.15$, $p=.160$). However, among parents with lower levels of guilt (-1SD), those who chose more unhealthy foods in the buffet had significantly lower intentions to change their fruit and vegetable feeding behavior in the future ($b=-.25$, $p=.022$). Discussion: Parental guilt about feeding was associated with less healthy behavior among parents with higher BMI, yet healthier intentions for parents overall. Guilt was only associated with greater intentions to improve feeding if the parent had served a large amount of unhealthy foods in the buffet. Thus, guiltier parents may not have greater intentions to improve until their poor feeding behavior is salient. Importantly, the VR buffet was sufficient for making these behaviors salient and potentially prompting intentions to change. Future research is needed; however, the VR buffet may be useful not only for measuring and understanding parents' feeding behavior, but also as a platform for interventions that encourage feeding behavior change among parents

3. **Interactive immersive virtual environments cause relaxation and enhance resistance to acute stress**

Stefan Liszio & Maic Masuch

ABSTRACT: INTRODUCTION: Even in situations of great pain and emotional distress, (natural) virtual environments (VE) presented in virtual reality (VR) can distract from stressors and help finding relaxation and joy (Hoffman et al., 2000; Baños et al., 2013; Wiederhold et al., 2014). While studies demonstrated that immersion supports distraction from acute strain, as well as recovery from prior strain respectively, little is known about the persistency of this effect in following situations. To increase these restorative effects, influencing characteristics of such VR applications must be examined. It has been shown that higher levels of immersion result in deeper relaxation and increased positive affect, supporting the hypothesis that immersion consumes cognitive resources necessary for experiencing stress, anxiety, or pain (Liszio et al., 2018). We assume that interactivity of the VE reinforces immersion since interacting with the virtual world increases the experience of spatial presence and binds additional resources. Thus, we investigate whether interactivity increases the relaxing and mood enhancing effect

of natural VE. Furthermore, we target the question whether using such a playful, immersive VE as preventative measures increases resistance to acute psychosocial stressors. **METHOD:** To investigate the influence of interactivity, we developed a VR application that has two modes: a non-interactive mode and an interactive mode. The natural VE (a computer-generated beach) and all objects therein were identical in both modes. The interactive mode comprises two additional consecutive mini-games. In the first game, the player has to destroy wooden barrels with coconuts. In the second game, the player needs to plant and water flowers to feed a turtle. The application was designed as a seated experience for Oculus Rift and Touch controllers for realistic interaction with the game world (i.e., grabbing, throwing). Heart rate variability (HRV) was recorded over the entire experiment. Self-reported anxiety (State-Trait Anxiety Inventory), affect (Positive and Negative Affect Schedule), presence (Igroup Presence Questionnaire) and player experience (Game Experience Questionnaire; GEQ) were assessed at three points in time. We used a between-subjects design with three conditions (interactive, non-interactive, control). After preparation and giving informed consent, subjects in both experimental groups were exposed to the VR app. Subjects in the control group were asked to wait in the lab while the experimenter was present. This phase lasted nine minutes in all conditions. Subsequently, all participants were stressed using a VR version of the Trier Social Stress Test. **RESULTS:** 57 healthy subjects aged 18 - 49 years ($M = 23.7$, $SD = 5.67$) participated in this study. Mean HRV values while using the VR app were significantly higher (i.e., indicating relaxation) in the interactive group compared to the non-interactive and the control group. Considering relative change of HRV from induction to stress phase as dependent variable, we found significant differences between all three groups, with the interactive condition denoting the lowest decrease. Surprisingly, group differences in the mean anxiety and affect values were not significant. This inconsistency may be due to different methods of data collection: subjective data was collected by asking the participants retrospectively and thus may be less accurate than the continuously recorded physiological data. The experience of spatial presence was significantly higher in the interactive condition compared to the non-interactive condition. Moreover, an increase of spatial presence predicts an anxiety decrease (32%) and a positive affect increase (33%). Analysis of the GEQ data points at the interactive-mode being associated with more positive player experience. **CONCLUSION:** The observed physiological stress responses indicate that interactivity plays an important role in the relaxing, mood enhancing effect of VE presented in VR. Resulting in deeper immersion, relaxation and joy, playful interaction in VR helps improving resistance to subsequent stressful situations

09:00—10:15 (Session 1C)

1. Traffic accidents: Studying driver's fatigue behavior by means of a VR driving simulator and physiological parameters

Pedro Gamito, André Lourenço, Carlos Carreiras, & Pedro Mendes Jorge

ABSTRACT: Traffic accidents still take the lives of more than a million people worldwide, they are also responsible for millions of injuries and the leading cause of death among young adults. 20% of the accidents are related with fatigue. Aiming in shedding some light on driver's fatigue behavior and building on previous work, we devised an experimental setting for acquisition of fatigue's physiological-

based indicators on a VR driver simulator. We have monitored and recorded indicators such as driver's position/angle of the steering wheel (SWA – steering wheel angle), reaction speed and driver's physiological profile (electrocardiography [ECG], temperature and skin conductivity [SC]), while the participants were driving through three different VR environments: highway, secondary road and city street. In these settings, developed in Unity 3D, we introduced several stimuli (changing speed, width and sinuosity of the track, degree of congestion, unforeseen obstacles or other distractions) to module participants' behavior and understand how fatigue, as measured by the Karolinska Sleepiness Scale (KSS) is correlated with those indicators. Regarding the analysis of the physiological indicators, the ECG was analyzed in 4 minutes windows and the frequency using heart rate variability (HRV) analysis. From temperature and the SC, on-sets were extracted as main features. The classification methodology was based on the combination of three independent SVM (support vector machine) classifiers with HRV, SWA and SC and trained from KSS reported values. The evaluation was preformed based on the correlation with driving behavior obtained from the simulator. A pilot study with 10 participants, which preformed two independent simulations, lead to the creation of user-tuned classifiers. Preliminary data revealed promising results relating to behavioral data and classification outcomes. Future work aims at generalizing classifiers to find features that work for all the population.

2. Usability & security: Next-gen graphical authentication schemes

Jeremiah Still

ABSTRACT: Authentication protects valuable information by requiring users to confirm their identity. Users are granted access to systems if they can confirm something they know (e.g., a password), something they have (e.g., a token), or something they are (e.g., a fingerprint; Cazier & Medlin, 2006). Alphanumeric passwords, a knowledge-based scheme, are the most commonly used authentication scheme (Grawemeyer & Johnson, 2011; Zviran & Haga, 1999). Alphanumeric authentication fails mainly because of end-user issues (e.g., do not use the entire password dimensional space, reuse passwords across services). Technical security requirements often make authentication difficult (Grawemeyer & Johnson, 2011). For example, passwords have to be long and complex to help defend against brute force attacks. Any next-generation authentication scheme needs to strike a balance between security requirements and usability (Still, 2016). Popular graphical next-generation schemes involve the use of pictures instead of alphanumeric characters. People can quickly and easily remember pictures versus strings of letters, symbols, and numbers. Further, the memorability of the picture-based passcodes is impressive. With very little practice, users do not forget passcodes weeks later. However, this very strength of graphical authentication presents a weakness for security. A casual attacker can look over-the-shoulder of a user and steal their credentials. The recognition of this security vulnerability has produced over a decade of possible deterrents against casual bystanders. They can be classified as those schemes that group targets among distractors, translate them to another location, and disguise the appearance of targets. These schemes can help prevent Over-the-Shoulder Attacks (OSA). The previous literature over the last decade has shown that visually rich stimuli such as pictures show superior memorability. Further, images offer extra sensory data (c.f., letter, numbers, and special characters), which helps encoding and later retrieval (i.e., picture superiority effect). This talk will explore an array of next-gen graphical authentication schemes created in our laboratory over the last few years (e.g., Tiller, Angelini, Leibner, & Still, in press; Still & Bell, 2018; Cain & Still, 2017). The trade-off between

security and usability will be highlighted (Still, 2016). And, our recent findings resulting from directly comparing the usability of OSA resistant graphical authentication schemes and alphanumeric passwords will be discussed (Cain & Still, 2018). This talk will target both experts in the field along with novices. The experts will benefit from learning about cutting edge research, while the novices will start to gain an understanding of the complexities surrounding the creation of next-gen authentication schemes.

3. **Assessment of executive functions in a virtual reality environment: Pilot study in Mexican population**

Gaspar Ayora, Irene Alice Chicchi Giglioli, Georgina Cardenas Lopez, & Mariano Alcañiz

ABSTRACT: The executive functions (EFs) are often referred as a group of voluntary processes that manifest themselves in mental states of focusing or attention, aiming to achieve the demands of a task. There are three primordial executive functions: inhibition (behavioral inhibition and interference control), working memory and cognitive flexibility. From this functions others are built, such as reasoning, problem solving and planning (Diamond, 2013). The appropriate set on of cognitive functions is essential to the mental and physical health, academical and work success and to the physiological, social and cognitive development. When something isn't properly working in an individual's life, executive functions are of the first indicators of some condition (Diamond, 2013). Poor scores on the EFs measures are observed in stress situations, depression, loneliness, sleep deprivation and physical problems. There's and increasing focusing of attention in analyzing the ecological validity of the assessment of executive functions (Chaytor & Schmitter-Edgecombe, 2003; Jansari, Devlin, Agnew, Akesson, Murphy & Leadbetter, 2014). Along the years, the assessment of cognitive functions moved from the diagnostic to the client's everyday cognitive abilities (Chaytor & Schmitter-Edgecombe, 2003) seeking to draw a picture of the person's daily function. From the beginning neuropsychological assessment has employed paper-and-pencil test to assess cognitive abilities (Parsey & Schmitter-Edgecombe, 2013). However, problems concerning the ecological validity have raised (Chator & Schmitter-Edgecombe, 2003). Virtual Reality (VR) can recreate daily experiences, compensating the limitation of the traditional tests on reflecting daily situations (Slater, Lotto, Arnold & Sánchez-Vives, 2009). The Advanced Therapeutic Tools for Mental Health (ATHENEA) is an international Project of the Technical University of Valencia (UPV) in collaboration with the National Autonomous University of Mexico. Using virtual reality, this Project assess four basic needs derived from the consistency theory of Grawe (2003). This model suggests that people seek the satisfaction of four basic things: attachment, self-enhancement, increasing pleasure and avoiding pain, and the need of orientation. Consistency happens when these needs are in perfect balance. This virtual environment comprises ten situations that aim to evaluate each of the basic needs. For example, situations designed to assess self-enhancement, require the participant to perform several cognitive tasks in which the set-on of executive functions is crucial to complete the tasks. VR, then, could be and interesting and promising option to increase ecological validity and provide reliable measures of behavior (Chicci, Riva & Alcañiz, 2017) such as executive functioning. A pilot study is being carried out with a sample of 60 healthy Mexican participants with ages between 18 and 55 years old. Procedure: Patients will perform 5 sessions in the virtual environment. Sessions two, three and four require executive functioning to solve the exercises correctly. Measures: Traditional (paper-pencil) neuropsychological assessment will be performed to evaluate the same cognitive functions that are required for the exercises on the virtual platform, as

developed by the designers. These functions include inhibition, working memory, speed of processing, attention, cognitive flexibility, sustained attention, divided attention, among others. While completing the tasks, physiological activity of the participants Will be recorded using the Empatica E4 wristband. Data includes blood volume pressure, electrical properties of the skin, temperature, heart rate, etc. Expected Results: We seek to present a comparison between the neuropsychological measures and the performance on the virtual environment, along changes in the physiological data. Preliminary statistical results will be presented at the CYPSY 2019.

11:00—12:15 (Session 2A)

1. The cultural and psychological factors underlying online social capital and psychological well-being

Heyla Selim & Graham Scott

ABSTRACT: We conducted a cross-cultural investigation into the impact of Online Social Network (OSN) usage on wellbeing. In particular we explored the mechanisms underlying Online Social Capital, Identity Motives, Online Self-Presentation Strategies (OSPSs), and Psychological wellbeing. This extended previous research by Selim, et al, (2016) which demonstrated that, for OSN users in both the UK and Saudi Arabia, cultural demands (adherence to cultural norms, need to satisfy family and friends) often clash with personal needs. For example, UK OSN users might need to balance the identity motives of distinctiveness and self-esteem with the societal norm that interprets ‘boastful’ behaviour as negative. Saudi users, meanwhile, may sometimes want to express socially unacceptable opinions or interact with non-family members of the opposite sex on OSNs, while concealing such behaviour from significant others who might perceive such behaviours negatively. Saudi users thus often utilize fake profile pictures and pseudonyms online, and the requirement to satisfy conflicting needs can lead to self-fragmentation that negatively impacts psychological wellbeing. A total of 694 participants (563 female; 284 from the UK and 410 from Saudi Arabia) were recruited online and completed measures of Online Social Capital (Online Bridging: outward focus, contact with a broader range of people; Online Bonding: seeking emotional support, access to scarce or limited resources, ability to mobilize solidarity, and out-group antagonism: Williams, 2006), Identity Motives (to maintain or enhance feelings of: self-esteem, continuity, distinctiveness, belonging, efficacy, and meaning in their identities; Vignoles, 2011), OSPSs (positive impression management, self-disclosure (mind casting); Selim, et al., 2016), and psychological wellbeing measures Satisfaction with Life (Diener, 1985), Subjective Happiness (Lyubomirsky & Lepper, 1999), and Loneliness (Russell, 1996). Following preliminary analysis, mediation analyses were carried out to examine the role of Identity Motives and OSPSs as mediators between Social Capital (bridging) and the psychological wellbeing outcomes of Happiness and Loneliness, with participants’ age, sex, and level of education as covariates. In the UK sample, the identity motive of self-esteem completely mediated the relationship between social capital (bridging) and loneliness [effect=0.0718, CI=0.0260, 0.1237], while sex also significantly impacted loneliness [$b=-.2230$, $t(278)=-3.7573$, $p<0.001$]. Higher levels of bridging led to increased self-esteem, which reduced loneliness, while men were more lonely than women. In the Saudi sample, the identity motives of meaning [effect=0.0862, CI=0.0372, 0.1493] and self-esteem [effect=0.0905, CI=0.0388, 0.1579] and

the self-presentation strategy of positive Impression management (PIM) [effect=0.1005, CI=0.0311, 0.1749] all completely mediated the relationship between bridging and happiness, while age also significantly impacted happiness [$b = -0.0223$, $t(401) = -0.7527$, $p < 0.05$]. Higher levels of bridging led to higher levels of self-esteem, meaning and positive impression management, which in turn resulted in increased happiness, while increased age was associated with decreased happiness. Also in the Saudi sample, the identity motives efficacy [effect=-0.0331, CI=-.0568, -.0144], distinctiveness [effect=0.0216, CI=0.0045, 0.0440], and belonging [effect=-0.1009, CI=-0.1408, -0.0672], all completely mediated the relationship between bridging and loneliness, with none of the covariates significant. Higher levels of bridging led to higher levels of efficacy, distinctiveness and belonging, which in turn resulted in decreased loneliness. In both samples, bridging is linked to loneliness. While this is mediated by self-esteem in the British samples, among Saudi users the relationship is more complex, with loneliness being mitigated by increased belonging, and higher ratings of efficacy and distinctiveness. Although bridging was not related to increased happiness in UK users, there was a strong connection among Saudi users, mediated by their ability to manage their online persona and cultivate self-esteem. These findings suggest that more research on the role of social network sites among adults from different cultural backgrounds is needed, since connections through SNSs may play an important role in psychological development.

2. **Engaging in phygital at work: Human resources discourse to promote augmented reality acceptance in organizations**

Ilaria Vergine, Eleonora Brivio, Tommaso Fabbri, Andrea Gaggioli, Giuseppe Leoni, & Carlo Galimberti

ABSTRACT: Context: Digital disruption causes a modification in how subjects think and perceive events, and in traditional ways of creating value in the market and in social interactions. As a consequence, humans have to cope with the crisis of previous models (Riemer, Gal, Hamann, Gilchrist, & Teixeira, 2015). The improvement of digital technologies also affects the shape of the environment. New kinds of space and places are emerging. The boundaries between ‘real’ and ‘online’ environments are becoming blurred, and physical and digital dimensions of environments are more and more integrated. Phygital could be considered an example of the effects of digital transformation. In this environment, physical and digital coexist with these features: context awareness, embeddedness, and natural interaction (Gaggioli, 2017). Digital disruption and its consequences on environments (e.g., phygital) modify workplaces too. This study aims to comprehend how subjects’ online communications deal with one phygital aspect: Augmented Reality (AR). The study investigates Discourses provided through TED talk format because this kind of public speech could be considered relevant to the co-construction of social representation (figured world) related to AR. The research purpose is giving some hints to support Human Resources in developing strategic communication for the effective implementation of AR. The contribution is an extension from the presented material at 23rd Annual CyberPsychology, CyberTherapy & Social Networking Conference (2018) entitled A new field for (transdisciplinarity) cyberpsychology: Phygital environments. An intermediate paper has been presented at 7th International e-HRM Conference: HRM 4.0 for Human-Centered Organizations (2018). Methods: A corpus-assisted discourse analysis was conducted, which is a technique of discourse analysis. It is suitable for developing evidence-based interpretations and detecting Discourses (Jones, 2012). When

subjects interact, they use Discourses to spread ideologies and figured worlds (Gee, 2014). The corpus was selected from the TED website, in particular from TED talks, which could be considered a communication where scientific ideas are spread in a non-academic context with attention to possible and future consequences in the daily life. This focus on the future should be considered consistent with the strategic vision needed to bring successful changes in organizations (Gratton, 2015). The corpus was constructed with the following criteria: 1) the talk was tagged by TED website itself within inherent 'Topics' such as AR, Augmented Reality or mixed-reality and the talk content was strictly related to AR phenomenon and not to virtual reality or other kinds of mixed-reality; 2) the talk was recorded during 2018, and its contents are related to AR, Augmented Reality or mixed-reality. Initially, the corpus included 23 talks; however, only 7 talks were analyzed because they satisfied the previously mentioned selection criteria. The AntConc (Anthony, 2018) software was used to process texts. The analysis followed these steps: 1) measure of lexical complexity; 2) detection of keywords (reference corpus: BNC), sequential and non-sequential patterns; 3) disclosure of Discourses; 4) comparison with findings of other team members. Results: Implementing AR should be considered a change, and it could be possible to narrate it as a journey. The Discourse of journey implies to introduce: technical Discourse about characteristics of technology; Discourse about human psychology (e.g., expectations); Discourses about figured world related to the environment; experiential Discourse which connotes the effective implementation of AR as a richer experience of the working world. Conclusion: Introducing new technologies means managing the complexity of socio-technical systems. New technologies open possibilities for interacting/collaborating and achieving information. The capacity of helping the workforce to think about possible scenarios proactively is critical to building a richer and smarter experience of the environment through the opportunities related to the implementation of phygital environments.

3. Social media and sex: A baseline study of adolescent sexual risk behaviors

Sean-L Pennington, Sybil Rosado, M. Parker, C. Smith, & A. Helm

ABSTRACT: In today's technological age, one can find that the parameters of social interaction are being defined by the social standards of the internet. Human interaction now has the access to become digital through the anonymous lens of the internet. I believe this understanding of anonymity and ease of access coupled with sexually based advertising, is a defining factor in how individuals engage in sexual health practices. Supporting evidence includes the fact that the age range for highest risk of transmitting Sexually Transmitted Infection (15-24), is also the same age range of the most frequent social media users. This age group also accounts for 50% of individuals living with sexually transmitted infection even though they account for about 20% of the sexually active class. This research will investigate the access of sex on the internet and if the pipeline of which provides safety information for it's users. I am under the profound belief that the research will deduce that the access to sex in the digital age is so fast that it encourages sexually risky behavior through a filter of anonymity and influences an unrealistic understanding of sexual health fantasized by the internet.

11:00—12:15 (Session 2B)

1. The Advent of Cyberneuropsychology: Impacts of technology on the brain and society

Dustin Weissman

ABSTRACT: With emerging technological advancements, current fields of study overlap significantly, but fall short independently at providing a comprehensive picture of technology's positive and negative influences on humans, society, and neuropsychological development. This presentation explores the effects of technology on developing and mature brains and on the field of neuroscience as a whole. Topics addressed relate to the global impact of technology on society; including socialization, economics, privacy, government and corporate involvement, the gaming industry, media channels, and mental and physical health. Learning Objectives: 1- Apply a clear and concrete definition of the emerging field of CyberNeuropsychology; 2-Gain knowledge of the empirical research supporting the need for this new field; 3-Recognize the positive and negative impacts of technology on mental and physical health.

2. Cognitive behavioral immersion: treating addiction and inducing positive affect with virtual reality

Noah Robinson & Steve Hollon

ABSTRACT: Drug overdose deaths are the leading cause of injury death in the United States—approximately 72,000 people died last year from overdose deaths (CDC, 2017). Substance abuse disorders often develop on top of strong emotional processes and negative experiences; intoxication becomes a way to cope with negative affect. For others, they are a source of positive affect and hedonic gain. In order to prevent relapse, interventions must be immediately accessible to break maladaptive cycles of self-regulation. Immersive virtual reality (VR) can provide immediate access to cognitive behavioral interventions, social support and emotion regulation tools. Although the majority of clinical VR research has focused on inducing negative affect, VR can also facilitate positive hedonic experiences that are clinically transformative (Riva et al., 2016). Data collected immediately before and after 165 first-time exposures to VR games at a residential rehab facility suggests that VR not only decreased negative affect but increased positive affect too (something that prescription medications cannot do). Anecdotal experiences of patients receiving CBT in VR, via networked virtual environments, also suggest that therapy may be enhanced by the affective regulation provided by virtual environments. By changing the context of a patient's thoughts, feelings, behaviors and physiology, VR is able to alter mood. This "cognitive behavioral immersion" can facilitate the acquisition of CBT skills via immersive virtual environments. Additionally, VR may help prevent relapse after discharge by providing an immediate alternative behavior that facilitates social connection and affective regulation.

