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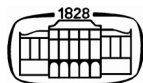
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3rd International Conference on Behavioral Addictions
March 14–16, 2016
Geneva, Switzerland

PLENARY PRESENTATIONS

PL-01

Internet pornography addiction: Theoretical models, behavioral data, and neuroimaging findings

MATTHIAS BRAND

University of Duisburg-Essen, Duisburg, Germany

Background and aims: Internet pornography addiction (IPA) is considered one specific type of Internet addiction. From substance dependence research, it is well known that addiction can be viewed as a transition from voluntary, recreational drug use to compulsive drug-seeking habits, neurally underpinned by a transition from prefrontal cortical to striatal control over drug seeking and taking (Everitt & Robbins, 2015). *Methods:* These concepts have been recently transferred to Internet addiction in general, and IPA in specific. For example, in two recently published theoretical models on Internet addiction (Brand et al., 2014) and specifically on Internet Gaming Disorder (Dong & Potenza, 2014), cognitive processes and emotional responses to specific Internet-related cues are considered crucial in the development and maintenance of the addictive behavior. These models are investigated in the context of

PA. *Results:* Behavioral data support the theoretical assumption showing that cue-reactivity and craving can be demonstrated in individuals with IPA. Also, executive reductions and reduced inhibitory control when being confronted with pornographic material increase the probability of experiencing a loss of control over the consumption of pornography. Functional neuroimaging findings suggest specific brain correlates of IPA, which are comparable with those reported in individuals with Internet Gaming Disorder and other behavioral addictions as well as substance dependence. Particularly the ventral striatum, a region associated with reward anticipation, responds to the confrontation with explicit pornographic material in subjects with IPA. *Conclusions:* Existing findings suggest that IPA is a specific type of Internet addiction, which is comparable with Internet Gaming Disorder and other types of behavioral addictions.

PL-02

The role of motives in substance-related and behavioral addictions

ZSOLT DEMETROVICS

Institute of Psychology, Eötvös Loránd University, Budapest, Hungary

Background and aims: Drinking motives were found to be proximate predictors of alcohol consumption. Moreover, studies suggest that motives explain up to 50% of the variance in adolescent alcohol use. The aim of the presentation is to discuss the motivational background of gambling and video gaming by presenting research tools as well as some of the most important findings of recent studies. *Results:* Recent studies revealed that people have similar motives to gamble and to play video games than they have to drink alcohol or to use cannabis. However, there are also important differences in motives behind substance-related and behavioral addictions. One of the most important factors is escapism, i.e., playing online

games in order to escape reality, especially problems of the real world. In online video gaming escapism appears to mediate between psychiatric symptoms and problematic online gaming. *Conclusions:* Findings support the idea that motives play an important role in behavioral addictions as well as in substance-related addictions. Furthermore, it appears that there is a considerable overlap in motives between different substance use disorders and behavioral addictions, whereas another part of motives are specific to certain addictive behaviors. Therefore motives should carefully be explored in each particular case. (Supported by the Hungarian Scientific Research Fund [grant numbers: K83884, K109375, K111938].)

PL-03

Pathological gambling: neural working mechanisms and beyond

ANNA E. GOUDRIAAN, RUTH J. VAN HOLST, TIM VAN TIMMEREN

University of Amsterdam, Amsterdam, The Netherlands

Background and aims: In the past decade, neurobiological research on pathological gambling has flourished. Based on neurobiological similarities between pathological gambling and substance use disorders and similarities in genetics, diagnostic criteria, and effective treatments, pathological gambling was the first behavioral addiction to be included in the DSM-5 within the revised category Substance-related

and addictive disorders. *Methods and results:* In this presentation, novel findings from gambling research in the Netherlands will be presented, both regarding neurobiological research and upcoming changes regarding online gambling. Implications of neurobiological research for novel intervention research, such as in neuro-modulation studies and personalized medicine will be highlighted.

PL-04

Draft clinical description and diagnostic guidelines for gaming disorder for consideration in ICD-11

SUSUMU HIGUCHI

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Despite the magnitude of behavioral addictions worldwide and the associated health and social consequences, these types of disorders are poorly defined and their place is disputed in established diagnostic and classification systems. Only pathological gambling or gambling disorder is included as a discrete clinical entity in ICD-10, under “habit and impulse disorders”, and DSM-5, under “Substance-Related and Addictive Disorders”. Concerning Internet addiction (IA), several diagnostic criteria or guidelines have been proposed. Recently, DSM-5 has included 9-item criteria set for Internet gaming disorder (IGD) in Section 3. The publication of these new criteria has led to increased research into IGD. ICD-10 has been used worldwide and the work on ICD-11 is currently in progress

with its release – tentatively scheduled for 2018. However, the beta draft version of ICD-11, published online, does not include IA or IGD as a disorder. Consequently, WHO convened the meetings of experts in the field of IA and behavioral addictions in 2014 (Tokyo) and 2015 (Seoul) to discuss public health and classification aspects of these conditions. As a result, clinical descriptions and diagnostic guidelines for gaming disorder (including online and offline options) were developed based on a careful review of current evidence. The draft will be extensively reviewed and field tested for clinical utility, validity and reliability. Depending on the results, it will then be proposed for inclusion in ICD-11. The draft will be delivered and discussed in my presentation.

PL-05

Genetic studies of gambling disorder and other behavioral addictions

MARC N. POTENZA

Yale University School of Medicine, New Haven, USA

Background and aims: Although genetic factors have been implicated in multiple psychiatric disorders, the genetic factors underlying behavioral addictions are poorly understood. This presentation will describe a current understanding of genetic factors linked to gambling disorder and other behavioral addictions. *Methods:* Data from existing genetic investigations, including from both epidemiological twin and molecular studies, will be reviewed. *Results:* Approximately 50% of the contribution to gambling disorder is genetic in nature, with an increasingly large proportion of the variance contributing to more severe patterns of gambling disorder. Shared genetic and/or environmental factors contribute to the co-occurrence of gambling disorder and multiple psychiatric disorders including alcohol-use disorder, drug-use disorders, major depression and anxiety disorders as well as

transdiagnostic measures relating to obsessions and compulsions. Although multiple allelic variants have been implicated in studies of gambling disorders, genome-wide association studies have not found genes contributing at a whole-genome level to gambling disorder. Genetic studies of non-gambling behavioral addictions are at considerably earlier stages and warrant further attention. *Conclusions:* Multiple genetic factors appear to contribute to gambling disorder and other behavioral addictions and interact with environmental factors to contribute to the behavioral addictions and co-occurring conditions. Transdiagnostic measures hold potential in genetic studies of behavioral addictions. Identification of specific genetic factors linked to behavioral addictions should help advance prevention and treatment efforts, including the possibility of personalized interventions.

PL-06

Internet addiction: Rarely an addiction and not the Internet that one is addicted to

VLADAN STARCEVIC

University of Sydney, Sydney, Australia

Background and aims: The popularity of Internet addiction has been astonishing, but the concept has been controversial. The purpose of this presentation is to examine terminological and conceptual issues associated with Internet addiction. *Methods:* Literature review and conceptual synthesis. *Results and discussion:* Internet addiction is terminologically and conceptually indefensible. First, addiction may be a correct designation only for the minority of individuals who meet the general criteria for addiction; in many cases, addiction as the conceptual framework is not adequate to characterize repetitive and problematic Internet use. Second, there is no evidence that addiction to the Internet as a medium exists, although the Internet as a medium may play an important role in making some behaviours addictive. Third, Internet addiction is a

heterogeneous concept that refers to the endless variety of behaviours performable online. Therefore, the term “Internet” should be replaced by the specific behaviours in question (e.g., gaming, online social networking, sexual activity). *Conclusions:* There are no valid reasons for maintaining Internet addiction. Alternative terms such as “problematic Internet use” are more appropriate, although not without their own problems. Abandoning Internet addiction has not been easy because the term has been popularized to the extent that it has become a part of popular discourse, many publications have given Internet addiction a quasi-scientific status and some leaders in the field have been ambivalent about disposing of the term. The promotion of terminological precision and conceptual rigour in this domain remains an important task for all researchers and clinicians.

PL-07

Food, eating and emotions: les liaisons dangereuses

CLAUS VÖGELE

University of Luxembourg, Esch-sur-Alzette, Luxembourg

As with other fundamental drives that motivate us to seek pleasurable goals, eating and food have always been associated with mood and emotions. In particular, palatable and energy-dense foods are often consumed to regulate negative emotions, to reduce stress and to enhance overall well-being. Nevertheless, the uncontrolled consumption of such foods contributes to obesity and is a cardinal characteristic of binge-eating. Self-regulatory efforts to control the consumption of such foods are, in part, undermined by the fact that the potency of the ingredients

that make them palatable (i.e. sugar, fat, and salt) has been increased multifold in the past century. As a result, it has been argued that such foods might have an addictive potential and that a subset of individuals who have difficulties in controlling consumption of these foods may be addicted to them. This talk discusses basic mechanisms, findings, and models that help our understanding of the interactions between eating and emotions while considering the concept of food addiction.

PL-08

Incentive salience and novelty in compulsive sexual behaviors

VALERIE VOON

University of Cambridge, Cambridge, United Kingdom

Compulsive sexual behaviors (CSB) or sexual addiction are commonly hidden and can be associated with marked distress. The behaviors occur commonly in the general population at 2–4% and can be associated with dopaminergic medications used in the treatment of Parkinson’s disease at a similar frequency of 3.5%. In preclinical studies, sexual motivation is associated with dopaminergic mechanisms. This talk will focus on evidence supporting a role for incentive motivation theories. CSB is associated with enhanced reactivity to sexual cues of a neural network implicated in drug cue reactivity studies with greater subjective ‘wanting’ associated with enhanced

connectivity of this network. The sexual cues are associated with enhanced early attentional bias which link with a greater preference for cues conditioned to sexual rewards. Functional connectivity of this saliency network is decreased at rest and influenced by depression scores. CSB is also associated with greater preference for novel sexual imagery linked to enhanced dorsal cingulate habituation to sexual outcomes. These findings highlight a relationship with incentive motivation and negative emotionality theories of addiction and emphasize a role for habituation and preference for sexual novelty that might be unique to online sexual materials.

ORAL PRESENTATIONS

OR-01

Survey-assessments of problematic social media use: Are we making claims on the basis of false positives?

MARIEK M. P. VANDEN ABEELE, ANTONIUS J. VAN ROOIJ

iMinds-MICT-Ghent University, Ghent, Belgium

Background and aims: In the field of behavioral addictions research, problematic media use and its correlates are often assessed by means of survey studies administered among large-scale samples that are considered representative for the general population (e.g., Festl, Scharkow & Quandt, 2013). Although this confirmatory approach can be relevant to unravel correlates and processes underlying problematic media use, the validity of survey designs for identifying the 'true prevalence' of pathological problem use in the population is questioned and false positives are a cause of concern (Griffiths et al., n.d.; Van Rooij & Prause, 2014). *Methods:* In order to validate or falsify the survey-based approach, the current study aims to follow-up on survey results by interviewing positive cases to assess their functioning. We present preliminary results of a study in

which we conducted in-depth interviews with teenage problematic social media users and their personal network. Positive cases are identified through an abbreviated and modified social media version of the CIUS (Meerkerk, Van den Eijnden, Vermulst, & Garretsen, 2009; Van Rooij, Ferguson, Van de Mheen, & Schoenmakers, 2015), which is currently being administered to a representative sample of 3000 Flemish teenagers. Results: We contrast the extent to which teenage problem users' answers on the instrument correspond with the daily life experiences of the teenagers themselves and of persons in their immediate social surroundings. *Conclusions:* Our survey identifies the percentage of teenagers who are problematic social media users: follow-up interviews shall provide information on the validity of this approach.

OR-02

Fear of missing out (FOMO) as a predictor of problematic social media use among teenagers

MARIEK M. P. VANDEN ABEELE, ANTONIUS J. VAN ROOIJ

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Background and aims: A pathway to problematic digital media use that Billieux et al. (2015) identify in the current literature, is the 'excessive reassurance' pathway, in which socially insecure and anxious individuals display addictive patterns of social media use in order to gratify their excessive social reassurance needs. Thus, it is possible that a Fear Of Missing Out (FOMO) is an underlying mechanism that explains the relationship between excessive social reassurance needs and (problematic) social media use. *Methods:* This abstract contains preliminary results (N = 1977, final N = 3000) from an online survey among high-school pupils (Mage = 14.84). Measures include a Fear Of Missing Out scale and an abbreviated and modified scale for Problematic Social Media Use. We performed linear

regression analysis to examine whether FOMO predicts problematic social media use. Gender, age and school track were included as control variables. *Results:* Predicting PSMU, the preliminary regression analysis resulted in a significant model ($R^2 = .14$). Girls, and teenagers in more vocationally oriented school tracks were more likely to report problems, while age did not predict problematic use. FOMO appeared to be the strongest predictor problematic social media use ($\beta = .31$, $p < .001$). *Discussion and Conclusion:* Our study shows that FOMO is an important predictor of problematic social media use. This suggests that FOMO may play a role in explaining the problematic use of social media.

OR-03

Is there some impulsivity under Chronic Pain? A study in in Parkinson's disease

GIOVANNI ALBANI, ELISA PEDROLI, PIETRO CIPRESSO, CARLO DALLOCCIO, MASSIMO SCIARRETTA, ALESSANDRO MAURO

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Department of Neuroscience, University of Turin, Rita Levi Montalcini, Italy
Department of Neurology, Civil Hospital of Voghera, Pavia, Italy

Background and aims: Non-motoric symptoms, such as pain, are often reported in individuals with Parkinson's disease (PD) as symptoms having a substantial effect on their quality of life. Pain affects approximately 60% of these patients with different clinical manifestations including musculoskeletal, central, neuropathic and visceral features. Some of these patients seem to show a specific pattern of chronic pain, characterized by an unclear identification of cause and a poor response to treatments. Aim of this study was to describe the peculiar clinical features of these PD with chronic pain. *Methods:* We recruited 30 consecutive

PD patients, 17 females and 13 males, mean age 66.4 years, mean Hoehn & Yahr stage 2.79, mean duration of disease 8.51 years, mean UPDRS motor score 37.6. We investigated the clinical features associated with chronic pain, when it was present. *Results:* While neuro-radiological data, nerve conduction study findings and disease correlated variables do not differ significantly, patients with chronic pain showed higher L-dopa daily dosage intake compared to the rest of the studied sample. *Conclusions:* Our data suggest a possible link between chronic pain and dopamine dysregulation syndrome in PD.

OR-04

Cognitive control training in online problem gambling: an online randomized controlled trial among non-treatment seeking problem gamblers: Rationale and methods

LUQUIENS AMANDINE, MIRANDA RUBEN, GAMBOTTI LAETITIA, TANGUY MARIE LAURE, CARRÉ ARNAUD, AUBIN HENRI-JEAN

Département de psychiatrie et d'addictologie, Hôpital Paul Brousse, University of Paris-Saclay, University of Paris-Sud, Villejuif, France

Background and aims: Control has been described as the core cognitive dysfunction in addictive behaviors. We developed a cognitive training program targeting cognitive control for Internet use in problem gamblers, already used routinely in our center. We present rationale and methods of a web-based, randomized, controlled, single blinding, clinical trial, assessing the efficacy of this program, among non-treatment seeking problem gamblers, identified by a screening tool based on player account based gambling data registered by the French authority of regulation of online gambling. *Methods:* Identified problem gamblers will be approached by e-mail to take part in the study. At baseline, 6 and 14 weeks assessments will be performed online. Interventions will consist of: an online cognitive training program targeting inhibition or a program with a similar format targeting visual acuity – considered as neutral. An

optional guidance by phone will be proposed. Efficacy will be assessed by the change of Problem Gambling Severity Index (PGSI) (recall period shortened to 30 days). Secondary criteria will be change in gambling activity, self-reported gambling practice, and inhibition performance. We will also assess the acceptability of this program and the preferred level of guidance. *Expected results:* We expect a significantly larger reduction of PGSI in the active program and in all other secondary criteria. Feasibility data will be available in patients with an addictive disorder attending our department where cognitive training is available as usual care. *Conclusions:* If effective, our challenging and innovative web-based cognitive control training program for problem gamblers could critically broaden the range on therapeutic possibilities in this minimally treatment seeking population.

OR-05

Gender differences between males and females in sex addiction – Psychological and social Characteristics and implications in treatment

RONIT ARGAMAN

MSW Argaman Institute Tel Aviv, Israel

Background and aims: According to researchers and therapists around the world, the prevalence of sex addiction in the United States ranges from 3–8%. Social awareness to the problem in the 70s and 80s, focused primarily on men sex addicts and myths in relation to sex addiction present it as a masculine phenomenon. In recent years, there is a growing recognition that women also suffer from sex and love addiction, and there is a growing need for treatment

adjustments. However, social perceptions related to the sexual behavior of men and women in general and hyper-sexuality in particular (double standard) stops many women from turning to help. Although we can find similarities in sex addiction among men and women there are also significant differences that may affect the unique therapeutic needs of women. Differences in the perception of the romantic and sexual relationship between men and

women. Difficulty in defining the problem by the woman herself or by therapists. Different types of sexual behaviors and their etiology – with men sexual behavior focuses mainly on objectifying and emotional detachment (sexual stimulation), while in women the focus is on attachment and self-objectification (sexually stimulating relationship).

Severe consequences of sexual behavior on women, medical (STI / STD, unwanted pregnancy), psychological (humiliation, shame), rape and sexual abuse. The presentation will focus on gender differences both in personal and social perspectives and therapeutic perspective.

OR-06

The Spectrum of Cyberaddictions... or the scientific sins that resulted in their current conceptualizations

JOËL BILLIEUX

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Background and aims: Internet-related disorders are generally conceptualized as behavioral addictions including the core components of substance use disorders. Although the public health issues associated to problematic Internet use is no longer debatable, the position that it consists of an addictive behavior remains controversial. *Methods:* In the current talk, three classic sins of behavioral addiction research will be considered in relation to “Internet Addiction”: (1) the sin of the confirmatory approach; (2) the sin of ignoring heterogeneity; and (3) the sin of

(over)pathologization. *Results:* Theoretical and methodological shortcomings of existing studies will be discussed, along with avenues for future research. *Conclusions:* By relying on existing substance abuse criteria and a priori conceptualizing of Internet-related disorders as addictive behaviors, past studies largely failed to identify the uniqueness of these conditions. We thus suggest that research should shift from a mere criteria-based approach toward an approach focusing on the psychological processes involved.

OR-07

A longitudinal analysis of internet gaming addiction and interpersonal dependency

LUKAS BLINKA, KATEŘINA ŠKAŘUPOVÁ, ANNA ŠEVČÍKOVÁ

Masaryk University, Brno, Czech Republic

Background and aims: Social environment is an important feature of online games. Several studies have suggested that social obligation or intensive team play is increasing the risk of excessive gaming. The present study explored the development of online gaming addiction over time and its association with components of interpersonal dependency as a of personality traits responsible for social functioning. *Methods:* Online questionnaire was administered three times during a period of 6 months to a sample of online gamers; 1605 participated in all three waves of data collection. Addiction-Engagement-Questionnaire was used to measure online gaming addiction; Relationship Profile Test measured the three components of interpersonal dependency (destructive overdependence, dysfunctional

detachment, and healthy dependency). For data analysis a latent growth modelling was employed. *Results:* The model had a good fit (RMSEA = 0.032; 90% CI: 0.017; 0.047). Participants differed in baseline addiction scores and baseline gaming intensity. While addiction scored remained stable, respondents varied in the growth of gaming intensity. Interpersonal dependency had an effect on the general amount of gaming activity, but had no effect on its variability over time. As for control variables, the effect of age was negligible and there was no relationship with gender. *Conclusions:* Factors of interpersonal dependency influenced baseline of addiction but had no further effect on change. While the intensity of gaming varied over time, gaming addiction was stable.

OR-08

Treating Reward Deficiency Syndrome (RDS) with a nutrigenomic dopaminergic brain activator by targeting reward gene polymorphisms utilizing genetic algorithms

KENNETH BLUM, MARCELO FEBO

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Background and aims: Algorithms based on the identification of reward genes polymorphic targets were successfully used to customize Neuro Adaptogen Amino acid Therapy (NAAT) [KB220, LG839]¹ for the treatment of obesity a subset of Reward Deficiency Syndrome (RDS). We now propose that nutrigenomic targeting of RDS risk alleles by altering NAAT ingredients may also be an applicable nutrigenomic solution for addiction and pain. This hypothesis is based on the recent development of the

Genetic Addiction Risk Score (GARS)² and unpublished rsfMRI work showing that KB220Z significantly induced enhanced dopaminergic functionality across the brain reward circuitry. *Methods:* (1) A small subset of 1,000 obese subjects identified in the Netherlands was administered various KB220 formulae customized according to respective DNA polymorphisms. (2) Patients attending seven diverse treatment centers n = 273 who completed the ASI-Media Version were tested for ten reward genes

selected for polymorphisms that had been associated in numerous studies with a hypodopaminergic trait. (3) A crossover study placebo vs a variant of NAAT-KB220Z, observed resting state functional connectivity in abstinent heroin addicts $n = 10$. Results: (1) There was a significant decrease in both Body Mass Index (BMI) and weight in pounds (Fig 1; 2) When we selected 10 genes with appropriate variants, a statistically significant association between the ASI-Media Version alcohol and drug severity scores and GARS was found ($P < 0.004$; $P < 0.05$). (3) KB220Z in abstinent heroin addicts, remarkably increased resting state functional connectivity was observed in a putative network that included the dorsal anterior cingulate, medial frontal gyrus, nucleus accumbens, posterior cingulate, occipital cortical areas, and cerebellum³. In other unpublished rat work we show that KB220Z significantly activates, above placebo, seed regions of interest including the left nucleus accumbens, cingulate gyrus, anterior

thalamic nuclei, hippocampus, pre-limbic and infra-limbic loci. *Discussion:* In 2005 our laboratory received the first USA patent on Nutrigenomics and RDS treatment. This was awarded on the basis of our earlier work showing anti-addiction activity of a nutraceutical consisting of amino-acid precursors and enkephalinase inhibition.⁴ The results seen in rs-fMRI induced by KB220Z demonstrate significant functional connectivity, increased brain volume recruitment and enhanced dopaminergic functionality across the brain reward circuitry. This robust yet selective response implies clinical relevance.³ *Conclusions:* We are now ready to propose a Reward Deficiency System Solution that promotes early identification and stratification of risk alleles by utilizing GARS allowing for customized nutrigenomic targeting of these risk alleles by altering NAAT ingredients as an algorithmic function of carrying these polymorphic DNA-SNPS potentially yielding the first ever nutrigenomic solution for addiction and pain.

OR-09

Is emotional eating the missing link between stress and food addiction?

LÉNA BOURDIER, ARNAUD CARRÉ, LUCIA ROMO, CECILE DANTZER, SYLVIE BERTHOZ

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Background and aims: Stress triggers Emotional Eating (EE), and unhealthy eating can become an addiction in vulnerable individuals, but the underlying mechanisms are unknown. Recent reviews on the links between emotions and eating emphasize the need for taking into account variability across both individuals and emotions, as well as their interactions, to understand how to promote and support healthy eating. To gain knowledge on this issue, we investigated perceived stress, negative affectivity, positive and negative EE and vulnerability to food addiction in young adults at risk for psychological distress and unhealthy behaviors, i.e. students. *Methods:* To achieve this objective, a sample size of 200 participants per gender was planned and a battery of standardized self-report questionnaires of perceived stress, negative affectivity, positive and negative EE and food addiction was assessed. Statistical design was

based on univariate (correlation) and multivariate (regression) analyses followed by structural and equation modelling (SEM). *Results:* Preliminary analyses on a subsample (193 women / 200; 37 men / 200) of this on-going study validated our hypotheses on (1) gender differences in self-reported mean scores; (2) the fact perceived stress and negative affectivity are differentially linked with positive and negative EE and that these associations are influenced by gender; (3) that EE and food addiction are positively correlated; (4) that EE mediates the association between perceived stress and vulnerability to food addiction (preliminary SEM analyses on women only). *Conclusions:* Data collection is currently being completed, but the preliminary results highlight important factors underlying unhealthy eating and support the craving 'self-medication' theory.

OR-10

Self-Esteem Fluctuation and Internet Game Use

SUNG-HOON CHO, JUNG-HYE KWON

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Background and aims: There is some evidence that life stress and low self-esteem (SE) are associated with excessive Internet game use. However, cross-sectional research design is insufficient for capturing the causal relationship among life stress, SE and daily Internet game use. Using the ecological momentary assessment (EMA), this study aimed to examine the impact of SE and its fluctuation from daily stress on the Internet game use. *Methods:* A total of 99 adults (76 male, 23 female) recruited from the community completed a short electronic questionnaire 5 times per day on the website for 10 days. To facilitate the responding, the reminding message was individually provided. Electronic questionnaire measured the severity of perceived stress (1 item), the self-esteem

(2 items), and the amount of Internet game use (1 item). *Results:* Multilevel mediation analysis indicated that: (1) prior severity of perceived stress was negatively related with current SE; (2) current SE was also negatively related with later Internet game use; and (3) current SE was significantly mediated the relationship between prior perceived stress and later Internet game use. Interestingly, when there was more decrease in SE from prior perceived stress, the more Internet game use was followed. *Conclusions:* Our findings indicated that SE was a mediator between daily stress and Internet game use. In addition, results suggest that SE reactivity to daily stress could be a risk factor for Internet game disorder and that people may become excessive Internet gamer to self-medicate against low SE.

OR-11

Feasibility of mobile application system for screening Smartphone Addiction Patients

JIN KYUN CHOI, BUM JOON PARK, KWANG SOO JANG, YEJIN KIM, HWANJO YU, IN HYE YOOK,
JO-EUN JEONG, DAI-JIN KIM, IN YOUNG CHOI

Department of Medical Informatics, College of Medicine, The Catholic University of Korea, Republic of Korea

Backgrounds and aims: The number of smartphone users is increasing worldwide. Currently about 40 million people (78.6%) have smartphone in South Korea. The objective of this study is to explore the feasibility of screening and diagnosis of (patients with) smartphone addiction using mobile technology. *Methods:* We developed mobile application to prevent excessive use of smart phone, which is called Smartphone Addiction Screening System (SASS). It was developed using open source software and calculated time of usage and data for power consumption including CPU, Wifi/Cellular data, and LCD. The questionnaire was given to 30 different people, who were divided into addiction group and control group by using Korean smartphone addiction proneness scale for adults. We collected time spent for smart phone applications for four

weeks and used tensor factorization technique to explore dominant patterns because smartphone usage records are third order time series data. *Results:* Among the 30 participants, 16 (53%) had been categorized as addiction group and 14 as control group; both group consisted of 50% of males and 50% of females. After analyzing the usage data, ten dominant addiction patterns were derived. Proportion of each pattern was used to predict smartphone addiction. We used 10-fold cross validation. As a result, we proved that the 10 patterns can predict smartphone addiction with accuracy of 80%. *Conclusions:* Our result showed that the mobile application can be used as a screening tool for smartphone addiction. Further development and research will be conducted to improve the effectiveness of the system.