3. Investigating the impact of smartphone use and dependency on inhibitory control

Rachel Warsaw, Andrew Jones, Carl Roberts, Matt Field, & Suzanne Gage

ABSTRACT: Context: Smartphones have grown increasingly prevalent in our lives in recent years. Dependency on our mobile devices is associated with an inhibitory control deficit, the component of executive function (EF) responsible for restraining impulsive action and implementing goal-focused behaviour. Indeed, the mere presence of smartphones and receiving push notifications (app specific

messages on smartphones) can be detrimental to cognitive functioning. The present study aimed to further clarify the associations between smartphone use and dependency, push notifications, and smartphone-related and general inhibition. **Methods:** In total 56 participants, who volunteered from the University of Liverpool community and the general population, took part in the study. This involved completing the Smartphone Addiction Scale (SAS) as a continuous measure of participant's dependency on their smartphone, the impulse control subscale of the Executive Function Index (EFI), and Barratt's Impulsiveness Scale (BIS), two distinct, subjective measures of impulsivity. Two Stop-Signal Tasks (SST) were administered to objectively measure inhibitory control, with neutral and smartphone-related cues. The neutral cues consisted of directional arrows where participants had to respond by clicking corresponding keys. The smartphone-related cues consisted of twelve icons of popular applications (apps), each with a notification and no-notification variation, totalling twenty-four image cues. Finally, with their permission, a smartphone usage monitoring app was installed on participant's smartphones to gather daily data on total use time, number of pick-ups, time interval between pick-ups, and longest use time over five days. This data was averaged using the mean to form an objective measure of smartphone usage time. Demographic information including age, gender, ethnicity and employment status was also collected. **Results:** Hierarchical regression analyses demonstrated no association between SAS scores and measures of inhibitory control, in either condition (smartphone-related: $\beta = -.008$, 95% CI = $-.63$ to $.59$, $p = .95$; general: $\beta = -.16$, 95% CI = $-.25$ to $.05$, $p = .19$). Continuous SAS scores were also not associated with reaction times to SST trials containing push notification ($\beta = -.21$, 95% CI = -2.58 to $.29$, $p = .12$). A repeated-measures ANOVA demonstrated that average daily smartphone use time was not related to general inhibition or smartphone-related inhibition ($F(1, 54) = 2.02$, $p = .16$, $\eta^2 = .04$). A paired-samples t-test demonstrated that there was a within subject difference during the smartphone-related SST, whereby participants responded faster to trials which contained notifications compared to trials without notifications ($t(55) = 2.27$, 95% CI = 1.92 to 30.47 , $p = .03$). **Conclusion:** Our results suggest that the amount of time a smartphone is used for is not indicative of the functional impairment of smartphone dependency, and that dependency itself may not equate to an inhibition deficit in either condition. Smartphone dependency was also not associated with response time to trials containing smartphone push notifications. However, individuals did respond faster to the presence of push notifications compared to no notification in the smartphone-related SST, supporting suggestions of urgency towards personally relevant content. Additional factors are thought to influence the relationship between smartphone use, dependency and inhibitory control; previous research suggests such factors might include the interactive nature of smartphone devices, the properties and differential uses they offer, and individual's self-control. Future research could concentrate on delineating these additional influences and the impact on executive function as a whole in adult populations.

11:00—12:15 (Session 2C)

1. **Factors that affect youths' justification of cyber-harassment**

Seda Gökçe Turan

ABSTRACT: Violence and media are important issues in media theories and research. The interaction between individual, society and phenomenon of violence which can be increased or normalized and this

issues discussed not only in the media theories but also in many other disciplines in terms of different variables. Though it is unlikely to be the only factor affecting the phenomenon of violence, media tools and developments in technology have now caused violence to be debated in different dimensions. In this research, the effects of the concepts of digital media literacy, cyber violence and emotional deafness (alexithymia) on the perception of individuals as justification violence are discussed as factors that cause individuals to perceive violence as legitimate through communication tools. In this research conducted with the participation of 400 university students, it was determined that variables of being cyber bullying victim, being a cyberbully, digital media literacy and alexithymia (emotional deafness) were explanatory effects on justification of cyber violence. As a result of present research cyber victimization, digital media literacy and alexithymia have explanatory effects on justification of cyber harassment whereas being a cyberbully has no explanatory effects on justification of cyber harassment. In this context, it has come to the point that the use of digital media literacy and conscious internet using are important in order to prevent justification of cyber harassment.

2. **Kids Helpline Circles: Phase 2 findings from participant action research in the development of a secure national mental health social network**

Andrew Campbell, Brad Ridout, Krestina Amon, Brian Collyer & John Dalgleish

ABSTRACT: Phase 1 (year 1) of this project was presented at CyPsy23 and attracted much interest and praise from the audience in attendance. Phase 2 (year 2) of the findings will be delivered demonstrating the success of this innovative, mental health, initiative to engage youth aged 13-25 across Australia in group counselling via a purpose-built social network operated by Kids Helpline - Australia, in collaboration with The University of Sydney Cyberpsychology Research Group. First conceptualized in 2014, the social network for mental health management is known as 'KHL Circles'. Now completing its second 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 new findings will be presented on its effectiveness and changes adopted via iterative design to best support young people via group counselling in a social network. During 2018, the second phase of the clinical recruitment cycle, N=100+ clients were recruited and divided in 4 groups that underwent group counselling asynchronously for a period of 8 weeks, per group. Each group was established with a close age focus (e.g. 13-14 year olds; 18-19year olds, etc), 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). In contrast to Phase 1, where an ELGG social media platform was used, but not found not to be easily engaged with by both users and counsellors, the second phase trialed a customized 'off the shelf' social network platform known as Humhub <https://www.humhub.org/> that was rolled out for PC, Mac and Mobile app use, providing clients with anonymity when engaging with other clients at all times. Whilst this did not stop clients wanting to disclosure their identity once relationships were formed, Kids Helpline provides a contractual agreement with its clients that during Humhub 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 second clinical trial noted clients perceived improvement of mental health distress and increased levels of perceived social support and significant reduction in depression symptoms. Moreover, that Humhub was the preferred platform by clients and counsellors for mental health service delivery of group counselling. 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.

3. **Online suicide games: A form of digital self-harm or a myth?**

Maria Bada & Richard Clayton

ABSTRACT: A lot of attention is currently being given to online suicide games, such as the Blue Whale Challenge, Momo, the Fire Fairy, Doki Doki, and others. They are said to involve posting about progress through a series of challenges leading to suicide. Additionally, other less obviously dangerous challenges such as the salt and ice challenge, the cinnamon challenge and more recently skin embroidery are viral on social media. The “challenge culture” is a deeply rooted online phenomenon, whether the challenge is dangerous or not, and it especially motivates youngsters because of their desire for attention. Previous research shows that the Internet is spreading self-harm behavior among vulnerable teenagers who are characterized by epidemiological, psychological, psychiatric, social, and cultural risk factors (Kumar, 2017). There is little research on the reasons or the motivation of young people for revealing self-harm online. Self-harmers might be uttering a cry for help due to psychiatric issues, they might want to appear “cool”, or they may be trying to trigger compliments (Boyd, 2010). Research has shown that self-harm and depression are linked to an increased risk of suicide and so, digital self-harm behaviors may precede suicide attempts (Whitlock, et al., 2013, Cooper, et al., 2005). Digital self-harmers are more likely to have psychiatric issues during high school and they are also more likely to report being frequent users of drugs and alcohol (Englander, 2013). However, there is no evidence for large numbers of deaths linked to suicide games, which are thought to be “fake news”. Nevertheless, authorities around the world react to the news reports by releasing warnings and creating information campaigns to warn youngsters and parents about the risks related to the online suicide games. In India, this has led to a court decree for shutting down websites to stop the spread of the Blue Whale challenge (Times of India, 2017). All this may have the unintended effect of creating interest in a previously non-existent issue. In this paper, we synthesize qualitative data with existing knowledge on the phenomenon. We conducted interviews with child protection experts and NGOs; we conducted a systematic review of dozens of historical news reports from 2015-2019 and we reviewed Police and other related authority websites searching for relevant warning releases. This research does not dispute that the suicide amongst young people is undoubtedly a growing phenomenon. But, the findings from this study show that media and social media copy stories about suicide games and feed on each other with little attention to whether they have any evidence basis. This way they promote the challenge culture and exaggerate fears surrounding online risk. This is driving youngsters to seek out these challenges. Finally, the authorities react by releasing warnings, contributing further to the interest. However, we have found no evidence of suicide games leading to mass suicide in the way that the hype suggests. Our research suggests that

policy measures are taken such as: a) awareness and education to ensure that young people can handle risks online and offline; b) development of national and international strategies and guidelines for suicide prevention and how the news related to suicides is shown in media and social media; c) development of social media and media literacy; d) collaborative efforts of media, legal systems and education to prevent suicides; e) guidance for quality control of warning releases by authorities.

13:30—14:45 (Symposium 1: Online CBT for anxiety and post-traumatic stress disorders)

1. **Internet-based CBT for test anxiety**

Sara Freedman & Tzvi Richman

ABSTRACT: Introduction: Test anxiety is characterized by an excessive amount of anxiety, worry and stress, as well as physiological arousal and negative cognitions, which occur in an examination type situation. Test anxiety is widespread – estimates vary between 14% and 50% of students, depending on definition and can reach clinical levels of distress. Reports indicate that test anxiety adversely impacts test results, thus preventing accurate measurement of examinee's abilities. Women report higher levels of test anxiety than men, and it is associated with minority groups and lower socioeconomic status. Effective treatment for test anxiety include cognitive and behavioural interventions. Up to half of individuals who have an anxiety disorder do not actually receive treatment. This may be particularly pertinent for sufferers of test anxiety: it primarily affects students, who may not have the resources for treatment, and it is not a recognized disorder. Thus, the provision of online therapy may provide a pathway for overcoming these barriers to treatment. This study examines an online CBT intervention for test anxiety in students. Method: The study included seventy-five students recruited via social media, and six CBT experts who provided feedback on the intervention and ways to improve it. A dedicated Internet site was built for the purpose of this study. This housed a CBT intervention for test anxiety, that included five treatment modules. Background variables were measured using a socio-demographic questionnaire and an education questionnaire. Anxiety variables were measured before and after the intervention using the Spielberger State and Trait Inventory, and the Spielberger Test Anxiety Inventory. Qualitative information about the user experience was received through feedback at the end of each module. The CBT experts provided qualitative feedback on all aspects of the intervention. Results: The results of the study confirmed that this self-help internet intervention significantly reduced the level of test anxiety among the subjects. However, only a small minority of the students completed all the treatment modules. The qualitative feedback from participants and CBT experts identified aspects of the intervention which were helpful, as well as those that required improvement. The research hypotheses regarding the relationship between test anxiety and gender variables, socioeconomic status, past scores and country of birth, were not confirmed. Conclusions: As far as we know, this is the first study that has examined the efficacy of a self-help internet based intervention to reduce test anxiety. The study contributes to theoretical knowledge by joining the findings of previous studies which indicate that, at least in the Israeli population, there is no significant relationship between test anxiety and gender variables, economic situation, country of birth and previous grades. In practice, the results of this study indicate that this self-help intervention was found to be effective in reducing test anxiety and gained significant qualitative information that will assist in the planning and implementation of future self-help

interventions for this population.

2. **The role of working alliance in the CBT of panic disorder with agoraphobia and generalized anxiety disorder delivered in telepsychotherapy**

Stéphane Bouchard, Genevieve Robillard, André Marchand, Geneviève Belleville, Stéphanie Watts, Frédéric Langlois, Patrick Gosselin, & Michel G. Dugas

ABSTRACT: Context: There is debate in the field of psychotherapy on the importance of the working alliance for treatment effectiveness. The debate is especially relevant to telepsychotherapy, where the entire psychotherapy is delivered through communications media such as videoconference. Despite the claim that “common factors are the most important predictors of treatment outcome”, empirical results in the field of cognitive behavior therapy (CBT) of anxiety disorders have constantly showed this assertion to be unfounded. This is also documented in videoconference-based psychotherapy. In this debate, our position is that a sound working alliance is a prerequisite for an effective treatment, which essentially rests on helping patients to engage in strategies that break fearful associations with perceived threat. It is therefore important to compare the variance explained by the working alliance and by cognitive changes. This has never been fully explored and the sample sizes of all prior studies on telepsychotherapy were too small to adequately test it. Aim: The goal of this study was to examine the contribution of the working alliance on the outcome of CBT delivered in videoconference or in face to face by pooling results from randomized control trials (RCT) on panic disorder with agoraphobia (PDA) and on generalized anxiety disorder (GAD). Method: Treatment completers from two different RCT were combined to create a sample of 168 adults receiving a principal diagnosis of PDA or GAD. All participants were randomly assigned to CBT delivered either in face to face or in videoconference over 15 weeks. All variables were measured at pre-treatment, post-treatment and 6-month follow-up, except for the Working Alliance Inventory, which was administered after the fifth therapy session (the optimal moment to obtain a measure of alliance). In the RCT for PDA patients, the main outcome variable was the Panic and Agoraphobia Scale, and the Agoraphobic Cognition Scale was used to document cognitive changes. In the RCT for GAD patients, the Penn-State Worry Questionnaire was used to measure outcome, and the Intolerance of Uncertainty Scale was used to measure cognitive changes. Scores on all four instruments were transformed into z-scores in order to pool outcome and cognitive process measures using different scales at pre, post and follow-up. The Beck Depression Inventory (BDI) was administered in both RCT and therefore scores were not z-transformed. Results. Repeated measures ANOVAs extended results from previous studies showing that delivering CBT in telepsychotherapy is as effective as in face to face [e.g. for z-transformed outcome score, main effect of Time: $F(2, 266) = 142.78, p < .001$; Condition by Time interaction: $F(2, 266) = 1.92, ns$, partial eta-squared = .01]. There was no significant difference in alliance between videoconference or face to face treatments [$F(1,164) = .3, ns$, partial eta-squared = .002]. Scatterplot of the relationship between working alliance and treatment outcome revealed a lack of variability due to very strong alliance in the sample. In multiple regressions using only the working alliance as predictor, the alliance played a significant role in predicting post-treatment outcome ($sr = -.23, p < .01$ for both z-transformed outcome measure and BDI). When z-transformed scores on cognitive changes measures were entered into the regressions, the role of the alliance became non-significant for the z-transformed outcome measure ($sr = -.09, ns$) and barely significant for the BDI ($sr = -.14, p < .05$). The cognitive changes measure was always significant and

strong ($sr = .71$ and $.45$, all $p < .001$). Results of analyses using only patients receiving telepsychotherapy mirror those of the entire sample. Conclusion. The working alliance is important in CBT and in telepsychotherapy, but as a mean to engage in behavioral and cognitive changes.

3. **RESILIENT – An online multidimensional treatment to promote resilience after a disaster: Who participated?**

Jessica Lebel, Geneviève Belleville, Vera Békés, Marie-Christine Ouellet, Charles Morin, Nicolas Bergeron, Tavis Campbell, Sunita Ghosh, Stéphane Bouchard, Stéphane Guay, & Frank MacMaster

ABSTRACT: Background. An interdisciplinary team worked on developing a therapist-assisted self-help online treatment that aimed at targeting the major mental health problems reported by the evacuees from the 2016 Fort McMurray (Alberta, Canada) wildfires: symptoms of post-traumatic stress disorder (PTSD), of depression and of insomnia. For each problem, specific, evidence-based interventions have been included in the program in an integrative manner (e.g., prolonged exposure, cognitive-behaviour therapy for insomnia, behavioural activation). This paper aims to explore the characteristics of the evacuees who participated to the online treatment, compared to those who refused to participate. A secondary aim is to explore the characteristics of participants who completed the 12-session treatment compared to those of the participants who did not complete it. Participants and Procedure. A year after the wildfires, 697 evacuees were invited to participate in a longitudinal study to assess the prevalence of PTSD, insomnia and depression and to monitor the evolution of these symptoms up to three years after the events. Participants completed an online assessment in May 2018, comprising multiple questionnaires, including the PTSD Symptoms Checklist (PCL), Patient Health Questionnaire - Depression Subscale (PHQ), Insomnia Severity Index (ISI), Posttraumatic Cognitions Inventory, Ways of Coping Questionnaire, MOS social support survey and more. Participants presenting PTSD, depression and insomnia symptoms were randomised to a treatment or waitlist condition. To be included in the treatment study, participants had to a) present severe PTSD symptoms ($PCL \geq 23$) or b) present moderate PTSD symptoms ($PCL \geq 10$) combined with depressive ($PHQ \geq 5$) and/or insomnia ($ISI \geq 8$) symptoms. Participants completed another online survey in November 2018 and waitlist participants were invited to the treatment along with other participants from the longitudinal study who newly presented symptoms. Overall, as of December 2018, a total of 156 participants were invited to take part in the treatment. Participants either accepted or refused to initiate treatment, or did not answer. Among participants who initiated treatment, those who finished the treatment completed the 12 sessions with the assistance of their assigned therapist. Those who did not complete the treatment completed an average of 3 sessions (± 2.9) before terminating contacts with their assigned therapist. Results and conclusions. Primary objective. Compared to those who refused or gave no answer ($n=79$), participants who accepted to take part in the treatment ($n=76$) presented more severe PTSD, depression and insomnia symptoms. They also presented more self-blame and negative cognitions about themselves and the world, and reported using more social support seeking coping mechanisms. They reported having less instrumental and emotional support, suffered more considerable damage during the wildfires (house, cars, sentimental possession, etc.) (all $p < .05$, partial $\eta^2 = .035$ to $.082$). Participants that accepted to take part in the treatment also experienced significant problems with insurance claims, a change in their work status as a result of the wildfires and a decrease in social life (seeing friends and family) since the wildfires and evacuation (all $p < .05$, $\phi = .197$ to $.244$). No differences were found for age, gender, marital status,

education level, number of days evacuated from home, being a first responder during the wildfires, or experiencing financial problems or a decrease in work or sports and leisure since the wildfires (all $p > .05$). Secondary objective. When participants that finished the treatment ($n=16$) were compared to those who did not ($n=21$), only gender was statistically different ($\chi^2(1)=5.78$, $p=.016$, $\phi = -.395$). Men who initiated the treatment were more likely to complete it than women. Individuals with a more severe clinical portrait and benefitting from less social support in their surroundings are more likely to participate to an online treatment. These findings will help targeting people in need in the recovery phase after a natural disaster.

4. **RESILIENT – An online multidimensional treatment to promote resilience after a disaster: Preliminary results from a randomized controlled trial**

Geneviève Belleville, Marie-Christine Ouellet, Jessica Lebel, Vera Békés, Charles M. Morin, Nicolas Bergeron, Tavis Campbell, Sunita Ghosh, Stéphane Bouchard, Stéphane Guay, & Frank P. MacMaster

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. Alberta Health Services estimated in August 2016 that mental health staff in the city had received 20,000 referrals in three months, 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 presentation, we will report on the preliminary results of a randomized controlled study (RCT) assessing the efficacy of an online self-help intervention targeting post-traumatic resilience on specific symptoms (post-traumatic stress disorder [PTSD], insomnia, depression). We previously presented the study protocol at CYPSY23 (Gatineau, 2018). Participants and Procedure. 1,510 phone surveys have been conducted in May 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 included four assessments with online questionnaires (T1 to T4). A period of six months separated all four times of assessment. After completion of T2 (pre-treatment) in May 2018, participants with significant post-traumatic stress, depressive or insomnia symptoms ($n = 136$) were randomised either to a treatment condition ($n = 69$) or to a waitlist control condition ($n = 67$). Participants were on average 45 years old, and mostly women (76%). Four percent identified as members of a First Nation. Age, gender, membership in a First Nation and pre-treatment post-traumatic stress, depression and insomnia symptom severity did not differ between the treatment and waitlist conditions (all $p > .05$). Participants completed T3 (post-treatment) in November 2018. Attrition rate was 19% ($n = 13$) in the treatment condition and 16% ($n = 11$) in the waitlist condition. 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; prolonged exposure to avoided situations and memories; sleep management strategies (restriction of time in bed, stimulus control, sleep hygiene education); behavioural activation; relaxation and mindfulness exercises; problem-solving strategies; and cognitive restructuring. A small portion of material was unlocked each week, and access to one module was accessible after the completion of a previous one. Supervised



graduate psychology students provided brief regular weekly contacts for 12 weeks by videochat or phone, according to the participant's preference. Access to the online material was unlimited in time. Results. Participants in the treatment group completed an average of 5 sessions (+/- 5.26) and 14 completed the entire 12-session treatment. Mixed model ANOVAs revealed significant Assessment Time X Treatment Condition interactions on post-traumatic stress, depression and insomnia symptom severity, showing improvements of symptoms in the treatment condition. Conclusions. These results demonstrate the effectiveness of the RESILIENT online treatment platform to decrease post-traumatic stress, insomnia and depression symptoms in evacuees from the 2016 Fort McMurray, Alberta wildfires. This computerized psychotherapeutic tool was successful to provide access to specialized evidence-based mental health care to promote resilience and mental health after a disaster in a remote population. Future research will focus on verifying the implantability and usability of the platform among Fort McMurray health professionals. The assessment of the platform's potential for adaptation to respond to the needs of diverse populations (e.g., sexually abused women, members of First Nations, Inuit and Métis) is also underway.

13:30—14:45 (Session 3A)

1. **Distinguishing the relative impact of PTSD and TBI on i-Pad-measured cognitive function**

Michael Roy, Doren Walker, Patricia Taylor, Annabel Raboy, Zena Kirby, Kerri Dunbar, Thomas Oliver, & Melissa Guerra

ABSTRACT: BACKGROUND: Traumatic brain injury (TBI) and posttraumatic stress disorder (PTSD) are common, frequently comorbid, complications of the recent wars in Iraq and Afghanistan. In fact, PTSD has been reported to be three times more common in those service members with TBI than those with injuries to other physical injuries. PTSD and TBI both may impair cognitive function, but it remains insufficiently clear what the relative impact of each is on overall cognition, as well as what specific aspects of cognition with which each typically interfere. We report analyses of the detailed assessment of cognitive function and its various components, relative to the number of lifetime TBIs experienced, and PTSD symptom severity, in a cohort comprised of military service members as well as a small number of their family members, recruited in the military healthcare system. **METHODS:** Data were collected from 326 participants in an ongoing prospective cohort study at Walter Reed National Military Medical Center and Fort Belvoir Community Hospital. Questionnaires include the Ohio State University TBI Identification Method (OSU-TBI) to document TBI history, the PTSD Checklist--Civilian Version (PCL-C) to identify PTSD symptom severity, and the Patient Health Questionnaire (PHQ-9) to verify depression symptom severity. Cognitive function was assessed with the NIH Toolbox Cognition Battery (NIH-TB), which includes the: Dimensional Change Card Sort (DCCS) test of executive function; Flanker Inhibitory Control and Attention (Flanker) test of executive function and attention; List Sorting Working Memory (List Sort) and Picture Sequence Memory (PSMT) tests to respectively assess working and episodic memory; Pattern Comparison Processing Speed (Pattern Comparison) test to measure time to process and respond to information; Oral Reading Recognition (Reading) test of literacy, comprehension and performance; and Picture Vocabulary (Vocabulary) test of overall intelligence. We conducted one-way analysis of variance (ANOVA) to compare relationships between number of TBIs (0, 1, 2, 3+), PTSD (full, subthreshold, and little or no symptoms), and

neurocognitive performance on the NIH-TB. We then used multiple regression to analyze the relationship between TBI number, PTSD and depression severity, and each cognitive task as well as an NIH-TB composite score. **RESULTS:** Participants have a mean age of 42, 75.5% are male, and 70% have experienced a TBI—20% one, 18% two, and 62% 3 or more. Of the entire study population, 20.4% have probable PTSD ($PCL > 50$) and 43% have subthreshold PTSD ($PCL 28-49$). PTSD symptom severity was strongly associated with NIH-TB composite score ($p = .001$), and of the component tests, it was most strongly linked to DCCS ($p < .0001$), followed by List Sort ($p = .001$), Flanker ($p = .012$), Pattern Comparison ($p = .031$) and PSMT ($p = .033$). Vocabulary and Reading scores were not associated with PTSD. While TBI number, PHQ-9 and PCL scores all correlated with cognitive performance, multiple regression analysis identified PTSD symptom severity as the only independent predictor of overall cognitive impairment. PTSD symptom severity also predicted performance on Flanker, PSMT, and Vocabulary tests. TBI history and PTSD severity both predicted impairment on Pattern Comparison, while TBI was the sole independent predictor of impairment on DCCS. No significant relationships were evident for Reading. There were no differences in total cognition, or performance on any task, between those with 3+ TBIs and no PTSD or depression compared with healthy controls. **CONCLUSION:** Cognitive function remains largely intact after multiple TBIs if significant symptoms of PTSD are not evident, and measures of literacy and overall intelligence are relatively impervious to both PTSD and TBI. Cognitive impairment after TBI is predominantly associated with PTSD, though TBI alone may impair some aspects of executive function.

2. **Virtual reality air travel training (VR-ATT) in children along the autism spectrum - A pilot study:**

Ian Miller, Brenda Wiederhold, Catherine Miller, & Mark Wiederhold

ABSTRACT: Abstract. A core deficit of children with autism spectrum disorder and primary treatment concern for their parents and caregivers, functional communication—the ability to express one's needs without resorting to challenging or aberrant behaviors—plays an integral role in enhancing independence, self-advocacy, social integration and overall quality of life. However, shortfalls in treatment accessibility and fidelity, compounded by highly variable symptoms and obscure evidence of the generalizability of skills learned in these interventions, hinder service deliveries that improve daily functioning. A host of evidence across child development, training, and education research supports the use of virtual reality (VR) as a tool that can overcome these shortfalls. The first phase of this multiphase project sought to apply a VR functional communication activity based on air travel skills. Often, this experience can exacerbate hyper- or hyposensitivity to physical stimuli, aversions to change, or intense preoccupations with repetitive movements, and make travel difficult. Thus, the current project applies a VR air travel training module (VR-ATT) as a tool to teach air travel skills to children along the autism spectrum. **Participants.** The current program focused on teaching air travel skills to five children diagnosed with ASD. Four of the five children were nonverbal and used props and pictures to communicate. All participants participated under full informed consent from a legal guardian, as approved by the ethics review board. **Methods.** Using ISO 13485 certified virtual airport environments, five children were administered a 15-minute VR-based air travel functional communication activity using an iPhone X, Google Cardboard glasses and a narrative script for the therapist to follow. Researchers delivered the training module to four of the five participants once per week for three weeks. The fifth participant was only able to attend one in-office VR training session. A final fourth training

session took place at the San Diego International Airport to test the real-world training transfer of this module. Data collected included parent surveys, clinical measurements, and clinical observations. Parent surveys included a 1-5 rating (1 = needs full support (i.e. stroller), 5 = no support (i.e. walks through willingly) on their child's travel ability. Clinical measurements included a 4-point activity checkpoint scale (check in, security, wait at gate, board airplane), an activity specific vocabulary list and a mean length of utterance calculation to assess verbal communication. Results. Analysis of parent surveys indicated a significant improvement in the children's travel ability. On average, parents noted their child's air travel ability to improve 1.4 points on a 5-point scale ($\bar{x}_{pre} = 2.2$, $\bar{x}_{post} = 3.6$) ($t(4) = 2.75$, $p = .051$). Four of the five parents reported at least 2-point improvements. The fifth reported no change. Parent surveys also supported the use of VR as a training and at-home practice tool for this population. Clinical measurements of activity completion also showed significant improvements in each child's ability to navigate the VR air travel module. Four of five participants showed improvements from pre to post intervention, while the fifth showed no change. On average, participants improved 1.8 points from session one to session four ($\bar{x}_{pre} = 2.2$, $\bar{x}_{post} = 4.0$) ($t(4) = 3.09$, $p = .037$). Conclusion. All participants ($n=5$) successfully navigated the air travel rehearsal at the airport, from check in to boarding the airplane, without interruption. Family surveys noted the novel application of virtual reality training and the effectiveness of the intervention. Virtual reality is a feasible intervention technology for children on the autism spectrum. Subsequent VR training modules will include public transport, public safety, classrooms, playgrounds and relaxation training. Future studies will also include wider age ranges, ability levels, biomarker correlates, and communication outputs.

3. **Virtual reality: An important tool in women's healthcare:**

Brenda K Wiederhold, Jose Luis Mosso, & Mark D Wiederhold

ABSTRACT: Virtual Reality (VR) has proven efficacy in the management of chronic pain and pain during medical procedures. Over the past decade, we have used VR as an adjunct to improve quality in the delivery of women's healthcare. Specifically, we have evaluated how VR can be used to alleviate pain and anxiety during gynecological surgery (such as colposcopy, conization and cone biopsy) and other procedures. Additionally we have evaluated the use of VR during, and preceding, both normal and caesarean section (C-section) deliveries. This presentation will focus on a study of 50 patients.

13:30—14:45 (Session 3B)

1. **Friends who game together, stay together: A self-determination theory approach to the impact of multiplayer video gaming on social well-being**

Yemaya Halbrook, Aisling O'Donnell, & Rachel Msetfi

ABSTRACT: Social video games have become increasingly popular, but it is currently unclear as to how the social connections they offer affect social well-being, traditionally defined as having strong personal relationships and social stability. To address this question, we studied the context of the social interaction in video games, operationalised as the particular conditions in which the video game is played. For this study, we defined context as three particular elements of social gaming: the type of multiplayer game that is being played, with whom the multiplayer game is being played, and what

platform this multiplayer gaming takes place. We argue that particular game contexts satisfy certain psychological needs to different extents, and satisfaction of such needs (e.g., autonomy, competence, and relatedness) relates to well-being, as outlined in the self-determination theory (SDT). We have thus chosen to apply this theoretical framework to this study in order to determine what relationship, if any, these basic psychological needs have with context of social gaming and social well-being. Following approval from our faculty ethics committee, an anonymous online survey was created. Participants (N=1464) were recruited through online social media platforms, ranging from 18 to 71 years of age ($M = 26.42$, $SD = 7.92$), with 1246 (85.1%) male, 197 (13.5%) female, 10 (.7%) non-binary, 2 (.1%) other, and 5 (.3%) indicating they prefer not to say. During survey completion, participants completed measures concerning the context of their multiplayer gameplay; their levels of autonomy, competence, and relatedness in relation to video games; and finally, three questionnaires concerning their social well-being levels (defined and operationalised here as loneliness, satisfaction with life, and social support). We were interested in determining if the context of social gaming impacts social well-being and in particular, if this occurs through autonomy, competence, and relatedness using multi-categorical mediation analysis. Although there were a few significant indirect effects with the type and the platform of the video game, the strongest effects related to who the game is played with. Specifically, playing with friends known in real life resulted in significantly higher levels of social well-being through autonomy and competence when compared to the category of online acquaintances. Further, the direct relation between who the game is played with and social well-being is mediated by an increased satisfaction of the need for relatedness and playing with friends in real life had significantly higher indirect effects than family, friends met online, and online acquaintances, but not with significant other. As multi-categorical mediations examine comparisons between a reference category and all other categories, we also conducted MANOVAs to determine any differences in the outcome variables based on who participants typically game with. Playing with online acquaintances yielded the overall lowest levels satisfaction of needs and social well-being when compared to playing with friends in real life, family, significant other, and friends met online. Interestingly, those playing with friends met online reported the highest levels of autonomy, competence, and relatedness, but did not have the highest levels of overall social well-being. Indeed, those who played with their significant other reported the highest levels, particularly in actually received support. This indicates that although a gamer's psychological needs are met while playing with friends met online, this does not necessarily mean their social well-being is positively impacted. This merits further research, then, into examining if there are specific levels of autonomy, competence, and relatedness in video games that most benefit social well-being, particularly in the case of who the multiplayer game is being played with.

2. **A point-light avatar and different perspectives control the feeling of embodiment**

Chang-Seop Kim, Myeongul Jung, & Kwanguk Kim

ABSTRACT: Introduction: Embodiment describes the sense of one's own body, and is critical to self-identity and self-experience. Previous theories suggested that embodiment can be classified into three components: ownership, self-location, and agency. However, no recent advances have been made in our understanding these subcomponents. To address this issue, we used virtual avatar technologies and full-body motion capture systems, differing in the extent of graphical realism and in terms of perspective. Previous theories suggested that the embodiment subcomponents are influenced by visual bodily

characteristics and the use of different viewpoints. Here, we developed a size-matched virtual avatar, a point-light avatar, and an out-of-body point-light avatar, and investigated whether such control of graphical realism and perspective modulated the experience of embodiment. Method: We recruited 28 participants (mean age = 23.89 ± 3.08 years; 14 females). We used a within-subject experimental design with three virtual avatars: 1) those matched to participant bodily size (human avatar; HA); 2) those featuring only point-light animation (point light avatar; PLA), and 3) those employing a third-person perspective (out-of-body point light avatar; OBPLA). We employed motion capture technologies (24 Flex-13 cameras; Optitrack) and head-mounted displays (CV1; Oculus) to evaluate all three conditions. The virtual environment included basic furniture and a mirror so that participants could see their bodies. Under the PLA condition, the participant can move point lights to trace his/her body; the conditions are identical to those of the HA condition with the addition of graphical realism. Each PLA consisted of 15 spherical point lights 5-cm in diameter placed on all joints and the center of the head. In the OBPLA condition, the PLA setup was employed but the viewpoint was moved 120 cm backwards and 30° upwards to afford a third-person perspective. We used an embodiment questionnaire (EQ) to (separately) measure ownership, self-location, and agency scores. Preliminary Results: The ownership scores differed significantly among the three conditions [$F(2, 54) = 11.217, p < 0.005, \eta^2 = 0.191$]. The post-hoc results suggested that the HA condition was statistically more effective than the PLA and OBPLA conditions; the latter two conditions did not differ significantly in terms of ownership scores. The self-location scores differed significantly among the three conditions [$F(2, 54) = 17.094, p < 0.001, \eta^2 = 0.388$]. The post-hoc results suggested that the HA and PLA self-location scores were significantly higher than the OBPLA scores. The HA and PLA scores did not differ significantly. The agency scores did not differ significantly among the three conditions. Discussion: We developed a new methodology to study the subcomponents of embodiment. HA/PLA controlled ownership levels; PLA/OBPLA controlled self-location. Further work is needed, but it may be possible to control the subcomponents of embodiment using virtual avatars differing in terms of graphical realism and perspective.

3. **NPCs matter: Preliminary evidence for the relationship between video game play and more positive attitudes towards minorities within the framework of intergroup contact theory:**

Agnieszka Mulak & Mikołaj Winiewski

ABSTRACT: Games have been shown to change the players' perception of others and impact implicit and explicit attitudes towards specific social groups. Research examining this topic focused mostly on negative consequences of stereotypes in games. Racial, ethnic (Sisler, 2008, Behm-Morawitz, Ta, 2014) and gender (Behm-Morawitz, Mastro, 2009) stereotypes in game characters were linked to negative attitude change, even in the absence of violence (Saleem, Anderson, 2013). Contrary to these findings, it has been postulated diversity in games may result in prejudice reduction (Amichai-Hamburger, McKenna, 2006). Evidence shows cooperative gameplay positively impacts attitudes towards the cooperation partner's group (Ewoldsen et al. 2012). The effects described above, both positive and negative can be explained within a broader framework of intergroup contact hypothesis (Pettigrew, Tropp, 2006). Confirmed in a multitude of research, it states that interactions between two distinct social groups positively influence attitudes towards the "other" group (out-group) and diminish stereotypes. Initially it specified situational conditions necessary for positive change. Research has shown they are

best construed as a single factor of contact quality. They improve the effects of intergroup contact but are not necessary; Intergroup contact itself suffices for prejudice reduction. Positive consequences of intergroup contact were confirmed for interactions on an online platform (Amichai-Hamburger, 2008), on Facebook (Shumann, van der Linden, Klein, 2012) and in chatrooms (White, Abu-Rayya, Bliuc, Faulkner, 2015). The main goal of this study was to test whether intergroup contact with game characters is related to less prejudice and more positive attitudes towards out-groups. The study included a survey of gamers and an evaluation of games they played conducted by independent judges. The survey was conducted online. Participants were polish gamers (N=2324), mostly male (64%) aged 11 to 52 years old (M=19, SD = 6.53). Each respondent named three games they played the most in the previous month. Within the 1953 games we acquired, we grouped all titles that were part of a series, receiving 362 titles. Participants were also asked about time they devoted to playing (contact duration). Social distance scale was used as a measure of prejudice towards minorities most present in the polish society. In the second part of the study, most frequent games were evaluated by independent judges to assess the presence and contact quality with various social groups in the game. In particular, the judges assessed: every real-world group they observed in the game world that was an out-group to the players and every fictional race they observed, providing a count of real-world and fictional out-groups in each game. For each group the judges assessed how strongly it is represented (i.e. the percentage of group representatives in the whole game society), which allowed for a calculation of Hirshman-Herfindahl Diversity Index for each of the games (as a proxy for intergroup contact). Additionally, the average valence of contact with members of each group in the game (contact quality), the amount of gameplay that included interactions and aggression in the gameplay were assessed. We intend to present how game world's diversity and both duration and quality of contact with real-world minorities and fictional races relate to attitudes towards real-world out-groups. Preliminary results confirm that intergroup contact in interactions with game characters is related to less prejudice. Diversity of the game's social world (measured inclusively with the fictional races) was associated with more positive attitudes towards out-groups in general and almost all minorities included in the research. The amount of gameplay that included interactions with in-game characters (contact duration) and contact quality with the real-world minorities significantly impacted the relationship.

15:30—16:45 (Session 4A)

1. Virtual reality in interventional treatments in Pain Clinic National Medical Center, November 20, ISSSTE, first experience

José Luis Mosso, Brenda Wiederhold, Mark Wiederhold, Dejanira Mosso, & Patricia Canseco

ABSTRACT: Objective. We present a progress with 4 cases of advantages of virtual reality (VR) results to reduce pain and anxiety during interventional treatment under fluoroscopy on patients diagnosed with narrow channel syndrome, lumbar disc hernias and chronic pain. Methodology. Patients under informed consent and prone position, with head mounted display HMD allows them navigate into virtual reality scenarios. Vital signs are measured before, during and after procedure each. The procedure begins with minimal analgesia with intravenous single doses with fentanyl 50 mcg without sedation, we infiltrate locally with local anesthesia (lidocaine 1%); depending on the interventional procedure involved. The

interventional procedures were: discography with discolysis with ozone, caudal blockages, and foramina blocks. During the procedure, patients navigate virtual reality scenarios created at the Virtual Reality Medical Center in San Diego by Brenda Wiederhold. At the end of the procedure, patients recover one or two hours before leaving the Medical Center. Results. Pain was reduced during each procedure thanks to virtual reality scenarios distractions in 7 patients without using sedatives. Conclusions. VR During pain treatment is an excellent option in pain clinic. Chronic pain treated with anti-inflammatories administered directly to the spine is an area to use VR to reduce pain. With this experience we demonstrate the cost benefit advantage that offers satisfaction to patients and savings to health institutions. No complications were presented.

2. **Expectations of the self in virtual reality: A qualitative analysis of individuals' experiences when creating virtual avatars**

Swati Pandita, Lee Humphreys, & Andrea Stevenson Won

ABSTRACT: Researchers often embody participants in humanoid virtual avatars to conduct social science experiments. However, many researchers are concerned with whether and how an avatar, a digital representation of the participant, should be photorealistic, behaviorally realistic, or a mixture of both. The visual fidelity of an avatar can affect how present a participant feels within a virtual world, which in turn can affect individual interactions within that virtual environment. A less explored outlook on avatar representation should consider the participant's notion of what "feels like them." As consumer virtual reality (VR) becomes more available to the public, individuals may increasingly inhabit embodied social virtual worlds. With increased exposure to VR, more individuals are building expectations of what VR should be like and beginning to envision how they are represented in such environments. These expectations in turn can influence one's VR experience if they go unmet. Traditionally, virtual environments are populated with gaming avatars that are often hypersexualized, fantastical, or restricted to Eurocentric humanoid features. Researchers often work within these restrictions to create neutral humanoid avatars, and study questions related to human behavior. In order to provide an additional perspective to this debate, we ask: What are the hidden norms and values that users engage in when they are creating their avatars? And how does this affect how people are ultimately represented and how well they relate to their avatar? In this study, 16 participants were asked to create a virtual avatar for their dream job interview. Participants were given a choice of using consumer grade platforms, Adobe Fuse, Face Gen, and Daz3D Studio. Upon avatar creation, participants were interviewed about their creation experience with open ended questions that asked about their previous avatar creation experiences, what makes an avatar feel like "you", whether the current avatar represent you, and their thoughts about the user interface and who designed the software. Participants were recruited using purposive and snowball sampling. Purposive sampling was utilized in order to select participants that would be able to answer the research question and navigate the software (Lincoln and Guba 1985; Lofland et al., 2006). The criteria for recruited participants included: (1) familiarity with avatar creation software, either commercial or within a video game and (2) use of avatars either within experimental or non-experimental contexts (e.g. participating in a virtual reality study or playing games with avatars). Participants were asked to voice their thoughts by talking out loud during this process and a screen recording was taken of this experience. Accounts of their avatar customization experiences were further gathered through semi-structured interviews that took place right after the avatar

customization experience. Data were coded using thematic analysis at a latent level (Braun and Clarke 2006). Preliminary emergent themes that arose from this work involved norms or assumptions that participants have around avatar appearance and usage. Participants do not expect their avatar to share high physical resemblance to them, and noted that one positive feature of virtual reality is that it allows for users to remain anonymous even with using a photorealistic avatar. An underlying appreciation for the anonymity virtual reality provides was also emphasized when multiple participants expressed wanting to be judged for what they had to say and not how they looked in order to avoid eliciting stereotypical behavior from their imagined interviewer. Further analysis on what participants consider to be a representative avatar will be completed prior to the conference date.

3. **Virtual reality mobile-based biofeedback: Development and usability test of an application**

Javier Fernández-Álvarez, Pietro Cipresso, Michelle Semonella, Desirée Colombo, & Giuseppe Riva

ABSTRACT: Biofeedback techniques aim to provide individuals with insight of a certain psychophysiological process in order to facilitate its regulation. Despite the existence of diverse biofeedback techniques, there is always a signal (e.g. visual, audio display, tactile) that enables the person to be aware of normally unconscious physiological activity. Although biofeedback has shown to be effective for a vast array of medical and psychological clinical conditions, precisely one of the long-standing limitations has been how to best the targeted physiological processes. In that vein, Virtual Reality (VR) permits to represent the physiological process through virtual stimuli that are connected to biosensors, strengthening the engagement of users and potentially augmenting also the effectiveness of the interventions. Finally, the integration of VR and biofeedback can be greatly disseminated if developed for mobile devices. Therefore, we present the development and usability test of a VR mobile based biofeedback application for emotion regulation. According to theories like Polyvagal Theory or Neurovisceral Integration Model, heart rate variability (HRV) is a key index of parasympathetic activity and the way individuals manage to regulate stress and emotions. Hence, our prototype uses a CorSense sensor which has a sampling rate of 500 hz and therefore it permits to work with a powerful enough HRV in real time. Besides, the virtual environment was developed in Unity with two different parks to carry out the HRV biofeedback training. Finally, the head-mounted displays are Gear VR and Oculus Go, which are completely wireless. The usability and user's experience of the prototype were tested in a pilot evaluation with 14 participants (9 women) who underwent a 45 minutes protocol, which involved three steps: (i) experiencing the virtual environment through a 5 minutes sesión; (ii) answering a battery of questionnaires; (iii) doing an interview with one of the researchers in charge of the study.. The included instruments were (a) ITC SOPI to assess the presence in the environment; (b) the system usability scale; (ii) the flow state scale to have the evaluation of user's engagement; and (d) an in depth interview to gain insight with regard to the qualitative experience while doing the protocol. Results yielded good usability of the system in all the measures. With regard to the qualitative interviews a much more interesting feedback could be obtained, identifying aspects in terms of the navigability and the design of the environment to be improved as well as very promising acceptability of the users in order to implement the system in different contexts. Taken together, these findings show that, despite some limitations, the system is usable and provides an enjoyable user's experience.

15:30—16:45 (Session 4B)

1. Personality and cybersecurity behaviors: The role of the “Big Five”

Charlotte Dawson, Alex Shappie, & Scott Debb

ABSTRACT: Previous research has focused on intention as a predictor of cybersecurity behaviors. However, observed behavior can differ from self-reported intention. For example, many express concerns regarding cybersecurity, but fewer put these concerns into action (e.g., employing best practices for protecting data). Personality may play an important role in the association between intention and behavior, and some evidence suggests that personality may even be a stronger predictor of behavior than intention. All “Big Five” factors (i.e., extraversion, agreeableness, conscientiousness, neuroticism, and openness to new experiences) have been studied in the context of cybersecurity; however, few studies incorporate all five factors and many studies operationalize cybersecurity behavioral outcomes in different ways, making it difficult to generalize findings between studies. Although all five factors have been associated with cybersecurity practice, conscientiousness may have the strongest connection to cybersecurity behaviors. To address these concerns, the present study examined the association of all five personality factors with cybersecurity behaviors, while also controlling for related variables (e.g., self-efficacy). Undergraduate students (N=676, ages 18-56) were recruited from psychology courses, email announcements, and research participant pools at two public universities in Virginia, USA, and completed an online survey of self-report measures. Participants completed the Big Five Inventory (BFI) to assess the five domains of personality and the Online Security Behavior and Beliefs questionnaire which attributes cybersecurity-related behaviors across multiple domains including perceived barriers, response efficacy, security self-efficacy. Significant bivariate correlations were found between self-reported cybersecurity behaviors and agreeableness, openness, neuroticism, and conscientiousness. Additionally, the cybersecurity-related factors were all significantly correlated with cybersecurity behaviors. Linear regression analyses with all five factors revealed that agreeableness, conscientiousness, and openness were significantly associated with cybersecurity behaviors. A hierarchical regression analysis including the three significant personality factors and the cybersecurity-related factors indicated that conscientiousness and openness predicted a significant amount of variance over-and-above the cybersecurity-related factors. These results suggest that personality plays an important role in predicting cybersecurity behaviors and are consistent with previous research indicating that conscientiousness is often the strongest predictor of cybersecurity behaviors. Future research should aim to develop cybersecurity models that take into account personality, attitudes, intention, and behaviors, and to better understand how conscientiousness in particular can be incorporated into cybersecurity training across a variety of vocational and educational settings, including organizational hiring practices.