OR-12

Resting-state slow wave activity is associated with symptom improvements following outpatient treatment for Internet gaming disorder with comorbidity

JUNG-SEOK CHOI, DAI-JIN KIM, SAM-WOOK CHOI

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Background and aims: Internet gaming disorder (IGD) is often comorbid with psychiatric issues such as depressive or anxiety disorders. The identification of predictive factors and biological markers associated with changes in IGD symptoms following treatment may provide a better understanding of the pathophysiology underlying IGD. The present study aimed to determine neurophysiological markers associated with symptom changes in IGD patients with comorbid psychiatric issues. *Methods:* The present study included 63 young male participants; 34 IGD patients (22.71 ± 5.47 years) and 29 healthy controls (23.97 ± 4.36 years). Of the 34 IGD patients, 20 completed a 6-month usual outpatient management that included pharmacotherapy and/or cognitive behavioral therapy. Of these patients, 14 were diagnosed with a comorbid depressive disorder and six with a comorbid anxiety disorder. Electro-

encephalography (EEG) scans were acquired during a resting-state from the 20 IGD patients prior to and after treatment. The primary treatment outcome was a change in score on the Young's Internet Addiction Test from pre- to post-treatment. *Results:* The IGD patients with comorbidities showed increased resting-state EEG activity in the delta and theta bands at baseline but the increased delta band activity was normalized after 6-months treatment. Higher absolute theta activity at baseline predicted a greater possibility of improvement in addiction symptoms following treatment. *Discussion and conclusions:* The present findings showed that increased slow wave activity represented a state neurophysiological marker and that increased theta activity at baseline may be a favorable prognostic marker for IGD that is comorbid with depressive or anxiety disorders.

OR-13

**Screening for emerging addictions in young people.
Results of the Spanish National Strategy of Mental Health**

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Background and aims: The emergence of addictive problems associated with the development of the Information and Communication Technology (ICT) is a challenge for mental health in modern societies. These addictive problems are very relevant in young people. The

current Spanish Mental Health Strategy (2015–2019) analyses 14 mental health topics (suicide, chronicity, alcoholism etc.), including the problem of "emerging addictions" in young people: online gambling addiction, and technological addictions (Internet addiction, mobile

addiction and videogame addiction). The main objective of the Strategy is to develop a screening protocol for the emergent addictions that can be used by health professionals to early detection of emerging addictions in youth who is suspected they may have that problem. If the suspicion is confirmed, the young should be cared by specialized health services. *Methods:* The procedure consisted on the evaluation of gambling addiction and technological addictions using validated questionnaires (NODS, TDI, TDM and TDV), and the selection of the two items which have the greatest power of discrimination between people who have one of these addiction problems (online gambling, Internet, mobile or videogame) and those who use such technology in a non-problematic manner. The selected criterion was the Positive Predictive Value (PPV), which is based in the calculus of the sensitivity and specificity values.

The two items that presented the greatest Positive Predictive Value were selected for screening for each type of addiction. *Results:* The two items of each questionnaire that presented the highest PPV scores were selected. The values were the following: TDI: Item 8 (VPP = .85), and Item 3 (VPP = .83); TDV: Item 17 (VPP = .98), and Item 23 (VPP = .96); TDM: Item 4 (VPP = .93), and Item (VPP = .92). *Conclusions:* Early detection of technological addictions (Internet, video games and mobile phone) in youth is a priority for the current Spanish National Strategy of Mental Health. The results obtained in this research allow to propose a protocol of screening for technological addictions, with the main objective of detect, by part of mental health staff, these problems as soon as possible. The final screening protocol presented to the National Strategy of Mental Health is explained.

OR-14

The effect of smartphone overuse on the neural activities underlying the emotional states during facial emotion discrimination task

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The aim of the present study was to investigate the interaction between cognitive control and emotional state in smartphone overusers. The task consisted of emotional faces (happy and angry) and was designed to examine the effect of emotional discrimination between smartphone overusers and normal controls. We compared the behavioral responses and functional magnetic resonance imaging (fMRI) activations between two groups. The sample included 31 male normal controls (mean age = 28.16) and 31 male smartphone overusers (mean age = 28.09). The stimulus material for each trial consisted of a happy or angry face on the left or right side and a fixation cross on the center of a grey background. The participants were instructed to discriminate emotional facial expressions while undergoing

fMRI scans. Spatial pre-processing and statistical analyses of the fMRI data were performed using statistical parametric mapping 8. In the behavioral results, the smartphone overusers showed lower accuracy than normal controls in the happy face followed by the angry face and the angry face followed by the happy face conditions. In addition, smartphone overusers showed slower reaction time than normal controls in the angry face followed by the happy face condition. In the fMRI result, smartphone overusers revealed more activation on the right inferior frontal cortex compared to normal controls in previous angry face trials. In this study, we could demonstrate the different behavioral response and cerebral activation between normal controls and smartphone overusers during the facial emotion discrimination task.

OR-15

The influence of Internet game content characteristics on Internet game addiction among youths: Application of the public health model

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Background and aims: Internet and smartphone use disorder is influenced by many factors. On the other hand, Korea is known for the high percentage of Internet use. With the wide supply of smart phones reaching 78.6% in 2014, access to Internet game has become ever more convenient. According to the public health model, not only individual factors but characteristics of the agent and environment are important in explaining Internet addiction. Currently, a systematic scale measuring the contents and characteristics of the agent is not available in Korea. This study aims to (1) develop a scale that measures characteristics of Internet game contents (agent) and (2) examine the influence of agent on Internet game addiction among youths. *Methods:* An overview of literature on media contents resulted in a scale that included 13 concepts and 44 items. After obtaining the face validity

by several experts, a pretest survey was conducted for confirmation. Using the scale, a survey was conducted to 1,500 youths in two major provinces in Korea to examine the influence of the agent characteristics on Internet game addiction. *Results:* Exploratory factor analysis resulted in 8 concepts and 27 items: interest, relationship, accessibility, benefit, anonymity, immersion, competition, and escape from reality. These factors explained the characteristics of Internet related to individual's use of the media. The influence of the agent characteristics on Internet game addiction was also examined. *Discussion:* Understanding the influence of agent characteristics calls for more concrete regulations and active policy implementation for intervention and prevention of Internet-smartphone addictions among youths is of vital importance.

OR-16

Could isolating exercise dependence influence eating disorders treatment?

BRIAN COOK

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Background and aims: Exercise in individuals with eating disorders (ED) is described as compulsive, but also reflects definitions of exercise dependence. Previous research has suggested that intervening on exercise dependence may benefit ED treatment. The purpose of this review was to examine the effect of isolating exercise dependence as part of ED treatment. **Methods:** The protocol for Preferred Reporting Items for Systematic Reviews and Meta-Analyses was followed. Inclusion criteria was: research articles, systematic reviews, meta-analyses, or clinical protocols for the management of exercise in ED treatment. **Results:** A search initially returned 149 articles, of which 19 provided specific details of how therapeutic exercise protocols have been used in ED treatment. Of these, 9 concluded that screening for exercise dependence/addiction/compulsion may enhance ED treatment. Outcomes reported were

reduced compulsive exercise, patients' acceptance/compliance with treatment programs, reduced ED psychopathology, and reduction in anxiety. An additional 5 cross-sectional studies identified exercise dependence as a potential mediator of the exercise and ED relationship. **Conclusions:** This review suggests that intervening on psychological factors (e.g., exercise dependence) may break a multi-chain link of causal factors in the development and maintenance of ED pathology and therefore may be useful in treating excessively exercising ED patients. This highlights the need to develop clinical interventions/treatments for exercise dependence. Such treatment may also benefit nonED individuals with exercise dependence. Additionally, the use of multiple terminologies to describe a similar pattern of pathological attitudes and behaviors may be limiting the ability to disseminate knowledge of exercise dependence.

OR-17

Threshold stimulus, exercise intensity, and substance use in exercise dependence

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Background and aims: As individuals' fitness improves, their threshold stimulus (i.e., stimulus required to overload musculoskeletal, cardiorespiratory, and nervous systems or further adaptation) increases. Moreover, strenuous intensity exercise results in additional beta-endorphin release. Thus, elevated exercise amount and tolerance in individuals with exercise dependence may indicate increased threshold stimulus and beta-endorphin release. The aim of this study was to examine exercise intensity levels and threshold stimulus (i.e., proxy for physiological differences) related to exercise dependence. Because substance use is also associated with beta-endorphin release, we examined drug and alcohol use in exercise dependence. **Methods:** 197 regular exercisers (M age = 20.40, SD = 3.15) completed a demographic questionnaire which included substance use items, the Exercise Dependence Scale, Leisure-time Exercise Questionnaire, and International Physical Activity Questionnaire. Participants were categorized into the

following groups: at-risk, symptomatic, or asymptomatic for exercise dependence. ANOVAs with Bonferroni post hoc analyses were used to examine group differences in exercise amount and intensity, sedentary behavior, and substance use. **Results:** Significant differences were found for total exercise amount [$F(2,194) = 14.19, p < .01$], mild [$F(2,193) = 3.44, p = .03$] and strenuous intensity exercise [$F(2,194) = 21.25, p < .01$], but not moderate intensity. At-risk individuals reported significantly more sedentary behavior [$F(2,160) = 7.15, p < .01$]. No differences were observed among substance use. **Conclusions:** Exercise dependence was not associated with substance use. However, effects of strenuous intensity exercise may indicate increased threshold stimulus in those at-risk for exercise dependence. This may indicate unique physiology associated with exercise dependence. Therefore, future research is encouraged to examine strenuous intensity exercise and physiological changes in exercise dependence.

OR-18

Exploring the Pathways Model for Problem Gamblers in Hypersexual Patients

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Background and aims: While there has been an increase in the amount of research linked to hypersexual behavior over the past decade, there is a paucity of work highlighting the etiology, risk factors, or possible pathways through which hypersexuality may arise. **Methods:** We examined NEO-Personality Inventory data from the DSM-5 Field Trial for Hypersexual Disorder among men ($N = 254$) who

were classified as meeting the threshold. **Results:** We hypothesized 3 latent classes of hypersexual patients based on the pathways model commonly applied to those with gambling disorder. The data was explored using Latent Class Analysis (LCA) with alternative models compared to the hypothesized latent classes. The three-class model was supported with facets of personality paralleling the

pathways model among problem gamblers. *Conclusions:* This is the first study to compare the pathways model common to gamblers with hypersexual patients. The parallel

in data between hypersexual behavior and gambling disorder suggests these two patterns of de-regulated behaviors may share common pathways in their development.

OR-19

Exploring the Pathways Model for Problem Gamblers in Hypersexual Patients

ERIN B. COOPER, RORY C. REID

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Background and aims: While there has been an increase in the amount of research linked to hypersexual behavior over the past decade, there is a paucity of work highlighting the etiology, risk factors, or possible pathways through which hypersexuality may arise. *Methods:* We examined NEO-Personality Inventory data from the DSM-5 Field Trial for Hypersexual Disorder among men (N = 254) who were classified as meeting the threshold. *Results:* We hypothesized 3 latent classes of hypersexual patients based on the pathways model commonly applied to those with

gambling disorder. The data was explored using Latent Class Analysis (LCA) with alternative models compared to the hypothesized latent classes. The 3 classes model was supported with facets of personality paralleling the pathways model among problem gamblers. *Conclusion:* This is the first study to compare the pathways model common to gamblers with hypersexual patients. The parallel in data between hypersexual behavior and gambling disorder suggests these two patterns of de-regulated behaviors may share common pathways in their development.

OR-20

Exploring gambling craving through the Elaborated Intrusion Theory of desire: A mixed method study

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Background and aims: Gambling disorder is a well-established behavioral addiction, which has been aligned to substance-related addictions in the DSM-5. While craving is now recognized as a criterion for substance related addictions in the last edition of the DSM, it was not retained for gambling disorder. Research is thus needed to test whether established models of craving can be applied to gambling craving. In this context, the current study aims to explore gambling craving based on the rationale provided by the Elaborated Intrusion Theory of Desire (EIT), a recent yet recognized cognitive model of craving. *Methods:* A mixed-method study was conducted among 31 regular and problem gamblers. The qualitative part consisted in 10 open questions focused on the triggers and the components involved in the EIT. The quantitative part consisted of a

questionnaire designed to assess the triggers promoting gambling behaviors, and inspired from the substance abuse literature. *Results:* Thematic analysis reveals 5 categories of answers: affect (positive and negative), cues, images, thoughts and physiological sensations. The descriptive analyses highlighted the most relevant triggers (e.g., spontaneous thoughts, boredom, visual imagery) and phenomenological characteristics (e.g., visual imagery, course of the craving episode) associated to gambling craving. *Discussion and Conclusions:* The use of a mixed approach allowed us to better understand the phenomenology of gambling craving and confirms the relevance of the EIT applied to gambling. This study supports the use of psychological interventions, derived from the EIT, which aim to interfere with mental imagery to reduce the vividness of craving episodes.

OR-21

Outcomes of an evaluative and psycho-educative procedure of re-admission in a casino

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Background and aims: In Switzerland, an excessive gambler can be voluntarily or forcedly excluded from a casino and, after a minimum of one year, can make a request for this exclusion to end. The present study, conducted with the casino of Neuchâtel, examines statistical outcomes of the procedure in use and offers a preliminary evaluation of its efficacy and utility. *Methods:* This procedure consists of an examination of the gambler's financial situation by the casino's personnel, followed by a psycho-educative and

evaluative interview conducted by a local addictions center. Based on data from a two-year period, we observed the proportion of accepted re-admission requests, as well as the proportion of re-admitted gamblers who were re-excluded later on. *Results:* Results indicate that among all the requests (N = 65), only 26% were accepted. 60% of inquirers got their exclusion maintained at the socioeconomic evaluation stage and 14% based on the subsequent addictological evaluation. In addition, among the 17 readmitted

individuals, 4 asked for a new exclusion. *Discussion:* In sum, the majority of re-admission requests did not pass the first stage (the socioeconomic evaluation). Furthermore, despite the psycho-educative interview, 24% of re-admitted gamblers asked for a renewal of their exclusion, possibly due to a relapse into excessive gambling. However,

requesting a new exclusion could also be a strategy aiming at preventing excessive gambling before it would cause harm. *Conclusion:* A specific study on factors leading to re-exclusion is needed, in order to further evaluate the procedure in use and to improve psycho-educative interventions within the readmission process.

OR-22

Development and Preliminary Validation of a Brief Smartphone Addiction Inventory for the Screening of Schoolchildren

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Background and aims: Smartphone use among children increases progressively. A growing range of stimulating applications may trigger the risk of addiction. The aim of this work was to develop a brief, easy-to-use tool for screening children at risk for smartphone addiction. *Methods:* A 6-item agree-disagree Likert-scale (6-point range), was developed on the basis of the ‘components’ model of addiction (Griffiths, 2005). The brief tool was administered to 441 Hungarian speaking schoolchildren (mean age = 13.4 years, SD = 2.22) along with the 26-item Smartphone Addiction Inventory (SPAI; Lin et al., 2014). *Results:* Principal components analysis yielded a single component of the tool, which accounted for 52.38% of the

variance. The internal reliability of the scale was good (Cronbach’s $\alpha = 0.82$). Content validity was confirmed by statistically significant differences between heavy and light users ($p < .001$). The brief tool correlated positively and significantly with the 26-item SPAI ($r = 0.67$, $p < .001$), that justified its congruent validity. Younger children (9–13 years) scored higher on the scale than their older (14–18 years) peers ($p < .001$). *Conclusions:* The Hungarian version of the brief smartphone addiction inventory appears to be a valid and reliable tool for screening for mobile phone addiction among schoolchildren. Given that younger children may be more vulnerable to the maladaptive use of mobile phones, screening this population is highly recommended.

OR-23

Is Internet Gaming Disorder associated with high impulsivity and poor decision-making?

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Background and aims: The study of Internet-related disorders recently made a step forward in the acknowledgment of excessive online gaming as a potential condition with the proposal of tentative criteria of “Internet Gaming Disorder (IGD)” in Section 3 of the DSM-5. The construct being in need for further validation or rejection, the purpose of this study was to compare gamers endorsing IGD criteria versus non-problematic gamers with regard to established risk factors central in addictive disorders, including impulsivity, inhibitory control and decision making. *Methods:* 98 regular online gamers were recruited, 30 meeting the IGD criteria. Participants took part in laboratory tasks measuring inhibition processes (Hybrid-Stop Task) and decision-making abilities (Game of Dice Task). They also completed questionnaires measuring

self-reported involvement in online games, impulsivity traits, motives to play, and comorbid depressive symptoms. *Results:* No significant differences emerged from the experimental tasks when comparing IGD to non-IGD subjects. However, relationships between several psychological constructs and dimensional indexes of problematic video game use were identified. *Discussion:* The current proposal for IGD criteria appears unsatisfying in their potential discriminative power to distinguish problematic and regular online gamers. Moreover, substantial proportion (30.6%) of individuals is considered as problematic. *Conclusion:* Further studies are required to determine valid criteria to identify IGD. Indeed, DSM-5 criteria fail to distinguish between highly involved versus addicted gamers.

OR-24

Rethinking disadvantageous decision making in pathological gambling: The role of gambling-related distorted cognitions

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Background and aims: Impaired decision making under risk and uncertainty is well documented in gambling disorder, and has often been related to impulsive personality.

However, studies are lacking that test the influence of gambling-related cognitive distortions on laboratory measures of decision making in pathological gamblers. This

is surprising given the prominent role of these cognitions in etiological models of gambling disorder. To fill this gap in the literature, the current study tested the impact of both impulsivity traits and gambling-related cognitions on decision making in both pathological and non-pathological (regular) gamblers. *Methods:* Treatment-seeking pathological gamblers (PG; N = 21) and healthy (nonpathological) gamblers (N = 47) were recruited and performed the Iowa Gambling Task (IGT, to measure decision under uncertainty), the Devil Task (to measure decision under risk), the UPPS-P Impulsive Behavior Scale (UPPS-P), and the Gambling-Related Cognition Scale (GRCS). *Results:* In comparison to regular gamblers, PG

were characterized by impaired decision making in both the IGT and the Devil Task. PG also displayed higher levels of emotional impulsivity (urgency) and lack of premeditation (two facets of the UPPS-P), and presented pronounced predictive control bias and illusion of control (two facets of the GRCS). When covarying for GRCS illusion of control scores, the group difference in decision making on the IGT was rendered non-significant, consistent with the suggestion that individual differences in illusion of control contribute to deficits in decision making under uncertainty. *Conclusions:* The current study emphasized the central role of the illusion of control in the impaired decision-making process characterizing pathological gamblers.

OR-25

Free-to-Play: About addicted Whales, at risk Dolphins and healthy Minnows. Monetization Design and Internet Gaming Disorder

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Background and aims: The structure of video games is not only changing due to technical innovation, but also because of new game design and monetization approaches. Moreover, elite gamer groups with financial in-game investments co-finance all users of free-to-play-games. Besides questions on youth protection, the growing popularity of free-to-play games has fostered discussions on proposed associations to Internet Gaming Disorder (IGD). *Method:* Free-to-play browser gaming children and adolescents were examined in a German school-based representative study (N = 3967; age range 12 to 18). Based on a clinical self-report AICA-S (Wölfling et al., 2011), these were categorized into non-problematic, risky, and addicted users. Psychosocial problems (SDQ; Goodman, 1997), perceived stress (PSS; Cohen, Kamarck & Mermelstein, 1983) as well as coping strategies (BriefCOPE; Carver, 1997), and Average Revenue per

(Paying) User (ARPU) were used as dependent variables. Further, an industry classification (Freeloaders, Minnows, Dolphins, and Whales) for free-to-play gamers was used for additional testing regarding relationships of IGD, SDQ, PSS, BriefCOPE, and ARPU. *Results:* Among free-to-play gamers the prevalence for IGD amounted to 5.2%. Subjects classified with IGD displayed higher psychosocial symptoms than non-problematic users, reported higher degrees of perceived stress, and were more often applying dysfunctional coping strategies. Additionally, we found a higher ARPU among subjects with IGD. *Conclusions:* ARPU is significantly associated with IGD. Whales share significant characteristics with addicted video gamers, Dolphins might be classified as risky consumers, Minnows, and Freeloaders are rather non-pathological gamers. Based on the detailed characterization of addicted free-to-play browser gamers, evidence based recommendations and policy implications are proposed.

OR-26

The Social Media Disorder Scale: Validity and Psychometric Properties

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Background and aims: There is growing evidence that social media addiction is an evolving problem, particularly among adolescents. However, the absence of an instrument measuring social media addiction hinders further development of the research field. Particularly, there is a strong need for a short and easy to administer measurement tool that can distinguish between addicted and highly engaged, non-addicted social media users. In the absence of specific diagnostic criteria for social media addiction, the development of this new measurement tool was based on the assumption that social media addiction and Internet Gaming Disorder (IGD) are two forms of the same overarching construct Internet Addiction, and should thus be defined by the same set of diagnostic criteria. Therefore, the

development of the Social Media Disorder (SMD) scale was based on the nine DSM-5 criteria for IGD. The aim of the present study was to test the reliability and validity of this newly developed SMD-scale. *Methods:* Three online surveys were conducted among a total of 2,198 Dutch adolescents aged 10 to 17. *Results:* The 9-item SMD-scale showed solid structural validity, appropriate internal consistency, sufficient test-retest reliability, and good convergent and criterion validity. Moreover, the nine items generally showed adequate sensitivity and good specificity. *Conclusions:* This study generated evidence that the short 9-item scale is a psychometrically sound and valid instrument to measure SMD.

OR-27

Tilt, Irrational Beliefs and Online Poker Excessive Gambling

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Background and aims: In poker, the Tilt is a brief episode in which the gambler is not able to control his rational decisions regarding the game. It is combined with a loss of control, irrational beliefs, chasing and loss of money. Tilt is experienced by the wide majority of the players, and could be a gateway to excessive gambling. The aim of this study is to better understand the link between the frequency of the Tilt episodes, the irrational beliefs and online poker excessive gambling. *Methods:* The sample consists of 182 online poker players aged on average 32.6 years (SD = 9.4). Participants filled out an online self-report questionnaire, comprising scales measuring excessive gambling (Problem Gambling Severity Index, PGSI), tilt episodes' frequency,

gambling irrational beliefs (Gambling Related Cognitions Scale, GRCS), anxiety, depression and sensation seeking. *Results:* The frequency of the tilt episodes, irrational belief "Inability to stop gambling" and anxiety were significant predictors of online poker excessive gambling. Irrational beliefs "Inability to stop gambling" and "Interpretive bias" predicted the frequency of tilt. *Conclusions:* Tilt and gambling irrational beliefs are associated to online poker excessive gambling supporting the hypothesis that tilt could be a factor encouraging excessive gambling. Tilt enables to better understand online poker players. It could be a way to detect and to prevent online poker excessive gambling.

OR-28

Food addiction and personality traits

FERNANDO FERNÁNDEZ-ARANDA

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Background and aims: In this presentation we would like to explore whether eating disorder (ED) patients differ in specific personality traits depending on a diagnosis of food addiction (FA) and to find a model to predict FA in eating disorder patients using measures of personality and impulsivity. The idea that personality characteristics implicated in addiction could also contribute to ED is not a new concept and has been confirmed by empirical data, but this association could be biased by a diagnosis of FA that may have not been considered in earlier studies. Assuming that FA is comparable to other (substance and/or behavioral) addictions, it can be expected that patients receiving this

diagnosis will have more addictive-like personality patterns than those who do not fulfill the YFAS criteria for FA. *Methods:* Recent studies in this context (ED and gambling disorders) will be presented, and the extent to which the FA construct can be supported by personality vulnerabilities, even when compared with healthy controls. *Results:* Patients with FA have lower self-directedness, more negative urgency and a higher lack of perseverance than patients without this diagnosis. *Conclusions:* Patients with food addiction seem to have relatively more difficulties focusing on long-term goals.

OR-29

Impact of gender, age of onset and personality traits in the clinical presentation of different subtypes of compulsive buyers

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Background and aims: In spite of the revived interest in compulsive buying disorder (CBD), its classification into the contemporary nosology systems continues to be debated, and scarce studies have addressed heterogeneity in the clinical phenotype through methodologies based on a person-centered approach. The aim was to identify empirical clusters of CB based on the patients' sex and age, age of compulsive buying onset, and personality traits. *Methods:* 110 patients, consecutively attending to a specialized unit for CB treatment, were pre-clustered into distinct groups according to a sequential clustering approach. The resulting groups were considered as inputs and grouped into the desired number of clusters according to the agglomerative hierarchical clustering method. *Results:* three clusters were identified: a) Type I, named "male compulsive buyers" (n = 32, 29.1%), included only male patients, reported the highest prevalence of comorbid gambling disorder and the

lowest mean in the personality trait reward dependence; b) Type II, named "female low-dysfunctional" (n = 32, 29.1%) principally included employed women, with the highest level of education, the oldest age of CB onset, the lowest mean for harm avoidance and the highest means for persistence, self-directedness and cooperativeness; and c) Type III, named "female highly-dysfunctional" (n = 46, 41.8%), included only women, with the youngest age of CB onset, the highest levels of comorbid psychopathology, the highest mean in the harm avoidance and the lowest mean in self-directedness. *Conclusions:* patients' sex, age, age of compulsive buying onset and personality traits seem to be useful for determining CB clusters which represent different clinical subtypes, which should be considered for clinical research, to develop assessment instruments with high discriminative capacity, efficient preventive programs and flexible treatment plans.

OR-30

Israeli women with a gambling disorder – Echoes of socio-cultural views in an interview process

BELLE GAVRIEL-FRIED

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Background and aims: Over the years, gambling has been perceived as a predominantly male concern. Women gamblers are considered to be violating their traditional gender roles as mothers and care givers. The scant references in the gambling literature to the mothering skills of women with gambling problems ranges from descriptions of these women's lack of availability for their children, through parental neglect, to critical commentary that attempts to recast their gambling behavior. The present study examined how 13 Israeli women with a gambling disorder viewed their maternal function and constructed their maternal identity. *Methods:* Semi-structural in depth

interviews were conducted with 13 Jewish Israeli women with a gambling disorder and then analyzed using the Interpretive interactionist approach. *Results:* The participants construct their maternal identity and function in a positive light, in a way consistent with the Good Mother myth. *Conclusions:* Jewish Israeli women with a gambling disorder have internalized the central discourse in Western countries about the Good Mother myth as well as the prevalent discourse in Israeli society on the proper role of women and mothers in particular. The interviews reveal their fervent desire to be perceived as normative women who form part of mainstream society by virtue of their maternal role.