2. Confirmatory factor analysis to analyze Instagram Questionnaire factor structure fit across cultural settings

Daniel Schaffer & Scott Debb

ABSTRACT: Introduction: The Instagram and Well-Being questionnaire is a 19-item self-report inventory designed to assess Instagram and social media use. Item 14 of the measure contains 40 sub-items specifically assessing reasons for an individual’s Instagram usage. Each sub-item contains a

potential reason-for-use and participants respond on a Likert-scale based on how much they use Instagram for that reason. In prior research, an exploratory factor analysis (EFA) was conducted using a sample of 367 undergraduate students at the University of Sydney (Australia) and results demonstrated a three-factor structure: (1) sense of belonging, (2) self-expression, and (3) documentation/curation. The purpose of this study was to assess the goodness of fit of this factor structure in a sample of undergraduate students from the United States, oversampling African Americans. Sample: Data were collected from 735 students at two public universities in the Southeastern region of Virginia, USA. One of the recruitment sites is a larger research-based institution with a fairly diverse student body and the other is a mid-sized liberal arts Historically Black university. After cleaning the data and removing cases due to significant missingness, 520 participants were retained for the analyses. The resulting sample self-identified as female (82%), African American (42%), Caucasian (38%), Alaskan Native (< 1%), Native American (< 1%), Asian/Asian-American (4%), Latino/a (7%), Hawaiian Native or Pacific Islander (1%), and multiracial (7%). The average age of the sample was 22.51 years old. All participants reported current use of Instagram. Method: Confirmatory factor analysis (CFA) was conducted using Mplus to assess goodness of fit for the previously established three-factor model. The means and variance adjusted weighted least squares (WLSMV) analysis method was used for this study, as this is the optimal method for categorical and Likert-scaled data. Results: Goodness of model fit was assessed: $\chi^2(87) = 1542.82$, $p < .001$; RMSEA = 0.19, 95% CI [0.18-0.20]; CFI = 0.77; TLI = 0.73. Follow-up exploratory analyses were conducted to determine if the three-factor model maintains fit when the sample was partitioned into African American students only and Caucasian students only. In both cases, though, the three-factor model did not meet statistical criteria for exact or approximate fit. Discussion: According to the results of this CFA, the three-factor model previously established does not meet criteria for exact or approximate model fit for this data. While this could be due to a multitude of reasons, poor model fit could be due to the cross-cultural component of the study. Because the original three-factor structure model was found within Australian participants, it is possible that the same model may not maintain reliability and fit across different cultural samples. Given that the three-factor model continued to demonstrate lack of fit after partitioning the sample by race, it is most likely that global cross-cultural differences are influencing the differences in model fit.

3. **Effects of autobiographical self-referencing on presence and emotions in immersive storytelling: An exploratory study**

Andrea Gaggioli, Stefano Magoniand, & Alice Chirico

ABSTRACT: Self-referencing refers to a set of cognitive processes that individuals use to understand incoming information, by relating it to one's self or personal experiences (Northoff, 2006). Previous research has shown that self-referencing promotes narrative engagement, defined as the "degree of immersion" into the narrative content (Escalas, 2007; McDonald et al., 2015). In the present contribution, we explored the impact of autobiographical self-referencing (ASR) on sense of presence and emotions elicited by an immersive narrative. We manipulated ASR by asking participants in the experimental condition (N=36; 18 females; 18 males) to relate a virtual narrative to an episode of their past, present or future life. In the no ASR condition (N=35; 17 females, 18 males), participants were instructed to appraise the immersive narrative with no explicit request to form autobiographical associations. The virtual experience tells the story of sail boat being caught in a fierce and enduring

storm, causing the ship to almost capsize. However, the vessel survives the storm, and eventually clear skies return. The virtual scenario does not include human characters. After the experience, all participants were asked to type a list of all the thoughts they had while they were immersed in the virtual scenario. The thought protocols were later coded to identify associations with personal stories. Next, all participants filled three self-reported measures to assess the experiential profile of the immersive narrative. The Positive Affect and Negative Affect Schedule (PANAS) was administered before and after the virtual experience to signal changes in positive and negative affect. The ITC-Sense of Presence Inventory (ITC-SOPI) was administered after the virtual experience to measure presence. Finally, personal relevance of the narrative was assessed via an ad-hoc, three items scale. As expected, data revealed that participants in the self-referencing condition reported higher number of autobiographical associations than participants in the no self-referencing condition. A parametric-samples t-test was conducted to compare sense of presence and personal relevance in the two experimental conditions, showing no significant differences between groups. A mixed ANOVA was performed on PANAS scores, with group as a between-subject factor and time as a within-subject factor. In PANAS-PA, neither the main effect of time, nor the main effect of group, nor the time x group interaction turned out to be significant. The ANOVA on PANAS-NA scores revealed no significant main effects, however, a significant time x group interaction was found [$F(1, 61) = 6.101, p = .016, \text{partial } \eta^2 = .08$], with levels of negative affect increasing in the experimental condition from baseline to post-measure. These findings indicate that experiencing the immersive narrative in the self-reference mode generated more autobiographical associations compared with the no self-reference mode, but the manipulation of self-relevance did not produce a significant impact on sense of presence and positive affect. The significant increase in negative affect at post-measurement in the self-reference condition may be explained in light of the hypothesis (which preliminary analyses of reported associations seem to support) that the situation described by the immersive narrative (i.e., a ship facing a storm) could have preferentially elicited associations with challenging autobiographical situations charged with negative emotions, be them either actual life events (i.e., facing a real storm) or metaphorical translations of life events (i.e., sailing used as a metaphor for a stressful university exam), thus enhancing also the intensity of the resulting affect (Velten, 1968). While this explanation requires further validation, in overall these findings tentatively suggest that self-referencing may play a role in shaping the affective profile of an immersive narrative experience, with potential implications for clinical applications of virtual storytelling.

4. **Transcending the lab: Using storytelling and theatre practices to support self-transcendent experiences in virtual reality**

Alexandra Kitson, Ekaterina Stepanova, Ivan Aguilar, Natasha Wainwright, & Bernhard Riecke

ABSTRACT: In this project, we took knowledge from the arts and storytelling, and designed an immersive Virtual Reality (VR) installation intended to foster feelings of self-transcendence—individual experience of connection or unity with other people or one’s surroundings. Instead of simply bringing participants into our lab, placing a head-mounted display on them, and expecting them to have a profound experience, we created an experience that starts from the moment they walk into the lab until the moment they leave. We hypothesized this type of holistic experience would better support the context necessary for self-transcendence compared to a traditional lab/clinical setting. Self-transcendence can be very positive and have lasting effects on well-being, and even lead to positive

transformation. Yet, the path to self-transcendence is not easy and accessibility to contexts that support self-transcendence is low due to many factors, for instance decreased exposure to nature and spirituality in parts of western society today. Immersive technologies, such as VR, can provide novel opportunities to invite self-transcendence because they can produce awe-inspiring and “impossible” situations, and be integrated into narrative contexts to allow presence. Existing work on designing for self-transcendence has so far focused on the experience in VR itself and the effects after exiting. For example, the AWE-project can elicit awe in some people by exposing them to seeing Earth from space. Several virtual experiences use forms of meditation to self-reflect, e.g., The Meditation Chamber, Inner Garden, and Osmose. Yet, little work has been done on the transitions into and out of VR. Many forms of immersive media make use of transitions to support a particular mood or response, e.g., theme parks and theatres. The experience itself seems to be greatly influenced by the actions and thoughts that come directly before actually engaging with it. Therefore, designing for the pre- and post-VR experience might better support the intended user experience, i.e., self-transcendence. We used storytelling and theatre practices to help develop our immersive installation that would help support an existing VR experience, the AWE-project. Here, we focused on one particular feeling of self-transcendence—awe. We tested the effectiveness of our design elements of transitions with 16 participants while simultaneously collecting qualitative data to explore creative solutions for supporting self-transcendence surrounding the VR experience itself. We used a mixed methods approach to evaluate our prototype with a between-subjects design comparing our pre- post-VR experience to a VR-only condition. Participants were given two questionnaires: transcendence emotions questionnaire (TEQ) to assess feelings of self-transcendence, and Igroup presence questionnaire (IPQ) to assess feelings of engagement and “being there”. Participants’ creativity and diminished-self, both associated with awe, were measured by a “self” drawing activity. Pro-social behaviour, often an outcome of self-transcendence, was measured through a pen-drop task. Our preliminary results showed our design elements mostly supported the intended experience of self-transcendence, but there is still much work to be done in accommodating individual preferences for the pre- post-VR experience as well as improving upon the virtual experience itself. The questionnaires and behavioural measures point toward our immersive installation better supporting transcendent emotions (TEQ), presence (IPQ), pro-sociality (pen-drop task), and creativity but not diminished-self (“self” drawing) compared to VR-only. Thus, our results suggest a more holistic approach sets the context better than a traditional lab/clinical setting for a VR experience designed to foster self-transcendence. However, results are limited for this small sample size study. We recommend psychologists and clinicians using VR for supporting subtle, emotional experiences such as self-transcendence consider including these five aspects derived from our results through thematic analysis: child-like wonder, perceived agency, emotional and perceptual shifts, gradual transitions, and multisensory components.

15:30—16:45 (Session 4C)

1. Interpersonal online risks: Exploring the dual systems model, personality and the fear of missing out

Masa Popovac & Anna Eldred

ABSTRACT: With the increased role of technology in interpersonal communication, the formation and

maintenance of relationships as well as the popularity of online dating sites, it is imperative to understand the potential factors that may contribute to online risk taking behaviours in this context in order to inform effective prevention and intervention strategies. The present study focused specifically on Interpersonal Online Risks (IOR) and involved the development of a 12-item measure that explored aspects such as talking to strangers online, sharing personal information with them, and sexting (i.e. sending or receiving sexually themed images, comments or videos). Using this measure, the study explored the relative contribution of the HEXACO personality dimensions, the Fear of Missing Out (FoMO) and the variables associated with the Dual Systems Model (Steinberg et al., 2008), namely, Sensation-Seeking and Impulsivity, on risk taking in this context. The Dual Systems Model has been explored extensively in relation to offline risks but has not been examined in the context of online risk taking nor IOR specifically. The model posits that developmental changes in brain structure create a period of heightened vulnerability to risk taking at mid- to late adolescence due to peaks in reward-seeking and lowered self-regulation (often measured as Sensation-Seeking and Impulsivity). Thus, it is of interest to examine whether this model may be relevant in the context of online risk taking as well. The aims of the study were thus to: (i) develop and validate a measure of IOR behaviours, and (ii) to use this scale to investigate the Dual Systems Model variables (Impulsivity and Sensation-Seeking), personality and FoMO as a multifaceted approach to understanding individuals' IOR behaviours. A total of 251 participants aged between 16-67 ($M = 32.1$) completed the Brief Sensation Seeking Scale (Hoyle et al., 2002), Brief Impulsivity Scale 11 (Patton et al., 1995), the HEXACO-60 personality measure (Ashton & Lee, 2009) and FoMO Scale (Przybylski et al., 2013). Data was collected through an online survey using social networking sites, online communities, and recruitment within a university and school context. In line with the first study aim, a Principal Component Analysis showed that items in the IOR scale loaded onto two distinct factors: labelled 'Developing relationships' (6 items; e.g. 'I disclose more information to people online') and 'Sexting' (6 items; e.g. 'I have sent a nude image of myself to someone online'). The Cronbach's alpha for the scale was .93 and an item-analysis indicated that the removal of any items would have decreased the reliability of the scale. To explore the predictors of IOR, 3 hierarchical regression analyses were conducted: one for the overall IOR scale and additional analyses for the two subscales given the exploratory nature of the study. Age was the only significant predictor of IOR behaviours in general and the only predictor for sexting specifically, with younger individuals engaging in more risks. In relation to developing relationships online, age and a number of personality traits were significant predictors, namely, younger individuals and those lower in Honesty-Humility and Extraversion and higher in Openness to Experience had a higher likelihood of engaging in risks associated with relationship formation online. Impulsivity was shown to be a significant predictor in all regression analyses up until the inclusion of the personality variables. Sensation-Seeking and FoMO failed to predict IOR. This study highlights the potential differences in online and offline risk taking and the factors that may contribute to this. It provides an avenue for future research in this area that could lead to the development of targeted interventions for specific age groups.

2. **#Eating disorders and Instagram: What emotions do you express?**

Clelia Malighetti, Alice Chirico, Simona Sciara, & Giuseppe Riva

ABSTRACT: Instagram is an image-based social media platform for mobile devices that offers the possibility to upload, edit, share pictures and very short videos with other users. This increasingly-used

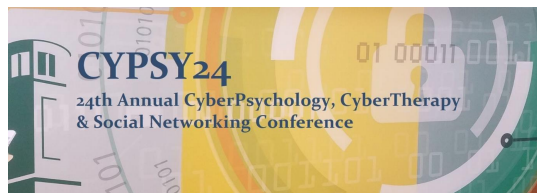
social media platform promotes a new form of communication and self-expression based on images and photos. Despite this image-based communication has become a wide form of online self-presentation, it is still less investigated compared to social media text content analysis of written posts. Crucially, most Instagram images that circulate on a daily base show thin, muscular, and unrealistic body ideal. With this regard, recent studies showed that social media have created a breeding ground for disordered eating. Moreover, psychological research on social networks has focused on the effect of exposure to content. However, Instagram provides a new opportunity to study not only the exposure effect to image-based material, but also the role of authoring figurative content. Instagram allows being both authors and consumer. Crucially, this figurative authored content is also emotionally salient, but this aspect has been poorly studied to date. Far less investigated is the emotional profile of pictures with hashtags related to eating disorders. Here we sought to examine the emotional expression of hashtags related to eating disorders of self-produced images posted by users on Instagram. Specifically, given the role emotion regulation and recognition deficits in eating disorders, the present study aims to explore the emotional expressions associated with different hashtags for eating disorders. We considered 250 Instagram photos of females. The hashtags were selected accordingly to a web-ranking on the most popular hashtags for eating disorders on Instagram: #anorexia, #thinispo, #ANA, #eatingdisorder, #fitinspiration. The emotions expressed in each photo were measured using the Emotion API from Microsoft Azure Cognitive Service. This technology can recognize eight emotions: anger, contempt, disgust, fear, happiness, neutral, sadness, and surprise. We expect an emotional flattening and a mitigation of emotional expression from the images related to eating disorders that might be read as an expression of emotional deficits which might be close to alexithymia. Therefore, it would be crucial to understand the bodies featured related to these hashtags so that effective interventions and preventative measures can be informed, developed, and implemented. Data collection is ongoing, thus results will be presented and discussed in the final version of the article.

3. **Advancing an understanding for managing police operations in response to cyberstalking and cyber harassment**

Melanie Pitchford, Niamh McNamara, Emma Short, James Barnes, & Ellie Myers

ABSTRACT: With the advancement of technology, ever increasing internet usage and the exponential growth of the use of social media sites, cyber harassment and cyberstalking are becoming ever more prevalent. The principle objective of the current study was to investigate the number of cyber harassment and cyberstalking cases reported within two regions of the United Kingdom (UK) and by interviewing victims to establish how the recording procedure and management of these cases by police forces impacts on the victim's overall experience. Using relevant crime data from two UK police forces the frequency and method by which these cases were recorded was assessed and is reported. The criteria for selection of potential interviewees were that their case was closed, they were over 18 years of age and they were not identified as vulnerable on the crime record. From the data sets 1,621 victims were identified as eligible to be invited to take part. Of those invited, 53 (44 female, 9 male) people agreed to participate. The interviews were conducted in a relaxed atmosphere using a semi-structured interview technique, the 53 victims were asked about their experiences both of the cyberstalking/ cyber harassment and their experiences of reporting the crime(s) to the police. At the time of interview their ages ranged from 20 to 72 years, $M = 38$ years 3 months, $SD = 12$ years 3 months. All the interviews

were audio recorded and the duration of the sessions ranged from 15 to 81 minutes, $M = 34$ minutes, $SD = 16$ minutes. The recordings of the interviews were transcribed and anonymised and the transcripts were then thematically analysed. Overall, the findings suggest that police officers' response to the victim's initial contact is key to continued engagement and co-operation. Initial reporting occurred only after a prolonged period of stalking or harassment. The concerns raised by the victims in relation to their decision to report related to: (a) their relationship with the perpetrator, (b) feeling that the harassment will not be taken seriously, and (c) a fear of negative judgment from the police. The quality of interactions with police officers and the nature of the subsequent action taken either heightened or reduced victims' distress. This also signaled to victims the police officers' attitudes towards them and the potential seriousness of the crimes committed. Additionally, the quality of these interactions was central to victims' decisions to continue to co-operate with police. If victims felt their efforts to provide evidence or report further incidents went unappreciated, they reported a desire to disengage from the process. The study has real world impact as it has the potential to increase police efficiency and enhance their understanding of how to improve victim experiences and satisfaction. Recommendations are made for the police and future research.



Wednesday, June 26th – NSU Main Campus: Nursing & General Education Building (NGE)

Time	Event						
08:30	Registration Continues: NGE 3 rd Floor						
Concurrent Sessions							
	<table><tr><th>Symposium 2: NGE 314</th><th>Session 5A: NGE 318</th><th>Session 5B: NGE 320</th></tr><tr><td>Experiential pedagogy and the socio-cybersecurity curriculum <i>Moderated by Carlene Turner</i> 1. Infusing cybersecurity in social science research methods curriculum <i>Yuying Shen</i> 2. Teaching cybersecurity to non-computer science students using experiential pedagogy: digital forensics in the American court systems curriculum <i>Claude Turner</i></td><td>Big data demonstration: Big data analytics applied in social science Twitter Open Source Intelligence (OSINT): automated open source intelligence collection, analysis and visualization tool <i>Mary Ann Hoppa, George Hsieh, Bigyan KC, & Scott Debb</i></td><td>1. Assessing pain with virtual reality -- A pilot study <i>Maureen Simmonds, Tassilo Baeuerle, & Kyle Lepage</i> 2. Relevance of ‘nudging’ in CMC (mixed reality) for flow elicitation. A preliminary study <i>Carlo Galimberti, Andrea Gaggioli, Dafne Birtig, Alice Chirico, Alex Collina, & Ilaria Vergine</i> 3. Visualizing movement with learning outcomes in educational VR environments <i>Swati Pandita, Elif Celikors, Natasha Rojas, Cynthia Yue, Jack Madden, Natasha Holmes, & Andrea Stevenson Won</i></td></tr></table>	Symposium 2: NGE 314	Session 5A: NGE 318	Session 5B: NGE 320	Experiential pedagogy and the socio-cybersecurity curriculum <i>Moderated by Carlene Turner</i> 1. Infusing cybersecurity in social science research methods curriculum <i>Yuying Shen</i> 2. Teaching cybersecurity to non-computer science students using experiential pedagogy: digital forensics in the American court systems curriculum <i>Claude Turner</i>	Big data demonstration: Big data analytics applied in social science Twitter Open Source Intelligence (OSINT): automated open source intelligence collection, analysis and visualization tool <i>Mary Ann Hoppa, George Hsieh, Bigyan KC, & Scott Debb</i>	1. Assessing pain with virtual reality -- A pilot study <i>Maureen Simmonds, Tassilo Baeuerle, & Kyle Lepage</i> 2. Relevance of ‘nudging’ in CMC (mixed reality) for flow elicitation. A preliminary study <i>Carlo Galimberti, Andrea Gaggioli, Dafne Birtig, Alice Chirico, Alex Collina, & Ilaria Vergine</i> 3. Visualizing movement with learning outcomes in educational VR environments <i>Swati Pandita, Elif Celikors, Natasha Rojas, Cynthia Yue, Jack Madden, Natasha Holmes, & Andrea Stevenson Won</i>
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09:00 – 10:15	3 Effectiveness of experiential pedagogy in infusing cybersecurity across the curriculum: The case of SOC-401 <i>Carlene Turner</i>						
10:15	Social Networking Break: Coffee & Tea (NGE 324)						
11:00	Poster Session A (3 rd Floor NGE)						

Keynote Address 2
(NGE 205)

Human-Machine Communication for Enhanced Decision Making

Dr. David Stargel



(Deputy Chief Scientist, U.S. Air Force Research Lab, Human Performance Wing, Dayton, OH, USA)

11:00

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11:45

Discussion Panel: Social trust in cyberspace: Technology-mediated shifts in the shared social contract

(NGE 205)

11:45

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12:15

David Stargel, Grainne Kirwan, Mary Ann Hoppa, & Peter Foytik

12:15

–

13:30

Buffet Lunch: NGE 205

Concurrent Sessions

Session 6A: NGE 316

1. Cognitive effects of transcranial direct current stimulation and virtual environments

Justin Asbee & Thomas Parsons

13:30

–

14:45

2. Randomized controlled trial of allostatic neurotechnology to treat mild traumatic brain injury

Michael Roy, Paula Bellini, Gustavo Marino, Spiros Kulubis, Charles Tegeler, & Lee Gerdes

3. The effect of eye-feedback training on orienting attention in individuals with sluggish cognitive tempo

Kiho Kim & Jang-Han Lee

Session 6B: NGE 318

1. Joint attention, social cognition, and augmented reality devices

Jeahwan You, Jiwoong Heo, & Kwanguk Kim

2. Body size change perception and the body ownership illusion

Myeongul Jung & Kwanguk Kim

3. Raising HE students' awareness of technology mediated abusive behaviours – Bedfordshire Cyber Awareness Programme (BCAP)

Marcia Gibson, Antony Brown, Emma Short, Katy Haigh, Fiona Waye & James Barnes

Session 6C: NGE 320

1. If you want it, will you get it? How the motivation of SNS users to establish the social ties affect their social capital?

Yadviga Sinyavskaya and Alexander Porshnev

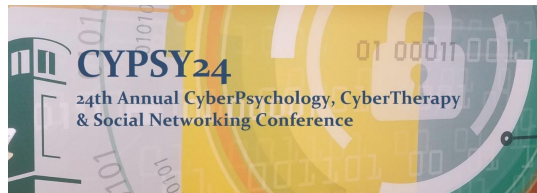
2. Video Games and their effects on well-being: A review

Yemaya Halbrook, Aisling O'Donnell & Rachel Msetfi

3. Influence of social media use, parenting style and academic self-concept on adolescents' academic performance

Luis Vallejo & Gordon Ingram

14:45 – 15:30		Social Networking Break: Coffee & Tea (NGE 324) Poster Session B (3 rd Floor NGE)	
Concurrent Sessions			
Session 7A: NGE 316		Session 7B: NGE 318	
1. Prior tech experience and motivation to engage in immersive virtual reality intervention: A Study of verbally fluent adolescents and Adults with autism <i>Julia Parish-Morris, Ashley Zitter, Sinan Turnacioglu, Rita Solórzano, Judith Miller, Vijay Ravindran, & Joseph Mccleery</i>		1. From acceptability to acceptance of the setting in videoconference telepsychotherapy: Analysis of interactional models <i>Lise Haddouk, Stéphane Bouchard, Eleonora Brivio, Carlo Galimberti, Alain Trognon & Geneviève Robillard</i>	
2. Cultural differences in attitudes towards interactive messages for digital addiction: A UK-China comparison <i>John McAlaney & Raian Ali</i>		2. Public speaking training in front of an imaginary or virtual audience: A randomized controlled trial <i>Ni Kang, Ding Ding, Dwi Hartanto, Willem-Paul Brinkman & Mark Neerincx</i>	
3. The impact of level of alcohol consumption and social context on the perceived attractiveness and employability of Facebook users <i>Graham Scott & Gillian Bruce</i>		3. Understanding digital disconnection in terms of death anxiety <i>Dave Harley</i>	
Session 7C: NGE 320		Session 7C: NGE 320	
1. As long as you're with me: The effects of social presence and distance on pain perception in virtual environments <i>Andrea Stevenson Won, Swati Pandita, & Kaylee Kruzan</i>		1. As long as you're with me: The effects of social presence and distance on pain perception in virtual environments <i>Andrea Stevenson Won, Swati Pandita, & Kaylee Kruzan</i>	
2. Indigenous patients under virtual anesthesia in ambulatory surgery 11 years later <i>Dejanira Mosso, Brenda Wiederhold, Mark Wiederhold & Jose Luis Mosso</i>		2. Indigenous patients under virtual anesthesia in ambulatory surgery 11 years later <i>Dejanira Mosso, Brenda Wiederhold, Mark Wiederhold & Jose Luis Mosso</i>	
3. Towards an advancement of multisensory integration deficits in anorexia nervosa: Exploring temporal discrimination processing of visuo-auditory stimuli <i>Alice Chirico, Clelia Malighetti, Silvia Serino, Pietro Cipresso, Elisa Pedrolì, Cosimo Tuena, Manuel Muratore, & Giuseppe Riva</i>		3. Towards an advancement of multisensory integration deficits in anorexia nervosa: Exploring temporal discrimination processing of visuo-auditory stimuli <i>Alice Chirico, Clelia Malighetti, Silvia Serino, Pietro Cipresso, Elisa Pedrolì, Cosimo Tuena, Manuel Muratore, & Giuseppe Riva</i>	
Dinner on your own			
If you will be staying the evening, let's meet in downtown Norfolk! Discounts are available at a number of the local restaurants if you show your conference badge (see the conference website for listings)			



June 26, 2019 Program: Detailed Information

09:00—10:15 (Symposium 2: Experiential pedagogy and the socio-cybersecurity curriculum)

1. **Infusing cybersecurity in social science research methods curriculum**

Yuying Shen

ABSTRACT: Social science research methods course, which is designed as a core curriculum component for upper level undergraduate students majoring in sociology or other related fields, introduces students to different methods in social science research, including design and conceptualization of research, sample selection, data collection, & data analysis. “Stronger cybersecurity starts with a data and analytics strategy.” Integrating cybersecurity concepts into social science research methods teaching provides students with a better understanding of how to go about data integrity and other cybersecurity issues that may arise and must be addressed in the process of social science research. The present study therefore aims to develop, deliver, and assess two completed teaching modules developed to infuse cybersecurity into social science research methods curriculum at Norfolk State University. It is hypothesized that our instructional modules, composed of lectures, computer lab practice and assignments, will help to improve our social science undergraduate students’ awareness and knowledge of cybersecurity. A randomized group of NSU undergraduates majored in sociology, social work, and health management has voluntarily participated in our two instructional modules. Our hypotheses were tested with measurable objectives and specific evaluation method for each instructional module. Professional assessment and feedback from an education professor who has been participating the instructional session was obtained. Additionally, pre- and post-tests surveys and statistical analyses were conducted to assess the impact of the modules on the targeted undergraduate students. Statistical analysis of data we have collected indicates improvement in participating students’ knowledge and awareness of social science study and research along with cybersecurity concepts. This project enables the social science undergraduate students to be exposed to critical technological concepts and techniques, which are useful not only for valid and reliable social science study but also necessary for keeping America and the World cyber secure.

2. **Teaching cybersecurity to non-computer science students using experiential pedagogy: digital forensics in the American court systems curriculum**

Claude Turner

ABSTRACT: Traditionally, cybersecurity is a discipline that is situated in computer science and information technology departments. Increasingly, the relevance of cybersecurity to non-computer science and non-informational technology disciplines is more apparent. This presentation is based on the effort to create stand-alone socio-cybersecurity modules and teach them in one session of an American Court System class from Criminal Justice. The module in question, Digital Forensics and Governmentality, was collaboratively created by a cybersecurity instructor and a sociology instruction. The module was co-taught by the team as well. The module was grounded in experiential pedagogy as a major focus of the modules was the hands-on exercises that the students completed after the lecture. A multi-stage methodology was used to assess the outcome of the infusion of the modules into the course.

First, quasi experimental methodology was used to conduct surveys through the Blackboard LMS. The students were asked to complete a pre-test, the module was then taught, and then the students completed the post-test surveys. Paired t-test analysis was used to compare the indicator means before and after module infusion. The students also completed review of the steps in the digital forensics evidence gathering and discussed their reactions. This discussion was analyzed using content analysis. The paired t-test results demonstrated that the infusion of the module into the American Court System class impacted student' learning outcomes for two out of eight concepts. Students also increasingly identified and explained adherence to the digital data gathering protocol. The utilization of experiential pedagogy reinforced its value in teaching cybersecurity to sociology students. The sociology students confirmed that the laboratory exercise was useful in their understanding of the cybersecurity concepts.

3. **Effectiveness of experiential pedagogy in infusing cybersecurity across the curriculum: The case of SOC-401**

Carlene Turner

ABSTRACT: This research is predicated on the idea that cybersecurity can: (1) be increasingly understood through an interdisciplinary lens, (2) flourish as a research agenda in the social sciences, (3) be effectively taught to sociology and criminal justice students. A new 400-level undergraduate course, Socio-Cybersecurity, was created based on this premise. The course was consciously created with a lecture and laboratory structure, borrowed from the natural and physical sciences. SOC-401 has been taught once at our institution, and the resulting analysis demonstrated students' outcomes from this course. The methodology that was used for this analysis includes a quasi-experiment survey. On the first day of the course students, who were all Sociology majors, completed a short pre-test survey of their perceptions of cybersecurity. The post-test survey was conducted on the final day of the course using the same perception scale. The data was analyzed using paired T-test to compare mean perceptions at the beginning and end of the course. Content Analysis of the students' final projects was also done to explore their overall conclusions from the course. The conclusion from teaching this course demonstrates that there was a significant mean different in all four learning outcomes across the pre and post test conditions. The content analysis also demonstrates a clear understanding of the usefulness of cybersecurity to sociology students. Therefore, the recommendation is that infusing cybersecurity into the social sciences would be a smart investment for higher education institutions.

09:00—10:15 (Session 5A: Big Data Demonstration— Big data analytics applied in social science)

1. **Twitter Open Source Intelligence (OSINT): automated open source intelligence collection, analysis and visualization tool**

Mary Ann Hoppa, George Hsieh, Bigyan KC, & Scott Debb

ABSTRACT: Information gathered from publicly available sources like news, blogs and social media – called Open Source Intelligence (OSINT) – easily can result in hundreds of millions of new data points daily. Twitter is an obvious OSINT source, since professionals use social platforms to share details relevant to their work. A capability has been developed at Norfolk State University called TwitterOSINT that can help analysts and researchers derive and visualize useful OSINT from Twitter.

TwitterOSINT's powerful language processing capabilities, and its ability to collect and process information in near-real-time, make it applicable in many disciplines. Two TwitterOSINT use cases will be demonstrated: a cyber defense strategy that involves collecting information about vulnerabilities, threats, attacks, and countermeasures as they develop, and to monitor emerging trends in the cybersecurity landscape; and a data collection and analysis scenario drawn from the social sciences.

09:00—10:15 (Session 5B)

1. Assessing pain with virtual reality -- A pilot study

Maureen Simmonds, Tassilo Baeuerle, & Kyle Lepage

ABSTRACT: Background: Pain is a complex physiological and psychological phenomenon, notoriously difficult to measure and manage. While research on numerous potential biomarkers continues, no definitive biomarker for pain has been identified. Improved methods to measure pain and its impact, especially methods that do not rely on patient self-report, are a priority research area. We have previously shown that pain compromises task performance involving motion. It is, therefore, plausible that specific motion characteristics could provide a pain proxy that will mitigate the sole reliance on self-report. Purpose: The purpose of this study was to assess the feasibility of using 3-dimensional movement characteristics captured in a VR environment to accurately estimate pain and mitigate reliance on patient self-report. Methods: The study had two Phases. In Phase I we developed a set of tasks in a VR environment which required participants to perform a set of upper limb motions. We tested the tasks on five pain-free adult participants under no-pain (baseline), and experimentally induced pain conditions. In Phase II eighteen participants with and without clinical pain performed a set of refined tasks under baseline, experimentally induced pain and fatigue conditions. The resulting data were evaluated, and simple models were fit to the pain and fatigue reported by the participants under the different experimental conditions. Key Results: Phase I: Descriptive statistics and simple ordinary least-squares regressions were computed and showed that: 1. perceived pain and fatigue correlate with motion acceleration and velocity; 2. pain correlates with the amount of time taken by a participant to perform a task; 3. pain and fatigue are partially confounded in that pain and fatigue are moderately correlated during the tasks; 4. there is a multiplier effect between pain and induced fatigue on the variance of hand-motion velocity and on the variance of hand-motion acceleration. Phase II: Based on Phase I results, models incorporating further task structure were fit to the resulting data and compared using the Akaike Information Criterion. Model fit performance indicate that human motion in this VR paradigm is a candidate source of biomarkers for assessing (i) pain, and (ii) the impact of pain intensity on specific movements characteristics. To test if participants with clinical pain and participants without clinical pain showed any differences in the relationship between motion and reported pain a semi-parametric likelihood ratio test was computed. This test, comparing the alternate hypothesis of a clinical pain-specific effect on the relationship between motion and pain against the null hypothesis of no clinical-pain-specific effect, was found to be significant. This is important, because it suggests motion in VR can be predictive of clinical and experimentally induced pain. Discussion: The results suggest that this VR approach may have the potential to quantify the impact of pain intensity on movement, and thereby not only provide a proxy pain but also an indicator of treatment efficacy. Per-participant results further suggest that model accuracy may be greatly increased by (i) characterizing participant type based on

personal characteristics such as age, sex, and movement skill and (ii) improving our characterization of human motion. The characteristics of human motion in this VR paradigm may present a candidate source of biomarkers for evaluating pain and the impact of pain intensity on specific movements. A great deal of further study is required to generalize these early results and to develop motion statistics / parameters and models which can consistently predict pain across chronic and other pain populations.

2. **Relevance of ‘nudging’ in CMC (mixed reality) for flow elicitation. A preliminary study**

Carlo Galimberti, Andrea Gaggioli, Dafne Birtig, Alice Chirico, Alex Collina, & Ilaria Vergine

ABSTRACT: Context: The innovative technologies permeating our lives pose questions on the new ways of communicating (Computer-Mediated Communication) in mixed (digital/virtual and real) environments. Crucially, it is still unexplored the nature of elements emerging from communications in these intersubjective spaces, such as the experience of shared-flow (i.e., mutual engagement) among team members. Flow in CMC is still a debated phenomenon, which has been mostly studied at the individual level. Most studies considered flow emerging from single subjects interacting with a computer, while the interaction between participants simultaneously interacting with a medium is still an open issue. In this preliminary study, we aim to address this aspect focusing on the study of shared flow among members interacting in Mixed Reality (MR) environments. According to Social Psychology of Cyberplaces, we assume that among team members interacting for a task resolution in CMC, deep cooperation can grow until the reaching of a shared optimal experience. Specifically, this pilot study tested the feasibility of manipulating different types of nudging in a dyadic mediated interaction (supported by MR) and the resulting impact on intersubjective spaces characteristics (i.e., Shared flow, Social Presence and Utterance Intersubjectivity). On the basis of this study, we will discuss whether and how, within a CMC environment, a featured nudge could bring forth an emergent entity which merges the members into a single unit and which culminates in the optimal experience of a shared-flow. Methods: The study involved 30 participants, divided into 15 dyads randomly assigned to three different conditions (“nudge for empathy-Ne”; “nudge for awareness-Na”; “control-C”). Dyads, divided by a separative wall to recreate the CMC “gap”, were connected through a mediated-communication (PC-MR device). MR device was functional to visualize a long-distance situation and jointly act in it by being teams’ aim the resolution of a collaborative task. We hypothesized that “Ne” might induce the highest levels of mutual connection at the behavioural, cognitive, attentive and emotional level (social presence and intersubjectivity) and of mutual engagement (shared-flow) compared to the other conditions. We adopted a mixed methodology combining quantitative and qualitative measurements of individuals’ mediated experience. The quantitative phase dealt with the measurement of participants’ trait empathy (IRI) before, and with the assessment of social presence (Networked Minds Social Presence Inventory-NMSPI) and flow (Flow State Scale -FSS) after the task. The qualitative phase consisted of conversational analysis of dyads’ mediated interactions transcriptions, in order to detect interactional patterns intended to favour negotiation processes and reach, if possible, intersubjectivity. Results:

3. “Na” showed the highest levels of 2nd order social presence (cognitive, emotional, behavioural and attentive mutual involvement) as a result of the rational awareness of Other’s presence. However, to achieve the 3rd order mutual social presence (symmetry of mutual involvement perception among members), intersubjective elements should be involved. These were all traced within “Ne”, which led to experience the highest levels of flow and shared-flow, while “Na” the lowest due to the “breaking-flow”

experience. Participants provided with “Ne” engaged into a dialogical comparison with their partner developing empathy, mutual comprehension and growth. Team was perceived as a single emerging entity where subjects moved synchronously as in a couple-dance. Conversely, “Na” led subjects to dialogically cut out their partner by focusing only on themselves. Team acquired the role of a functional-utitarian tool. Conclusion: The study showed how a nudge intervention on a CMC dyadic interaction can contribute to re/shape the intersubjective space between interacting partners in terms of intersubjective communicative behaviours and shared-flow. Results are useful to guide future projects on shared-flow among members in CMC environments, that are three elements which have gained importance within contexts such as corporate and academy.

4. **Visualizing movement with learning outcomes in educational VR environments**

Swati Pandita, Elif Celikors, Natasha Rojas, Cynthia Yue, Jack Madden, Natasha Holmes, & Andrea Stevenson Won

ABSTRACT: Consumer virtual reality hardware (VR) has made educational applications more affordable and accessible to a larger audience. However, outside of the well-established utility of simulation training, the advantages of VR over other platforms remains under investigation. In a previous study we deployed three learning environments (VR, desktop, hands-on) designed to teach participants about the phases of the moon. A secondary analysis of the tracked movement and event data from the virtual reality component of this experiment provides additional information on what kind of participant behavior is linked to learning success. Video game experience has been proposed to affect performance in virtual environments to account for gender differences. Video games more typically played by men may allow more familiarity with the controllers used in virtual reality. As VR is becoming more accessible to the public, with consumer headsets sold at local big box retailers, students may also now come to a virtual learning environment with more knowledge about VR and experience with it. Therefore, accounting for these factors may prove useful for assessing the efficacy of virtual learning environments. Fifty-six participants between the ages of 18 and 24 were recruited from the undergraduate student population of a medium-sized private university to complete the virtual reality condition of a physics educational module. Participant data were excluded if: (1) improper instruction was given to the participant (n=1), (2) participant had to re-start the condition after completing over half of the learning module (n=2), (3) if movement data was still recorded after completing learning module (n=2). As a result, 5 participants were removed from analysis of movement data. The movement and event related data of 51 participants (43 female, 7 male, 1 other) were analyzed in an exploratory secondary analysis. In order to characterize participants' movement behavior, the X, Y, and Z position and the pitch, yaw, and roll of participants' head and hands were recorded for the entire session. Total movement was calculated as the Euclidean distance (mm) of positional data, including both headset and controller movement. Summing movement data by seconds allows for standardized comparisons between participants; for example, we can compare the first 30 seconds of the experiment across participants. Total movement was then chunked into 1000 ms (per second) intervals and plotted as a time series. Time spent in each condition was calculated as the difference between the start and end of the learning condition. Start and end time was determined by the timestamps of movement data in the VR condition, which commenced upon instruction. In the hands on and desktop conditions, participants were video recorded throughout the session; start time was coded as right after instructions were given

and questions were answered. End time was coded when participants indicated they were finished. We found that participants with experience with the positional tracking of the Oculus Rift moved around more in the first minute of entering the virtual environment than individuals without VR experience, or who had only experienced phone-based VR. This trend was consistent across the right hand, left hand and head movements. Participants with video game experience did not show any significant difference in their overall initial movement and right hand, left hand, and head movement despite video game experience predicting better post test scores. Overall, time spent in VR and average movement (mm) per 1,000 ms positively correlated with score improvement.

13:30—14:45 (Session 6A)

1. Cognitive effects of transcranial direct current stimulation and virtual environments

Justin Asbee & Thomas Parsons

ABSTRACT: Introduction: Electrical stimulation of the brain has been in use for quite some time, however this method of stimulation has gained popularity and increased scientific rigor starting in the early 2000's. Transcranial direct current stimulation (tDCS) consists introducing a small amount of current (between 0.5 and 2.0 mA) at the scalp to influence brain activity in the underlying areas. tDCS itself does not directly cause neurons to fire but influences how likely neurons are to fire. Investigations have been conducted to examine the influence of tDCS on cognition and cognitive domains, with potential applications examined including manipulation of a wide range of domains of cognition, emotions, and perceptions. A limitation of these studies is that cognitive manipulation using tDCS has often involved static stimuli (e.g., 2D pictures) that may not reflect the cognitive processes that occur in activities of daily living. To address these limitations, a growing number of studies include virtual environments (VE) that provide dynamic and interactive simulations of everyday cognitive functioning. Lacking is a quantitative meta-analysis that enhances understanding of the variability and empirical significance of cognitive manipulations following tDCS while persons interact in virtual environments. This paper reveals preliminary results from our quantitative review of the literature. Methods: Studies using tDCS in conjunction with virtual stimuli to influence cognition were included. Selection criteria: 1) quantitative data; 2) cognitive measures; 3) at least one experimental group and a control (sham) group; 4) peer-reviewed and published study; 5) enough data to calculate an effect size; and 6) stimuli from a virtual environment. Searches of electronic databases yielded 756 studies, and of these, 14 studies (640 subjects) met inclusion criteria. It was found that the degree to which tDCS can influence cognition when using stimuli from VEs varies greatly based on the cognitive domain examined. Results: An overall analysis using both static and dynamic virtual stimuli tDCS produced a statistically significant Hedge's g of 0.26, 95% CI [0.18, 0.35], $Z = 5.98$, $p < 0.001$. The effect size for tDCS on cognition using dynamic stimuli produced a small to medium effects: $g = 0.32$, 95% CI [0.20, 0.44], $Z = 5.24$, $p < 0.001$. Additionally, the effect of tDCS on cognition using static stimulus pictures from virtual environments was also statistically significant, $g = 0.26$, 95% CI [0.14, 0.39], $Z = 4.14$, $p < 0.001$. In further analyses, we divided the data various ways to examine potential moderators of the effect of tDCS on cognition using virtual environments. Data was divided based on cognitive domain. Transcranial direct current stimulation seemed to have the greatest influence on skill acquisition, $g = 0.74$, 95% CI

[0.48, 0.99], $Z = 3.95$, $p < .001$, and spatial/visual abilities, $g = 0.61$, 95% CI [0.42, 0.80], $Z = 6.25$, $p < .001$. The effect size was smaller for inhibition, $g = 0.15$, 95% CI [0.04, 0.26], $Z = 2.97$, $p = .005$.

Discussion: In summary, tDCS when used with VEs produced medium effect size impacts on cognition, which appear to be highly dependent on the specific domain of cognition. Visual/spatial abilities and skill acquisition seem to be influenced the most compared with inhibition. This meta-analysis provided a clearer picture of what can be expected when tDCS is used with VEs. Because tDCS had a large impact on skill acquisition, one of the most fruitful uses of tDCS and VEs may be for training purposes.

However, a more fully developed meta-analysis needs to be performed to improve our understanding of when tDCS is beneficial and when tDCS may not be needed.

2. **Randomized controlled trial of allostatic neurotechnology to treat mild traumatic brain injury**

Michael Roy, Paula Bellini, Gustavo Marino, Spiros Kulubis, Charles Tegeler, & Lee Gerdes

ABSTRACT: Background and Purpose: Persistent symptoms after mild traumatic brain injury (mTBI), including chronic pain and sensory disturbance, may be related to alterations at the level of neural oscillations. Studies in mTBI patients show suboptimal proportionation of power across the brain electrical frequency spectrum, including high amplitudes for both low frequency and high frequency ranges, with the latter being associated with disturbed sleep. We are conducting a study to evaluate a noninvasive, closed-loop, acoustic stimulation neurotechnology as a novel treatment to enable both physiological and clinical recovery from mTBI, through auto-calibration of neural oscillations. The hypothesis is that acoustic stimulation neurotechnology based on one's own brain electrical activity will result in greater reduction in mTBI symptom severity than exposure to non-specific acoustic stimuli (random tones) delivered in a comparable way. Population: Participants are active duty or recently retired service members, or their family members, with mTBI 3 months to 10 years prior, and subsequent persistent symptoms resulting in a Neurobehavioral Symptom Inventory (NSI) Score >23 . The 2 study sites are Uniformed Services University (USU)/Walter Reed National Military Medical Center, Bethesda, MD, and Womack Army Medical Center (WAMC), Fort Bragg, NC. Design type and procedures: The study is a randomized, single-blind, two-arm, controlled clinical trial that will enroll 106 individuals with persisting symptoms after mTBI, and equally randomize them to either 10 sessions of a closed-loop acoustic stimulation neurotechnology, administered by a trained technologist, or 10 sessions of non-specific acoustic stimulation (random tones) that mimic the algorithm-guided approach. Sessions can be completed over 1-5 weeks. Each session includes a series of protocols in which sensors are placed on the scalp for monitoring of brain electrical activity. Software algorithms perform real-time analysis of brain signals and produce changing patterns of acoustic stimulation (audible tones of variable pitch and timing), delivered back to the user through standard earbud headphones. Both groups undergo the same sequence of procedures, and experience comparable levels of social interaction from study investigators and support personnel. Both the participants and those measuring and analyzing outcomes are blinded to treatment allocation. The primary outcome is differential change on the Neurobehavioral Symptom Inventory scores at three months, and final follow-up will occur at six months. Secondary outcomes include symptom inventories for PTSD, depression, sleep, pain, dizziness, and quality of life, as well as objective measures of reaction time (ANAM simple and procedural reaction times), balance (modified Balance Error Scoring System, mBESS) and heart rate variability (Faros system). Preliminary Baseline Results: To date, 7 participants have completed baseline assessment, and data is presented here

for them; we will update this at the time of the meeting when we should have many more participants having completed both baseline and outcome measures. Participants to date are 71% Male, with a mean age of 35, 3.43 deployments, and 2.71 TBIs. All are active duty. Participants had an average heart rate of 70 BPM, blood pressure of 119/79, and ANAM simple reaction time score of 409.1 msec and procedural reaction time score of 762.9 msec. Mean baseline scores are 40.7 on the NSI, 39.7 on the PTSD Checklist for DSM5 (PCL-5), 11.1 on the PHQ-9 screen for depression severity (a score ≥ 20 is exclusionary), 60.3 on the HIT-6 measure of headache symptom severity, 37.4 on the DHI measure of dizziness symptom severity, 20.3 on the Insomnia Severity Index, and 4.4 on the mBESS. Preliminary Conclusions: Allostatic neurotechnology is an appealing approach to the treatment of symptoms after mTBI; completion of this study will provide valuable data on its efficacy.