OR-31

Current Considerations Regarding Food Addiction

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Background and aims: Parallels in biological, psychological, and behavioral systems have led to the hypothesis that an addictive process may contribute to problematic eating. The Yale Food Addiction Scale (YFAS) was developed to provide a validated measure of addictive-like eating behavior based upon the diagnostic criteria for substance dependence. Recently the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) was released, which included significant changes to the substance-related and addictive disorders (SRAD) section. *Methods:* In the current presentation, changes in the

assessment of addictive-like eating based on the DSM 5 have been analyzed and will be discussed. Research on the assessment of addictive-like eating in children and the foods characteristics most implicated in "food addiction" will be reviewed. *Results:* The YFAS 2.0 provides a psychometrically sound tool to assess addictive-like eating based on the DSM 5. "Food addiction" in children is associated with elevated BMI and problematic eating. Highly processed foods are implicated in addictive-like eating. *Conclusions:* "Food addiction" may be an important contributor to problematic eating.

OR-32

What matters: quantity or quality of porn use?

Psychological and behavioral factors of treatment seeking for out-of-control pornography consumption

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Background and aims: For most people pornography consumption (PC) plays a role of entertainment, but for some it is an out-of-control behavior and reason for treatment seeking. Previous experimental studies showed no differences in PC frequency between pornography users that report and do not report issues related to this behavior. It raises a question: Whether mere quantity of PC is at all related to treatment seeking? Here we propose a model explaining sources of treatment seeking for out-of-control pornography use with two main factors (negative consequences of PC, subjective experience of losing control over sexual behavior) and four additional factors (onset and number of years of PC, religiosity, age, dyadic sexual activity). *Methods:* The model was verified using online questionnaire data from a sample of 569 heterosexual

Caucasian males aged from 18 to 68 years, including 132 treatment seekers for out-of-control sexual behaviors. *Results:* Analysis showed that treatment seeking is not correlated with mere frequency of PC, but there was a significant correlation with negative symptoms of PC. Further, this relation was mediated by experience of losing control over sexual behavior which was in itself correlated with religiosity. Onset of PC and age appeared to be insignificant. Our model was fairly fitted (CFI = 0.982) and explained 43.4% of variance in treatment seeking behavior. *Discussion:* Severity of negative symptoms and subjective experience of out-of-control sexual behavior are much better predictors of treatment seeking than mere frequency of PC.

OR-33

One or Multiple Neural Mechanisms of Problematic Pornography Use?

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Background and aims: Clinicians and researchers often hesitate how to conceptualize problematic pornography use (PPU). The two most discussed frameworks are behavioral addiction and compulsion. Neuroscientific studies on pornography use and compulsive sexual behaviors (CSB) indicate a significant involvement of brain reward circuits in such conditions and the similarities with other addiction-related behaviors. However, clinical observations and recent studies on risky sexual behaviors and problematic alcohol use show that reward circuitry disruption is not the

only possible neural mechanism of problematic behaviors. Due to recent findings, addictive behaviors may be underlined either by increased reward system reactivity for appetitive cues or increased amygdala threat-reactivity. *Methods:* Here we present our studies on paroxetine treatment of PPU and role of amygdala threat-reactivity in this condition. *Results and Conclusions:* We will discuss the meaning of these findings for PPU and CSB treatment as well as for directions of future neuroscience research.

OR-34

Testing problematic technological scales in socio-addict patients: the case of the mobile phone

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Background and aims: In the behavioral addictions field, little research has been done using a clinical sample. Previous literature has not explored whether mobile phone usage is linked to health problems. The objective of this study was to explore whether mobile phones (i.e., Mobile Phone Problem Use Scale adapted to Adults; MPPUSAd) or smartphones (i.e., Smartphone Addiction Scale – Short Version; SAS-SV) are suitable to measure addictive characteristics in a clinical sample. *Methods:* A questionnaire was applied to a convenience sample in a Spanish clinical center specialized in socio-addictions. The sample (N = 31), was primarily male (71%), with a mean age of 33.31 years (SD = 14.07). The survey included: socio-demographics and the MPPUSAd (22 items using a 1–10 Likert scale) and SAS-SV (10 items using a 1–6

Likert) to explore potential excessive uses. *Results:* Of the 31 patients (i.e., Internet, gaming, cybersex, gambling and shopping addiction); 21 (67.7%) sought advice from this clinic regarding a technology addiction (e.g. cybersex), the remainder were seeking treatment for behavioral addictions in which technology was not a necessary component (e.g., compulsive buying). The MPPUSAd ranged between 1.41 (SD = .84) and 5.26 (SD = 3.46), and the SAS-SV ranged from 1.15 (SD = .36) to 2.11 (SD = 1.45). MPPUSAd was positively correlated with SAS-SV ($r = 0.89$, $p < .001$, $r^2 = 0.792$). *Discussion and conclusions:* Based on these exploratory findings it seems that mobile phones and smartphones are not problematic regarding their association with behavioral addictions in which participants were seeking treatment for.

OR-35

Severity levels of Game Transfer Phenomena: Associated factors and impact

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Background and aims: Analysis of over 1,600 self-reports has shown that gamers experience non-volitional phenomena with videogame content, so called Game Transfer Phenomena (GTP). This includes perceptual distortions of objects, visual, auditory or tactile hallucinations, intrusive thoughts, verbal outbursts, involuntary motor activations, and responses to real objects as those in the videogame. Previous analysis of the sample showed that 97% have experienced GTP. The aim of this study was to examine the individual characteristics, gaming related variables, and impact of GTP on those who have experienced different levels of severity of GTP; mild, moderate and severe (i.e., frequency and number of GTP experienced). *Methods:* A self-selected sample of 2,362 gamers participated in an online survey. Chi-square tests

were used to analyse the data. *Results:* The majority of gamers experienced mild levels of GTP. Those with severe levels of GTP were significantly more likely to (i) be students, (ii) be aged 18 to 22, (iii) play sessions of 6 hours or more, (iv) play to escape, (v) have a sleep disorder (13%), (vi) consider themselves as having dysfunctional gaming (8%). More gamers in the severe group had used drugs, experienced flashbacks as side-effects of drug use and experienced distress or dysfunction due to GTP (58%) compared to the other groups. *Conclusions:* Findings suggest that those with higher levels of GTP share characteristics with profiles of gamers with dysfunctional gaming. Future studies should investigate the temporal stability of GTP and the relationship between GTP, dysfunctional gaming, and sleep disruptions.

OR-36

Development of a structured clinical interview for Internet addiction for teenagers and young adults

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Background and aims: In the past 20 years, a heterogeneous set of assessment instruments have been developed to measure Internet addiction (IA) for research and clinical purposes. Their development has generally consisted of a transposition of other preexisting disorders (gambling disorder, etc.). The validity of these instruments remains difficult to establish because of the lack of a sound criterion. The development of a consensus around Internet addiction based on a structured clinical interview could overcome this issue. The aim of the presentation is to share the process and preliminary outcomes of the development of the Structured Clinical Interview for Internet Addiction to assess people aged from 15 to 25 years old. *Methods:* Three iterative focus groups have been conducted on the conceptualization and

the operationalization of IA with 20 experts (clinicians and researchers) from different countries (Canada, France and Switzerland). To set thresholds and validate the preliminary version, experts were individually asked to assess the level of concordance of the instrument with their own conceptualization and to rate the scale with three cases which represented different levels of IA (non-addicted, at-risk, Internet addicted). *Results:* Results and process are discussed related to the development and the operationalization of other existing instruments and within the context of an ongoing larger study based on clinical trial assessment of real cases. *Conclusions:* This study represents a first step in the development of a gold standard to the validation of IA instruments.

OR-37

Atomoxetine for hoarding disorder: a preclinical and clinical investigation (preliminary results)

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Background and aims: Despite some studies suggested that childhood attention-deficit hyperactivity disorder (ADHD) and inattention symptoms may be related to hoarding, only a small case series study investigated the effectiveness of ADHD medications in hoarding disorder (HD). The aim of the present study was to evaluate the preclinical and clinical effectiveness of atomoxetine, a noradrenaline reuptake inhibitor approved for childhood and adulthood ADHD, in an animal model of compulsive-like behaviors (marble burying test) and in patients with a primary diagnosis of hoarding disorder. *Methods:* we performed a preclinical investigation assessing the effects of atomoxetine on the marble burying behavior test in mice. The number of marbles buried in vehicle and atomoxetine treated groups was measured. Subsequently, we conducted a clinical investigation on five patients fulfilling the DSM-5 criteria

for hoarding disorder. These patients were treated with atomoxetine 40-100 mg for 12 weeks. Full response was defined as a more of 35% decrease in UCLA Hoarding Severity Scale (UHSS) and partial response was defined as a more of 25% decrease in UHSS scale. *Results:* Atomoxetine significantly reduced the number of buried marbles in a dose dependent manner in comparison to control mice, without affecting the locomotor activity. Three out of five atomoxetine-treated patients were classified as full responders and two patients as partial responders after 12 weeks of treatment. *Conclusions:* these preclinical and clinical data suggest that atomoxetine may be considered as a potentially effective compound for hoarding disorder and therefore should be considered for future controlled trials in hoarding disorder.

OR-38

Neuromodulation of decision-making networks with alfaEEG-guided repetitive transcranial magnetic stimulation: preliminary results from a pilot study

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Backgrounds and aim: Decision-making is a complex process which rely on a distributed neural network that includes multiple cortical and subcortical regions. Among them, the prefrontal cortex seems to be particularly relevant as demonstrated by several neuropsychological and neuroimaging investigations. The aim of our study is to investigate the neuromodulating effects of alfaEEG-guided

repetitive transcranial magnetic stimulation (alfa-rTMS) over the right dorsolateral prefrontal cortex (DLPFC) on a decision-making task in healthy volunteers. *Methods:* The alfa-EEG rhythm was determined through an EEG assessment at baseline and the alfa rhythm frequency was used to set up the rTMS frequency. Subsequently, the 10 healthy volunteers were randomized to receive in a

cross-over design both active alfa-rTMS and sham alfarTMS over the right DLPFC in a 1:1 ratio. All healthy volunteers performed a decision-making task (the Iowa Gambling Task) at baseline and after both active and sham stimulation. They were also assessed pre- and post rTMS with an EEG assessment. Results: From our preliminary results emerged that active alfa-rTMS seems to increase the alfa rhythm amplitude in the posterior derivations and to decrease the beta rhythm amplitude in the anterior

derivations. Despite we did not find overall significant differences in decision-making performances after the two interventions, some participants showed a trend toward a better performance on the decision-making task after active alfa-TMS versus sham TMS. *Conclusions:* Our study could represent a first step for elucidating the neurophysiological effects of alfa-guided rTMS and its putative effects on decision-making processes when administered on right prefrontal regions.

OR-39

Adolescent gambling addiction and gambling-type games on social networking sites: Issues, concerns, and recommendations

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Background and aims: Research indicates that compared to the general population, teenagers and students make the most use of social networking sites (SNSs). Although SNSs were originally developed to foster online communication between individuals, they now have the capability for other types of behavior to be engaged in such as gambling and gaming. *Methods:* The present paper focuses on adolescent gambling addiction and the playing of gambling-type games via SNSs and comprises a selective narrative overview of some of the main concerns and issues that have been voiced concerning gambling and gambling-type games played via

social network sites. *Results:* Overall, there is little empirical evidence relating to the psychosocial impact of adolescents engaging in gambling and gambling-type activities on SNSs, and the evidence that does exist does not allow definitive conclusions to be made. *Conclusions:* It is recommended that stricter age verification measures should be adopted for social games via SNSs particularly where children and adolescents are permitted to engage in gambling-related content, even where real money is not involved.

OR-40

Mindfulness as a treatment for gambling disorder: Current directions and issues

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Mindfulness is a form of meditation that derives from Buddhist practice and is one of the fastest growing areas of psychological research. Studies investigating the role of mindfulness in the treatment of behavioral addictions have – to date – primarily focused on gambling disorder. Recent pilot studies and clinical case studies have demonstrated that weekly mindfulness therapy sessions can lead to clinically significant change among individuals with gambling

problems. The purpose of this paper is to appraise current directions in gambling disorder research as it relates to mindfulness approaches, and discuss issues that are likely to hinder the wider acceptance of mindfulness as a treatment for gambling disorder. It is concluded that although preliminary findings indicate that there are applications for mindfulness approaches in the treatment of gambling disorder, further empirical and clinical research utilizing larger-sample controlled study designs is clearly needed.

OR-41

State of literature & Research protocol: Mindfulness Based Relapse Prevention (MBRP) as a treatment for gambling disorder

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Background and aims: Currently, cognitive-behavioral therapies (CBT) with no available drug approval is considered as the “golden standard” for the psychological treatment of problem gambling. However, CBT does not work for all problem gamblers. This observation leads us to consider other therapeutic approaches as a treatment for gambling disorder. Mindfulness Based Relapse Prevention (MBRP) is a new promising psychological approach to

prevent relapse in addictive behaviors. It integrates mindfulness practices and elements of Marlatt's and Gordon's cognitive-behavioral relapse prevention therapy. The object of the study is to assess the efficacy of MBRP in gambling disorder. *Methods:* The study is a randomized controlled trial comparing treatment as usual plus a MBRP eight-week program of two-hour weekly sessions, to treatment as usual alone, in a sample of adult outpatients

with gambling disorder. Patients in each group will be assessed at 8 weeks, and at 3 and 6 months. The primary outcome is the reduction in number of fulfilled DSM-5 criteria for gambling disorder. Assessments procedures include Ecological Momentary Assessments (EMA) especially for craving assessment. *Expected results:* We hypothesize that patients in the MBRP group will show a

greater decrease in the number of fulfilled DSM-5 criteria for gambling disorder, of craving scores and a greater decrease of time and money spend on gambling in comparison to the TAU group. *Conclusion:* MBRP in gambling disorder could become an interesting alternative to the classical cognitive behavioral therapy approach.

OR-42

A Review on Pharmacotherapy and Management of Hypersexual Behavior

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Background and aims: There has been a growing interest in the area of pharmacotherapy of sexual disorders in the recent years. Different hormonal levels, neurotransmitters, receptors, and brain areas involved in sexual desire have been yet identified. However, there is still incomplete understanding of neurobiology of hypersexual behavior. Various pharmacological agents have been reported to decrease sexual behavior. The aim of the present article was to review pharmacological treatments available for patients with hypersexual behavior. Moreover, mechanism of action, dosages and algorithm of use of the available treatments were discussed. Optional new treatments undergoing clinical trials were also mentioned. *Methods:* Studies were identified by searching electronic databases of Medline, PsycINFO, Cochrane Library, and Clinical Trial Registers. All eligible studies investigating efficacy and safety of the pharmacological treatments for patients with hypersexual

disorder conducted between 2000 and 2015 were included in the present article. *Results:* Current pharmacotherapies include Selective Serotonin Reuptake Inhibitors (SSRIs), Antiandrogens, and Gonadotropin-releasing hormone agonists. The most commonly used pharmacotherapy is reported to be SSRIs. However, Anti-androgen therapy has been reported to decrease sexual desire and have an effect size comparable to cognitive behavioral therapy. Gonadotropin-releasing hormone agonists were reported to be treatment options for patients with severe hypersexual disorder. *Conclusions:* The use of pharmacotherapy integrated with behavioral and cognitive therapies is recommended. There are still gaps in the knowledge regarding pharmacotherapy of hypersexual disorder. Development of agents with more efficacy and better safety profiles are needed.

OR-43

The emotion regulatory function of online social networking: preliminary experimental evidence

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Background and aims: Correlational research suggests that emotion regulation deficits, which are known risk factors for substance addiction, may also play a role in the development of problem behaviors such as excess use of social networking sites (SNS). This study sought to experimentally assess the hypothesized emotion regulatory function of SNS use. *Methods:* 32 undergraduates (56.3% female) were randomized to view brief movie clips known to reliably induce positive (40.6%), negative (25.0%), or neutral mood (34.4%), followed by time spent browsing a SNS (56.3%) or control website (43.8%). Mood was assessed before and after viewing the movie clips and browsing the web using the Positive and Negative Affect Schedule. *Results:* Participants viewing the positive clip reported significantly higher positive affect compared to the negative and neutral

conditions (multivariate main effect $p = .03$). A comparison of change scores for ratings of positive affect in those browsing a SNS versus control webpage was statistically significant ($p = .05$), with no significant main effect of movie clip valence and no interaction. Positive affect increased in those browsing a SNS ($M = 18.78$ vs. $M = 22.89$), and decreased in participants viewing the control webpage ($M = 24.64$ vs. $M = 22.93$). There were no significant between-group differences in self-reported negative affect. *Conclusions:* Given that this is a pilot study findings should be considered preliminary, but data provide initial experimental evidence to support the hypothesized emotion regulatory function of SNS, with SNS exposure resulting in increased positive effect.

OR-44

Exploring Problematic Smartphone use and the links to Anxiety and User Personality

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Background and aims: Worldwide smartphone usage has greatly increased with research showing that in the UK smartphone penetration has risen from 62% in 2013 to 81% in 2015 (MobileSquared, 2015). Alongside this growth in

smartphone usage, research on the influence of smartphones on human behavior has increased. Smartphone based interventions have proven useful in different contexts, such as diabetes management, physical and healthy eating

monitoring (Fjeldsoe, Marshall, & Miller, 2009). However, a growing number of studies have shown that excessive use of smartphones can lead to detrimental consequences (Billieux, Maurage, Lopez-Fernandez, Kuss & Griffiths, 2015). This paper will discuss the research findings of a large scale study exploring the psychological aspects of smartphone use. *Methods:* A sample of 825 smartphone users ranging from 13 to 69 years of age (mean = 24.9 years, SD = 8.94) completed an online survey comprising of modified DSM-5 criteria, the Spielberger State-Trait Anxiety Inventory, the Narcissistic Personality Inventory

and the Ten-Item Personality Inventory. *Results:* The results revealed a significant relationship between problematic smartphone use and high levels of anxiety. High narcissism scores amongst users were linked to problematic smartphone use. *Conclusions:* This is the first large-scale study of problematic smartphone use and personality characteristics. The findings emphasize that problematic smartphone use is linked to anxiety and narcissism. The development of personalized health interventions are needed to prevent the negative consequences of smartphone use.

OR-45

Adolescent Internet gambling and related internalizing and externalizing symptoms

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Background and aims: The Internet allows accessible and unlimited opportunities for adolescents to participate in gambling practices with potentially adverse psychological outcomes. The present study is based on data from the EU NET ADB project and the goal was to investigate the prevalence of Internet gambling and related emotional and behavioral characteristics among adolescents in Greece. *Methods:* A cross-sectional school-based study of 14–17 year-old adolescents (N = 1984; F/M: 1024/960; mean age 15.7 ± 0.6 years) was conducted in Greece. The sample selected was random and participating students completed a self-completed anonymous questionnaire that included questions on Internet access and use, the Internet Addiction Test, the Youth Self Report, and the South Oaks Gambling Screen-Revised for Adolescents. *Results:* In total, 24.1% of adolescents participated in online gambling. Among those who gambled online, 3.3% were at-risk for problem

gambling and an additional 17.4% were classified as exhibiting problem gambling. The prevalence of at-risk or problem gambling was higher among boys than girls [9.4% vs. 0.9%, $\chi^2(2, n = 1984) = 194.13, p < .001, \phi = .34$]. At-risk or problem gambling was associated with increased frequency of clinical or borderline internalizing problems [37.5% vs. 11.4%, $\chi^2(4, n = 1984) = 58.99, p < .001, \phi = .19$] and increased frequency of clinical or borderline externalizing problems [48.8% vs. 12.0%, $\chi^2(4, n = 1984) = 134.54, p < .001, \phi = .28$] among adolescents. *Discussion and conclusions:* Findings provide important evidence relating to further understanding the development of gambling among adolescents in Greece. The strong association between at-risk or problem gambling and both internalizing and externalizing problems indicates the need for the implementation of effective interventions targeting adolescent populations.

OR-46

Comparison for genetic predisposition of Internet gaming disorder and alcohol dependence by using targeted exome sequencing; two preliminary case-control studies

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Backgrounds and aims: The aim of this study was to evaluate and compare the genetic predisposition of Internet gaming disorder (IGD) and alcohol dependence (AD). *Methods:* 31 Korean males with alcohol problems (45.1 ± 8.9 years), 29 normal controls (31.7 ± 7.2 years), 30 IGD subjects (23.1 ± 6.4 years) and another 30 normal controls (24.3 ± 3.8 years) were enrolled. We have designed a targeted exome sequencing for the testing of 72 candidate genes that have been suspected to play a role in the pathogenesis of addiction. Genes included addiction-related neurotransmitters genes. Based on the RefSeq gene set, exonic regions of these genes were captured. The genotype frequency of each variant was compared between each cases and control groups. *Results:* In problematic alcohol users, 10 SNVs were identified, rs2272395 (OR = 0), rs2245532 (OR = 0), and rs2304725 (OR = 0.365, 95% CI 0.160-0.829) in SLC6A11 (GABA transporter), rs2229110 (OR = 0.335,

95% CI 0.152-0.736) and rs28408173 (OR = 2.661, 95% CI 1.265-5.596) in GABRD (GABA A receptor, delta), rs76568780 (OR = 0) and rs77638792 (OR = 0) in SLC6A4 (Serotonin transporter), rs73363996 (OR = 0.217, 95% CI 0.057-0.823) in GABRA5 (GABA A receptor, alpha5), and rs769404 (OR = 0.415, 95% CI 0.199-0.864) in GAD1 (Glutamate decarboxylase 1). And one SNV in SLC6A4 that was not reported in public databases was also identified. We identified 3 single nucleotide variants (SNVs), rs3735273 (OR = 0.362, 95% CI 0.162-0.804), rs6950777 (OR = 0.362, 95% CI 0.162-0.804), and rs5884156 (OR = 0.362, 95% CI 0.162-0.804) in DDC (Dopa decarboxylase) in IGD subjects compared to normal controls. *Conclusions:* In AD compared to NC, 10 SNVs in the GABA and serotonin-related genes were found. On the other hand, in IGD, 3 SNVs in the dopamine-related gene were found.

OR-47

Comparative Study on Smartphone usage and mobile phone dependency among university students in China and Singapore

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Background and aims: Smartphone users can engage in various activities on their phones similar to activities on personal computers, but with the advantage and convenience of compact size and mobility. However, research has shown some potential associated risk that some users become dependent or addicted to mobile phone, especially among young smartphone users. The aim of this study was to understand the use and influence of smartphone, given the rapid adoption and heavy usage patterns by users. *Methods:* Data were gathered by using stratified random sampling among university students in both China and Singapore. *Results:* A factor analysis of the sample of 572 university students in China displayed a set of mobile phone dependency (MPD) symptoms: inability to control craving and productivity loss, as well as escape and feeling anxious. Meanwhile, a factor analysis of the 562

university students in Singapore showed a similar set of MPD symptoms. MPD significantly correlated with Individual media dependency (IMD) goals and psychological traits. Regression analyses showed that IMD goals, MPD and psychological traits were significant predictors of smartphone usage. *Conclusions:* This study clearly identified distinct MPD symptoms among university student smartphone users. IMD goals and psychological traits such as self-esteem, leisure boredom, and sensation seeking were significantly associated to smartphone users' MPD in both China and Singapore. In varying degrees, IMD goals, psychological traits and MPD had significant impact on smartphone use behaviors. This showed that smartphone can be addictive, and people use smartphone to achieve a range of goals and may easily become addicted.

OR-48

Food Addiction and therapy outcome

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Background and aims: To date, the prevalence and correlates of food addiction (FA) have been examined in a wide range of different populations, from non-clinical populations to populations with abnormal weight, namely in obesity, and in individuals with eating disorders (ED), via studies that typically employ a cross-sectional design. FA scores have been found to be associated with higher levels of negative affect and depression, higher general psychopathology, more severe eating pathology and a greater body mass index. However, a limited number of studies have addressed the question of how FA is related to therapy outcome in weight-loss seeking populations, and the few studies analyzing this concept have shown contradictory results. *Methods:* In this presentation, the relationship

between FA and treatment response in ED populations will be explored and discussed using new/unpublished prospective studies. *Results:* After successful completion of therapy, reduction in ED symptoms positively correlated with improvements in FA. Although patients who presented higher FA scores at baseline were also those who presented a greater reduction in ED symptoms at the end of the therapy, we were not able to show that baseline FA scores served as a predictor of therapy response. *Conclusions:* FA scores clearly seem to be associated with ED severity, and after therapy, a reduction in FA scores is associated with an improvement in ED symptoms. However, more prospective studies are needed in order to clarify the influence one has on the other.

OR-49

Predictors of treatment outcome to individual cognitive-behavioral intervention for compulsive buying

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Background and aims: Compulsive buying disorder (CBD) has been recognized as a prevalent and increasingly common mental health problem with serious social bearing. Nevertheless, understanding of specific contributing neurobiological and etiological factors is sparse and the categorization in the main classification systems remains unsolved. Moreover, studies about the treatment outcome are still scarce. The objective of this study is (1) to assess what socio-demographic and clinic variables are specifically related to the CB phenotype and to evaluate post-treatment

changes of individuals with a diagnosis of CB treated with individual cognitive behavioral therapy (CBT); (2) to assess the potential moderator effect of sex on CBT outcome; and (3) to explore the best predictors of post-treatment changes, relapse, and dropout rates. *Methods:* A cohort design was applied with prospective follow-up. The sample comprised 90 patients and the CBT intervention consisted of 16 weekly outpatient individual sessions and a 3-month follow-up period. *Results:* CB is characterized by a high proportion of women, with significant cumulated debts (13,226 euros),

significant emotional distress and a personality profile characterized by marked novelty seeking, harm avoidance, reward dependence, persistence and cooperativeness. Furthermore, patients showed significant improvements, in both the level of psychopathology and the severity of the CB behavior. Several socio-demographic, psychopathological

and personality factors predicted high risk of relapse or dropout treatment. *Conclusions:* Patients with CB can be treated with strategies to improve self-control and emotional regulation, but other techniques should be incorporated to address the individual characteristics of each patient.