3. **The effect of eye-feedback training on orienting attention in individuals with sluggish cognitive tempo**

Kiho Kim & Jang-Han Lee

ABSTRACT: Sluggish cognitive tempo (SCT) is a kind of attentional disorder characterized by symptoms of slowness in behavior or in thinking, difficulty initiating and sustaining effort, hypoactivity, daydreaming, forgetfulness, and confusion in thinking. Along with orienting attention deficits that are thought to be related to specific attention problems, thoughts related to daily life activities are also believed to be affected by SCT symptoms. Thus, there has been an increasing number of studies that use pharmacological and behavioral treatments for SCT symptoms, with an increasing need for further research on interventions targeting attentional difficulties among individuals with SCT. The aim of the present study was to improve the dysfunction of orienting attention in individuals with SCT. To this end, we developed a preliminary attention training program based on a modified Posner spatial cueing paradigm that provides real-time constant eye-gaze feedback was used using eye-tracker. The task was designed for the participants to make orienting- related response as quickly and as accurately as possible. A total of 38 participants with SCT only were randomly assigned to one of following two conditions: eye-feedback (N = 19) or control (N = 19). The participants in the eye-feedback condition received three repeated trainings on the modified version of the Posner's spatial cueing test (measuring visual orienting of attention based on the eye-tracking system); we also used real-time constant eye-gaze feedback designed to lead the participants to quickly and accurately engage and to disengage, with pre- and post- measurement of eye-movements (overt attention) and the revised attention network test (ANT-R; covert attention). The participants in the control condition received three repeated same trainings without any feedback, with pre- and post-measurement of eye-movements measure and ANT-R. The results revealed that the eye-feedback group showed a greater improvement in engaging and disengaging attention through the overt attention measurement than the control group, while the eye-feedback group showed a greater increase only in the orienting network related to disengaging attention in the covert attention measure more than the control group. These results suggested that repeated attention training using the eye-feedback could improve the orienting network on both covert and overt attention in individuals with SCT. Taken together, our results suggest that the eye-feedback can be meaningfully used in attention training to enhance the efficiency of attention in clinical settings.

13:30—14:45 (Session 6B)

1. **Joint attention, social cognition, and augmented reality devices**

Jeahwan You, Jiwoong Heo, & Kwanguk Kim

ABSTRACT: Introduction: Various augmented reality (AR) devices including the HoloLens have recently been used to overlay additional information on displays to enhance visual cognition. Although such devices afford several advantages in terms of mutual interaction compared to existing virtual reality devices, previous studies focused only on the advantages afforded by such devices to individuals. Here, we used the concept of joint attention (JA) to study the effect of AR on human-human interactions; JA refers to shared attention to objects. We analyzed recognition memory by two types of interaction (initiating JA and responding JA; IJA and RJA, respectively). Method: This is an ongoing study; we have analyzed 14 participants (mean age = 24.86 ± 2.36 years; females, 35%) to date. We employ two HoloLens (Microsoft), each with a field of view of $30 \times 17.5^\circ$ and a resolution of $1,268 \times 720$. We developed two types of JA tasks (IJA and RJA tasks) involving the participants and the experimenter; both feature learning and testing phases. In the learning phase, we ask participants to memorize pictures to the best of their ability. In the IJA condition, each participant views and points to the screen; the experimenter responds to the participant's selection. In the RJA condition, the experimenter chooses a screen item first and each participant is asked to respond to that selection. Each learning phase block features 12 trials. In the testing phase, we determine whether or not participants have correctly memorized 36 (12 target, 12 non-target, and 12 novel pictures). All participants engage in two blocks of IJA and RJA tests with the testing order counterbalanced across participants. We use d-prime [$d' = Z$ (hit rate) – Z (false alarm)] and total head movement as the principal dependent measures. Preliminary Results and Discussion: At present, we have only preliminary results, which suggest the absence of a significant difference between the IJA and RJA conditions, unlike a previous study that did not use AR devices. We have found no between-group difference in d-prime [$t(13) = -1.769$, $p > 0.10$] or total head movement [$t(13) = 0.569$, $p > 0.579$]. Information-processing via IJA and RJA does not differ from that afforded by current AR devices. Thus, such devices may not be useful to social cognition or JA, perhaps because of the narrow field of view, low resolution, and/or interruption of eye contact. Further work is required.

2. **Body size change perception and the body ownership illusion**

Myeongul Jung & Kwanguk Kim

ABSTRACT: Introduction: Assessing changes in body size can be of key importance. For example, a decrease in body size may suggest a problem with food supply. We usually assess changes in body size either directly or in a mirror, but it is impossible to notice daily variations. However, this is achievable in a virtual world. Recent research suggests that the body ownership illusion (BOI) is a method by which one's body is transferred to others. Here, we develop a virtual reality tool to identify locations on the body in which changes are noticeable; we compare the body of an investigator with those of others via BOI synchrony and asynchrony. Method: We recruited 28 participants (mean age = 23.39 ± 2.13 years). We used a 2×2 within-subject experimental design, thus two levels of avatar movement synchrony (sync vs. async) and two different bodily size changes (fatter vs. slimmer). Each condition was subject to three trials; all participants viewed a virtual avatar of their original body size (in terms of height; and

shoulder, belly, and pelvis widths); the body size was then changed linearly from 0 to 15% in the fatter or thinner direction. As the virtual avatar changed, participants were asked to judge whether it had changed or not as quickly as possible; we defined this as the “body size change perception” (BSCP) value. Participants used head-mounted displays to view the virtual environment and observe the virtual avatar’s body, both directly and in a mirror of the virtual world. Results: The BSCP value was significantly higher under the sync than the async condition (sync, 8.8%; async, 7.5%, $p < 0.01$), and as the avatar grew fatter rather than slimmer (fat, 9.4%; slim, 6.9%, $p < 0.01$). We found no interaction effect between the synchrony level and direction of change ($p = 0.09$). Additional analyses suggested that these differences were driven by females, not males (females: $p < 0.01$; males: $p > 0.05$).

Discussion: We developed a novel BSCP measure and found that the body ownership illusion may be attributable to the BSCP. The difference between fatter and slimmer may reflect changes in bodily ratios; females perceived more differences between their own and others’ bodies. Although this was a pilot study, we hope that our results can contribute to the development of useful methods for virtual fitting or treatment of eating disorders.

3. **Raising HE students’ awareness of technology mediated abusive behaviours – Bedfordshire Cyber Awareness Programme (BCAP)**

Marcia Gibson, Antony Brown, Emma Short, Katy Haigh, Fiona Waye & James Barnes

ABSTRACT: In this talk we discuss the development, dissemination and evaluation of the Bedfordshire Cyber Awareness Programme (BCAP): Developed as part of the HEFCE CATALYST fund, with the goal of improving universities’ responses to hate crime and online harassment on campus. This was motivated by concern regarding an increased prevalence of cyber harassment, cyberstalking and online hate incidents involving university students in the UK. The increase may be in-part, symptomatic of a broader issue of, “Lad culture” a phenomenon that is becoming commonplace in certain online settings as well as on many university campuses. Contrary to the name, it can be displayed in behaviours of, and supported by males and females. Lad culture involves holding and openly expressing as normalised; immature sexist, misogynistic, racist or homophobic attitudes. It has been linked with rape, violence, bullying and harassment as well as sexual objectification in youth culture. Online harassment and cyberstalking have serious impacts on victims, and can lead to negative changes in personal relationships, freedom to use technologies as desired, work and financial changes. In many cases victims exhibit symptoms of post-traumatic stress disorder (PTSD) as well as generalised anxiety disorder (GAD). Specifically, within the UK, the 2016 “Brexit” vote to leave the European Union and recent terrorist attacks have both been linked to an increased proclivity for hate-related incidents. University students it seems, are not immune and there have been several high-profile cases. One involved a group who were suspended (and three of whom, expelled) after creating a Facebook chat group called, “F*** women, disrespect them all” where members shared misogynistic, racist, paedophilic and anti-Semitic content and “jokes”. Another involved a student posting a video online that documented her subjection to racist chants of, “Sign the Brexit papers” and “We hate the blacks” by her fellow students, while she barricaded herself inside of her bedroom within university halls of residence. Cyberstalking, online harassment and hate incidents break several UK laws including the Protection from Harassment 1997 Act, Malicious Communications 1988 Act and Communications 2003 Act. As such, university students whom, possibly due to their frequent immersion in shifting off and on-line cultural norms, relatively

young ages, differences in cultural background or (due to the electronically mediated nature of the communications) lack of physical cues that would normally lead to the realisation that personal actions are causing harm or distress to another; may not realise the seriousness of their actions, both in terms of victim impacts or from a legal perspective. Indeed, such actions are, by the person(s) perpetrating them, often considered merely to be part of normal, everyday “banter”. The BCAP project was piloted at the University of Bedfordshire in the United Kingdom. The programme aims to challenge anti-social attitudes, educate staff and students to differentiate acceptable and unacceptable online and electronically executed behaviours, signpost support services, offer guidance on how to take self-protective actions and to take appropriate bystander interventions in online and other relevant digital settings. Evaluation was conducted via observation and pre and post intervention questionnaires. Preliminary analysis of the comparison between the pre and post session responses shows that approximately 63% of respondents changed their opinion on their readiness/willingness to take action if they witnessed harmful online interactions, with a statistically significant ($p= 0.0165$ and $p= 0.00175$) difference in the variance of answers to the questions about willingness and readiness to take action if they witnessed a harmful online interaction happening to a stranger. This indicates that the training does have an impact in terms of participant’s opinion on their nature as a bystander.

13:30—14:45 (Session 6C)

1. If you want it, will you get it? How the motivation of SNS users to establish the social ties affect their social capital?

Yadviga Sinyavskaya and Alexander Porshnev

ABSTRACT: Our work-in-progress work aims to reveal how the motivation of social media users to connect with other people is related to their social capital growth. The several key features of users' individual ego-networks were chosen as a social capital proxy. In particular we investigate how vary the ego-networks characteristics of users' with different motivation for extending their social circle. Traditionally social networking sites (SNS) are treated in the literature as a space for searching new- or strengthen existing social ties. A bunch of research point to the positive relationship between certain online behavior and social capital (see Ellison, Steinfield, Burke et al.). However, there is a gap in understanding how the own motivation of a person to connect with other people contributes to the growth of his or her social network and how it may shape the structure of ego-network. Fulfilling this gap helps to understand whether the «rich» social capital may be the result of a user propensity to establishing new connections and bridging people. In addition we show that such personality characteristic as propensity to make connections is transperrable to the online activity. In our previous research we focused on the relationship between the motivation to make connections and the engagement of user in different online praticies like self-disclosure, relationship maintenance etc. We revealed that the propensity to make connections with other people is a strong predictor of online behavior, so we expect that it also will a useful and meaningful predictor of social capital 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 motivation of users to make connections from 375 respondents was obtained during online survey. 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. Additionally, we obtained the data on their ego-networks (by obtaining their agreement via information consent beforehand). For assessing the social capital of users different metrics of their ego-networks like density, distance, transitivity and clustering coefficient were calculated. First, we conducted regression analysis to test our main hypothesis that desire to establish new connections would influence the growth of social contacts even in presence of current amount of friends which was shown to be the valuable predictor of expansion of social network and recognized as preferential attachment (e.g. Barabási et al., 2002). To sum up, the intention to develop social connections is a predictor of the social capital growth. The comparison of the ego-network features of users' with different motivation to establish the social ties with others is the focus of further research.

2. Video Games and their effects on well-being: A review

Yemaya Halbrook, Aisling O'Donnell & Rachel Msetfi

ABSTRACT: Literature on the relationship between video games and well-being has shown to be limited in that this research frequently focuses on particular types of video games along with related facets of well-being. For instance, research into social video gaming tends to examine relationships with social well-being variables, such as social support, whereas studies on violent video games (VVGs) generally measure aggression as their outcome variable. Additionally, video games requiring physical interaction and exercise, commonly referred to as exergames, usually examine physical outcome variables such as BMI and overall physical health. To date, no review has analyzed evidence on multiple types of video games and multiple aspects of well-being in order to determine the nuanced differences in the effects of video games on well-being. We therefore conducted a systematic search using the PsycINFO, PsycArticles, Scopus, Web of Science, and EMBASE databases with the search terms, 'video game', 'online game', 'active game', and 'MMORPG' for video games, and 'physical', 'social', 'well-being', 'aggression', 'mental health', and 'physical health' for well-being. Although a systematic search was employed, we utilized a narrative review method as we did not have the narrow criteria required of a systematic review or meta-analysis. Although our original focus was on the aforementioned types of video games, we identified an additional noteworthy area of research concerning problematic gaming behaviors (PBGs) and deemed it beneficial to include as it has a significant contribution to this area of research. After applying our inclusion criteria, 59 articles in total were used in this review. We synthesized this research on how video games affect well-being in a way that allowed for comparing and contrasting similar literature, leading to several interesting and significant findings. Firstly, although this review clearly demonstrates that video gaming can have both positive and negative effects on well-being, these are moderated by individual and socio-contextual variables. For example, online social spaces can be beneficial to those who are high in attachment avoidance, but not when individuals use them for escapism purposes. In regard to violent video games, those with individual traits such as high levels of moral disengagement are significantly more likely to experience increases in aggression after playing these games when compared to those with low levels. Further, the socio-contextual variable of exposure to home violence has a stronger influence on aggression than violent media in general. Exergames can also depend on socio-contextual factors simply because they may be difficult to obtain or use, they may represent a financial burden, and often require open spaces to play. Secondly, our review determined that there is a significant relationship between

problematic gaming behaviors and negative psychological symptoms, which is in line with previous research. Much of this research, however, is built on the assumption that video games are causing the symptoms rather than considering the possibility of a bidirectional relationship. Lastly, we discovered a contradiction in literature surrounding the positive and negative effects of social video gaming on well-being. For example, although some research indicates online social gameplay can have positive effects on social well-being, other research suggests that these online relationships are negative as they lead to lower levels of offline support. However, confiding in online friends is positively associated with high levels of well-being, just less so than offline support. Merely showing that strong online gaming links are related to lower offline social support does not definitively indicate people have lower social well-being. The findings of this review, therefore, have enabled us to provide unique theoretical insights regarding academic research, practical developments in the video game industry, and clinical implications of video games designed for health.

3. **Influence of social media use, parenting style and academic self-concept on adolescents' academic performance**

Luis Vallejo & Gordon Ingram

ABSTRACT: A widely held public opinion nowadays – reinforced by frequent media scare stories – is that young people's academic performance and general wellbeing can suffer due to them spending an increased amount of time on social media and other smartphone-based activities (Orben & Przybylski, 2019). Academic research on the matter is more mixed, with some studies showing that smartphone addiction can have serious effects on academic performance (e.g., Hawi & Samaha, 2016), while others suggest that students can use social media and smartphones to cooperate in their studies and even sometimes receive better grades (e.g., Peñuela, Paternina, Moreno, Camacho, Acosta, & De Leon, 2014). Potential explanations for this divergence in findings include the influence of mediating variables such as self-concept and relationships with parents. Hence, this study aimed to see how parental styles and academic self-concept influence any correlation between use of social networks (and the Internet in general) and academic performance. To do this, mixed-methods data collection was carried out with 176 tenth- and eleventh-grade students, aged 15–18 years, from a mixed-sex school in Bogotá, Colombia. Academic performance was measured through the official grades (in Mathematics and Spanish) received by students in their end-of-year exams. Parenting style was measured using the PCRI-M scale, originally developed by Steinberg (1992) and translated into Spanish by Soto and Arndt (2004). Academic self-concept was measured by the academic subscale of the multidimensional self-concept scale AF5, developed in Spanish by Musitu and Garcia (2009). Internet use was measured in two ways: the Internet Addiction Test (IAT; translated into Spanish by Carbonel et al., 2012) to record general internet use, and some simple questions about amount of time spent weekly and daily on social media to record social media use in particular (following Vossen & Valkenburg, 2016). Finally, for the qualitative component of the data collection, participants were asked six semi-structured interview questions about their experience of social networks, whether they used them for academic purposes, and whether their use was regulated by parents. Data showed that while there was a significant relationship between parenting style and internet use (with children of authoritarian and authoritative parents using the internet less) neither parenting style nor amount of internet use had a significant effect on academic results. Academic self-concept did show a positive relationship with academic results, and a negative relationship with

internet use, but given the lack of a significant relationship between these other two variables, it cannot be seen as mediating that relationship. From the qualitative data, it was observed that young people approach online social networks as virtual meeting spaces, with a different relational logic from their face-to-face social circles. This is important because it means there may, for example, be more opportunities for individuals with high and low academic self-concepts to interact in both academic and non-academic discussions. It is possible that the increased opportunities for academic interactions cancel out the fact that internet-based non-academic activity is competing for adolescents' time with more traditional academic activities such as homework, and lead to the null relationship we found between internet use and academic performance.

15:30—16:45 (Session 7A)

1. Prior tech experience and motivation to engage in immersive virtual reality intervention: A Study of verbally fluent adolescents and Adults with autism

Julia Parish-Morris, Ashley Zitter, Sinan Turnacioglu, Rita Solórzano, Judith Miller, Vijay Ravindran, & Joseph Mccleery

ABSTRACT: Background. Older children and adults with autism spectrum disorder (ASD) who are verbally fluent may appear “high-functioning” but nonetheless struggle with everyday tasks like having a conversation at the grocery store or taking public transportation (Matthews et al., 2015). These daily activities, which are core to adaptive functioning, can be improved with intensive role-playing and practice (Laugeson et al., 2015). However, these methods are sometimes infeasible when critical contexts, such as police encounters, occur rarely. In the case of important but infrequent situations, role-playing using immersive virtual reality (VR) could provide a platform for practicing essential skills in safe environments that can be progressed as the user gains new skills. Immersive VR is increasingly accessible to the general population, and its potential as an intervention tool for individuals motivated by new technologies is especially high. Research suggests that individuals with ASD and fluent language abilities are interested in novel technologies (Odom et al., 2015), and may benefit from tech-based interventions (Rutter, Bailey, & Lord, 2003) including VR (for a review, see Turnacioglu et al., 2018). However, large and rigorous experimental tests of these hypotheses are scarce. In the present study, we examine prior tech experiences and tech motivation in adolescents and adults with ASD who agreed to participate in a safety and feasibility study of immersive VR as a tool to prepare for interactions with police. Methods. Sixty verbally fluent individuals (aged 12-38 years) with average IQ estimates and ASD participated in the present study. Participants did not have medical risk factors associated with VR. Thirty participants (Cycle A) visited the Center for Autism Research at the Children's Hospital of Philadelphia and participated in one session of immersive VR using Floreo, Inc.'s Pilot Police Safety Module (P-PSM; approximately 45-minute session, ~8 total minutes of VR). The other 30 participants (Cycle B) engaged in three VR sessions. One participant in Cycle B chose not to continue the study after 1 session, and is excluded from the current analyses. Upon completing the final session, participants rated the VR system using the System Usability Scale-ASD (Parish-Morris et al., 2018). Results. Participants' prior tech experiences, ages, and IQ estimates did not differ by Cycle, so both Cycles are reported together. Before their first session of VR, the majority of participants (75%) reported that they

use some kind of technology “very frequently”, and more than half of participants (67%) reported “very high” enjoyment of technology. Ninety-seven percent of participants indicated that they were interested in VR and 98% reported that they thought using VR would be fun. Thirty-nine participants (65%) reported that they had used VR at least once before. The majority of participants (90%) reported that they thought VR could “sometimes be a better way to teach skills than a regular human teacher”. Ninety-seven percent of participants reported being at least “a little excited” about the possibility of learning new skills through VR. After engaging in 1 session of VR, 83% of participants agreed or strongly agreed that they liked the experience. Finally, 80% of participants agreed or strongly agreed that they would like to use the P-PSM again. Discussion and Conclusion. In this relatively large study, we demonstrated that verbally fluent, intellectually able adolescents and adults with ASD are highly motivated to use immersive VR as an intervention tool, and that most participants think some new skills might be learned better using VR than traditional methods. This result, combined with high system usability scores and an excellent safety/feasibility profile (McCleery et al., in preparation) suggests that immersive VR is a promising intervention platform for teaching essential skills to individuals on the autism spectrum.

2. **Cultural differences in attitudes towards interactive messages for digital addiction: A UK-China comparison**

John McAlaney & Raian Ali

ABSTRACT: Background: The excessive and obsessive use of the internet and digital technologies, known as Digital Addiction (DA), is becoming a social issue. As such treatment and prevention approaches are needed. DA has unique characteristics in comparison to what could be considered traditional addictions. Given that it inherently involves the use of technological devices this provides the opportunity to deliver interactive, intelligent prevention and intervention strategies in real time and whilst the targeted behaviour is occurring. However, for any large-scale, multi-national prevention campaign to be optimised cultural differences within the target population must be considered. This study aimed to contribute towards this literature by exploring cultural differences in the acceptance of DA prevention messages in the UK vs China. Method: An initial series of exploratory interviews were conducted with a sample within the UK to determine what strategies may be used to address overuse of digital devices. These interviews were subjected to content analysis, which was then used as the basis for an online survey that was disseminated throughout the UK and China. A total of 373 useable surveys were returned, of which 151 came from the UK and 222 came from China. Results: Most respondents in both countries agreed that they felt they should reduce their use of digital technologies, and that they would welcome software systems that facilitated this change. There were several statistically significant differences in preferences over how such a system should operate. UK respondents wished for the system to be easily under their control, whilst behaving largely autonomously when needed, and to also be transparent as to why a message had been triggered. Chinese respondents on the other hand were less likely to state a preference for such a high degree of control over any such system. A number of additional differences over factors such as presentation style of messages was noted. Discussion: The result suggest that many users of the internet and digital technologies would like to have greater control of their usage and are open to systems which will help them achieve this. However, the preferred implementation of this does appear to vary between the UK and China, suggesting that any future

prevention and intervention strategies take cultural dimensions into consideration.

3. **The impact of level of alcohol consumption and social context on the perceived attractiveness and employability of Facebook users**

Graham Scott & Gillian Bruce

ABSTRACT: The majority of social media users freely disclose information about their alcohol drinking behaviour online (Erevik et al., 2017). Disclosures are typically aimed at friends, who view them positively (Beullens & Schepers, 2013), but they are likely to be viewed more negatively by those outside the users' close peer group (Jain et al., 2014), including potential employers (Bohnert & Ross, 2010). Male and female drinking behaviour is often interpreted differently by viewers (Walther et al., 2008), and while it has been shown that both moderate (Scott & Bruce, 2019) and excessive alcohol consumption (Ridout, Campbell, & Ellis, 2012) negatively impact perceived employability, the degree to which the disclosure of each may impact candidates' employment chances remains unknown. Additionally, although timeline owners are often described as drinking in a social context, the influence of social setting on perceived employability has not been explored. We investigate perceptions formed of social media users by manipulating Facebook timeline owner gender, level of alcohol consumed, and social context, while measuring perceptions of attractiveness and employability. Online snowball sampling was used to recruited 117 participants (76 female; Mage=25.09), who saw 12 Facebook profiles in total. Timeline owners could be male or female, and the top item on each timeline was an update by the owner describing them drinking a beverage, which contained manipulations of drink type (non-alcoholic/light drinking/heavy drinking) and social context (alone/group). Each participant saw each drinking scenario only once, but the manipulations were counterbalanced across 3 participants groups, e.g., "cooking dinner and enjoying a nice cup of tea (non-alcoholic)/small glass or pinot grigio (light)/bottle or 2 or merlot (heavy)" or "nice evening to meet Sam for a strong coffee/gin & tonic/few jugs of mojitos and watch the game". For each timeline owner we measured participants' perceptions of physical-, social-, and task-attractiveness (the extent to which participants wanted to be their friend, thought they were attractive, and thought they would be good to work with) on 5-item Likert-type scales (McCroskey & McCain, 1974) as well as perceived employability using a single item. A series of ANOVAs revealed interactions of gender and social context for social- and physical-attractiveness: females were rated more socially-attractive than males when in a group, while males were rated as more physically-attractive in a group than when alone. There was also an interaction of alcohol and gender, with females rated as more socially-attractive than males while engaging in light or heavy alcohol consumption, and appearing more physically-attractive than males when engaging in heavy alcohol consumption. Further analyses revealed an interaction of gender and social context for perceived task-attractiveness and employability: males were rated as higher in task-attractiveness and more employable when alone, while females were rated higher on both dimensions when in a group. There were additional interactions of alcohol and gender: males were rated higher in task-attractiveness when they drank non-alcohol, females were rated higher when they drank non-alcohol or light alcohol. Males and females were both rated as more employable when they did not drink alcohol, but within the light and heavy alcohol conditions, females were rated more employable than males. Results demonstrate that males and females are perceived differently both in distinct social settings, and when drinking alcohol. On all measures of attractiveness females are generally perceived more positively than males when drinking,

and when in a group. While all timeline owners' perceived employability was negatively impacted by disclosed alcohol consumption, the negative impact was more severe for males than females. Alcohol consumption and social context independently effect both personal and professional impressions formed of Facebook users, although gender interacts with both differentially.

15:30—16:45 (Session 7B)

1. From acceptability to acceptance of the setting in videoconference telepsychotherapy: Analysis of interactional models

Lise Haddouk, Stéphane Bouchard, Eleonora Brivio, Carlo Galimberti, Alain Trognon & Geneviève Robillard

ABSTRACT: Context: Social acceptability of technical innovations is a key-factor in the success of e-health programs and should be considered not as a tool, but as a device (Pascal, 2012). This prospect underlines variables such as the motivation, expected benefits, collaboration modalities (Souffrin, 2017). Acceptance precedes patient's compliance to the treatment and is an important factor for the success of the care process. In telepsychotherapy, acceptance of the setting is a complex psychological process including emotional, interactional and intersubjective aspects. Our previous works showed that telepresence predicts the strength of the therapeutic relationship (Bouchard et al., 2010) and suggests that telepresence predicts intersubjectivity (Haddouk, 2016). We assessed the acceptance of the setting in 2 videoconference telepsychotherapy frameworks and we approached the problem from the phenomenology of breaks in acceptance. Our preliminary results illustrated how the processes of co-construction of intersubjectivity in telepsychotherapy depend on a complex reality resulting from interactional and reciprocal processes between therapist, patient and setting. The present research is a part of a larger project on the topic of telepresence in videoconference telepsychotherapy and an extension of our previous work. By observing gradual modalities of acceptance of the setting and different ways to deal with breaks of acceptance for both users, it aims to a better understanding of the processes related to the level of acceptance of the setting and its influence on the quality of the interactions. We assume that a low level of acceptance of the setting by patients and psychologists would be related to a low level of telepresence and intersubjectivity. Methods: We want to analyze cases from a sample of adults receiving CBT videoconference telepsychotherapy, who were suffering of anxiety disorders and displayed breaks in acceptance of the setting. Some cases are "completers" (the patient finished the program) and other cases are "non-completers" (the patient stopped the program after two sessions and before common agreement that there was no more clinical needs to address). Thus, in some cases the breaks could be successfully dealt with and in some others not. All therapy sessions were videorecorded and coded. Our method is based on the comparison of the interactions at different levels. Segments considered to be significant in terms of breaks of acceptance of the setting have been selected by an external and independent judge who viewed the video sessions. We analyzed verbal and non-verbal, paraverbal and proxemic interactions, focusing only the interaction breaks. We used a structural interaction grid (Haddouk et al., 2018) to observe the interactional process. We used 5 items from the telepresence in videoconference scale (Bouchard and Robillard, 2018) in hetero evaluation to assess physical presence and social presence for both participants. We used a functional

interactions grid (Galimberti et al., 2011) to analyze rules of interactions, construction of enunciative co-presence and how people experienced intersubjectivity, We analyzed relevant conversational sequences to grasp and describe the intersubjective processes resulting from activities exploiting the properties of the verbal interaction, which are linked to any form of communication (Trognon et al. 2010). The work is still in progress. Conclusion: E-health development needs an evaluation of the specific processes that arise in videoconferencing practices. Acceptance of the setting is at the origin of such process, particularly in psychotherapy where the alliance between client and health professional is fundamental. By observing the practice of videoconference psychotherapy and its breaks, we want to define some modalities of the concept of mutual acceptance of the setting for both patient and psychologist. Our work may lead to identify strategies to help both interlocutors to accept more flexibly breaks in acceptance and technological problems occurring during telepsychotherapy.

2. **Public speaking training in front of an imaginary or virtual audience: A randomized controlled trial**

Ni Kang, Ding Ding, Dwi Hartanto, Willem-Paul Brinkman & Mark Neerincx

ABSTRACT: When preparing for a public speech, practicing with an audience is suggested to be effective in enhancing speech performance. However, it is often impractical to organize an audience to practice a presentation. Virtual reality can provide a solution, i.e., practicing with a virtual audience. This paper studied this practicing technique for enhancing speech performance and people's training satisfaction. A randomized controlled trial ($n = 40$) was conducted to compare practicing in front of a virtual audience with another practicing technique whereby the presenter had to imagine an audience while practicing. Individuals practiced their presentations in three training sessions with either a virtual audience or an imaginary audience. Participants' performance was assessed in a closing session where they delivered their speech in front of a human audience. The results showed that individuals seemed to benefit more from a virtual audience than an imaginary audience in reducing speech anxiety. The clearest benefit of practicing with a virtual audience was the satisfaction it gave. Participants were more positive towards training with a virtual audience regarding both the training process and its effect on their presentation ability. We anticipate that virtual audiences can be beneficial in motivating individuals to practice their presentation skills.

3. **Understanding digital disconnection in terms of death anxiety**

Dave Harley

ABSTRACT: Smartphones and social media are now ubiquitous. Increasingly we rely on these digital environments to express how we feel and to explore and manage our social relationships. There is growing concern that our dependence on these forms of digital connectivity is having a detrimental effect on our psychological wellbeing. Studies show that excessive smartphone use can be a cause of depression, stress and anxiety (Elhai et al 2017) just like other behavioural 'addictions'. The effects of smartphone dependency persist beyond actual use, with even moderate smartphone users experiencing stress and anxiety when they cannot access their phones (Cheever et al, 2014). Whilst the value of digital abstinence is emerging we have yet to explore the implications of being 'digitally disconnected': how do people react to being disconnected from their phones and what is the best way to understand their psychological responses? In this study we consider the role of death anxiety as an explanation for

changes in attitude and behaviour when people are disconnected from their smartphones. Terror management theory (TMT) (Solomon et al, 2015) is used as a framework for understanding such responses by positing 2 main hypotheses: 1) the mortality salience hypothesis which suggests that reminders of our own mortality make us assert our cultural worldview more strongly in an attempt to maintain a sense of psychological immortality and; 2) the anxiety buffer hypothesis which suggests that when aspects of our cultural worldview are challenged, thoughts about death become more conscious. In this study we build on the second hypothesis, considering smartphone use as an ‘embodied’ cultural worldview which sustains our psychological sense of immortality. Previous TMT studies have shown that as well as making one more conscious of death, challenges to one’s cultural worldview are likely to make one less sociable, more shy and more ageist. In this study we consider whether these same shifts are present when participants are ‘digitally disconnected’. Psychology undergraduates who were regular smartphone users took part in the study which consisted of two parts: an online survey (capturing demographic information, smartphone use, smartphone related self-esteem and a measure of ageism) followed by a face to face lab session where participants were randomly assigned to one of two groups (connected versus ‘digitally disconnected’). Participants in both groups were first asked to establish a smartphone connection with a friend before considering a series of hypothetical social situations. Participants responded to these situations by assessing their levels of sociability and shyness using a visual scale. Next the participants were allocated to either the connected or disconnected condition with phones being removed accordingly. A short filler task followed and then a reassessment of their levels of sociability and shyness measures in relation to the same hypothetical situations (whilst taking into account the impact of digital disconnection). Finally, participants’ levels of ageism were reassessed. Analysis of the results showed that shyness was significantly increased by being digitally disconnected. However digital disconnection did not directly affect sociability, ageism or the accessibility of death thoughts. Closer analysis of the digitally disconnected group showed that shyness was significantly positively correlated with changes in ageism and smartphone-based self-esteem was significantly positively correlated with the accessibility of death thoughts. Understood from a TMT perspective these results show that smartphones are used as anxiety buffers, with digital practices representing an embodied cultural worldview which defends the self against the reality of annihilation. Smartphone users who are the most attached to their devices are likely to become more aware of death, to be more shy and more ageist when they do not have access to their phones.

15:30—16:45 (Session 7C)

1. As long as you’re with me: The effects of social presence and distance on pain perception in virtual environments

Andrea Stevenson Won, Swati Pandita, & Kaylee Kruzan

ABSTRACT: Virtual reality (VR) has been used to treat pain for decades, but the increased availability and portability of virtual environments bring new opportunities to understand the mechanisms involved and develop new therapies. The vivid and interactive nature of VR creates a sense of presence in the virtual world, or in virtual bodies, by plausibly replacing sensory information from the real world with sensory information that creates a virtual environment and/or body. When a person in pain subjectively

feels that he or she is not present in the real-world location of the painful stimulus, his or her sense of actual or potential damage may be less, and therefore his or her pain tolerance may be greater. One component of virtual worlds that may affect pain perception is thus their ability to “transport” the viewer to locations other than the hospital, their home, or other places where they are experiencing pain. Virtual worlds also allow for social interaction, which has the potential to strongly affect both pain and the sensation of presence in an environment. In our study, we used a within-subjects design to examine the main effects of social interaction and perceived location, as well as the potential interaction between the two. In this study participants completed a series of induced-pain heat ramps in virtual environments. Participants wore a head-mounted display and were represented by an avatar during these tasks. Participants completed an induced pain threshold task five times; once in a baseline “practice” task, and four more times in conditions crossing two factors. The factor of social interaction depended on whether participants were interacting with a research assistant confederate in an immersive virtual reality (VR) environment or whether they were alone in the virtual reality environment. The factor of perceived location depended on whether this conversational partner was believed to be located “Near”, in an adjacent room, or “Far”, in another state. There was a significant main effect of social interaction, such that being present with another person in virtual reality increased pain threshold compared to an environment with no social interaction, whether the environment represented a “near” or “far” location. In other words, participants who were interacting with another person removed their hand from the thermode later (at a higher temperature) than participants who were merely instructed to examine the virtual environment. However, there was no main effect of location on pain threshold. Nor there was there a significant interaction between distance and social presence on pain threshold. There is evidence from other work that social support may mitigate the sensation of pain. However, in this experiment the participants were interacting with research assistants with whom they were not acquainted. Thus, a strong possibility is that the additional distraction of conversing with another person added improved the virtual experience. The environments in this study were designed to be visually similar to one another, which could possibly explain why we found no effect of perceived location on participants’ pain threshold. This supports the explanation that previous effects of non-hospital environments reducing pain perception may be due to the difference in associations and unrelated to the perceived location of the virtual space. Further investigation will help clarify these results. If social interaction in virtual reality is more effective than social interactions in other media, how can this knowledge be used to better design interventions?

2. **Indigenous patients under virtual anesthesia in ambulatory surgery 11 years later**

Dejanira Mosso, Brenda Wiederhold, Mark Wiederhold & Jose Luis Mosso

ABSTRACT: Virtual reality (VR) pain distraction has been applied across 11 years in indigenous community in the alpine mountains in Mexico. During this time, different technologies have been applied with the same results. **Methodology.** Night vision, Smartphone, laptop, google cardboard are the used technology. 30 patients underwent ambulatory surgeries. **Results.** Somatic pain was reduced 24.7% in 30 indigenous patients. Technology used results were similar. No intravenous line were used, just in one patient with xylocaine reaction, no medications as analgesid or sedatives were used. **Costo benefit** was 100%, no hospitalization was needed, no medications were used in the intraoperative. **Conclusions.** VR is a useful and complementary tool for ambulatory surgery as virtual anesthesia for poorest people

where there are not clinics, hospital or complete public health institutions programs for indigenous communities. 11 years later technology has a better inversion to permit more distraction to reduce somatic pain during surgeries. There are two Cybertherapy courses a year in this indigenous communities where foreign Medical students from USA and Dubai have participated.

3. **Towards an advancement of multisensory integration deficits in anorexia nervosa: Exploring temporal discrimination processing of visuo-auditory stimuli**

Alice Chirico, Clelia Malighetti, Silvia Serino, Pietro Cipresso, Elisa Pedroli, Cosimo Tuena, Manuel Muratore, & Giuseppe Riva

ABSTRACT: Anorexia nervosa (AN) is a severe eating disorder, which affects mostly young females, and involves significant weight loss, a high fear of gaining weight and a distorted body image. Anorectic patients incur overestimations of their own body, thus suggesting that a distorted experience of body may play a crucial role in this disease. Specifically, a recent model of Riva and Dakanalis posits that a distorted body image could be due to difficulties in integrating the perception of both signals from different part of the internal (e.g., interoceptive) and external body. Many studies evidenced that patients affected by Eating Disorders (EDs) have impairments at the visual, interoceptive, proprioceptive, and tactile level. However, it is still unexplored whether anorectic patients struggle to integrate auditory-visual signals together. This would be a crucial issue, for instance, in food intake when we are overwhelmed by information from different senses, such as the sight of a chip along with the sound of crunching it. In this study, we tested whether temporal discrimination processing of visuo-auditory stimuli is impaired in ANs patients using the Sound-Induced Flash Illusion (SIFI). The illusion consists in the perception of a single visual stimulus (e.g. a dot blinking on a screen) as two separate stimuli (2 blinking dots when there is only 1), when it is presented along with two brief sounds (e.g. two beeps). This would happen since visual and auditory stimuli are unified into the same multisensory percept. The more a person is prone to experience this illusion, the more impaired is his/her temporal discrimination processing of visuo-auditory stimuli. We hypothesized that ANs showed less correct responses at the task compared to healthy participants. To test this hypothesis, we expose healthy people (control group) and anorectic patients, who are selected from the SR CDCA Spedali Civili of Brescia, to this illusion to assess the degree of impairment of visuo-auditory integration and we compare their performances in terms of reaction times and correct responses. The control group is composed only of females with a normal BMI from 18.5 to 24.9 and without ED symptomatology, as assessed through EDI-3. To date, we have collected data from 14 healthy subjects (mean age = 25 years; SD = 2; mean years schooling = 17; SD = 1; mean BMI (kg/m²) = 22.25; SD = 2.48; mean weight = 62.2; SD = 6.92; mean height = 1.67m; SD = 0.05m). We plan to expose 14 ANs to the same task in the following month. This study can have crucial implications for designing new treatments of EDs since it can elucidate processes underlying multisensory integration impairments, which can be specific for this population.



POSTERS (NGE 205)

All sessions will be concurrent with the morning and afternoon Social Networking breaks on Tuesday June 25. Poster boards will be numbered and will line the hallway outside of the rooms where the concurrent sessions will be held. Pins will be available. Judging for best *student* poster will only be done during the Tuesday sessions, with the winner being recognized during the Tuesday awards ceremony. Posters may be placed on the boards at the same time slots on Wednesday.

Session A
1. Virtual reality exposure with eye-gaze adaptive virtual cognitions <i>Ding Ding, Willem-Paul Brinkman, & Mark Neerincx</i>
2. Using cognitive task analysis to optimize the design of a therapeutic VR environment for first responders <i>Brandon Matsumiya, Clint Bowers, Anna Skinner, Jan Cannon-Bowers & Deborah Beidel</i>
3. Can we support lucid dreaming practices with a creative deep learning algorithm and immersive virtual reality biofeedback system? <i>Alexandra Kitson, Steve DiPaola, & Bernhard E. Riecke</i>
4. Faces and feelings: Studies in the implicit associations of new technology <i>Antonio Olivera-La Rosa, Javier Villacampa, & Gordon Ingram</i>
5. Looking for the right swipe: Gender differences in self-presentation on Tinder profiles <i>Isabela Enciso, Nathalia Eraso, Maria Jose Garcia & Gordon Ingram</i>
6. Fifty shades of grey hat: A socio-psychological analysis of conversations on hacking forums <i>John McAlaney, Emily Kimpton & Helen Thackray</i>
7. Cyberbehavior: A bibliometric analysis <i>Manuel J. Serafin Plasencia, Gustavo R. García-Vargas, María Del Pilar García-Chitiva, Mario Ivan Caicedo, & Juan C Correa</i>
Session B
1. Takeover interactions between an autonomous vehicle and the driver in five different external environments <i>Hucheol Lee, Jiwoong Heo, Joohee Jun & Kwanguk Kim</i>
2. Impacts of online gaming <i>Dustin Weissman</i>
3. The good, the bad and the in-between of online social networking in college adjustment: A qualitative study <i>Audrey Stenson, Dr Alison Attrill-Smith, Dr Chris Fullwood, Dr Grainne Kirwan, & Dr Irene Connolly</i>
4. The effectiveness of emojis in simulated text-based counselling <i>Una Neskovic, Garima Saini, & Anna M. Lomanowska</i>
5. Characteristics of cybersecurity victims at Clark Atlanta University <i>Shanice Blair, Breonna James, Douglas Green, Jamecha McKinney, Ukwu Kenneth, Medha Talpade & Roy George</i>
6. Status of cyber-aggression in Korea, and development of typology of cyber-aggression <i>Cheung-Moon Cho, Pal-Keun Nam & Hyesook Kwak</i>

Session A

1. Virtual reality exposure with eye-gaze adaptive virtual cognitions

Ding Ding, Willem-Paul Brinkman, & Mark Neerincx

ABSTRACT: Virtual cognitions are a stream of simulated thoughts people hear while emerged in a virtual environment. Although offering virtual cognitions during social skills training in virtual reality can enhance people's self-efficacy and knowledge of social interaction according to previous studies, lacking of adapting the virtual cognitions to people's focus of attention might limit their efficacy. To address this, we intend to use eye-tracking technology embedded in the head mounted display (HMD) as it gives information about users' focus of attention. In the context of a pre-therapy for spider/snake phobia, our virtual reality exposure system provides user eye-gaze adaptive virtual cognitions. To investigate the effectiveness of such virtual cognitions, an empirical experiment with 24 participants will be conducted. We want to examine with the aid of eye-tracking technology, whether the virtual cognitions could guide people's attention during the virtual reality exposure and affect people's self-efficacy of handling spiders/snakes. Furthermore, with the eye-gaze adaptive virtual cognitions, the exposure experience has the potential to be even more plausible, natural and effective.

2. Using cognitive task analysis to optimize the design of a therapeutic VR environment for first responders

Brandon Matsumiya, Clint Bowers, Anna Skinner, Jan Cannon-Bowers & Deborah Beidel

ABSTRACT: There exists a “research-to-practice” gap in the field of psychology between the best practices endorsed by research and the actual practices in the field (Lyon, Stirman, Kerns, & Bruns, 2011). This can be seen particularly with first responders and the lack of evidence based treatments available even though as many as 22% of first responders may develop Post Traumatic Stress Disorder (PTSD) (Flannery, 2015). Recent innovations in the field of psychotherapy for PTSD have included the use of virtual reality (VR) for treatment of veterans of Operation Enduring Freedom/Operation Iraqi Freedom/Operation New Dawn (OEF/OIF/OND) in combination with exposure therapy, an evidence-based treatment for PTSD, however, these innovations have not yet been disseminated to first responders (Rizzo & Shilling, 2017). To close this gap, the current study will be designing a new VR system that can help first responders be immersed in their scenes during exposure therapy. Cognitive task analysis (CTA) will be used to analyze the work that both therapists and first responders do in to help create a system that has been optimized from both the therapeutic standpoint and the patient standpoint. CTA in short, is the identification of cues and cognitive processes experts use to inform their work, combined with more traditional task analysis which breaks down tasks into their component subtasks (Cannon-Bowers, Bowers, Stout, Ricci, & Hildabrand, 2013). As part of the analysis, consultants will interview approximately 5 therapists to gather information on the process of exposure therapy and its usage of VR. The other part of this process will focus on interviewing approximately 5 first responders to gather information on the different sights, smells, and other common stimuli present during common scenes they experience. These interviews will also gather information about the different procedures that can be used during specific scenes to increase immersion in the VR system by mimicking their real-life duties at these traumatic scenes. Lastly, these interviews will begin probing first responders to understand what types of scenes that seem to bother them the most (e.g., pediatric calls), to better focus the construction of potential scenes to ones that will be the most beneficial. Early results from the CTA suggest that focusing on urban environments and indoor environments may be beneficial for first responders. These environments are flexible enough that many kinds of trauma could be addressed, while keeping the relative cost of designing the scenarios low. Other proposed changes from the CTA reducing the amount of unnecessary options on the screen during therapy. Current systems have a lot of flexibility in the options available, but therapists can “mislick” the wrong stimulus in the past which can disrupt immersion in the exposure scene. Additionally, automating a system that “triggers” a particular stimulus (e.g., sound, smell, visual effect) could be used at certain points in the timeline of scene, which may take some of the burden off the therapist who is coordinating several different tasks over the course of a therapy session. Lastly, the early results suggest that incorporating physiological sensors to increase objective measurement of a patient’s anxiety. This poster presentation will detail the results of the CTA, and how that influenced the development of the VR system. CTA can be useful for dissecting the therapeutic process and understanding how technology may be inserted into therapy to improve the outcomes for both therapists and patients.

3. Can we support lucid dreaming practices with a creative deep learning algorithm and immersive virtual reality biofeedback system?