OR-50

Overactive Stress System Linked to Hypersexual Disorder in Men

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Background and aims: Hypersexual disorder integrates pathophysiological aspects such as sexual desire deregulation, sexual addiction, impulsivity and compulsivity. However, little is known about the neurobiology behind this disorder. A dysregulation of the hypothalamic pituitary adrenal (HPA) axis has been shown in psychiatric disorders but has not been investigated in hypersexual disorder. The aim of this study was to investigate the function of the HPA axis in men with hypersexual disorder. *Methods:* The study includes 67 male patients with hypersexual disorder and 39 healthy male volunteers. The Sexual Compulsive scale (SCS), Hypersexual Disorder Current Assessment Scale (HD:CAS), Montgomery-Åsberg Depression Scale-Self Rating (MADRS-S) and Childhood Trauma Questionnaire (CTQ), were used in assessing hypersexual behavior, depression severity, and early life adversity. Basal morning plasma levels of cortisol and ACTH were assessed and low dose (0.5mg) dexamethasone suppression test was

performed with cortisol and ACTH measured post dexamethasone administration. Non-suppression status was defined with DST-cortisol levels $\geq 138\text{nmol/l}$. *Results:* Patients with hypersexual disorder were significantly more often DST non-suppressors and had significantly higher DST-ACTH levels compared to healthy volunteers. The patients reported significantly more childhood trauma and depression symptoms compared to healthy volunteers. CTQ scores showed a significant negative correlation with DST-ACTH whereas SCS and HD: CAS scores showed a negative correlation with baseline cortisol in patients. The diagnosis of hypersexual disorder was significantly associated DST non-suppression and higher plasma DST-ACTH even when adjusted for childhood trauma. Sensitivity analysis omitting patients with comorbid depression diagnosis did not change the results. *Conclusions:* The results suggest HPA axis dysregulation in male patients with hypersexual disorder. We will discuss these findings and future research on neurobiological markers of hypersexual disorder.

OR-51

Disentangling risk and harm: How to distinguish healthy engagement from problematic behavior

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Background and aims: In research on behavioral addictions most criteria are derived from DSM-IV criteria for substance abuse. We argue that for many behaviors, these criteria are not reliable indicators of harm, but rather indicate the risk of harm. This is problematic in particular for survey research, a prominent method in research on behavioral addictions, where this distinction is not considered. *Methods:* Using the proposed Internet Gaming Disorder diagnosis in DSM-5 as an example, this talk will disentangle notions of risk from harm by illustrating how behaviors/cognitions that indicate harm in the context of substance abuse are, in many cases, only indicators of risk in the context of online gaming. Healthy engagement with video games may be risky due to large amounts of time spent, but not necessarily harmful;

this makes the current criteria poor predictors of actual harm. The argument is supported by a Latent Class Analysis in a representative sample of ~7900 gamers. *Results:* Analysis shows how risk and harm only coincide in two classes; one small class very likely to experience both risk and harm, and a large normative class that seldom endorses either risk or harm. In the remaining three classes, risk and harm were endorsed at different levels, supporting the hypothesis that common indicators of risk used in research on behavioral addictions do not reliably predict harm. *Conclusions:* We argue that assessment scales used in population studies must inquire directly about objectively harmful outcomes in order to achieve specificity and avoid the risk of overdiagnosing.

OR-52

Internet Gambling behaviors: A latent class analysis

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Background and aims: The prevalence of Internet gambling is increasing. However, little information is available on gamblers' characteristics and risk factors for problem gambling. The current study aims to identify Internet gambler subgroups. **Methods:** Data was collected from 584 participants recruited online on gambling websites and forums. Participants completed questionnaires covering demographics, indebtedness, online gambling practices, the Gambling Motives Questionnaire, the Gambling Related Cognitions Scale, the Internet Addiction Test, the Problem Gambling Severity Index, the Short Depression-Happiness Scale, The UPPS-P impulsive Behavior Scale and a loneliness assessment. **Results:** Variables related to online

gambling practices, indebtedness and loneliness were explored in a latent class model. The first cluster (6.5%) includes isolated and indebted Internet Gamblers (lack of interaction with other gamblers, loneliness and indebtedness). The second cluster involves interactive non-indebted gamblers (75.4%) and the third one involves interactive indebted gamblers (18%). The three groups differ on most of the assessed variables including Problem Gambling Severity Index, the Short Depression-Happiness Scale, the UPPS-P subscales (except sensation seeking subscore). **Conclusions:** Results indicate that Internet Gamblers are a heterogeneous group. The between group observed differences could be targeted for preventive interventions.

OR-53

Evaluation of the nine Internet Gaming Disorder criteria proposed in the DSM-5

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Background and aims: In 2013 Internet Gaming Disorder (IGD) has been included in the DSM-5 (Section 3) as a condition requiring further research. Although welcomed by the scientific community, the nine IGD criteria had been heavily criticized. The present study had three aims: to (i) develop and validate a brief measurement instrument (Ten-Item Internet Gaming Disorder Test; IGDT-10) to assess IGD as suggested in the DSM-5, (ii) address the aforementioned criticisms by testing the measurement performance of the nine criteria using Item Response Theory, and (iii) investigate the cut-off value suggested in the DSM-5 using latent class analysis along with sensitivity and specificity analysis. **Methods:** Data collection took place online. The call for participation was distributed through Facebook and a gaming-related website by a popular Hungarian gaming magazine. The final sample comprised

4887 online gamers (mean age 22.2 years [SD = 6.4], 92.5% male). **Results:** The IGDT-10 proved to have good psychometric properties, therefore appears to be a reliable and valid measure for future research. Findings of the IRT analysis showed that some of the IGD criteria were associated with lower severity of the disorder (i.e., "continuation", "preoccupation", "negative consequences" and "escape"), while others (i.e., "tolerance", "loss of control", "giving up other activities" and "deception") were associated with more severe levels. These results suggest that IGD is manifested through a different set of symptoms depending on the level of severity of the disorder. "Preoccupation" and "escape" had very low discriminatory power. Finally, our statistical analyses supported the DSM-5 suggested threshold (i.e., endorsing five or more criteria). **Conclusions:** Apparently the nine IGD criteria need further evaluation and may be revised in the future.

OR-54

Understanding the problematic practice of physical exercise: Associations with quality of life, impulsivity, substance consumption and positive psychology

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Background and aims: Exercise addiction has been receiving substantial attention in the field of behavioral addiction. It is a unique form of addiction because in contrast to other addictive disorders it is carried out with major physical-effort and high-energy expenditure (Egorov & Szabo, 2013). The aim of the study was to investigate the relationship between problematic practice of physical exercise (PPPE), Physical activity (PA), substance

consumption, eating behaviors, impulsivity, quality of life (QOL) and happiness in French university students. **Methods:** Students responded to a battery of questionnaire. We measured their BMI, levels of PA, PPPE, QOL, eating behaviors, Happiness, Impulsivity and consumption of substances (alcohol, cannabis and tobacco). **Results:** A total of 783 French students from Ile-de-France (Mean age: 21.2, S.D.: 4.2) responded to the survey. A preliminary

dimensional analysis of PPPE using the EDS-R revealed that subjects had higher scores on withdrawal symptoms, lack of control and tolerance. Bivariate as well as multivariate analyses will be carried out to highlight the role of different associations between the PPPE, its dimensions and other variables (QOL, impulsivity, substance consumption). We also intend to investigate the relationship between PPEP and positive psychology variables. *Conclusion:* Future research

should aim to replicate these findings and consider using longitudinal or experimental designs as well as case studies to verify the causal nature of these self-critical tendencies. Considering the role of personality traits and eating disorders, a typological approach to determine the profiles of those potentially at the risk of PPPE is necessary to study the phenomena and propose appropriate interventions.

OR-55

Real differences or measurement error? – Retest reliabilities of behavioral measures in Gambling Disorder

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Background and aims: There is a strong need of longitudinal and intervention studies on the role of decision-making and cognitive control deficits as core mechanisms and possible vulnerability factors in Gambling Disorder (GD). However, more knowledge on the retest reliability of the applied behavioral measures is essential to facilitate this approach. Our study aimed to investigate retest reliabilities of behavioral measures in GD. *Methods:* We recruited a GD group (n = 26) diagnosed according to DSM-IV and a healthy control group (n = 52). In a quasi-experimental design, both groups performed two test sessions within 3–4 weeks. Within one test session, six tasks were applied to assess decision-making and cognitive control: Intertemporal Choice Task, Cambridge Gambling Task, Stop-Signal Task,

Go-Nogo Task, Delayed Match-to-Sample Task and AX-Continuous Performance Task. *Results:* Retest reliabilities were generally fair to excellent but highly varied between tasks and parameters. Low retest reliabilities were not related to practice effects. Importantly, retest reliabilities were mostly different between the GD and the control group. *Conclusions:* Behavioral measures to assess decision-making and cognitive control are useful for longitudinal and intervention studies of GD. However, group differences in the retest reliabilities of these measures may result in misleading group and intervention effects. Studies with longitudinal designs may use latent variable models to minimize measurement error.

OR-56

Losing Control: Clinical characteristics of men interested in treatment for use of pornography

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Background and aims: The current study investigated the prevalence of, and factors associated with, men's interest in seeking treatment for use of pornography. *Methods:* Using the Internet, we recruited 1298 male pornography users to complete questionnaires assessing demographic and sexual behaviors, hypersexuality, pornography-use characteristics, and current interest in seeking treatment for use of pornography. *Results:* Approximately 14% of men expressed an interest in seeking treatment for use of pornography. Treatment-interested men had 9.5 higher odds of reporting clinically significant levels of hypersexuality compared to treatment-disinterested men. Bivariate analyses also found that treatment-interested men were less likely to

be married/partnered, but consumed more pornography weekly, masturbated more often, and had more past attempts to cut back or quit using pornography compared to treatment-disinterested men. Regression analysis found that daily pornography use, frequent past attempts to cut back or quit using pornography and scores on the Hypersexual Behavior Inventory Control subscale were predictors of interest-in-seeking-treatment status. *Conclusions:* Current study findings could help develop screening practices aimed at identifying specific aspects of sexual self-control (i.e., "loss of control"), impulsivity, and/or compulsivity associated with excessive/problematic use of pornography among treatment-seeking individuals.

OR-57

Specific Forms of Passionate Attachment Differentially Mediate Relationships between Pornography Use and Sexual Compulsivity

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Background and aims: The current study examined the mediational role of two types of "passionate attachment" in the relationship of pornography use and sexual

compulsivity. Harmonious passion refers to when a person's sexual behavior is in harmony with other areas of his or her life. Obsessive passion refers to an "uncontrollable urge" to

engage in sexual activity that creates conflict with other areas of a person's life and contributes to personal distress. *Methods:* Using the Internet, we recruited 265 university men to complete questionnaires assessing demographics, pornography-use characteristics, passionate attachment for pornography and sexual compulsivity (non-specific to pornography). Relationships between study variables were examined using structural path modeling analysis. *Results:* Harmonious passion ratings were found to significantly, though partially, mediate the relationship between weekly pornography use and sexual compulsivity ratings. Obsessive passion ratings were found to fully mediate the relationship between weekly pornography use and sexual compulsivity

ratings. When a fully specified two-mediator model was employed, only obsessive passion remained a significant predictor of sexual compulsivity. The relationship between weekly pornography use and sexual compulsivity was fully explained by obsessive passion ratings, while harmonious passion was not found to contribute to sexual compulsivity scores, above and beyond the effect of obsessive passion. *Conclusions:* The findings that obsessive passion, but not harmonious passion, links pornography use and sexual compulsivity suggests that obsessive forms of passionate attachment may represent a target for treatment development for reducing and eliminating problematic pornography use or other compulsive sexual behaviors.

OR-58

Shopping as Addictive Behavior in Stress-Coping Paradigm

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Background and aims: Shopping as a social behavior can sometimes be regarded as “coping” in a stress-coping paradigm – distraction/avoidance style (Endler, Parker, 1998). As an only source of stress elimination, shopping may become a behavioral addiction (Holahan, Moss, 1994; Faber, 2007; Eng, 2013). The aim of this study was to investigate if shopping may be a behavioral addiction during distress among adults who may use it as a coping strategy. The question is what stressors are “triggering” shopping? Does it help when a person feels distressed? What are the outcomes? *Methods:* 160 people took part in the current research: three groups aged 18–33, 35–50, and 55–70 years. We used interview to assess the study aims (Coping Inventory for Stressful Situations, CISS Endler & Parker, 1994); and a personality questionnaire (NEO PI-R, Big Five, Costa & McCrae, 1987) were used. *Results:* (1) Sex

differences: more women (83%) than men choose shopping when stressed. (2) Elder the individuals less positive towards evaluating shopping as distraction, as it may provoke stress and negative experience (guilt, wasted money). (3) Although extraversion is higher in shoppers ($p < 0.01$), personality traits are not predictive of shopping as coping. (4) Shopping is effective during milder stress and at early coping process stages. *Conclusions:* While distress is high, shopping is not a constructive coping strategy as it may help only temporary: stressors are not eliminated, problems not solved, and a negative situation worsening. As an addictive behavior shopping has positive effects and destructive outcomes as well: rise in dopamine and serotonin, feeling of helplessness, and loss of control in a given situation. Positive and negative dynamics transform shopping into a behavioral addiction.

OR-59

Defensive styles and psychological symptoms in the background of work addiction

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Background and aims: Work addiction was first defined in the 1970s but became the focus of attention only after the millennium. Theoretical literature describing work addiction involves motivational, emotional, cognitive, and personality factors and identifies serious consequences of the disorder. At the same time, empirical studies on the etiology of work addiction are scarce. Our aim was to explore the psychological functioning of people with moderate and serious risk for work addiction, especially regarding defensive styles and psychological symptoms. *Methods:* A total of 170 workers of several workplaces were assessed. We used Work Addiction Risk Test (Robinson, 1999), Bergen Work Addiction Scale (Andreassen et al, 2012), Defensive Style Questionnaire 60 (Thygesen et al, 2008) and Brief Symptom Inventory (Derogatis & Melisaratos, 1983). *Results:* Compared to “low-risk of work addiction” group, “moderate-risk” and “high-risk” groups

showed significantly more immature/maladaptive defensive mechanisms. The high-risk work addiction group showed the highest values on both Image Distorting and Affect Regulating defensive style factors. ANOVA showed significant differences between the three work addiction risk groups on psychological symptoms (Global Severity Index) as well. The higher was the risk of work addiction, the more psychological symptoms they showed. *Conclusions:* Those people who use dominantly immature and/or maladaptive defense mechanisms are more imperiled by work addiction than people using adaptive defense styles. Our findings also showed that work addicted people have several psychological symptoms, more than non-addicted have. These results draw attention to the psychological background of work addiction and provide supporting evidence to early theoretical models.

OR-60

Internet addiction: A psychotherapy perspective

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Background and aims: Over the last decade, Internet addiction has been increasingly recognised as problem worth considering by clinicians in their everyday contact with clients. At the same time, researchers have suggested Internet addiction is a '21st Century epidemic'. The most efficacious therapy methods have not yet been agreed upon, and scientific therapy research is scarce. This talk aims to fill this gap in knowledge by outlining how Internet addiction treatment experts experience the presenting problem of Internet addiction in psychotherapy. *Methods:* An international pool of 20 Internet addiction treatment experts from six different countries (Germany, Austria, Switzerland, United Kingdom, USA, and Canada) shared their clinical experiences with Internet addiction. This talk will focus on

their perception of Internet addiction as an actual addiction, including the core components of both substance-related and behavioral addictions. *Results:* From the conducted interviews, it appeared the Internet addiction treatment experts were in favour of an official Internet addiction diagnosis as this would support their everyday clinical practice. *Conclusions:* This study's findings furthermore highlight the necessity to view Internet addiction from the perspective of psychotherapy, as this is where affected individuals are likely to seek professional help for their Internet-use related behaviors and cognitions. This talk is based on Kuss, D. J., & Griffiths, M. D. (2015). Internet addiction in psychotherapy. London: Palgrave.

OR-61

In the mood to watch pornography?

The role of general versus situational mood for Internet pornography addiction

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Background and aims: Pathological Internet pornography use is considered a specific Internet addiction (Young, 2008). In a recent cognitive-behavioral model of Internet pornography addiction (IPA), positive and negative reinforcement resulting from Internet pornography use were hypothesized to be important mechanisms in the development of IPA (Lai et al., 2014). This study investigates mood changes due to Internet pornography use in relationship with tendencies toward IPA. *Methods:* Male participants (N = 39) were investigated using an online survey with two parts: In the first assessment, demographic information, tendencies towards IPA, Internet pornography use motivation, and general mood were assessed. In the second assessment, participants were asked to indicate their sexual arousal and their actual mood before and after a voluntarily, self-determined use of Internet pornography at home. *Results:* The results showed that tendencies toward

IPA correlated with emotional avoidance and excitement seeking due to Internet pornography use, but not with general mood. Furthermore, tendencies toward IPA correlated with nervousness before Internet pornography use. Internet pornography consumption led to a decrease of sexual arousal, better mood, and less nervousness. *Conclusions:* The findings demonstrated that tendencies toward IPA were related to the Internet pornography use motivation to find gratification and to cope with aversive emotional states. Moreover, IPA was associated with aversive mood prior to voluntary Internet pornography use. Together with the observation that Internet pornography use changed mood, the results support theoretical assumptions that besides gratification also negative reinforcement plays an important role in the development of IPA. In the mood to watch pornography? The role of general versus situational mood for Internet pornography addiction.

OR-62

Resting-state activity of the insula: Differences between gambling disorder patients and controls and contribution to gambling-related symptoms

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Background and aims: Previous studies have reported abnormalities of resting-state activity in gambling disorder patients in the prefrontal cortex, striatum, amygdala and insula. However, little is known about how these contribute to gambling-specific symptoms. Provided that the insula has been recently observed to be involved in gambling-related cognitive distortions, we (1) explore resting-state functional anomalies in the insula in gamblers; and (2) test the link between connectivity of this area and gambling-related

cognitions and gambling severity. *Methods:* 25 gambling disorder patients and 26 controls underwent resting-state fMRI, and were assessed in gambling-related measures. We examined fractional amplitude of low-frequency fluctuations (fALFF) to determine between-group differences on regional spontaneous brain activity. Subsequently, a cluster in the insula exhibiting fALFF differences was selected as seed for whole-brain connectivity analysis. *Results:* fALFF showed differences between gamblers and

controls in the right insula and bilateral putamen. The right insula presented heightened connectivity with superior frontal and middle frontal gyri in gamblers, and with the inferior occipital gyrus in controls. In gamblers, the intensity of cognitive biases predicted heightened connectivity between the right insula and the right lingual gyrus. This area partially overlapped with the ones hyperconnected to the insula in

gamblers with higher severity scores. *Conclusion:* Spontaneous activity of the right insula and bilateral putamen appears heightened in gamblers. Tentatively, the observed involvement of connectivity between the insular location and the lingual gyrus in gambling-related cognitive biases and gambling severity can reflect the involvement of memory processes in gambling disorder symptoms.

OR-63

Cross-cultural studies on Internet Addiction: A review and a reflection about current and next future research trends

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Background and aims: Internet addiction (IA) is the most researched behavioral addiction, but only few cross-cultural studies have been conducted. The aim is to present the findings of a review and reflect on the characteristics of cross-cultural IA studies: classification (i.e., geographical scope, type of data used, time of data collection, sample size), the cultures involved, the IA issues, and the commonalities and differences. *Methods:* Scientific databases were selected to carry out searches; 10 documents were selected with inclusion criteria (i.e., empirical cross-cultural paper, focused on IA or other online excessive behaviors, and published in a peer-reviewed journal in English language) and manually analyzed. *Results:* Cross-cultural studies are published between 2008 and

2015, with an increase from 2012. Most studies are cross-national and use classic scales to estimate prevalence. The continents involved are Europe, Asia, and America. The commonalities show that the Asia has an increased prevalence IA, and male users are more affected. Furthermore, differences among countries and risk factors have been detected. Cultural factors are typically not considered. *Discussion and conclusions:* Future cross-cultural research on IA, and other addictive behaviors is needed, with other valid scales and mixed methods approaches, as well as the exploration of cultural characteristics. This strategy could promote the external validity (e.g., ecological type) of behavioral addictions, joint to other types of validity sources (e.g., face or clinical types).

OR-64

The utility of craving as a diagnostic criterion in the assessment of problem smartphone use

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Background and aims: Excessive smartphone use (SPU) may meet criteria for the classification as a non-substance addiction, with psychosocial variables such as high extraversion and low self-esteem acting as risk factors to promote problem behaviors enacted via the use of these new technologies. More research is needed to operationalize the core components of this potential behavioral disorder. The present study proposes to explore the utility of craving as a criterion in the diagnosis of problem SPU in the context of hypothesized independent and interactive etiologic pathways. *Methods:* Features of SPU that may encourage the development of habitual behaviors will be discussed (e.g., delivery of messages and other material on a variable interval schedule of reinforcement, the presence of classically conditioned cues signaling the availability of new

content), along with the relevance of craving to the development and maintenance of these behaviors, with the goal of assessing the suitability of the construct of craving in operationalizing problem SPU. *Results:* The relatively scarce literature on the role of craving in behavioral addictions will be reviewed and discussed, along with proposed next steps in researching problem behaviors specifically related to the use of mobile devices. *Discussion and conclusions:* Evidence suggests that the use of a craving criterion in the diagnosis of substance use disorders may be extrapolated to the assessment of potential addiction-like behaviors related to smartphone use. A proposed theoretical framework to facilitate the study of hypothesized problem behaviors related to smartphone use (e.g., texting, gaming, social networking) will be provided.

OR-65

Prevalence rates of Internet Gaming Disorder among Slovenian youth: Findings from a Nationally Representative Study

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Background and aims: Internet Gaming Disorder (IGD) has been suggested by the American Psychiatric Association (APA) in May 2013 as a tentative disorder worthy of further

research. Due to its relatively recent inclusion in the latest edition of the DSM-5, robust findings from studies attempting to identify its defining features, gather data on its

cross-cultural reliability and validity of each diagnostic criterion, and to determine prevalence rates in representative epidemiological samples worldwide is severely needed if IGD is to be recognized as an independent disorder and behavioral addiction in the future. *Methods:* A nationally representative sample of adolescent eighth graders in primary school in Slovenia (N = 1071; Mage 13.5 years; SD = 0.6; 50.2% male) was sampled to investigate several prevalence rates of IGD. *Results:* As expected, the results of this study demonstrated that IGD is seemingly present in a minority of the Slovenian adolescent population;

prevalence rates among eighth graders ranged from 2.5% to 4.7%, with higher rates being found among gamers and boys. The pattern of time spent on several leisure activities differed significantly between disordered gamers and the rest of the population. *Conclusions:* The present findings lend empirical support to the concept of IGD and also highlight the existence of IGD-related problems among Slovenian youth. This study will hopefully add to the ongoing international debate surrounding IGD and provide much-needed cross-cultural data on IGD from Slovenia.

OR-66

Gaming through mobile phones don't seem to produce addictive characteristics

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Background and aims: There is a need to explore mobile phone use patterns for entertainment and related addictive characteristics. A cross-national study between Belgium and Finland was conducted to explore this relationship. The aim was to examine whether adults play games excessively through smartphones as well as to identify the role of different gaming patterns via smartphones. *Methods:* An online survey was administered in Belgium and Finland. The sample consisted of 1030 participants (N_{Belgium} = 408; N_{Finland} = 602; 30% male; age range 18–76). Measures included: socio-demographics, smartphone uses (e.g., games), and the subscale of Dependence from the Short Version of the Problematic Mobile Phone Questionnaire (PMPUQ-SV-D). *Results:* 86.4% had a mobile phone (78.3% a smartphone). Of those that reported having a mobile phone, 58.5% used it daily, and 66.5% for an

entertainment purpose. The main activities were: (i) gaming casual games (28.2%), (ii) Facebook (20.5%), (iii) and e-mailing/messaging (11.3%). The PMPUQ-SV-D had a mean (M) of 11.19 and a standard deviation (SD) of 4.03, which situates the 50% between (Rank_{Q3-Q1}) 8 and 14; the results between the two countries were almost equal (Belgium: M = 11.25, SD = 4.49, Rank_{Q3-Q1} = 15–7; Finland: M = 11.4, SD = 3.63, Rank_{Q3-Q1} = 14–8). *Discussion and conclusions:* Smartphones are mainly used to remain in contact with others, through messaging and networking, and for casual games (a part from other punctual uses; i.e., searching information to other games). It is suggested that problematic gaming behavior may be more associated with computer and console usage, due to the data showing the dependence subscale did not present addictive characteristics.

OR-67

Not all that glitters is gold: Revisiting the diagnostic value of screening tests

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Background and aims: Based on survey results, papers often report the prevalence or the proportion of “addicts”; pathological Internet users, gamers or compulsive buyers. However, these studies usually fail to take into account the fact that surveys are unsuitable to provide a clinical diagnosis, given that the proportion of true positive cases (who score positive and are diseased) is much less than the number of positive cases on a screening test. *Methods:* The aim of this talk is to re-visit the classic concept of the test accuracy using examples from the field of behavioral addictions. Relying on published sensitivity, specificity and prevalence values, positive predictive values were calculated. *Results:* Positive predictive value is low when

the prevalence of the disorder is low, which is usually the case with behavioral addictions. Using popular instruments, such as the Compulsive Buying Scale (Faber and O’Guinn, 1992) and the Scale for the Assessment of Internet (and Computer Game) Addiction (Müller, Beutel and Wölfling, 2014) only 24 and 9 (respectively) out of 100 individuals scoring positive on a screening test truly has the disorder in a clinical sense. *Conclusions:* Low positive predictive value of a screening test contributes to the overpathologising of everyday behaviors. The use of surveys and screening tests is limited to serve as an early detection gate rather than labelling individuals as truly pathological.

OR-68

Neuroscientific approaches to Internet gaming disorder

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Background and aims: Research criteria for the Internet gaming disorder were recently added in the new version of the Diagnostic and Statistical Manual (DSM-5). Internet gaming disorder (IGD) can therefore be considered as a potential behavioral addiction. The description and definition of behavioral addictions are strongly influenced by the criteria of substance dependence disorders. These are in turn partly based on neurobiological and neuroscientific studies that were replicated for behavioral addictions. *Methods:* we will present here a review of the neuroimaging studies using functional and structural Magnetic Resonance Imaging or positron emission tomography in human participants with potential IGD. *Results:* Most of the reported studies aimed to evidence similar neural changes in IGD as in substance dependence, namely reduced responses

to rewarding stimuli, increased salience of drug related cues, diminution of the top-down control, i.e. expressed as impulsive behavior and impaired decision making. The most consistent results are related to the salience of cues related to the gaming behavior. Only few studies investigated top-down control and decision making. The results related to neuroadaptive changes in motivational brain systems in IGD are partly contradictory and different from the ones found in substance dependence. Some methodological limitations are discussed with regard to criteria and scales used to define the clinical groups. *Conclusions:* Taken together these findings suggest that neuroadaptive changes related to IGD might partly differ from the neural changes observed in substance dependence and indicate a need for new studies investigating the specificities of IGD.

OR-69

A historical perspective on food addiction

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Background and aims: In recent years, the concept of food addiction has gained more and more popularity. This approach acknowledges the apparent parallels between substance use disorders and overeating of highly palatable, high-caloric foods. Part of this discussion includes that “hyperpalatable” foods may have an addictive potential because of certain nutrients or additives. Although this idea seems to be relatively new, research on food addiction actually encompasses several decades, a fact that often remains unrecognized. *Methods:*

A literature review was conducted on the topic of food addiction. *Results:* Scientific use of the term addiction in reference to chocolate even dates back to the 19th century. In the 20th century, food addiction research underwent several paradigm shifts, which include changing foci on anorexia nervosa, bulimia nervosa, obesity, or binge eating disorder. *Conclusions:* Food addiction research has a long history, which is characterized by dynamic developments and refinements of definitions and methodologies.

OR-70

Impulsiveness, venturesomeness and undertaking risky behaviors related to gambling among Polish adolescents

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Background and aims: Gambling has become a serious problem among adolescents. This situation is partly related to easy on-line access to different kinds of gambling activities. Impulsivity is one of risk factors associated with gambling. This study had three aims: (1) to create impulsiveness scale addressed directly to adolescents (SPIM-16), (2) to create on-line game assessing tendency to venturesomeness, and (3) to evaluate whether score in the game significantly shapes relation between impulsiveness and pathological gambling among adolescents. *Methods:* The following methods were used in the study: the scale measuring impulsiveness (SPIM-16), the on-line game estimating tendency of venturesomeness and SOGS-RA (South Oaks Gambling Screen-Revised for Adolescents) diagnosing pathological gambling among adolescents. The construction of the game is based on a task in which

participants have to excavate gold bars from a mine. This may be performed in two different ways: on foot or by elevator. The third option (trolley) is available when a player undertakes risky decisions. On each step of the game information about the level of risk is being displayed. A player decides what kind of action he takes. The participants were students from three types of schools (vocational, technical, general high school) from eight Polish regions. *Results:* Data were collected from more than 600 students, but the final analysis included 540 participants. Three ways of playing were distinguished: low, moderate and high risk. In each group correlation between SPIM-16 and SOGS-RA were: 0.24 (low risk); 0.25 (moderate risk); 0.19 (high risk). *Conclusions:* The proposed game needs further studies and improvement to become a proper marker for venturesomeness.

OR-71

Blunted Endogenous Opioid Release Following an Oral Amphetamine Challenge in Pathological Gamblers

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Background and aims: Pathological gambling is a psychiatric disorder and the first recognized behavioral addiction, with similarities to substance use disorders but without the confounding effects of drug-related brain changes. Pathophysiology within the opioid receptor system is increasingly recognized in substance dependence, with higher mu-opioid receptor (MOR) availability reported in alcohol, cocaine and opiate addiction. Impulsivity, a risk factor across the addictions, has also been found to be associated with higher MOR availability. The aim of this study was to characterize baseline MOR availability and endogenous opioid release in pathological gamblers (PG) using [11C]carfentanil PET with an oral amphetamine challenge. *Methods:* Fourteen PG and 15 healthy volunteers (HV) underwent two [11C]carfentanil PET scans, before and after an oral administration of 0.5 mg/kg of

d-amphetamine. The change in [11C]carfentanil binding between baseline and post-amphetamine scans (Δ BPND) was assessed in 10 regions of interest (ROI). *Results:* MOR availability did not differ between PG and HV groups. As seen previously, oral amphetamine challenge led to significant reductions in [11C]carfentanil BPND in 8/10 ROI in HV. PG demonstrated significant blunting of opioid release compared with HV. PG also showed blunted amphetamine-induced euphoria and alertness compared with HV. Exploratory analysis revealed that impulsivity positively correlated with caudate baseline BPND in PG only. *Discussion:* This study provides the first evidence of blunted endogenous opioid release in PG. Our findings are consistent with growing evidence that dysregulation of endogenous opioids may have an important role in the pathophysiology of addictions.

OR-72

The Self-Discovery Camp (SDiC) and its efficacy in treating Internet use disorder

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Background and aims: Internet use disorder (IUD) is a unique behavioral addiction, potentially affecting a large percentage of the population, due to the spread of Internet technology. Therapeutic residential camps are operating in several other countries, including Korea, China and USA. However, studies examining the efficacy of these interventions are scarce. In Japan we launched the Self-Discovery Camp (SDiC) treatment camp in 2014 and have sought to measure its efficacy and the correlation between individual characteristics and outcome measures. *Methods:* We recruited 10 young males with IUD to spend 8 nights and 9 days at the SDiC, with zero online access. Programs included individual and group Cognitive Behavioral Therapy (CBT), individual counseling, lectures

on IUD and family programs, in addition to ordinary camp programs such as cooking and recreational activities. We measured and compared Internet use/gaming time and scores on the Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES), at the beginning of the camp and at a follow-up camp three months later. *Results:* Internet use/gaming time significantly decreased by the follow-up camp according to the baseline data. Problem recognition and self-efficacy towards positive change had also improved. Furthermore, age of onset correlated with problem recognition. *Conclusions:* Although this study is an open trial, the subject number small, and the follow-up period limited, the results suggest that SDiC may be efficacious in the treatment of IUD.

OR-73

What is Hypersexuality? An Investigation of Psychological Mechanisms in Men who have Sex with Men

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Background and Aims: The major criticism of hypersexuality has been the lack of empirical support for

any of the conceptualizations put forward to explain it. This study is designed to investigate personality, cognitive, and

psychophysiological factors that have been hypothesized to characterize hypersexuality by numerous authors. *Methods:* Participants were 243 men who have sex with men recruited using both on-line and community-based venues, programs, and word of mouth. Participants must have had sex with a man in the last 90-days, have no indications of major thought disorder or cognitive dysfunction, and be at least 18 years of age. Participants were assigned to a hypersexual disorder or comparison group based on a SCID-type interview. Data included three cognitive tasks, a self-report computer administered questionnaire, and a psychophysiological assessment of sexual arousal following mood induction. *Results:* Results showed group differences in personality factors, sexual behavioral control, and experiences of sexual

urges and fantasies. Sexual behavior control was related to sexual excitation and sexual inhibition, but not to more general behavioral arousal or behavior inhibition. Hypersexual participants showed lower levels of physiological arousal during the laboratory procedure, but did not show differences in inhibition of arousal by negative affect. *Conclusions:* We found that while hypersexuality is related to broad personality factors, the lack of sexual behavioral control appears to be related to arousal and inhibitory factors specific to sexual behavior and not general behavioral arousal and inhibitory systems. Further, our data is contradictory with respect to whether hypersexuality can be explained by higher levels of sexual arousal/excitation.

OR-74

Gambling in the Czech Republic: Prevalence and Social Consequences

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Background and aims: Since 2012, gambling has been monitored in the Czech Republic via population surveys, and additional results have been collected through qualitative research. The aim of this study was to present information about gambling and gambling-related social and economic consequences, which is described in the Annual Report on Gambling in the Czech Republic in 2014. *Methods:* Several general population surveys which measured various health aspects of the Czech population have been carried out since 2012. They contained questions about the prevalence of gambling, risky gambling behavior, and experience with different types of gambling opportunities. *Results:* In 2014, about one third of adult population gambled in the past 12 months, mostly lotteries

and scratch cards. Excluding these types of games, up to 19% gambled in the past 12 months and 8% in the past 30 days. Up to 13% of the population gambled online in the past 12 months and up to 5% in the past 30 days. Up to 440 thousand people are in risk of developing a gambling disorder, of which up to 150 thousand are in high risk. *Discussion:* Electronic gaming machines bear the highest risk of developing problems for the gambler, followed by online gambling and betting. Gamblers suffer from heavy indebtedness, mental health problems and loss of social relationships. *Conclusions:* The prevalence of gambling has been rising, especially within the youngest age groups and in online gambling. This calls for more intervention and accessibility of treatment for gamblers.

OR-75

Does pathological buying differ between women and men?

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Background: Pathological buying (PB) is characterized by a maladaptive preoccupation with buying and shopping resulting in repetitive purchasing of consumer goods in order to relief stress, to escape from negative feelings such as anxiety, depression, tension, or boredom, and to enhance a poor sense of self. The prevalence of PB is estimated to be about 5% in the general adult population (Maraz et al., 2015). The aim of the current study was to summarize the current knowledge about sex differences in PB. *Methods:* We performed a literature review. *Results:* In terms of prevalence rates, different representative surveys revealed different results with the majority suggesting that women are

more likely to suffer from PB than men. Clinical practice clearly shows that the vast majority of patients in treatment seeking samples for PB are women. Preliminary data from patients with PB suggest a lack of sex differences with regard to Internet PB. Previous research from university students indicated a prominent role of materialism in men and women but sex differences in temperamental components associated with PB (Müller et al., 2011). *Conclusions:* Future research should investigate differences of phenomenology, prevalence rates, and underlying factors of PB in women and men. Clinical implications will be discussed.

OR-76

Psychopathological distress and personality correlates in a sample of adolescent treatment seekers displaying excessive and addictive Internet use

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Background and aims: Excessive behaviors among adolescents are well-known phenomena that do not necessarily have to lead to severe negative consequences in terms of mental disorders. However, with the spread of the Internet and the growing popularity of online computer games, a substantial percentage of adolescents tend to express excessive online behaviors that, under certain circumstances, can lead to an addictive behavior. While there is considerable research on Internet addiction in adolescents focusing epidemiological aspects, clinical studies on minors with Internet addiction are still under-represented. Nevertheless, it is paramount to know more about clinical characteristics of young patients. *Methods:* Adolescents (n = 274) aged 12 to 16 years entering a specialized outpatient clinic filled in questionnaires in order to assess clinical (Internet addiction, psycho-

pathological distress) and subclinical (personality) aspects. *Results:* The average time spent online amounted to 5.2 hours per day. About one half (56%) of the subjects met the criteria for Internet addiction. Compared to adolescents showing excessive but not addictive Internet use, these adolescents had higher scores on depression, anxiety, and interpersonal sensitivity. Significantly decreased conscientiousness and increased neuroticism were found among those with Internet addiction. *Conclusions:* While clear associations between Internet addiction and psychosocial distress were found, not all of the treatment seekers with intense to excessive Internet use were classified with Internet addiction nor displayed psychopathological symptoms. The associations found between Internet addiction and specific personality traits suggest that developing an addictive use might be related to specific risk factors.

OR-77

The Pathological Buying Screener: development and psychometric properties of a new screening instrument for the assessment of pathological buying symptoms

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Background and aims: The study was designed to develop a new screening instrument for pathological buying (PB), and to examine its psychometric properties in a large-scale sample. *Methods:* By using a facet theoretical approach and based on literature as well as on clinical experience, a 20-item Pathological Buying Screener (PBS) was developed and administered to a representative German sample (n = 2,539). *Results:* Valid data were available from 2,403 participants who were subjects for three subsequent empirical studies. The first study explored the factor structure using exploratory factor analyses in a subsample of 498 participants. Based on factor loadings, a 13-item version with the two factors loss of control/consequences and excessive buying behavior was revealed. This two-factor

model was confirmed in study 2 by confirmatory factor analysis performed on another subsample (n = 1905). Study 3 investigated age and gender effects and convergent validity of the PBS using the Compulsive Buying Scale (CBS) in the full sample (N = 2,403). The total PBS score was adequately correlated with the CBS score. Hierarchical regression analyses with the CBS score as the dependent variable and the two PBS factors as the predictors indicated an own incremental validity of the two factors in participants ≤ 65 years. The reliability of the total score as well as of the two subscales was good to excellent. *Conclusions:* Overall, the PBS represents a useful measure for PB. Future studies are needed to replicate the two-factor structure in clinical samples and to define a valid cutoff for PB.

OR-78

Associations between adaptive emotion regulation strategies and gambling-related cognitive biases in gambling disorder patients

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Background and aims: Abnormal loss processing is a key factor in gambling escalation which may lead to gambling disorder and contribute to its maintenance. The present work is aimed at testing the hypotheses that (1) gambling disorder patients (GDPs) use specific emotion-regulation strategies potentially contributing to curving negative emotions caused by losses; and (2) these strategies significantly predict distorted causal attributions regarding gambling

outcomes. *Methods:* 41 GDPs and 45 healthy controls (HCs), matched in age, education years, and IQ were questioned about their use of emotion regulation strategies for negative events (as measured by the CERQ psychometric tool), and their gambling-related cognitions (GRCS). Gambling severity was assessed by means of SOGS questionnaire. *Results:* (1) GDPs showed stronger cognitive distortions in all GRCS subscales, and a more generalized

use of dysfunctional emotion regulation strategies. (2) Cognitive biases (gambling expectations, control illusion, predictive control, and interpretative bias) strongly correlated with gambling severity. (3) Strategies that are theoretically considered as adaptive (putting in perspective and refocusing on planning) also correlated with gambling severity. And, finally, (4) these two strategies predicted the strength of gambling-related cognitive distortions, mostly via illusion of control and interpretative biases.

Conclusions: Associations between theoretically adaptive emotion regulation strategies for negative/distressful events, gambling related cognitive biases, and gambling severity in GDPs suggest the use of such strategies could play a role in minimizing the negative impact of losses. Thus psychological interventions should consider the potential effects of training in those strategies and make sure therapeutic efforts are not counterproductive for debiasing.

OR-79

New technologies – new disorders? Smartphone use, online social networking, and the fear of missing out

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Background and aims: Fear of missing out (FoMO) is a new construct in Psychology and described as the pervasive unpleasant sensation that others might be having rewarding experiences of which one is not part, as well as the desire to stay continually connected with what others are doing. Although FoMO is not thought to be exclusive to the use of digital technologies, it is thought to play an important mediating role between social media engagement and negative outcomes of heavy use of these networks. This presentation describes a series of studies with the Spanish adaptation of the Fear of Missing out Scale (FoMOs). *Methods:* In a pilot study, the original FoMOs was translated into Spanish and a CFA was run on the data from 5963 Spanish speaking participants. Two subsequent studies used a linear regression analysis to predict symptoms of

psychological distress and latent profile analysis, respectively. Results: The Spanish FoMO scale possesses a unifactorial structure and correlates with mobile phone addiction, heavy use of social network sites, and psychological distress. Addictive behaviors in relation to the mobile phone as well as FoMO were identified as important predictors of psychopathological symptoms, especially anxiety. Four classes of social network users were identified (low-engagement light users, high-engagement heavy users, high-engagement low-risk users, and high-engagement high-risk users); individuals from the fourth class can be considered as potentially addicted to online social networking. *Conclusions:* The fear of missing out is emerging as an important correlate of maladaptive use of smartphones and online social networks.

OR-80

Joint Effects of Impulsive and Self-Regulatory Process on VLT Gambling

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Background and aims: Dual process models propose that behavior is influenced by the interactive effect of impulsive (automatic) and self-regulatory (controlled) processes. Consistently, evidence from the alcohol literature demonstrates that the impulse to engage in risk behavior is mitigated by a high capacity to self-regulate (van Hemel-Ruiter et al., 2015). The current study aims to extend this model to behavioral addictions, namely VLT gambling. It is hypothesized that impulsive processes favouring gambling (positive implicit gambling cognition) predict frequent VLT playing, but only if the capacity to self-regulate is low. *Method:* A clinical sample of adults (N = 57, Mage = 45 yrs, 54% men) completed two Single Category Implicit Association Tests, one reflecting tension-reduction, and the other enhancement, implicit (automatic, impulsive) gambling cognition. Participants also completed self-reports of past week gambling and the

Gambling Abstinence Self-Efficacy Scale, which provided a measure of the (controlled, self-regulatory) capacity to abstain from gambling when emotionally aroused. *Results:* Controlling for age and gender, consistent with hypotheses, implicit tension-reduction gambling cognition positively predicted VLT gambling frequency at low ($p = .046$) but not high ($p = .191$) self-efficacy for gambling abstinence (when feeling emotionally bad). However, self-efficacy for gambling abstinence (when feeling emotionally good) was not supported as a moderator of the effect of implicit enhancement gambling cognition on VLT gambling frequency. *Conclusions:* Results suggest that the cognitions inherent in the impulsive process leading to VLT gambling are tension-reduction or escape-related. Furthermore, there are emotionally relevant nuances to the ability to self-regulate gambling; these may contribute to both risk model specificity and interventions.

OR-81

**Effects of previous day's mobile device use on measures of emotion regulation:
Gender differences explored**

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Background and aims: Internet and mobile phone use can lead to negative consequences in females, specifically. Mobile phone use has been characterized as similar to other online activities, with evidence for the latter's association with emotion regulation (ER) deficits. Given previous findings, an association between mobile use and ER was hypothesized. *Methods:* The current data is from a preliminary lab based study consisting of undergraduate students ($N = 40$; 51.3% female; $M = 19.06$ years, $SD = 2.00$). Data regarding average and previous days' mobile device usage was collected. The Difficulties in Emotion Regulation Scale (DERS) and its subscales were used as a measure of ER. *Results:* Smart phone usage was reported in 97.5% of the sample, with 47.5% reporting average and previous days' mobile use to be greater than 3 hours

($M = 202.44$ mins, $SD = 102.75$). Males and females differed regarding their usage with females reporting spending significantly more time on their mobile devices the day prior ($t(37) = 2.617$, $p = .038$). Significant relationships between previous day usage and overall ER deficits ($r = .488$, $p = .047$) and subscales, non-acceptance ($r = .452$, $p = .052$) and difficulties in goal-directed behaviors ($r = .602$, $p = .008$), were found in the male sample only. *Discussion and conclusions:* The significant correlation in males suggests that excessive use of mobile devices may impact genders in different ways. Specifically, males may engage in usage to regulate their emotions while females may engage in usage for other reasons. The results from this study provide insight into a novel aspect of usage and its relation with ER.

OR-82

**Differences between problematic and non-problematic Internet pornography users:
The role of sexual excitability and hypersexual behaviors**

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Background and aims: The classification of Internet pornography addiction (IPA) is still discussed controversially. Some authors consider IPA as one specific type of Internet addiction (Brand et al., 2014). Theoretically, habitual sexual excitability and hypersexual behavior are specific predispositions for the development and maintenance of IPA. In the current study, problematic and healthy Internet pornography users were compared regarding sexual excitability and hypersexuality. *Methods:* Out of a sample of overall $N = 274$ male participants, two groups (both $n = 25$) consisting of healthy and problematic IP users were extracted ex post facto by using the short Internet Addiction Test modified for cybersex that measures tendencies towards IPA. These groups were compared regarding their self-reports on general sexual excitability (Sexual Excitation Scale) and hypersexual behavior

(Hypersexual Behavior Inventory). *Results:* The results showed significant differences between problematic and non-problematic IP users regarding sexual excitability and hypersexual behavior. Further, problematic IP users reported significantly higher scores on both scales. No differences were found for sexual inhibition. *Discussion and Conclusions:* Overall, the results underline the importance of specific predispositions for the development and maintenance of IPA and strengthen the theoretical model developed for specific Internet addiction. Moreover, results support the gratification hypothesis (Young, 2004), whereby the anticipation and the reception of sexual arousal can be seen as a major factor in developing IPA. To further evaluate the theoretical model by Brand and colleagues, other crucial factors like dysfunctional coping strategies and psychological symptom severity need to be tested for problematic and non-problematic IP users.

OR-83

Fronto-striatal hyperconnectivity associates with impulsivity and craving in gambling disorder

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Background and aims: Negative urgency (NU) and delay discounting of reward have been associated with craving and anomalies in reward processing in gambling disorder, allegedly subserved by fronto-striatal circuits. This study is aimed at investigating the association between functional connectivity (FC) within fronto-striatal circuits, impulsivity and current craving in gambling disorder patients (GDPs)

relative to healthy controls (HCs). *Methods:* Resting-state fMRI was obtained from 24 GDPs and 25 HCs, who also underwent impulsivity assessments by means of the UPPS questionnaire and the 'Now or Later' task to evaluate NU and delay discounting of reward, respectively. Seed-based FC maps were estimated from the nucleus accumbens (Nacc) bilaterally, and regional FC estimates were explored

in relation with impulsivity measurements. *Results:* GDPs showed heightened impulsivity in the two dimensions under scrutiny. In GDPs relative to HCs, higher NU was associated with hyperconnectivity between the Nacc and the putamen, anterior cingulate cortex, and the medial and ventrolateral prefrontal cortices. Also in GDPs, delay discounting was associated with an increased FC between the Nacc and the thalamus, dorsal caudate, insula and ventrolateral frontal cortex. Persistence of craving correlated with FC between

the Nacc and the anterior cingulate and medial frontal cortices. *Conclusions:* Hyperconnectivity in fronto-striatal circuits in GDPs may underpin alterations in reward and punishment integration and top-down emotional control processes. Such impairments could be particularly important under negative emotions, including aversive feelings related to craving. Our findings suggest the role of affective dysregulation in gambling disorder, and the importance of targeting it during treatment.

OR-84

Problematic Internet Use, Sleep Problems, and Psychiatric Symptoms among Portuguese Internet users: An empirical study

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Background and aims: Previous studies have shed light on the relationship between problematic Internet use (PIU), sleep problems, and psychiatric symptoms. However, little is known about the possible mediating effects, causal, and structural pathways between these variables. The aim of the present study was twofold. Firstly, to investigate the mediating role of sleep problems in the relationship between PIU and psychiatric symptoms. Secondly, to ascertain how each variable may develop in terms of structural pathways. *Methods:* A convenience sample comprising 622 Portuguese Internet users (Mage 25.2; SD = 9.6; 51.9% male) was recruited online from several social networking websites. Data on socio-demographics, PIU, sleep problems, and psychiatric symptoms were collected. *Results:* The results of the structural equation latent mediation model suggested that

among Portuguese Internet users, the relationship between PIU and psychiatric symptoms is partially mediated by sleep problems according to a nested model comparison (Satorra-Bentler scaled $\Delta\chi^2 = 16,52$; $\Delta df = 1$; $p < .0001$). Moreover, the present model reached satisfactory goodness of fit with PIU accounting for around 18% of the variability in sleep problems whereas the combined effect of both PIU and sleep problems accounting for around 36% of the variability in psychiatric symptoms. *Conclusions:* Despite the small number of studies on PIU among Portuguese Internet users and the fact that the cross-sectional design of this study does not allow causality to be inferred, the present findings may help informing clinicians and practitioners on the possible causal pathway regarding the development of PIU and subsequent psychiatric disorder.

OR-85

Construct Validity and Preliminary Psychometric Properties of the Internet Gaming Disorder Scale – Short-Form (IGDS9-SF) among Slovenian Youth: A Nationally Representative Study

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Background and aims: Following the initial recognition of Internet Gaming Disorder (IGD) by the American Psychiatric Association (APA) in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), a few psychometric instruments were devised to assess IGD using the updated diagnostic criteria suggested by the APA. The nine-item Internet Gaming Disorder Scale – Short-Form (IGDS9-SF) has been previously shown to be a valid and reliable tool to assess IGD, and still remains the briefest screening instrument that assesses the condition. Little is known about IGD in Slovenia and therefore the aim of the present study was twofold. Firstly, to present preliminary psychometric evidence to support the use of the IGDS9-SF in Slovenia. Secondly, to provide cross-cultural

empirical evidence regarding the nature of IGD. *Methods:* A nationally representative sample of adolescent eight graders in primary school ($N = 1071$; Mage 13.5 years; SD = 0.6; 50.2% male) was sampled. Data on socio-demographics, and IGD were collected. *Results:* The IGDS9-SF appears to be a valid and reliable tool to use in Slovenia among adolescent gamers and the general adolescent population. Additionally, IGD appears to affect a small minority of the Slovenian adolescent population. *Conclusions:* The findings obtained will be discussed in light of implications surrounding the assessment of IGD and the pervasiveness of gaming-related problems among Slovenian youth.

OR-86

Prevalence of Exercise Dependence in a sample of patients with Gambling Disorder and Hypersexual Behavior

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Background and aims: The past decade has seen an increase in research investigating behavioral addictions. Investigating overlap or co-occurring addictions has implications for understanding the etiology and treatment of these problems. While there has been an increase in research related to exercise addiction (EA), its prevalence among individuals with other behavioral addictions is poorly understood. *Methods:* Consecutive patients seeking help for hypersexual behavior (n = 31) and gambling disorder (n = 58) were assessed for co-occurring exercise addiction using the Exercise Dependence Scale and overall exercise descriptive data were assessed at intake. Descriptive and prevalence statistics were used to characterize the groups. *Results:* Despite anecdotal observations that individuals with one behavioral addiction will experience other manifestations of problematic addictive behaviors, our results found little

support this assertion. Hypersexual patients showed little evidence of co-occurring exercise dependence or presence of a gambling disorder. A small number of patients with a gambling disorder also had co-occurring hypersexuality but no comorbid problems with exercise dependence. On average, hypersexual patients were more involved in healthy behaviors including proper nutrition and exercise than patients with gambling disorders. Moreover, endorsements on the Exercise Dependence Scale suggest some items on the measure may be endorsed in ways that produce false positives among other populations with behavioral addictions. *Conclusion:* Patients with hypersexual behavior and gambling disorder do not appear to have overlap with exercise addiction. Hypersexual patients, on average, appear to have lifestyles more consistent with healthy living (e.g. nutrition and exercise) compared to problem gamblers.

OR-87

Advancing Understanding of DSM-5 Non-Substance-Related Disorders: Comparing Hypersexuality and Gambling Disorder

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Background and Aims: The past decade has seen an increase in research investigating de-regulated hypersexual behavior and gambling disorder. Collectively classified as behavioral addictions, little has been done to explore commonalities between different manifestations of de-regulated behavior. The current study reports findings comparing characteristics of gambling disorder with the proposed classification criteria for hypersexual disorder for the DSM-5. *Methods:* Self-report questionnaires measuring common indices reflecting stress proneness, emotional dysregulation, and impulsivity were administered to separate groups of treatment seeking patients with gambling disorder (n = 77) or individuals meeting criteria for the DSM-5 hypersexual disorder (n = 74). *Results:* Multivariate statistics were used

to explore group differences across study variables. Both groups showed comparable scores across measures and both groups had scores significantly higher than those observed in norming groups for the psychometric properties of each scale. Examination of effect sizes also supported the lack of significant differences between groups. *Conclusions:* While understanding about the etiology of these disorders continues to evolve, the underlying issues that precipitate and perpetuate these patterns of de-regulated behavior may be similar. These results suggest that problem gamblers and hypersexual patients may engage in dysfunctional behavior for similar reasons and that interventions targeting stress coping, impulsivity, and emotional regulation may generalize to both populations.