Alexandra Kitson, Steve DiPaola, & Bernhard E. Riecke

ABSTRACT: Lucid dreaming, awareness of dreaming while in a dream, allows the dreamer to recognize two different levels of awareness: the dream (actor) and the self (observer). The balance of these two levels is key to creative and flexible control of what happens in the lucid dream, and can enable the dreamer to explore their consciousness. Mastering this balance, however, is challenging and can take years to truly master. This poses a problem for those wanting to reap the benefits of lucid dreaming as well as researchers studying sleep and dreams since training takes time and a novice would not be able to become lucid reliably and consistently. Our proposed technological solution is to make use of immersive virtual reality (VR) for practicing awareness of the present moment, a skill that directly transfers to lucid dreaming, in particular becoming aware that one is dreaming. VR can be

especially effective because of its many similarities to lucid dreaming itself, such as the ability to experience impossible or improbable worlds, the use of perceptual cues that are aimed to elicit a deep emotional involvement in the user, and the use of structured narratives conceived to trigger reflection and transformative insights. However, where lucid dreams are created with all of our past experiences and memories, VR does not have such privileged access to give us personalized feedback. We can, however, use our own physiological signals that are mapped to elements in the virtual environment to help generate content. A combination of physiological measures can be correlated with states of awareness, thereby directly showing participants' awareness changing in real-time through creative visuals and audio. We present a proof-of-concept VR biofeedback system that uses our deep learning system, Painterly, to creatively and dynamically change the virtual environment from dream-like to clear or "lucid" as the participant's physiological state changes from inattentive to focused. Using the Muse 2 headset, we collect data on brain waves through an electroencephalogram (EEG), heart rate through a photoplethysmogram (PPG), and respiration through a combination of PPG and gyroscope. These data are then read via Bluetooth through an app, Muse Direct, which is then sent to a computer via Open Sound Control (OSC). These OSC messages are read and displayed in Unity, a game engine for VR. The raw data is filtered and mapped to a sliding-scale score ranging from 0 to 1, where 0 represents low lucidity and 1 represents high lucidity. This score is then used to dynamically change both the visuals and audio of the virtual environment, experienced by the participant through a head-mounted display and headphones. The participant can then playfully interact with an artistic virtual representation of their own physiological data to learn how to self-regulate their own states and awareness. We hypothesize this system will help with self-regulation and increased or sustained lucid dreams, and thus provide a more direct way of teaching lucid awareness and opening up its many benefits. In future research, we will investigate this hypothesis.

4. Faces and feelings: Studies in the implicit associations of new technology

Antonio Olivera-La Rosa, Javier Villacampa, & Gordon Ingram

ABSTRACT: This poster reveals the results of several exploratory studies we have made into the implicit associations people have with new technology, using the Implicit Association Test. Study 1: Despite growing research on online social networking, implicit associations of Facebook users have been largely understudied. In Study 1a, we used the Single-Target Implicit Association Test (ST-IAT; Karpinski and Steinman, 2006) in order to assess implicit associations between Facebook and two evolutionarily relevant constructs: sexual and prosocial behavior. Additionally, we controlled for the role of participant's relationship status as a potential moderator of Facebook implicit associations. In Study 1b, we extended these findings and explored the relationship between implicit and explicit associations towards Facebook. Across the two studies, we found that Facebook is more strongly associated with prosocial than with sexual behavior. This effect was not sensitive to sex differences. Further, the results of Study 1b revealed that implicit and explicit associations did not correlate. Study 2: Contradictory findings with regard to the nonlinear relation between human likeness and affective reactions have characterized psychological research on the uncanny valley hypothesis (Mori 1970/2005). In Study 2 we explored the phenomenology of the uncanny feeling (UF) by assessing implicit associations between uncanny stimuli (by android faces) and two emotional responses previously associated with the uncanny: fear and disgust. Further, we tested whether perception of uncanny stimuli may facilitate cognitions of deviant ("sick") morality and mental illness, as suggested by previous literature. Across five Single-Target Implicit Association Tests we found support only for a slight association of the UF with moral disgust (relative to fear). We found no evidence of an implicit link between the UF and fear or disgust, nor did the UF implicitly facilitate cognitions of psychopathy. General Discussion: We discuss the implications of these findings, including the potential role of implicit measures in cyberpsychology research, the methodological controversy over their validity, and their relationship with explicit judgements. We also outline other studies we are planning in this area, including on the relationship between implicit associations and levels of trustworthiness assigned to different sources of information and online agents.

5. Looking for the right swipe: Gender differences in self-presentation on Tinder profiles

Isabela Enciso, Nathalia Eraso, Maria Jose Garcia & Gordon Ingram

ABSTRACT: Tinder has become a popular online dating tool for people looking for either short- or long-term relationships. In this study we build on existing research on gender differences in the motivations of Tinder users, by analyzing gender differences in self-presentation. We predicted that women would try to attract men to right-swipe (i.e., potentially match) their profiles through largely visual means; while men would put more emphasis on showing off their skills and interests. In a sample of 300 randomly obtained Tinder profiles (150 heterosexual females and 150 heterosexual males), half from Colombia and half from the USA, we found mixed support for our hypotheses. There was no significant difference between numbers of photos uploaded by women and men, but certain types of photos were unique to one gender. Links to other social networks did not differ much between genders; however, men tended to include more textual information in their profiles.

6. Fifty shades of grey hat: A socio-psychological analysis of conversations on hacking forums

John McAlaney, Emily Kimpton & Helen Thackray

ABSTRACT: Background: The cybersecurity industry is facing a recruitment crisis, with a growing lack of suitably skilled employees

able to mitigate the cybersecurity challenges that society is facing. At the same time organisations such as the National Crime Agency in the UK are running campaigns that aim to encourage young people away from criminal hacking activities and towards legitimate cybersecurity careers. However, there remains a lack of understanding as to what determines the path which a young person takes when they first engage with computers and hacking. This research sought to address that gap by exploring the conversations that take place on hacking forums and subreddits. Method: Drawing upon previous research that involved engagement with hacking communities four hacking forums and three subreddits were identified that focussed primarily on discussion related to hacking. The nature of these forums/ subreddits differed in terms of the degrees to which they promoted legitimate cybersecurity activities or endorsed illegal behaviour. Text in hacking related threads was collected from these sites over the summer period of 2018. Software called Linguistic Inquiry Word Count (LIWC) was used to determine the linguistic characteristics of each forum/ subreddit. Thematic analysis was conducted on a smaller sample from each source. Results: Approximately 120,000 words of text were collected. Both the linguistic and thematic analysis are ongoing, but some preliminary results have been obtained. Most threads involved the sharing of knowledge and techniques, particularly with those who were new to hacking. However, there were several caveats on this support; such as the individual being expected to demonstrate willingness to learn and to have made a genuine effort to resolve problems themselves. Criminal activities were dissuaded, although this was often considered less in moralistic terms and more in relation to the benefits not being worth the risk. Nevertheless illegal, or at least potentially illegal, activities were alluded to, often as means to an end to solve a challenge. Illegality in itself did not appear to be a strong motivator. Discussion: There exists an established online community of hackers, which are likely to be encountered by any young person who becomes interested in cybersecurity and hacking. These communities may potentially act as an important source of social support and social identity for their members. Understanding how young people engage with these communities may better help us steer them towards legitimate cybersecurity careers, where their passion and skills can be used for societal good.

7. Cyberbehavior: A bibliometric analysis

Manuel J. Serafin Plasencia, Gustavo R. García-Vargas, María Del Pilar García-Chitiva, Mario Ivan Caicedo, & Juan C Correa

ABSTRACT: Cyberbehavior, as the object of study of cyberpsychology, refers to the set of human behaviors that require an electronic device with Internet access to interact with other persons in both synchronous and asynchronous way. Although the first studies of cyberbehavior took place with the popularization of the so-called “Social Web”, few works focus on reviewing this literature. This paper aims to provide a bibliometric review of the scientific publication on cyberbehavior by analyzing all the documents published by four of the most representative international journals on the topic. The results show that in spite of the growth of the scientific community, the research has focused on the use of Facebook and other social media, while relevant subject matters for psychologists (e.g., motivation, personality, Internet addiction, cyberbullying or self-expression) remain little explored.

Session B

1. Takeover interactions between an autonomous vehicle and the driver in five different external environments

Hucheol Lee, Jiwoong Heo, Joohee Jun & Kwanguk Kim

ABSTRACT: Introduction: Given the rapid development of autonomous vehicles involving artificial intelligence and sensor technologies, advanced driver assistance systems (ADASs), such as adaptive cruise control modules (‘Level 2’ automation), are of fundamental importance. The next stage, i.e., highly automated vehicles (HAVs) featuring ‘Level 3’ automation, makes no use of the driver’s hands or legs. However, HAV research has been limited to studies of vehicular factors; the impact of automation on human factors has yet to be rigorously examined. If the HAV automation system encounters a limitation (e.g., a pedestrian or traffic accident), the driver must immediately assume control. The takeover interaction between vehicle and driver is a major safety concern; the efficiency with which the takeover request (TOR) is executed is one of the most important HAV issues. Previous TOR studies focused principally on TORs made in good weather. We investigated human responses in various environments. Method: The simulator featured a desktop computer with three monitors, a steering wheel, and accelerator and brake pedals. We ran highway driving scenarios on the simulator; the speed was set to 100 km/h. We modeled five different environments. The sunny environment served as the control. In the night environment, the only light came from street lamps and the car headlights. In the foggy environment, visibility was only 100 m. The snowy environment featured many falling snowflakes. The rainy environment featured heavy rain, water fog, and the sound of raindrops hitting the car roof. Under each condition, participants manually drove the car for about 1 min, and the vehicle was then automated. After 1 min 30 s, the TOR message appeared; this featured both a visual icon and an auditory beep. Participants were instructed to take immediate control to avoid an accident scene ahead. We used a 1×5 within-subject experimental design (sunny, night, foggy, rainy, and snowy environments) with four trials of each condition; all conditions were counterbalanced across the participants. When the vehicle performed as an HAV, all participants engaged in text entry on a mobile phone. We quantified takeover performance by both the time required and effectiveness. The time elements included the takeover time (TOT) and the lane change time (LCT). The TOT was the time between the TOR and driver takeover. A driver input was defined as a

change of at least 2° in the steering wheel angle or an at-least 10% movement of the accelerator or brake pedal. The LCT was the time between the TOR and that when the vehicle crossed the center line during lane change. Takeover quality was defined according to the minimum time to collision (TTC) and acceleration. The TTC was the time at which the vehicle would collide with an obstacle if it continued at the same speed after the lane change. A higher TTC corresponds to better take-over performance. Acceleration was defined as the speed variation per frame. The steering wheel angle and the number of collisions were used to assess the effectiveness of takeover behavior. Preliminary Results: Our research is ongoing but the current results show significant main effects of LCT ($p < 0.001$), TTC ($p < 0.001$), and mean acceleration ($p < 0.05$). A trend toward significance is apparent for the TOT ($p = 0.055$). Discussion: We found that the external environment affected driver takeover performance. Further work with more subjects is needed.

2. Impacts of online gaming

Dustin Weissman

ABSTRACT: Massively multiplayer online role-playing games (MMORPGs) are a substantial part of the multibillion dollar gaming industry. Millions of people of all ages across the globe engage in game play. With the average gamer logging 26.6 hours a week online instead of engaging in real world activities and responsibilities, this genre has created an international epidemic. In the last ten years the literature on this topic has gained interest and momentum. Researchers continue to explore the innumerable reaches of MMORPGs and how the gamer and their community are affected. The aim of this study was to gain a more comprehensive understanding of how the gamer relates to their world, both virtual and real, on a social level. The participants were gathered online mostly from within one particular MMORPG, Perfect World International. This study surveyed 103 participants with an online questionnaire. They were and given compensation in the form of virtual money.

3. The good, the bad and the in-between of online social networking in college adjustment: A qualitative study

Audrey Stenson, Dr Alison Attrill-Smith, Dr Chris Fullwood, Dr Grainne Kirwan, & Dr Irene Connolly

ABSTRACT: Starting college or university is considered to be a major challenge of emerging adulthood (Credé and S. Niehorster, 2012; Matannah et al., 2010) which requires a lot of adjustment. Students are increasingly using online social networks to overcome the challenges of establishing themselves in a new environment, creating social networks or widening existing online social networks to their offline circles (Elison, Steinfeld & Lampe, 2011; Madge et al., 2004; Kalpidou, Costin & Morris, 2011; Boyd & Elison, 2007; Elison, Steinfeld & Lampe, 2007). Whilst some social network sites offer the facility to be omnipresent across a range of modes of communication (instant messaging, public or selected viewer wall posts), given the rise in trust and privacy concerns, interactions are leaning more towards social media sites which offer private interactions (Ellison et al., 2011; Yamagashi & Kikuchi, 1999). There is no existing research that explores private online and public online relationships in relation to college adjustment. Moreover, most work that has considered college adjustment has not taken diverse SNSs into consideration, such as WhatsApp, SnapChat and Instagram. The current research takes this into consideration as well as the dearth of appropriate measures to gauge the role of SNSs in college adjustment. Using existing offline adjustment scales such as the Student Adaptation to College Questionnaire (Baker & Siryk, 1989) and the College Adjustment Test (Pennerbaker et al., 1991), the current work follows recommendations for the development of a new scale (Taylor & Pastor, 2007; Feldt et al., 2012). It is also an extension to the work submitted in CyPsy22 which recommended further research into the use of diverse SNS's in relation to college adjustment (Stenson & Connolly, 2016). Using a qualitative approach, this study aimed to identify new experiences for undergraduate students and how public and private online groups are being used on social media to facilitate or hinder social adjustment or impact on issues that affect student persistence at college. A total of 70 participants from different courses and levels of study from one Irish and one English Higher Education Institute took part in 15 interviews (13 group interviews and 2 one to one interviews). The majority of participants were first year students ($n=37$). The participants discussed their acceptance into college, new experiences that college life brought with it and how they used online social networking both during the transition to college and in the aftermath. Thematic analysis (Braun & Clarke, 2012) was conducted on the transcripts of the interviews. Participants had strong affirmations towards using online social networks in order to socially adjust to the new environment and to maintain old friendships. As students progressed through the years of study, their use of online social networks changed from focusing on establishing new friendships to maintaining friendships and managing group projects. Five overarching themes were identified: social cohesion, social exclusion, influences of peer groups, online etiquette, and managing interpersonal skills. Whilst online social networking was deemed necessary and a positive experience by most participants in relation to establishing and maintaining a friendship network (the 'good'), there were some negative online occurrences that clouded the overall college experience for some (the 'bad'). Discussions in the group interviews also highlighted the workload of managing online social networking and the corresponding social and practical demands that it presents to the participants (the 'in-between'). The five overarching themes will be discussed in light of undergraduate student experiences and relevant foundations for student progression and success.

4. The effectiveness of emojis in simulated text-based counselling

Una Neskovic, Garima Saini, & Anna M. Lomanowska

ABSTRACT: Psychological interventions are not readily accessible to all in need of care. Limitations may include time constraints, lack of insurance, lack of transportation, and barriers such as illness, disability, or lack of anonymity. Many of these issues can be alleviated through the use of text-based counseling; however, there is a higher likelihood for text-based communication to be misinterpreted due to the limited capacity of transmitting non-verbal cues, such as facial and vocal expressions of emotion. The use of emoticons, or text-based pictorial representations of emotion, can reduce this ambiguity by serving the functions of nonverbal communication cues. The purpose of this study is to examine whether the use of emojis, a popular visually enhanced version of emoticons, can enhance the perceived effectiveness of emotional support in the context of a text-based counselling simulation. Participants in the study consist primarily of undergraduate university students. They are presented with a written vignette containing a fictional account of a university student undergoing stressors common to this population. They are then randomly assigned to one of six experimental conditions. Each condition involves viewing a simulated text-based interaction between the individual presented in the vignette and a fictional peer counsellor. The simulated interactions are based on samples of real exchanges from a text-based community support and counselling service. The experimental conditions differ based on the identification of the counsellor as either a human male or female or as an artificial intelligence agent, and whether or not the counsellor uses emojis in the interaction. After viewing the simulation, participants complete questionnaires regarding their evaluation of the effectiveness of the counselling session and their perception of the counsellor's empathy. Data collection for this study is currently in progress and will be completed by March 2019. Considering the growing popularity of online text-based counseling, the results of this study will provide an important source of empirical evidence that will be useful for improving online counselling and support services.

5. Characteristics of cybersecurity victims at Clark Atlanta University

Shanice Blair, Breonna James, Douglas Green, Jamecha McKinney, Ukwu Kenneth, Medha Talpade & Roy George

ABSTRACT: The cybersecurity business report (2018) estimates that cybercrime damage costs will hit \$6 trillion annually by 2021 which is an upward trend from \$3 trillion in 2015. This represents "the greatest transfer of economic wealth in history, risks the incentives for innovation and investment, and will be more profitable than the global trade of all major illegal drugs combined (Morgan, 2018)". To circumvent this crime, resources are being diverted towards training and understanding of the human factors engaged in the crime. For example, studies have identified the characteristics of the hacker based on the type of messages (Bamatraf, 2014; Bodford & Kwan, 2018), the psychosocial factors of the cybervictim (Das, Kim, Dabbish, & Hong, 2014; King et al., 2018; Redmiles, Kross, & Mazurek, 2017; Van de Weijer & Leukfeldt, 2017), and internet search characteristics (Greving & Sassenberg, 2018). However, most of the research has focused primarily on the Caucasian population with African Americans and other minorities being overlooked. Pew research center (Feb. 2018) indicates that 75% of US adults who own a smartphone are black and the majority (94%) who own a smartphone are 18-29 years of age. The report also indicates that reliance on smartphones for online access is especially common among younger adults, non-whites and lower-income Americans. Thus, it is important to study the psychosocial characteristics of this under-represented segment of the population in cybersecurity research. This project intends to specifically identify, (a) the personality characteristics, (b) the technological knowledge, (c) the socio economic status, (d) the motivations and device of access, of an African American cybersecurity victim. The central research question of this study is: What are the psychosocial characteristics of the African American cybersecurity victim? The population for this study are African American college students between the ages of 18- 22 years. Sampling was conducted in the context of a historically black university (HBCU) in the southern part of the U.S. An online survey was administered to volunteers who were recruited through electronic messages to students in classes. A total of 101 completed responses were analyzed. The following research questions (RQ) were analyzed: (1) What is the effect of personality type on becoming a cybersecurity victim? (2) What is the effect of knowledge and familiarity with technology on becoming a cybersecurity victim? (3) What are the demographic characteristics (age, gender, socioeconomic status, religion) of the cybersecurity victim? The independent variables for this study are personality type as measured by the Big Five Personality test (Goldberg, 1992); knowledge of technology as measured by the adapted version of the Technological Familiarity Questionnaire and the Technology Cognition Questionnaire (Gula et al. , 2009); message type varied by motivation (urgency, financial payoffs), and demographic characteristics assessed through self-report. The dependent variable included reports by participants of being a cybersecurity victim, based on their experiences and responses to 7 questions (e.g., Has your identity ever been stolen?; Has your email ever been hacked? Has your social media ever been hacked? (twitter, facebook, instagram, etc.); Has your pin or password ever been stolen?; Has your computer ever crashed? (because you clicked on email, spam, website, etc) Have you ever fallen victim to online money scams? Results indicated a significant impact of the psychosocial and knowledge variables on reports of being a victim of cybersecurity. Results support past research on the relationship between the demographic variables and cybersecurity victimization, but shed new light on these relationships in the minority population.

6. Status of cyber-aggression in Korea, and development of typology of cyber-aggression

Cheung-Moon Cho, Pal-Keun Nam & Hyesook Kwak

ABSTRACT: Survey on cyber-aggression has been conducted in Korea since 2015. This survey covers not only adolescents (more than 3,000) but also teachers (1,000) and parents (300), therefore the analysis of survey results on these three groups may provide valuable insights in developing policies for preventing and dealing with cyber-aggression.

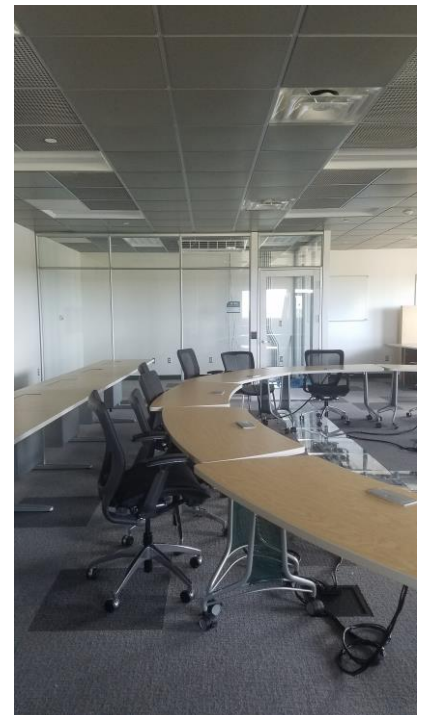
According to the preliminary analysis of 2018 survey, 32.6% of adolescents have ever experienced cyber-aggression during past one year (24.7% have experienced victimization, and 21.6% have committed aggressive behaviors). Comparison by a school grade shows that middle school students are the highest in experiencing cyber-aggression. Victimization rate for elementary pupils (4th to 6th), middle school students, and high school students are 19.8%, 22.2%, and 20.6% respectively, and aggressing rate for elementary pupils (4th to 6th), middle school students, and high school students are 14.3%, 25.1%, and 22.9% respectively.

In order to develop proper cyber-aggression preventive program, it is critical to clearly understand the characteristics and nature of cyber-aggression. However, unfortunately, it is admitted by many scholars that common understanding of cyber-aggression has not reached yet. Practical or suitable solution of this problem might be to develop typology of cyber-aggression, and to develop different cyber-aggression preventive program depending upon the types of cyber-aggression. For this purpose, four types of cyber aggression are suggested, namely, "power seeking cyber aggression", "revengeful cyber aggression", "inadvertent cyber aggression", and "hate speech". Based on this typology, appropriate preventive program for targeting each type will be discussed.

CYBERSECURITY RESEARCH COMPLEX & CYBERPSYCHOLOGY LAB TOUR



Norfolk State University's CyberPsychology research and academic programming stems from a 2015 cooperative agreement granted through the Department of Defense and Air Force Research Laboratory. This five year, \$5 million dollar award established [Norfolk State's Center of Excellence in Cybersecurity](#), and the [NSU Cybersecurity Research Complex](#).





[Dr. Scott Debb](#) from the NSU Psychology Department has been overseeing the development of the CyberPsychology Research Lab, which houses a dedicated psychological research space with eye tracking, EEG, GSR, and virtual reality capabilities. The lab is still being set up, and lab-based experimentation is set to begin during the 2018-2019 academic year. Below are pictures of the lab before and after construction in 2017.

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GALA DINNERS

Monday June 24:



Join us on the [Spirit of Norfolk](#) for a 2 hour evening cruise on the Elizabeth River. The cruise includes buffet dinner, open bar, and music/DJ in a semi-private room.

Tuesday June 25:



We will dine at [Saltine](#), 3 course fixe menu include drinks.

CYPSY25

Milan, Italy

CYPSY25 – the 25th Anniversary CyberPsychology, CyberTherapy & Social Networking Conference will be held in June 2020 in Milan, Italy. Please join us to celebrate this momentous occasion for our entire community!

Co-chairs and Co-organizers Professor Brenda K Wiederhold and Professor Giuseppe Riva