OR-88

Parents' perception of their children gambling

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Background and aim: Although legal age for gambling in Croatia is 18, approximately 80% of adolescents reported having gambled at least once in their lifetime on regulated activities, 19% regularly bet on sport results and as much as 12,3% have already developed severe psychosocial consequences related to gambling (Ricijas & Dodig, 2014). Additionally, adolescents' self-reports also suggest parental tacit acceptance of their gambling behavior (Ricijas et al., 2011). Therefore, the aim of this study is to explore parental

perception of their children gambling (frequency and gambling related problems) and to compare it to children's self-report. *Method:* Research is being conducted from October to December 2015 with expected sample of approximately N = 400 parents and their adolescent children (age range from 14 to 19). The following instruments were used: (1) Questionnaire on basic socio-demographic characteristics, (2) Gambling Activities Questionnaire and (3) Canadian Adolescent Gambling Inventory - CAGI

(Tremblay et al., 2010). Results: The analysis will be based on matched pairs (parents and their children) in order to verify the hypothesis that parental perception of their children's gambling is significantly different compared to their self-report. Furthermore, this paper will also address the effect of child's gender with regards to parental perception of their gambling. The results will be interpreted

in relation to social and economic circumstances in Croatia, emphasizing the significance of availability, accessibility and general acceptance of gambling, especially sports betting. Conclusion: These results will have significant practical implications in developing evidence-based preventive and treatment programs for young people.

OR-89

Grounding air castles: improvement of measurement to advance the study of problematic, addiction-like behavior

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Background and aims: The majority of current empirical Internet and game 'addiction' research papers tend to conceptualize these problematic forms of behavior using criteria derived from the existing DSM-IV criteria for pathological gambling. *Methods:* The current talk will summarize some issues with this approach, and extend the critique to include a reflection on the confusion between formative and reflective modeling of criteria. This issue connects to other aspects of scale development as well, including the modeling of Internet or game addiction as a single factor, and the assumption that all criteria are equally relevant in establishing a sum or cut-off score for 'addiction'. *Results:* Reflective modeling supposes that all criteria (or items) are caused by an underlying construct (i.e.

a latent variable). Formative modeling, on the other hand, assumes that the observed variables compose the main construct. In the latter case a correlation or coherence between items is not necessarily expected (Borsboom, 2006; Jarvis, MacKenzie, & Podsakoff, 2003) and different methods of analysis are sometimes implied. We will discuss examples from current literature on game and Internet addiction where these two approaches are used interchangeably and potentially incorrectly, and categorize them using the approach suggested in Jarvis et al. (2003). *Conclusions:* It will be argued that current Internet and game addiction measurement might benefit from a clearer distinction between formative and reflective modeling to improve measurement quality and validity in research.

OR-90

Clinical validation of the C-VAT 2.0 assessment tool for gaming disorder: A sensitivity analysis of the proposed DSM-5 criteria and the clinical characteristics of young patients with 'video game addiction'

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Background and aims: Clinicians struggle with the identification of video gaming problems. Addressing this issue, a clinical assessment tool (C-VAT 2.0) was developed and tested in a clinical setting. The instrument allows exploration of the validity of the DSM-5 proposal for 'Internet gaming disorder'. *Methods:* Using C-VAT 2.0, the current study provides a sensitivity analysis of the proposed DSM-5 criteria in a clinical youth sample (13–23 years old) in treatment for video gaming disorder (N = 32). The study also explores the clinical characteristics of these patients. *Results:* The patients were all male and reported spending extensive amounts of time on video games. At least half of the patients reported playing online games (n = 15). Comorbid problems were common (n = 22) and included

(social) anxiety disorders, PDD NOS, ADHD/ADD, Parent-Child relationship problem, and various types of depressive mood problems. The sensitivity of the test was good: results further show that the CVAT correctly identified 91% of the sample at the proposed cut-off score of at least 5 out of 9 of the criteria. As our study did not include healthy, extreme gamers, we could not assess the specificity of the tool: future research should make this a priority. *Conclusions:* Using the DSM-5 cut-off score, the C-VAT 2.0 shows preliminary validity in a sample of gamers in treatment for gaming disorder, but the discriminating value of the instrument should be studied further. In the meantime, it is crucial that therapists avoid false positives by using expert judgment of functional impairment in each case.

OR-91

What are people actually doing on Facebook?

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Background and aims: Facebook is the most used online social networking service. Previous studies have assessed a potential addictive use of Facebook, but so far none of those papers, to our knowledge, described precisely what people are actually doing on this service (e.g., video-games, friends-relatives monitoring, etc.), and the risk factors associated to addictive use remain largely unexplored. Our aims are to explore the heterogeneity of FB, to determine if certain usage patterns are more addictive and to test if impulsivity acts as a risk factor for FB addictive use. **Methods:** An online questionnaire was posted on FB during a two-month period (October–November 2015). Variables measured included demographics, questions on actual FB use, an adapted version of the Internet Addiction Test, and the UPPS-P Impulsive Behavior Scale. **Results:** 682 subjects

filled the questionnaire completely. The main activity is reading his/her own timeline, followed by watching friend's picture, commenting or reading friend's timeline. Gaming is not very common but when present, it is described as the main reason to go on FB. Regression analysis with the log of the IAT score as the outcome showed that younger age, positive and negative urgency, Lack of perseverance, gaming and writing on his/her own timeline were associated with a higher IAT score. **Conclusions:** Different FB activities does not have the same impact on potential addictive use suggesting that Facebook addiction is probably not a relevant concept per se, and should be assessed more specifically regarding the reasons FB is used for.

OR-92

Internet addiction diagnostic based on questionnaire: the fallacy of the cutoff point

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Background and aims: Dichotomizing a questionnaire is a frequent habit in the scientific literature as well as in clinical practice. It has been advocates for about 30 years that this method should be avoided. Therefore, the presentation will attempt to show from a clinical, an epidemiological and a statistical point of view that dichotomizing a questionnaire has many pitfalls. **Methods:** Based on a study of online Poker players (n=214), the Internet Addiction Test will be

used as an example. **Results:** Dichotomizing a questionnaire leads to a loss of statistical power, misclassification due to cutoff point and unreliable prevalence rates. From a clinical point of view, its usefulness is undocumented it has a potential nocebo effect. **Conclusions:** As already widely demonstrated in the literature, dichotomizing a questionnaire is a practice that should be avoided.

OR-93

Prevalence and Characteristics of Video Game Play and Problematic Levels of Play in Canadian Adults

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Background and aims: A number of studies have been conducted worldwide assessing prevalence of problematic video game playing in adults. Little research on the prevalence of video game play and problematic levels of such has been undertaken in North America. **Methods:** Participants were recruited from an online panel, targeted by age, province of residence, and preferred language to ensure a roughly representative Canadian sample. Respondents who reported regular video game play completed a survey of video game use, and problematic levels of play using the Behavioral Addiction Measure – Video Games (Sanders & Williams, in press). **Results:** 1,238 adults were contacted to participate in the study. 44% (n = 542) reported regularly

playing video games, and of those 93% (n = 506) completed the survey (Mean age = 41.7, Range = 18–88). 39% were female (n = 197). 66.4% (n=336) reported recreational levels of play, while 23.5% (n=119) experienced at least one marker of significant negative consequence or impaired control, classifying them as at-risk of problematic play. 10.1% (n = 51) were classified as problematic video game players based on the presence of both negative consequences and impaired control. **Discussion and Conclusions:** Prevalence and problematic levels of play in Canada are generally consistent with previous research. Additional research in Canada is needed given the popularity of video games in this country.

OR-94

Internet use: Personality and motivation behind using the Internet, and cross-cultural specifics

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Background and aims: Previous work from Germany highlighted the importance of personality and excessive private Internet usage for problematic Internet use (PIU). *Methods:* In a cross-cultural approach we aimed to replicate a negative association between PIU and the personality trait of self-directedness in Bulgaria (n = 163), Germany (n = 122), Spain (n = 126), Colombia (n = 80), China (n = 395), Taiwan (n = 60) and Sweden (n = 43). In total N = 989 participants took part in the study. *Results:* Results show that the personality dimension self-directedness was negatively correlated with the PIU score of the participants in all samples. Furthermore, the time spent on the Internet for private purposes was a significant predictor for PIU in

Bulgaria, Germany, Spain and Taiwan. In another large-scale cross-cultural study (N = 831) conducted in Germany (n = 109), France (n = 71), Italy (n = 286), Poland (n = 76), Turkey (n = 116), Hong Kong (n = 112) and Singapore (n = 61) we investigated the role of individual differences in motives for Internet use. Concerning PIU, the motive fear was positively and significantly correlated with PIU throughout all countries. *Conclusions:* In the context of Facebook use, persons with higher scores on the motives affiliation and intimacy – both reflecting the communal side of social motives – had a more positive attitude towards Facebook (affiliation in Italy, Poland and Hong Kong; intimacy in France, Hong Kong and Singapore).

OR-95

Examination of Changes in Exercise Dependence Symptoms in Endurance Athletes Throughout a Competition Season.

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Background and aims: It is theorized that exercise dependence may exist on a continuum. However, little is known about how symptoms may change longitudinally in athletes who are at high risk for exercise dependence. The aim of this study was to examine changes in exercise dependence symptoms in endurance athletes during a competition season (e.g., 12 months). *Methods:* The sample (N = 15) consisted of amateur competitive triathletes and long distance runners that completed the 'Questionnaire to Diagnose Exercise Dependency in Endurance Sports' (five subscales, 16 items) at eight time points throughout a competitive season. A Kolmogorow-Smirnow-test was used to check data for distribution of normality. ALM with repeated measures was calculated to examine changes in

each subscale score throughout the season. *Results:* ALM showed no significant changes in 'expected positive consequences', 'interference with social life' or 'health', and 'exercise as a possibility to compensate' subscales. However, 'withdrawal symptoms' showed within subject contrasts from t4 to t5 [$\mu_2 = .218$ ($F(1, 14) = 3.907$; $p = 0.068$)], t5 to t6 [$\chi^2 = .185$ ($F(1, 14) = 3.170$; $p = .097$)] and t6 to t7 [$\mu_2 = .174$ ($F(1, 14) = 2.952$; $p = 0.108$)]. *Conclusions:* Changes in withdrawal symptoms occurred during immediate competition preparation and the offseason (t6–t7). Thus, the exercise dependence continuum in endurance athletes may be attributed to a lack of goal-orientation towards major season highlight.

OR-96

Gambling problems and the family

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Background and aims: Family is one of the main sources of emotional support which may help the individual to cope with or prevent gambling problems (GP). The current study was conducted among young male adult gamblers to investigate associations between concordance of values, the effectiveness of problem solving in the family and the GP. *Methods:* Participants n = 91 (n = 67 in 12-months follow-up) took part in an online study, in addition to male

gamblers who were recruited via a screening survey of n = 2,853 adults aged 18 to 26 years in Munich, Germany. Regression analyses were conducted with non-planning impulsiveness and general psychological distress included as control variables. *Results:* Lower concordance of values in the family was a significant predictor of GP at baseline assessment and twelve months later. The effectiveness of problem solving in the family was not directly associated with

gambling problems but moderated the effect of the concordance of values. *Conclusions:* Perceived concordance of familial values might reduce the concealment of gambling

problems and facilitate help-seeking. Nonetheless, its benefits will be limited if the individual perceives his family as unable to effectively solve problems.

OR-97

Internet pornography addiction and attentional bias towards pornographic pictures in a sample of regular male and female cybersex users

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Background and aims: Research on Internet pornography addiction (IPA) as a form of specific Internet addiction has received growing attention in the past years. Recent studies indicated analogies to substance dependencies, for which attentional bias is considered a crucial mechanism in the addiction process. The underlying study investigated relationships between attentional bias and tendencies toward IPA in a sample of regular male and female cybersex users. *Methods:* In this study male (n = 60) and female (n = 60) regular cybersex users completed an Addiction Stroop (Bruce & Jones, 2004) and a Visual Probe Task (Mogg et al., 2003), which were modified with pornographic pictures. Sexual sensation seeking and tendencies toward IPA were assessed with questionnaires. *Results:* The results show that

male participants had significantly higher scores regarding attentional bias, sexual sensation seeking, and tendencies toward IPA. However, moderated regression analyses did not reveal any significant interactions of sex and attentional bias on tendencies toward IPA. *Conclusions:* Overall, results suggest differences in male and female cybersex users regarding the relative strength of attentional bias towards pornographic pictures as well as tendencies towards IPA. This strengthens the assumption that IPA might be more prevalent in men, while higher attentional bias scores could be referred to a higher pornography consumption of men. However, our findings suggest that an attentional bias towards pornographic pictures might be a crucial mechanism in both men and women for developing and maintaining an IPA.

OR-98

Approach bias towards explicit sexual stimuli and sexual motivation

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Background and aims: Explicit sexual material attracts attention. However, the question whether trait sexual motivation modulates this attentional bias is still under debate. *Methods:* In the present study we use a joystick task to measure biases in approach and avoidance behavior in females and males. The subjects had to pull or push a joystick to shrink or enlarge positive, negative or explicit sexual pictures. It was assumed that the reaction times differ with regard to the direction of movement (approach or withdrawal) and the emotional value of the pictures,

resulting in specific biases. Further we measured trait sexual motivation, a psychological construct related to sexual drive, using a questionnaire. *Results:* The first analyses revealed that the biases towards sexual stimuli measured by the applied experimental approach were minimal and the relation to trait sexual motivation was not statistically significant. *Discussion:* The results will be presented in detail at the conference and the implications will be discussed.

OR-99

Can behavioral addictions survive without tolerance and withdrawal symptoms?

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Background and aims: The concept of behavioral addiction was modelled on substance addiction, but extrapolations from substance addiction have been problematic. The purpose of this presentation is to examine the conceptualizations of the two most controversial aspects of behavioral addictions: tolerance and withdrawal symptoms. *Methods:* Diagnostic criteria sets and definitions of tolerance and withdrawal symptoms are reviewed in gambling disorder, Internet gaming disorder, mobile phone addiction, compulsive sexual behavior disorder, compulsive buying and exercise addiction. *Results:* Tolerance is usually defined in a way that superficially resembles its counterpart

in substance addictions. Thus, an increase in various aspects of the activity to achieve the desired effect replaces dose escalation in substance addiction. The contextual elements of a tendency to increase activity or explanations that do not invoke addiction are generally ignored. Withdrawal symptoms are described as nonspecific emotional reactions to activity deprivation, which is very different from the relatively specific physical symptoms that accompany substance deprivation. However, such emotional manifestations are usually considered to be equivalent to the constellation of physical symptoms occurring during substance withdrawal. *Discussion and conclusions:*

Attempts to transpose the concepts of tolerance and withdrawal symptoms from substance addictions to behavioral addictions have failed. If behavioral addictions are to be conceptualized rigorously and taken seriously, they should not be portrayed as a literal counterpart of substance

addictions. Criteria sets for various behavioral addictions should be developed independently, which would exclude the currently used, “borrowed” concepts of tolerance and withdrawal symptoms.

OR-100

Measuring Facebook addiction among adults: Validating the Bergen Facebook addiction scale in a non-student sample

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Background and aims: The problem of Facebook addiction has received quite some attention in the past few years. Thus far, however, the prevalence and correlates of Facebook addiction have been examined solely in student samples. As the average Facebook user is growing older, it is interesting to investigate whether Facebook addiction also affects adult Facebook users and to explore its determinants specifically for older user groups. The aim of the current study is to determine the validity and underlying factor structure of the Bergen Facebook Addiction Scale (BFAS), developed and commonly used among student samples (Andreassen et al., 2012), in a non-student population. *Methods:* A websurvey was conducted among Belgian adult Facebook users (aged 25–80), generating 1188 usable responses (mean age 49.5y). The questions contained the 18-item BFAS scale, translated with back translation in Dutch and French, as well as a

self-declared Facebook addiction scale. Exploratory factor analysis is performed on the BFAS scale in order to determine its underlying factor structure and correlates with self-declared Facebook addiction are examined. *Results:* The internal consistency of the 18-item BFAS proved high (Cronbach alpha = .94). When studying the underlying factor structure, however, only four of the six original sub-factors surfaced: conflict, salience, withdrawal and mood modification. The original sub-factors (tolerance and relapse) could not be retrieved as separate dimensions. *Conclusions:* The findings indicate that Facebook addiction prevails also amongst adult Facebook users. Moreover, the 18-item BFAS had high internal consistency in the current sample. A closer look at the underlying factor structure, however, is necessary.

OR-101

How do people with specific Internet addiction symptoms perform on a cognitive task when specific stimuli are presented?

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Background and aims: Previous theoretical models argue that the development and maintenance of a specific Internet addiction (SIA), e.g. the addicted use of communication applications, are mediated by specific cognitions. It has already been examined that Internet addicts show deficits in executive functioning and decision making measured with neuropsychological tasks using non-specific stimuli. However, to understand possible cognitive mechanisms in addictive behavior, recent literature recommends the presentation of specific addiction-related stimuli in experimental paradigms. In this analogue study, we adapted the Modified Card Sorting Test (MCST) with specific Internet communication stimuli and examined the participants' performance in relation to their SIA-symptoms. *Methods:* Currently 90 participants (58f; 18–38 years, $M = 23.32$, $SD = 4.45$) worked either on the original MCST ($n = 43$) or the adapted version with specific stimuli represented by

icons of four popular Internet communication applications (MCST-com; $n = 47$). Additionally, all participants filled out the short Internet Addiction Test modified for SIA tendencies toward Internet communication (s-IAT-com). *Results:* Simple slope analysis showed that participants who indicated higher scores on the s-IAT-com generally performed better on the MCST-com. Additionally, participants with higher s-IAT-com scores generally made more mistakes while working on the original MCST with plain symbols. *Conclusions:* Interestingly, when subjects are confronted with addiction-related stimuli, those with higher SIA-symptoms showed a better performance, which could be explained by better cognitive processing, possibly due to higher vulnerability to the specific stimuli as well as reasons of compensation and habituation. Future studies should focus on possible mediation effects between personal predispositions, cognitive functioning, and SIA-symptoms.

OR-102

The possible role of the insula in the epilepsy and the gambling disorder of Fyodor Mikhailovich Dostoevsky

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Background and aims: The retrospective diagnosis of Fyodor Mikhailovich Dostoevsky's (1821–1881) neurological and psychiatric disease is particularly interesting. Recent neurobiological data suggest a solution to the questions regarding the writer's retrospective diagnosis, claiming the insular cortex to be the origin of the rare ecstatic seizures. Regarding Dostoevsky's pathological gambling, this hypothesis is consistent with another finding from recent neuroscience, namely that the malfunction of the insula could be an important underlying pathology in gambling disorder. *Methods:* Literary and scientific overview (1928–2015) on the subject of Dostoevsky's epilepsy and gambling disorder. *Results:* Taking into consideration Dostoevsky's neurological (ecstatic seizures)

and psychiatric (pathological gambling) disease and the crossroads these two disciplines make regarding the underlying pathology we would like to suggest a speculative theory that these two disorders have a common insular pathomechanism: namely the malfunctioning of the risk prediction – risk prediction error coding system. *Conclusions:* Based on Dostoevsky's case, regarding gambling disorder in general, we would like to hypothesize that the three common gambling-related cognitive distortions (near-miss effect, gambler's fallacy and the illusion of control) can be all attributed to the impairment of the anterior insular risk prediction – risk prediction error coding system.

OR-103

World of Warcraft Avatars Longitudinal progression study based on the characteristics of players

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Background and aims: Video gaming addiction or problematic game use are heterogeneous concepts. Players differ widely in their involvement in games in terms of motivations and consequences. World of Warcraft (WoW) is one of the most played massive multiplayer online role playing games and characterization of Wow players involvement in the game is mandatory to better understand their motivations. *Methods:* In 2010, an online survey of Wow players and their avatar behavior in the game was performed. A five cluster model distinguished players by their involvement in the game: three of which were problematic: Unregulated achievers, Unregulated escapers,

and Hard-core gamers. The regulated social role players and the Regulated recreational gamers express no negative consequences. Avatar's players were monitored during five years in terms of in game progressions. This study proposes to analyze avatars progress in terms of clusters. *Results:* The avatars survival curb shows the following pattern (2010 T0: N = 690; T1: N = 550; T2: N = 378; T3: N = 339; 2015 T4: N = 190). The analysis will try to define if a specific cluster of players tend to persist in the game and if the progression of their avatars differs. *Conclusions:* This study will try to demonstrate if a correlation exists between certain types of players' motivations and in game involvement, and their avatars progression.

OR-104

Do perceived Parental Rejection and Core Self Evaluations influence Internet Gaming Disorder? A Mediation and Moderation model

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Background and aims: The role of family experiences and the effects of core self-evaluation (CSE: self-esteem, self-efficacy, neuroticism and locus of control) on Internet Gaming Disorder (IGD) has not been explored to date. The purpose of the current study was to (i) assess the relationship between parental rejection (PARTheory: warmth, aggression, neglect, undifferentiated rejection) and IGD; (ii) examine the way this relationship is mediated and moderated by CSEs. *Methods:* A cross-sectional study of online gaming community members was conducted with a battery of three self-report questionnaires. 175 individuals

met abuse and addiction criteria. Bivariate correlational, mediation and moderation analyses were performed to determine the effect on the above variables. *Results:* Results showed that parental rejection leads to low CSE that in turn is associated with IGD, suggesting a mediating effect of CSE. The moderation model was not confirmed. Paternal rejection was found to have an equal effect to maternal on the development of CSEs. *Discussion:* Findings combine psychodynamic and cognitive perspectives to IGD and bridge early emotional deficits with self-concepts and IGD, based on two theoretical frameworks (CSE, PARTheory).

Paternal rejection appears to be as important in shaping negative CSEs as maternal rejection, highlighting the role of father in the development of an individual's self-evaluation and its relation to this behavioral addiction. *Conclusions:*

The study extends understanding of IGD and the role of early maltreatment and personality in its development. Results may offer new insights in therapeutic interventions on IGD and aid service providers in their clinical work.

OR-105

Empathy and visuospatial perspective-taking in a behavioral addiction

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Background and aims: Previous reports have shown decreased empathy in people suffering from addiction to substances (i.e. alcohol, cocaine, methamphetamine and combinations of addictive substances). The first aim of the study was to verify whether this is also true for behavioral addictions. Our first hypothesis was that people suffering from problem gambling are less empathic than healthy controls (non-gamblers and gamblers). We also aimed to identify a cognitive marker of empathy that could be targeted in cognitive rehabilitation strategies. We suggested that visuospatial perspective-taking could be a potential cognitive marker of empathy and hypothesized that visuospatial perspective-taking performances predict empathy. *Methods:* 31 non-gamblers, 24 healthy gamblers,

and 21 problem gamblers performed a visuospatial perspective-taking task and completed the Interpersonal Reactivity Index (IRI; Davis 1980). *Results:* Compared to non-gamblers and healthy gamblers, problem gamblers had decreased empathy and lower performance at the visuospatial perspective-taking task. Furthermore, visuospatial perspective-taking abilities predicted empathy on two of the four IRI's dimensions: Interpersonal perspective-taking and personal distress. *Conclusions:* Reduced empathy is not limited to substance-related addictions; rather, it extends to behavioral addictions. Also, our data suggest that visuospatial perspective-taking may be taken into consideration as a viable cognitive marker for use as a rehabilitation target of empathy.

OR-106

Pathological Gambling: couple and personal adaptation

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Background and aims: Gambling has a great impact on family members and couple's relationship. Many studies report significant impact on partners but few consider both member of the couple at the same time. *Methods:* Couples (n = 71) where one member is pathological gambler responded to questionnaires as an initial eligibility evaluation for an efficacy study including couple. *Results:* VLT is the main gambling activity with nearly 20% of the couple's revenue spent on it, with some gamblers spending more than 50% of the total revenue on VLTs. Two thirds reported severe relational consequences (more than 75% reporting high dyadic dissatisfaction). Partners mentioned more psychological consequences than gamblers and both presented a higher psychological distress level than normal population. Half reported high financial insecurity and more

than the third mentioned important difficulties providing adequate response to basic needs. Physical violence is reported by approximately 25% of the couples, perpetrated by both gamblers and partners. Many counterproductive strategies are used by partners (e.g., reimburse gambling debts) but most of them use principally adequate reinforcers of non-gambling behaviors (e.g., encouraging him to start treatment). *Discussion:* These results point to the necessity to look at the well being of gamblers' partners from a general point of view. On the other side, many aspects of couple's functioning (e.g., reinforcers of gambling or of sobriety but also relational distress) is worth considering in the treatment of gamblers. *Conclusion:* Further developments are needed in the comprehension and treatment of gambling through a relational or couple's functioning perspective.

OR-107

Pathological buying in the online context – a model based approximation and diagnostic features with respect to Internet addiction

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Background and aims: Pathological buying (PB) is characterized by maladaptive buying behavior. The study aimed at investigating the role of different vulnerability factors for PB in the online context. In accordance with a recent model for specific Internet addiction (SIA) by Brand

et al. (2014), it was proposed that a predisposing excitability and Internet use expectancies may constitute potential pathogenic factors. In line with current addiction models, cue-induced craving was investigated and the diagnostic value of different screening instruments was analyzed.

Methods: We investigated 240 female participants with a cue-reactivity paradigm, which included online shopping pictures. The pictures had to be rated with respect to arousal and urge to buy, which constituted the latent dimension excitability from shopping. Different online shopping use expectancies and craving reactions were evaluated by questionnaires. The tendency towards online PB was assessed with the short Internet Addiction Test modified for shopping (s-IATshopping). In addition, the well-established Compulsive Buying Scale and the newly developed Pathological Buying Screener were applied. **Results:** In line

with the model for SIA by Brand et al. (2014), the relationship between excitability from shopping and tendency towards online PB was mediated by specific online shopping use expectancies. An increase of subjective craving was observed only in those participants with a high tendency towards online PB. Diagnostic concordances and divergences were found between the screening instruments. **Conclusions:** The results suggest that online PB has parallels with behavioral addictions as well as SIA and needs to be assessed by specific screening instruments.

OR-108

Prevalence and co-occurrence of addictive behaviors among Russian and Spanish youth: a replication study

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Background and aims: Recently, an addiction matrix measure was assessed among U.S. former alternative high school youth. This presentation seeks to examine the generalizability of findings using this measure among Russian and Spanish high school adolescents. **Methods:** Latent class analysis was used to explore addiction class identification within a population of adolescents in Russia (average age = 16.27; n = 715) and Spain (average age = 14.9; n = 811). Last 30-day prevalence of one or more of 11 addictions reviewed in other work was the primary focus (i.e., cigarettes, alcohol, hard drugs, eating, gambling, Internet, love, sex, exercise, work, and shopping) among Russian youth, and last-30 prevalence of one or more of 8 addictions among Spanish youth (the three drug use items had not been included in their questionnaire). **Results:** Results confirmed a two-class model (addicted class,

non-addicted class) among both Russian and Spanish adolescents. The mean number of addictions reported was 1.39 (SD = 1.78) addictions among Russian youth and 1.56 (SD = 1.68) addictions among Spanish youth. The prevalence of the sample that constituted the “addicted group” in Russia and Spain was 32.2% and 28.6%, respectively. The most prevalent addictions (i.e., love, internet, exercise) were similar. The results are similar to the U.S. sample. **Conclusions:** Latent class structures for addictive behaviors are the same across international adolescent populations. Our results suggest that addiction matrix items may be a reliable means to assess multiple addictions internationally. Implications for future research and for the development of addiction prevention and treatment programs are discussed.

OR-109

Cue-reactivity and craving in addictive Internet communication behavior using auditory cues

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Background and aims: The excessive use of online communication applications such as social networks, e.g. Facebook, or instant messaging services, e.g. WhatsApp, is considered a specific form of Internet addiction. Consistent with models on addictive behavior, craving responses to specific cues seem to be crucial in the addiction process. We investigated if the confrontation with auditory cues in terms of ringtones of certain applications resulted in increased craving and if this desire was associated with symptoms of Internet communication addiction. **Methods:** Participants (N = 54) rated twelve notification-sounds of popular Internet communication applications with regard to arousal, emotionality, and desire to use the smartphone. The Desire of Alcohol Questionnaire modified for Internet communication (DAQcom) was applied before and after the rating. Additionally, a short version of Young’s Internet Addiction Test modified for tendencies towards addictive

use of Internet communication applications (s-IAT-com) was used. **Results:** The results illustrate a significant increase of the DAQcom-score after the rating of the auditory cues in comparison to the DAQcom-score before. While the delta craving-score shows no correlation, both DAQcom-scores show a positive correlation with the s-IAT-com. The scores also correlated with arousal, emotionality, and desire to use the smartphone. These ratings were also correlated with the s-IATcom. **Conclusions:** Consistent with models on addictive behavior, our results indicate that auditory cues associated with Internet communication applications lead to increased craving. We could identify that cue-reactivity and craving are relevant mechanisms behind an addictive use of Internet communication applications similar to other behavioral addictions like Internet pornography addiction.

OR-110

Gender differences in sex addiction

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Ariel University, Ari'el, Israel

Background and aims: sexual addiction – otherwise known as compulsive sexual behavior – is associated with serious psycho-social problems and risk-taking behavior. The aim of this study was to investigate sex differences among men and women who use sites on the Internet dedicated to pornography and cybersex. *Methods:* the study used the Cybersex addiction test, Craving for pornography questionnaire, and a Questionnaire on intimacy among 267 participants (192 males and 75 females). Participants' mean age for males was 28.16 (SD = 6.8) and for females 25.5 (SD = 5.13). They used sites that are dedicated to pornography and cybersex on the Internet. Results of regression analysis indicated that pornography, gender, and cybersex significantly predicted difficulties in intimacy and it accounted for 66.1% of the variance of rating on the

intimacy questionnaire. Second, regression analysis also indicated that craving for pornography, gender, and difficulties in forming intimate relationships significantly predicted frequency of cybersex use and it accounted for 83.7% of the variance in ratings of cybersex use. Third, men had higher scores of frequency of using cybersex than women [$t(2,224) = 1.97, p < 0.05$] and higher scores of craving for pornography than women [$t(2,265) = 3.26, p < 0.01$] and no higher scores on the questionnaire measuring difficulties in forming intimate relationship than women [$t(2,224) = 1, p = 0.32$]. *Conclusions:* These findings support previous evidence for sex differences in compulsive sexual behavior. We will also describe the psycho-biological evidence for gender differences in sex addiction.

OR-111

Gender differences in sex addiction

AVIV WEINSTEIN, RINAT ZOLEK, ANNA BABKIN, MICHEL LEJOYEUX

Ariel University, Ari'el, Israel

Background and aims: sexual addiction, otherwise known as compulsive sexual behavior, is associated with severe psycho-social problems and risk-taking behavior. The aim of this study was to investigate sex differences among men and women who use sites on the internet dedicated to pornography and cybersex. *Methods:* the study used the Cybersex addiction test, Craving for pornography questionnaire, and a Questionnaire on intimacy among 267 participants (192 males and 75 females) mean age for males 28.16 (SD = 6.8) and for females 25.5 (SD = 5.13) used sites that are dedicated to pornography and cybersex on the Internet. *Results:* Results of regression analysis indicated that pornography, gender, and cybersex significantly predicted difficulties in intimacy and it accounted for 66.1% of the variance of rating on the intimacy questionnaire.

Second, regression analysis also indicated that craving for pornography, gender, and difficulties in forming intimate relationships significantly predicted frequency of cybersex use and it accounted for 83.7% of the variance in ratings of cybersex use. Third, men had higher scores of frequency of using cybersex than women [$t(2,224) = 1.97, p < 0.05$] and higher scores of craving for pornography than women [$t(2,265) = 3.26, p < 0.01$] and no higher scores on the questionnaire measuring difficulties in forming intimate relationship than women [$t(2,224) = 1, p = 0.32$]. *Conclusions:* These findings support previous evidence for sex differences in compulsive sexual behavior. We will also describe the psycho-biological evidence for gender differences in sex addiction.

OR-112

Internet videogame addiction is associated with delay discounting, impulsivity and sensitivity to social rejection

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Background and aims: There is previous evidence for impulsivity in Internet and videogame addiction. The aims of this study were to examine whether internet and videogame addiction is associated with delay discounting, impulsivity and sensitivity to social rejection. *Methods:* 20 participants (mean age 24) with high score on problematic Internet and videogame use (POGQ) were compared with 20 participants (mean age 24.8) with low score on the POGQ. They performed on computerized Delay discounting task, Balloon Analog Risk Task (BART) and

filled in the sensitivity to social rejection questionnaire. *Results:* participants with high problematic internet and videogame use showed lower rates of delay discounting, higher measures of impulsivity and higher measures of sensitivity to social rejection compared with control participants. Discussion and conclusions: the results of this study support previous evidence of impulsivity in internet and videogame users. It also provides new evidence for difficulties in delay discounting and sensitivity to social rejection among those who are addicted to Internet and

videogames. The results suggest that internet and video-game addicted individuals seek immediate gratification and cannot wait for later reward. Furthermore, these

individuals spend time in the virtual world where they feel safe and avoid social interactions presumably due to fears of social rejection.

OR-113

Social anxiety contributes to sex addiction among individuals who use a dating application on the Internet

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Background and Aims: there is an increasing trend in the use of the Internet for dating and sexual purposes (“Tinder”). The aim of this study was to investigate the effects of social anxiety, sensation seeking and gender on sex addiction among those who use Internet sites for dating. *Methods:* 279 participants (128 males and 151 females) age range: 18–38 years answered questionnaires on the Internet (Google drive). Questionnaires included demographic information, the Leibowitz social anxiety scale, Sensation seeking scale, and Sexual addiction screening test (SAST). *Results:* users of Internet dating applications showed higher scores on the SAST than non-users [$t(2,277) = 2.09$; $p < 0.05$]. Secondly,

regression analysis showed that social anxiety accounted significantly to the variance of sexual addiction (Beta = .245; $p < .001$). Gender or scores on the sensation seeking questionnaire did not contribute significantly to the variance of sexual addiction scores. Discussion and conclusions: results of this study indicate that users of dating applications on the internet have higher levels of sex addiction. Sex addiction can also predict levels of social anxiety. The study improves our understanding on the factors that influence sex addiction. The results indicate that social anxiety rather than sensation seeking is a major factor affecting the use of Internet dating applications for sexual purposes.

OR-114

Psychiatric-Mental Health Nurses’ Exposure to Clients with Problematic Internet Experiences

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Background and aims: Computer addiction is also known by some researchers as Problematic Internet Experiences (PIE). Mental health professionals have been cited in the literature to have clients with PIE in their practices; however, psychiatric-mental health nurses (PMHNS) were not included in the samples of these studies. The research aims were: (1) To what extent are PIE occurring in clients seen by PMHNS? and (2) What are the narratives of clinical cases of clients who divulge their PIE behaviors to PMHNS? *Methods:* A mixed-methods pilot study using a quantitative survey and a qualitative component measured the types and numbers of PIE cases via a descriptive survey and derived themes using narrative inquiry methodology from written case descriptions. A sample of 16 PMHNS provided the quantitative data; 9 of this sample summarized their clinical

cases. *Results:* PMHNS reported 92 adult and 33 child cases of PIE. Adult and child pornography, excessive use, and romantic sexual relationships were findings of the survey. Six themes were derived: (1) searching for pornography; (2) developing online romantic relationships; (3) online gaming is ruining my life; (4) spending excessive time on the Internet; (5) coming to terms with online sexual behaviors and addiction; and (6) cyberbullying. *Conclusions:* Clients with PIE are being treated by PMHNS in their practices. These findings propel PMHNS to advocate for and receive specific education related to PIE to provide evidence-based treatment for these disorders which have emerged from living in our highly technological, high-speed and complex 21st century.

POSTER PRESENTATIONS

PO-01

Comparison Study of smartphone usage in college students between self-report data and an measured data

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Background and aims: Nowadays smartphone overuse has become a social and medical concern. Currently clinicians use self-reported information for the diagnosis and treatment of individuals with problematic smartphone usage. However, research in human behavior has reported significant differences between self-reported values and actual behaviors. This paper examines the similarity and variance in smartphone usage patterns between the measured data and self-reported data. *Methods:* Together with the self-reported data, the real usage log data is collected from 35 college students in a metropolitan region

of Northeast Asia, using Android smartphone monitoring application developed by the authors. *Results:* The unconscious users often underestimate their usage time by around 40% in average. Most frequently used applications and time zones in a day sometimes do not coincide in self-reported and measured approach. Also there are strong patterns in application usage in a day. *Conclusions:* The result recommends clinicians to consider these self-report tendency and possible inconsistency, and hence utilize measurement tools in diagnosis and treatment of smartphone overusing subjects.

PO-02

Reasons for the implication of Kazakhstani women in religious addiction (extremism)

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Background and aims: During the period of 2013–2015 rehabilitation of victims of destructive impact of radical religious organizations was carried out in Pavlodar, Kazakhstan. In this current study, a comprehensive research was carried out focusing on women who are addicted to religion and were convicted for extremist religious activity. The aim of the research was to explore the reasons why women choose to be involved in organizations. This is an important area of research given that women increasingly take key roles in extremist organizations that prepare and conduct recruitment and acts of terror. Some of the respondents were even convicted for unlawful acts of extremist nature (dissemination of jihad messages). *Methods:* We used phenomenological approach in consulting, besides using questionnaires and semi-structured interviews. The final sample included 68 respondents. *Results:* Overall 13% of women reported having had a psychologically traumatic experience (bereavement and/or break-down). During crisis period the

chance of addiction development is very high if there is no support from family and friends. Furthermore, we found evidence for juvenile sensation seeking behavior in 29% of the sample such as searching for exciting experience, gaming, secret societies, etc. We found that 26% of women had a romantic motivation. Young women are often involved in terrorist organizations following their beloved ones. Finally, 32% reported being brought up in radically religious family. Family norms included absence of personal choice of life course, formation of black and white thinking, and implicit obedience to a leader. Therefore, all above-listed reasons of the involvement in destructive religious organizations contain fear of loneliness experienced by an infantile personality confronted in an aggressive environment. At the same time, lowering of critical thinking and heightened suggestibility are equally observed. None of the women was currently in a spiritual (religious) search. *Conclusions:* Clinical manifestations correspond to symptoms of behavioral addiction.

PO-03

A review of neuropsychological studies in subjects with Internet gaming disorder

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Background and aims: Internet gaming disorder (IGD) has become the focus of important health debate, given its recent inclusion in the appendix of DSM-5 as a health condition requiring further studies. The aim of this review is to describe cognitive functioning of people with IGD taking into consideration findings from neuropsychological studies. *Methods:* A comprehensive literature search was conducted using the PubMed database. The following search terms and their derivatives were used: video game addiction/addicts, Internet game addiction/addicts, Internet game/gaming disorder, cognitive functioning/functions, cognition, neuropsychology, executive functioning/functions, decision-making, neurocognition. Additional papers from supplementary sources were also included. In order to be included, studies had to assess cognitive functioning with neuropsychological methods, be published in a peer-reviewed journal, and be available with full text in English language. No time restrictions regarding the date of

publication were applied. Studies using only neuroimaging techniques were excluded. *Results:* 53 records were identified and 20 studies were chosen for further analysis. In most studies neuroimaging and neuropsychological techniques were combined and only 6 were conducted with neuropsychological methods only. Decision making and cognitive control were mainly assessed with tests such as Iowa Gambling Task or color-word Stroop task. Other neuropsychological methods were also used. *Conclusions:* Studies indicate higher impulsivity, reduction in inhibitory control and poor decision-making under risk. They provide evidence for similarities between substance dependencies and IGD. Differences in brain functioning of subjects with IGD and substance addiction, e.g. functional connectivity of neuronal circuits have been evidenced. Moreover, attention has to be paid on possible improvement of some capabilities, e.g. the integration of perceptual information, hand-and-eye coordination in frequent gamers.

PO-04

Gender swapping in World of Warcraft

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Background and aims: Motivation and involvement in massive multiplayer online role-playing games (MMORPGs) depend on various factors such as the choice of a specific avatar. In world of Warcraft (Wow), players can choose avatars' gender and race. Gender swapping consists of a player using an opposite gender avatar. As previous studies have found, players' identification with their own avatar is related to player's motivation to play, the phenomenon of gender swapping may become an important modulator of game involvement. *Methods:* 687 Wow players participated in an online survey posted in specialized French language European forums, as the official Blizzard WoW forums in 2011. They were asked about their gender and their avatars' gender and race. *Results:* Most of players

were males (87.3%). Results showed a significant trend ($p < 0.001$) for male players to choose female avatars (34.8%) over female players choosing male avatars (14.9%). Moreover, in the gender swapped avatars groups, the humanoid races were predominantly chosen. *Conclusions:* Gender swapping is a common phenomenon in MMORPGs such as Wow. Male players are more likely to choose avatars from the opposite sex. This tendency could reflect the desire, either to be considered as a female player who tends to have more in game advantages and favors from other male players, or to fantasize about a female avatar, this later hypothesis could be supported by the fact that humanoid races are predominantly chosen.

PO-05

Internet use problems correlates with subjective sleep disturbances in an adolescent community population in South Korea

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Background and aims: The strong associations between chronic insomnia, mental disorders and psychopathology were confirmed by many investigations. The aims of this study are (1) to find the prevalence of poor sleep quality complaints in Korean community students (2) to explore the relationship between poor sleep quality complaints and the psychosocial factors including the Internet use problems (3)

to explore the relationship between the severity of poor sleep and the psychopathology in the adolescents in Korea. *Methods:* It is a cross-sectional study of a stratified sample of 2,307 South Korean middle and high-school students. Subjects were given the Adolescent Mental Health and Problem Behavior Screening Questionnaire-II (AMPQ-II), the Symptom Checklist scale (SCL-90-R) and a

questionnaire concerning demographic characteristics. *Results:* Adolescents classified as suffering from sleep disturbances (22.3% of the participants) presented higher levels of general psychopathology. Age, gender, academic and Internet use problems, peer relationship difficulties including school violence, rule violation experiences were identified as correlates of the sleep disturbances complaints. Psychosocial correlates such as suicidal ideation and Internet use problems are important factors to consider when

faced with sleep disturbance complaints in this age group. *Discussion:* We found that Internet use problems and psychopathologic problems had a positive correlation with severity of sleep disturbances. *Conclusions:* Large-scale prospective studies and neurobiological studies are needed for a better understanding of the complex relationship between sleep, Internet use problems, psychopathology, and youth suicidal behavior.

PO-06

Development of the Cognitive Distortion in Speculative Stock Trading Scale

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Background and aim: Although stock trading in the financial market is supposed to be done in the most rational way possible, this is often not the case with people who regularly trade stocks. Furthermore, some people develop so risky and speculative patterns of stock trading that they show tolerance and withdrawal symptoms and chase losses in the financial market, similar to problem gamblers. This leads us to regard speculative stock trading as potentially another type of behavioral addiction. Previous research suggests that speculative traders' behavior appears to be driven by cognitive distortion, which is explained by prospect theory, anchoring bias, representativeness bias, etc. in behavioral economics. In this paper, we report the development of a scale to assess the degree of cognitive

distortion in speculative stock trading. *Methods and Results:* An initial pool of items for the scale was developed based on previous research and interviews. A sample of 1005 people who regularly engage in stock trading participated in the online survey. An exploratory and confirmatory factor analyses of the data indicated that a model of three factors that consist of 15 items provided a good fit to the data (i.e., cognitive bias of gain and loss; errors in making investment decisions; errors in self-perception). *Discussion and Conclusion:* The proposed scale shows an adequate fit to the data. Further research is under way to investigate the validity of the scale in detecting severe speculators whose behavior can be considered behavioral addiction.

PO-07

Qualitative analysis of the reasons of call to the Adalis gambling help-line

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Background and aims: In France, the market for gambling has been opened to competition and regulation by the law of 12 May 2010 which resulted in a large increase in online gambling. The use of phone and Internet (such as ADALIS, the French acronym for "Addiction Drugs and Alcohol Help-line") may remove some barriers to treatment. The aims of this study are: (1) To determine the characteristics of the gamblers who use Adalis hotline and identify the reasons of call and their predictive factors according to the characteristics. (2) To study the characteristics associated with orientation to healthcare. (3) To study the evolution of the reasons of call over 5 years with the expansion of online gambling and identify the specific features associated with

the practice of online gambling. *Methods:* A structured document and a case summary are completed for each call to ADALIS hotline. We analyzed the data between 2010 and 2015. Quantitative and qualitative analyses of the ADALIS gambling database were performed. Summaries of each call were submitted to lexical analysis using the Alceste and R softwares and subgroup analyses were performed. *Results:* Here we present the preliminary results of our research. *Conclusions:* This study will identify predictors of different reasons of call, to better identify people in need, facilitate the alliance with gamblers and learn about key moments in the course of problematic and pathological gamblers to facilitate action preventions, and promote the use of care.

PO-08

Comparing attachment addictive behavior patterns in women: addicts of intimate relationships and co-dependent mothers of adult sons

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Background and aims: Studies of adults' attachment in close relationships are attracting researchers' attention, although available data is small and under-evaluated. The aim of the

study was to explore addictive behavioral patterns which maintain such relationships, e.g., women's destructive attachment to a romantic partner ($n_1 = 48$; age $m = 28,7$) and

co-dependent mothers' patterns towards their alcoholic sons ($n_2 = 14$; age $m = 44,6$). *Methods*: The MIMARA scale (Brennan, Shaver, 1995) and the Codependency scale (Weinhold, 2002) were administered, in addition to an interview. *Results*: Addictive patterns have common traits; we found substantial similarity in the emotional states and behavioral patterns in these two groups. These patterns include uncertainty, provoking anxiety, violation of the other's boundaries, and the inability to meet the other's actual needs, including love and security. Relationship-addicted women feel hurt and anger, combined with irritation towards partner and to oneself; difficulties in understanding, expressing and regulating emotions;

depression; emptiness and exhaustion, and the inability to either improve the relationships or to end them. Both samples are characterized by emotional ambivalence: love and passion / hate in romantic relationships, love and pity / hate in "mother-son" relations. Feeling symbiotic ties with an object, "clinging" to them, but at the same time feeling frustrated, unloved, and unnecessary characterise these behavioral issues in addition to trying to control a partner / a son, manipulation, and masking their actions by concern. *Discussion*: These types of attachment behavior patterns share many similarities: inability to build genuine adult partnerships (with a romantic partner or with a son), inability to establish borders and a tendency for symbiosis.

PO-09

Theoretical skills relating to excessive gambling among Social workers in French speaking Switzerland

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Background and aims: This research focuses on the detection of problem gambling by social workers (SWs) in French speaking Switzerland. The aim is to investigate SWs' theoretical skills regarding excessive gambling, their ability to detect difficulties amongst their caseloads and their approach towards the follow-up of excessive gamblers. The rationale to conduct this study is the theoretical misunderstanding of the disorder, lack of screening tools and absence of appropriate financial responses by SWs. *Methods*: 42 social workers from different institutions within the Canton of Vaud anonymously answered an ad hoc questionnaire. The sample had an average of 6.81 years of service and 60% never received specific information or

training on excessive gambling. *Results*: 85% of respondents believed they had been in contact with an excessive gambler, amongst their caseload. 47.5% felt moderately capable of detecting excessive gamblers, while 30% felt incapable. Regarding the possible responses to excessive gamblers, 54% would investigate the situation and 76% would guide the person to a specialist centre. The majority were unaware of the diagnostic criteria of gambling. Finally, 78% felt the need to increase their skills relating to excessive gambling. *Conclusions*: This research shows SWs perceived lack of knowledge about excessive gambling, thus they are in need of information and training.

PO-10

Psychological traits associated to recreational gambling in Ecuador and Spain

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Background and aims: Gambling has been illegal in Ecuador since 2011. This makes Ecuador a very informative context to assess whether psychological features commonly associated with gambling are dependent on cultural/legal factors. *Methods*: Thirty-nine Ecuadorian and 55 Spanish recreational gamblers, matched on age and gambling severity, were assessed using the South Oaks Gambling Screen, the UPPS-P impulsive behavior scale, the Now-or-Later test of delay discounting, the Sensitivity to Punishment/Reward Questionnaire (SPSRQ), the GRCS for gambling-related cognitive distortions, and the CERQ for emotion-regulation strategies. *Results*: (1) Ecuadorian gamblers scored higher than Spanish ones in UPPS-P urgency and gambling expectancies, but lower in lack of premeditation. (2) Ecuadorian gamblers also scored higher in GRCS predictive and control illusions. (3) Ecuadorian

gamblers showed the customary correlation between gambling severity and cognitive distortions. However, in contrast to the Spanish sample, (5) in the Ecuadorian sample, impulsivity dimensions did not significantly correlate with severity, and (6) strategic gamblers did not differ from non-strategic gamblers. Finally, (7) Ecuadorian gamblers' emotion-regulation strategies correlated with cognitive distortions, but not exactly as in the Spanish sample. *Conclusions*: The absence of differences in gambling-related cognitions between gambler types in the Ecuadorian sample is in sharp contrast with previous findings in Spain. Moreover, the profile found in most Ecuadorian gamblers corresponds to the one specifically shown by Spanish strategic gamblers. We suggest that illegal gambling attracts part of the motivations and personality profiles specifically shown by strategic games in other countries.

PO-11

Validation of the Internet Gaming Disorder Questionnaire in a Sample of Adult German Internet Gamers

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Background and aims: With the inclusion of Internet Gaming Disorder in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders comes the need for a reliable and valid questionnaire to assess the diagnosis. The Internet Gaming Disorder Questionnaire (IGDQ) is a short self-assessment tool that measures Internet Gaming Disorder. Our study aims at investigating its reliability and validity in a sample of adult German gamers playing different Internet games. **Methods:** 894 Internet gamers (mean age: 26.49 ± 8.46 years old, range: 18–75 years, 87.36% male) completed an online version of the IGDQ and the Compulsive Internet Use Scale (CIUS) and provided information on their Internet and gaming use. Item and reliability analyses were computed. In order to investigate the component structure, the sample

was randomly divided into two subsamples. A maximum likelihood factor analysis was conducted for one subsample and a confirmatory factor analysis for the other subsample. **Results:** The IGDQ had a Cronbach's α of .70. The IGDQ score correlated with the CIUS score ($r = .59$) and the time spent playing Internet games in a typical week ($r = .24$). The maximum likelihood factor analysis extracted one component that explained 30.26% of the variance. The confirmatory factor analysis confirmed the extraction of one component. 7.94% of the gamers met the criteria for an Internet Gaming Disorder. **Discussion:** The IGDQ has acceptable internal consistency. The correlations of the IGDQ score with the CIUS score and the weekly time spent playing indicate that the instrument allows valid interpretations.

PO-12

Diagnostic validity of an Internet Gaming Disorder screening tool: Internet Game Use-Elicited Symptom Screen (IGUESS)

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Background and aims: The DSM-5 diagnostic criteria-based Internet Gaming Disorder screening tool is needed in Korea. This study aims to test diagnostic validity of the Internet Game Use-Elicited Symptom Screen (IGUESS) designed to screen for Internet Gaming Disorder in Korea. **Methods:** Two hundred and twelve adolescents attending a middle school located at U city of Gyeonggi Province in Korea were asked to respond to the web-based survey in a self-administered form. The questionnaire included the Internet Gaming Use-Elicited Symptom Screen (IGUESS, 9 items), Young's Internet Addiction Scale (Y scale, 20 items), and questions about Internet gaming behavior. Trained psychiatrist met all participants individually and performed diagnostic interview according to the DSM-5-based Internet Gaming Disorder criteria as a gold-standard.

Results: Positive rate of each screener was 33.2%, and 15.6% on the score 40 of Y scale, and the score 6 of the IGUESS as the cut-off respectively. The internal consistency was excellent, with Cronbach's α of 0.94, and 0.88 respectively. Cohen's Kappa between Y scale and IGUESS was 0.47. The diagnostic accuracy measures were as follows; sensitivity 88.9%, specificity of 87.8%, positive predictive value 25.0%, negative predictive value 99.4%. Area under the curve of a receiver operating characteristic curve was 0.88. The IGUESS showed statistical correlation with depressive, or trait-anxiety symptoms level. **Conclusions:** The authors suggested the IGUESS as an Internet Gaming Disorder screening tool with the score of 6 as the optimal cut-off point in the community settings for referral to further assessment.

PO-13

The addiction and attachment characteristics of runaway adolescents in Korea

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Background and aims: The aim of this study was to examine addiction characteristics of runaway adolescents in Korea focusing on depression, attachment and addiction. **Methods:** We carried out a short survey via telephone and e-mail to assess willingness to participate in adolescents. The final questionnaire was sent to 18 shelter-houses, and in the end, a total of 179 adolescents responded. **Results:** The mean age of participants was 17.43, and the mean of attachment scores was only 33.44. One-third (30%) of participants were rated as having depression based on the PHQ-9. The nicotine

dependence was assessed using Fagerström Test for Nicotine Dependence (FTND). We found that 45% of participants were low, 18% were moderate, and 36% were highly nicotine dependent. Overall, 42 % were problematic drinker and/or alcohol dependent. **Conclusions:** This is the first report on addiction and attachment characteristics of runaway adolescents. More intensive addiction-treatment and secure attachment enhancement programs are needed for runaway adolescents.

PO-14

Cocaine modifies preference of choice in rat gambling task

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Background and aims: Rat gambling task (rGT) is one of the most sophisticated animal model which shares many features of the human gambling tasks including uncertainty, reward and punishment. In this model, we examined how cocaine affects the preference of choice. *Methods:* Rats were trained in a touch-screen chamber to learn the relationships between 4 different light signals on the screen and accompanied reward outcomes and punishments set up with different schedules, for one session of 30 min each day. Then, they were allowed for free choices out of 4 different light signals. Once animals showed a stabilized pattern of preference, they were given 7 days of either saline or cocaine IP injections (a single injection per day) followed by 2

weeks of withdrawal. Their preference of choice was re-tested in rGT chambers. *Results:* Depending on their preference of choice, rats were separated into risk averse and risk-seeking groups. However, when they were exposed to cocaine, rats in the risk-averse group changed their preference towards more disadvantageous choices. *Conclusions:* These results indicate that cocaine influences different types of decision-making behavior as in gambling, which is not directly connected to obtaining cocaine itself. This implies that cocaine may aggravate pathological symptoms of bad choices, resulting in negative consequences, as it is observed in patients with behavioral addictions.

PO-15

Excessive smartphone use might relate to health problems

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Background and aims: This study aimed to explore the relation of excessive mobile phone (MP) use to sleep quality, depression, as well as to demographic factors and living circumstances of university students. *Methods:* In this cross-sectional study, 650 full-time students (20.41 SD = 1.66 y/o) (72.4% females) were invited to complete questionnaires (Insomnia Severity Index, Beck Depression Inventory-13) at the University of Miskolc in 2013. Frequency of awakenings at night due to MP, demands on being available via MP, perceived stressfulness of accessibility, and the anxiety caused by non-availability of MP for a day (nomophobia) were measured with a 4-point Likert scale and comments of closed ones regarding too much time of MP use (Yes/No) were also collected. The students of the first quartile of score ($\geq 7/13$) were compared

with others. *Results:* All students have MP, 82.5% of them have a smartphone. On average, they use their phone for phone call for 1.17 (SD = 1.15) hours a day and have Internet access for 3.66 (SD = 4.53) hours a day. Females chat significantly longer than males ($p = .002$), but they use Internet in a similar way. 26.9% of students are considered excessive mobile users, with higher tendency among females. Gender, age, marital status, children, accommodation, job, financial difficulties are not associated with MP use. Excessive smartphone users are more likely to have sleep problems ($F = 13.751$; $p < .001$) and depression ($F = 6.910$; $p = .009$), but it was not the case in mobile users. *Conclusions:* This study proposed that excessive use of smartphone exists in both males and females and has negative effect on health that should be taken into account.

PO-16

Addictive behavior in persons with obesity

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Background and aims: The typical for clinical picture of forming of alimentary-constitutional obesity, namely the interrelationship of disturbed eating behavior and mental disorders, remains little studied. The aim of this study was to study eating disorders in obesity. *Methods:* The age of participants was between 19 and 50 years. The average body weight index (BWI) was 30,800,38. The majority of the participating probands were persons with mental disorders (52.6% $n = 73$ persons), the group of patients with pre-nosological disorders (33.8% $n = 46$ persons) and persons with affective disorders (13.6% $n = 17$ persons). *Results:* Three variants of disturbances were distinguished: a) nervous bulimia (55.9% $n = 76$ persons); b) psychogenic

overeating in the form of hyper-alimentation of neurotic level under conditions of increased psychoemotional stress (14.7% $n = 20$ persons); c) abnormal eating behavior which was characterized by the excess use of caloric food and disturbance of regime of nutrition (29.4% = 40 persons). *Conclusions:* In patients who belong to the group of nervous bulimia (group 1) attacks of bulimia develop on the ground of psychoemotional stress, and enhancement of bulimic symptoms was followed by increase of anxiety and depressive disorders more often than in other groups ($p < 0.05$). Patients with psychogenic overeating (group 2) displayed substantial increase of appetite after stresses and agitation ($p < 0.01$), overeating attacks were clearly

connected with stresses ($p < 0.001$), for patients of this group ataractic character of intake of food was typical ($p < 0.001$). Patients with an abnormal eating behavior (group 3)

noted loss of appetite during agitation, became distressed more often ($p < 0.001$) than others, and the hedonistic motivation during intake of food became the leading motivation ($p < 0.001$).

PO-17

Putamen-based functional connectivity dysfunctions in gambling disorder: Associations with gambling-related cognitive biases

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Background and aims: Gambling disorder patients (GDPs) present functional frontostriatal alterations, but their involvement in GD symptoms remains underinvestigated. This study explores the relationship between resting-state activity in bilateral putamen and gambling severity/gambling-related biases. **Methods:** 25 GDPs and 26 healthy controls (HCs) underwent Resting-State Functional Connectivity MRI, and completed gambling-related cognitive biases (GRCS) and severity (SOGS) questionnaires. We examined fractional amplitude of low-frequency fluctuations (fALFF) to determine differences on spontaneous brain activity. Areas exhibiting fALFF differences were selected as regions-of-interest in a seed-based FC analysis. **Results:** fALFF showed between-group differences in right insula and bilateral putamen. GDPs, compared to HCs, showed left putamen hyperconnectivity with the anterior section of middle frontal gyrus, and hypoconnectivity with right cuneus/precuneus

and insula. Left putamen connectivity with a cluster extending from right anterior caudate to superior frontal gyrus, and another at right middle temporal gyrus, correlated positively with the intensity of cognitive biases, but not with gambling severity. Connectivity between left putamen and superior frontal gyrus correlated negatively with cognitive distortions. GDPs also showed hyperconnectivity between right putamen and left middle and right inferior temporal gyri, and hypoconnectivity between right putamen and right fusiform gyrus and precentral and postcentral gyri. Cognitive biases correlated with connectivity between right putamen and middle cingulate gyrus bilaterally, and left postcentral gyrus, with these maps not being completely separable from the ones showing correlations with gambling severity. **Conclusions:** Striatal connectivity with frontal regions correlate with gambling biases, with these connectivity maps not overlapping with the ones correlating with gambling severity.

PO-18

Psychological factors associated with Internet based problem shopping behavior among South Korean Internet Users

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Background and aims: Over the past decade the shopping habits have largely been influenced by the spread of the Internet. Given the rapid growth in e-retailing, there is emerging evidence that problematic shopping behavior is increasing online. However, there is currently limited research that identifies the psychological factors which are associated with problematic behavior. **Methods:** We recruited participants aged between 20 and 69 years among the online panel of an online research service. The sample size of the online panel survey was 598. Of these 598 participants, 50.7% ($N = 303$) were men and 49.3% ($N = 295$) were women. Dissociative Experiences Scale (DES), YIA, Korean Canadian Problem Gambling Index (K-CPGI), Richmond Compulsive Buying Scale (RCBS), Stress Response Index (SRI) and socio-demographic query

form were used in the collection of data. A participant was classified as an Internet based problem shopper if his/her total score of RCBS was above 25. Pearson correlation analysis, and chi-square test were used for data analysis. **Results:** Seventy five (12.5%) of the participants were classified as Internet-based problem shopper. Pearson correlation analysis revealed that the total score of RCBS was positively related to DES scores ($r = .559$, $p < 0.01$). RCBS scores were also positively related to gambling severity ($r = .422$, $p < 0.01$), stress perception level ($r = .461$, $p < 0.01$). **Conclusions:** Internet-based problem shopping is a relatively frequent phenomenon among Internet users in South Korea. The severity of Internet based problem shopping behavior is positively correlated with the severity of dissociation, gambling, and stress level.

PO-19

Research on the ways of socialization in multiplayer online video games, to establish typical profiles, and to suggest new forms of interventions

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Background and aims: this project will be conducted during my PhD in France, starting from September 2016. My aim in this research is to study the various forms of socialization in multiplayer online video games, such as *League of Legends* and *Counter Strike*. My aim is to explore the typical behavioral, cognitive, emotional and motivational profiles of gamers who exhibit “toxic behaviors” in game. *Methods:* I will focus on variables that could be manipulated in game to better the behavior of some players and the in-game experience of others. The participants will be split into three groups: a non-gamer group, a gamer group, a toxic behavior gamer group. The research will combine quantitative, qualitative and neuropsychological measures. *Results:* to be announced after the research has been conducted. *Discussion:*

I will look into a possible link between toxic behaviors during online video games and cyber-bullying and/or real life harassment. This research will also be done in partnership with the American anthropologist Jeffrey Snodgrass. I will translate into French a survey he created with his team and include it in my study. This survey is an attempt to elicit a more culturally/contextually-sensitive ethnographic understanding of online gaming “addiction.” The project will be piloted simultaneously in different parts of the world. *Conclusions:* As a final goal, my aim is to suggest new kinds of interventions – based on the studied variables – to prevent toxic behaviors in game. Moreover, the goal of this study is to promote positive social interactions in online video games and to enhance the players’ resources.

PO-20

Workaholism: A behavioral addiction?

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Background and aims: The DSM-5 proposed new category of Addiction and Related Disorders encompassing both substance use disorders and non-substance addictions, but not work addiction. Does workaholism fulfill the criteria for an addiction in the first place? *Methods:* We performed a literature review of clinical trials and systematic reviews investigating “workaholism”. We searched the following databases (November 2015) on PubMed. *Results:* Each behavioral addiction is characterized by a recurrent pattern of behavior that has this essential feature within a specific domain. Most of this pattern described in DSM-5 are found on “workaholism”: engagement in the behavior to achieve appetitive effects, preoccupation with the behavior (which subsume aspects of tolerance and withdrawal as examples of behavioral preoccupation), temporary satiation, loss of

control and suffering from negative consequences. Workaholism on the other hand involves: excessive time spent working, difficulty disengaging from work, which often elicits negative emotions during and after a work episode; frustration and distress when prevented from working association with an inflexible or compulsive working style, leading potentially to poor relationships with others at work and at home. Furthermore, work-family conflict are relatively high in workaholics as well as negative life outcomes which include high perceived stress, low self-esteem and low life satisfaction. Difficulties sleeping, career dissatisfaction may be present, and work “burnout” and ill-health are often described as well. *Conclusions:* Given the lack of consensus on the definition and symptoms of workaholism, DSM-5 criteria could be found.

PO-21

Cyberaddiction among university students: a cross-sectional study in Algeria, France and Hungary, 2014

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Background: The objective of the study was to measure the prevalence of cyberaddiction among university students in three countries with different socio-cultural contexts: Algeria, France and Hungary. *Methods:* A multicenter cross-sectional study was conducted in three university students’ campuses in Algeria (Constantine), France (Rouen) and in Hungary (Miskolc). The students filled in a questionnaire about cyberaddiction (Orman test), stress (Cohen score), and smoking. *Results:* A total of 2681 students were included: 187 in Algeria, 873 in Hungary and 1621 in France. The sex ratio M:F was 0.35 in Algeria, 0.65

in France and 0.24 in Hungary; the mean age was 23.8 (SD = 3.3) in Algeria, 20.2 (SD = 2.3) in France and 20.7 (SD = 3.0) in Hungary. The prevalence of cyberaddiction was 59.3% in Algeria, 23.5% in France and 17.4% in Hungary ($p < 0.001$). The mean of stress was 16.4 (SD = 6.3) in Algeria, 15.5 (SD = 7.5) in France, 17.0 (SD = 5.5) in Hungary ($p < 0.001$). 5.5% of students were smoker in Algeria, 21% in France and 22.3% in Hungary ($p < 0.001$). After logistic regression, students in Algeria had a higher risk of cyber addiction and students in Hungary had a lower risk of cyber addiction than students in France (respectively

aOR = 5.12; 95% IC:3.70-7.12 and aOR = 0.67; 95% IC:0.54-0.84). Stress was associated with cyberaddiction aOR = 1.07; 95% IC (1.05-1.09) *Conclusions:* In three different socio-cultural contexts: Algeria, France and

Hungary, risk cyberaddiction are different. Independently from the country, stress is associated with cyberaddiction. These findings are important to target the students for different awareness and information campaigns.

PO-22

Psychological predictors of intensive practice of Massively Multiplayer Online Role-Playing Games

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Background and aims: Massively Multiplayer Online Role-Playing Games (MMORPG) are video games with special characteristics, which are a persistent immersive online virtual world with the creation of an avatar and an important social aspect. These specificities raise the question of the need for some players to practice intensively and to neglect the real world in favor of the virtual one. The aim of this study is to develop an explanatory model for intensive practice of MMORPG. *Methods:* 313 regular MMORPG players were recruited on specialized forums. They completed several questionnaires: Beck Depression Inventory, Spielberger Inventory of State-Trait Anxiety, Rosenberg Self-Esteem Scale, Life Satisfaction Scale, Interpersonal Relationships Quality Scale, Feeling of Social Belonging Scale, and Problem Video Game Playing Questionnaire and Internet Addiction Test to assess their

intensity of practice. Hierarchical multiple regression analysis was performed by including first the age, then the psychosocial variables (life satisfaction, feeling of social belonging, quality of interpersonal relationships) and finally the psychopathological variables (depressive symptoms, anxiety, self-esteem). *Results:* Results highlighted that intensive practice of MMORPG can be significantly predicted by the age of the player ($b = -0.134$), depressive symptoms ($b = 0.313$) and feeling of social belonging ($b = -0.186$). *Conclusions:* This study showed that intensive MMORPG players are younger and have stronger depressive symptoms and a lower feeling of social belonging than other players. Future research should aim to clarify whether these characteristics are causes or consequences of intensive practice.

PO-23

Online Poker Players' Typology

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Background and aims: Several studies identified three specific groups among the population of problematic gamblers. The first groups consist in the "emotionally vulnerable" and "antisocial/impulsive" gamblers. The third group "behavioral conditioning" is characterised by a lower level of pathological gambling and high scores of irrational beliefs. The aim of this study is to replicate this model on the population of online poker players. *Methods:* The sample consisted of 182 online poker players aged 32.6 years ($SD = 9.4$) on average. Participants filled out an online self-report questionnaire, comprising scales measuring excessive gambling (Problem Gambling Severity Index, PGSI),

gambling irrational beliefs (Gambling Related Cognitions Scale, GRCS), anxiety, depression and sensation seeking. Cluster analysis was used to uncover classes. *Results:* Cluster analysis indicated four clusters in the sample: a group of unrisky players ($n = 49$), risky players, who reported high level of sensation seeking ($n = 66$), a group of excessive and depressive gamblers ($n = 33$) and a group of risky players showing a high level of irrational beliefs ($n = 34$). *Conclusions:* This exploratory study confirms the presence of three specific clusters of online poker problematic gambler. Their profiles are closed to those describe for gambling in the literature.

PO-24

Differences in patients with pathological gambling disorders according to their impulsivity score: preliminary data

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Background and aims: In DMS-IV pathological gambling (PG) is categorized as an impulsive control disorder, whereas in DSM-5 PG is categorized as an addictive behavior. Nevertheless, impulsivity is reported to be a core element in patients with PG, not exclusively specific for PG, but also plays a role for example in alcohol use disorders.

This study aims to investigate differences in psychiatric symptoms regarding the self-reported impulsivity score within a sample of problem gamblers. *Methods:* Forty-seven PG were split in to a high ($n = 26$) versus low ($n = 21$) impulsivity group according to their Barratt Impulsiveness Scale (BIS-11). Various questionnaires measuring

psychiatric symptoms (depression (BDI), anxiety (STAI), sleeping problems (PSQI), social interaction (SIS), social phobia (SPS) and an overall psychiatric score (SCL-90-R), as well as gambling specific questionnaires (KFG, NODS (life-time/last year), MACS) were compared between the high and low impulsivity group. *Results:* Results show that the high impulsivity group was significantly more burdened in several psychiatric parameters (BDI, STAI-t, PSQI, SIS,

SPS, SCL-90) and in some but not all gambling questionnaires (NODS lifetime, MACS). *Conclusions:* Current results indicate that problem gamblers with high level of impulsivity experience higher craving for gambling and more psychiatric symptoms. This indicates a higher burden of disease in general compared to problem gamblers with low impulsivity level.

PO-25

Impulsivity in Multiplayer Online Battle Arena (MOBA) gamers: Preliminary results on experimental and self-report measures

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Background and aims: Multiplayer Online Battle Arena (MOBA) games have become the most popular type of video game worldwide, overtaking Massively Multiplayer Online Role Playing Games (MMORPGs) and First Person Shooter (FPS) games. However, empirical studies focusing on the use and abuse of MOBA are still very limited, particularly regarding impulsivity which constitutes a hallmark of addictive states but has not yet been explored in MOBA. In this context, the objective of the present study is to explore the associations between impulsivity and symptoms of addictive use of MOBA games in a sample of highly involved League of Legends' (LoL, the most popular MOBA game) gamers. *Methods:* Thirty-six LoL gamers were recruited and completed both experimental (Single Key Impulsivity Paradigm) and self-reported (s-UPPS-P

Impulsive Behavior Scale, Barratt Impulsivity Scale) impulsivity assessments, in addition to assessment of problematic video game use (Problematic Online Gaming Questionnaire). *Results:* Results showed links between impulsivity-related constructs and signs of excessive MOBA involvement. Centrally, impaired ability to postpone rewards in an experimental laboratory task was strongly related to problematic patterns of MOBA game involvement. Although less consistent, several associations were also found between self-reported impulsivity traits and signs of excessive MOBA game involvement. *Conclusions:* Despite preliminary and based upon a small (but representative) sample, the results of the present study highlight potential psychological factors related to the addictive use of MOBA games.

PO-26

Impression management on Facebook with respect to gender stereotypes: relationship with Neuroticism

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Background and aims: This study presents a follow-up study on a previous research on gender and Facebook use, which had shown that adolescents present themselves on Facebook as more sexually undifferentiated than they considered themselves to be. This finding indicates the use of a certain impression management on Facebook profiles. The present study used observer-ratings of a subgroup of these Facebook profiles and matched them with the self-report data of Facebook users, to see if a stronger impression management is associated with higher neuroticism. Users with higher neuroticism were expected to use Facebook more intensively, rate themselves as higher on gender stereotypes and show a greater difference between self- and observer ratings with respect to masculinity and femininity. *Methods:* The Facebook profiles

of 309 adolescents between 12 and 17 years, who provided self-ratings of masculinity and femininity, neuroticism and indicators of FB use, were rated by same-age observers on the Bem Sex Roles Inventory. *Results:* Correlations between self- and observer ratings were found, but observer ratings of femininity were lower than the respondents' self-ratings. Neuroticism correlated with the respondents' higher use of Facebook and more friends, with their self-ratings of gender stereotypes, but also with a greater difference between self- and observer-ratings of masculinity and femininity. *Conclusions:* Respondents with higher neuroticism are more active on Facebook and show a higher impression management on Facebook with respect to gender stereotypes, but want to be seen as less stereotyped (especially with femininity).

PO-27

Psychometric Development of Problematic Stock Trading Scale

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Background and aims: Despite the increasing number of retail investors and growing concern over their addictive behavior over the past few decades, there are no reliable and valid instruments for assessing problematic stock trading. The aim of this study is to develop the Problematic Stock Trading Scale (PSTS), a valid and reliable scale that measures problematic stock trading. *Methods:* A sample of 500 retail investors was used in this study. Twenty-two items (nearly twice the final number of items) were initially selected as preliminary items, based on previous addiction scales such as gambling and substance use disorders as well

as the clinical experience of the experts involved. The final items on the PSTS were determined via exploratory factor analysis. *Results:* The exploratory factor analysis revealed three core factors related to problematic stock trading. The 12-item PSTS consists of five 'Preoccupation' factor items, four 'Risky Investment' factor items, and three 'Cognitive Distortion' factor items. Reliability and external validity were confirmed. *Conclusions:* The present findings highlight the potential use of the PSTS for future research and possibly for clinical application by defining problematic stock trading as a behavioral addiction.

PO-28

Gambling and mental health among college students: evaluation of a stress management intervention

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Background and aims: In France, in 2011, over a third (39%) of 17 year olds said they had played a game of chance and gambling in the last 12 months (Inserm, 2013). Motivations included to cope with stress and to avoid adverse effects associated with stressful events, thus games of chance and gambling may be used as an escape from reality (Inserm, 2008). In an environment where players are often ashamed to consult a professional (Cooper, 2004), psychoeducation via Internet could be an interesting alternative to professional consultation. However, very few studies have examined the use of the Internet in the treatment or prevention of moderate gambling (Zermatten, Jermann, Khazaal, & Bondolfi, 2010). The fact that entry to the university is considered stressful and represents a potentially stressful situation (Boujut & Décamps, 2012; Grebot &

Barumandzadeh, 2005) leads us to carry out our study with students at the university. The main objective was (1) to assess the mental health of students and its possible relationship with gambling and money and (2) to evaluate the effectiveness of a stress management intervention via games. *Methods:* The battery of questionnaire administered via the Internet consisted of: sociodemographic data, Canadian Problem Gambling Index: ICJE, Perceived Stress Scale: PSS 10, Rosenberg Self-Esteem Scale: RSE, Satisfaction with Life Scale in Studies: ESDE, Godin Leisure Time Exercise Questionnaire: GLTEQ, Scaled General Health Questionnaire-28: GHQ-28. The Internet stress management intervention program was based on cognitive behavioral approaches. *Results and Conclusions:* study underway.

PO-29

Childhood maltreatment in behavioral addictions: preliminary data

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Background and aims: Traumatic stress in childhood affects human's development in a detrimental way, e.g. altered stress-response and emotional regulation processes. Compared to the general population, a high rate of childhood maltreatment is reported in psychiatric disorders and especially in substance use disorders (SUD). Less is known about childhood maltreatment in addictive behaviors such as gambling disorders (GD) and internet addiction (IA). *Methods:* This study aims to investigate childhood trauma experience in patients with addictive behaviors (GD, IA), in patients with substance use (heroin dependence) compared to a healthy control group (HC). Childhood maltreatment was measured with the childhood trauma questionnaire (CTQ). *Results:* Participants were 39 outpatients with GD,

20 outpatients with IA and 28 heroin-dependent outpatients in heroin assisted treatment (HAT), recruited from the Department of Psychiatry (UPK) of the University of Basel (Switzerland). 20 healthy controls were recruited from the general population. Significant differences in the total CTQ score and in the categories emotional neglect and physical neglect were found. No significant differences between GD, IA and HAT were found. *Conclusions:* Surprisingly and against the expectation based on the harmfulness of heroin abuse, behavioral addicted patients showed a similarly burden of childhood trauma experiences than patients in HAT. These findings indicate similar predisposition factors involved in the development of SUD and addictive behaviors.

PO-30

Increased brain sensitivity to near-misses in pathological gamblers

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Background and aims: Near-misses during gambling are losing outcomes which come close to a win. These events are known to invigorate gambling behavior. Recent neuroimaging studies have shown that near-misses activate the brain 'reward system' – in particular the ventral striatum – suggesting that their invigorating effect might result from a false sense of reinforcement. Here we investigated whether near-miss-related brain activity is (1) enhanced in pathological gamblers, and (2) modulated by dopamine, which has been linked to reinforcement processes and pathological gambling. *Methods:* Two groups of pathological gamblers ($n = 22$) and healthy controls ($n = 22$) played a slot machine task delivering wins and near-misses in an fMRI scanner. Participants were asked to rate their gambling motivation, and played the task once under placebo and once under sulpiride (dopamine receptor

antagonist) in a counterbalanced manner. *Results:* Behaviorally, gambling motivation was higher in gamblers than in controls. At the brain level, near-misses elicited robust responses in the striatum, which were stronger in pathological gamblers compared to healthy controls. Group differences were specific to near-miss events, as the groups did not differ for win-related activity. However, the results did not show a reliable modulation of near-miss brain responses by sulpiride. *Conclusions:* Our results strengthen the hypothesis that near-misses reinforce gambling behavior by 'hijacking' the reward system, and that this mechanism plays a role in compulsive gambling behavior. The absence of pharmacological modulation by sulpiride, consistent with previous negative results (Porchet et al., 2013), suggests that the reinforcing effect of near-misses does not depend on dopaminergic mechanisms.

PO-31

Technology addiction and alexithymia features in a sample of Italian adolescents

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Background and aims: Difficulties in identifying and describing feelings may be positively associated with addiction to new technologies. Because of their inability to correctly identify and manage emotional states, alexithymic adolescents may overuse technologies to fulfil their unmet social needs. This study aims to investigate the relationship between alexithymia and Internet, games and mobile phone addictions. *Methods:* 230 Italian adolescents (51.74% males; age range = 13–20 years, mean = 15.86 ± 1.30 years) were recruited from public middle schools located in Rome (Italy). Participants completed measures assessing multiple addictions (Shorter PROMIS Questionnaire, SPQ), mobile phone use (Mobile Phone Questionnaire, MPQ) and

emotional regulation (Toronto Alexithymia Scale, TAS-20). *Results:* Approximately 51.74% of adolescents (26.52% males) were at risk for one or more addictions on SPQ scales. Findings show significant positive correlations between TAS-20 total score and SPQ game addiction scale ($r = .253$; $p < .001$), SPQ Internet addiction scale ($r = .297$; $p < .001$) and SPQ mobile phone addiction scale ($r = .423$; $p < .001$). Furthermore, correlations between sleep disturbances related to mobile phone use and SPQ total score ($r = .262$; $p < .001$) were found. *Conclusions:* Overall, findings provide important evidence on the association between technological addiction, mobile phone-related disturbances and alexithymic features in adolescence.

PO-32

Is there a Link Between Obsessive Compulsiveness and Exercise Addiction?

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Background and aims: Early research suggests that exaggerated exercise is linked to obsessive-compulsiveness (Davis et al., 1995). In this survey-research, we studied the relationship between exercise addiction, high-intensity exercising, and obsessive compulsiveness. *Methods:* An online sample of 401 men ($n = 198$) and women ($n = 203$) volunteers (mean age = 27.7 (SD = 9.0) years) completed a demographic questionnaire gauging their exercise habits. Their obsessive compulsiveness (OC) and exercise addiction (EA) were also assessed with two common

psychometrically validated instruments. *Results:* Those who reported exercising at high intensity scored higher on EA ($p = .009$), but not on the OC scale. A simple linear regression was calculated to predict EA based on OC that yielded a statistically significant regression equation ($F(1,399) = 12.52$, $p < .001$), but with a low $R^2 = .030$. Another linear regression testing the predictive power of the weekly hours of exercise on OC was statistically not significant. *Conclusions:* The results show that those reporting high intensity exercise habits exhibit higher EA than those

exercising at low intensity. The findings also indicate that EA shares little common variance (3.0%) with OC. The latter is also unaffected by high intensity exercising, nor is it

related to the total weekly volume of exercise. In conclusion, OC and EA appear to be two relatively unrelated constructs in exercise behavior.

PO-33

Relationship Between Susceptibility to Exercise Addiction and Physical Appearance

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Background and aims: The ‘‘Adonis Complex’’ (AC) is a strong concern with the physical appearance (Pope et al., 2002). Its severity may be linked to exaggerated volumes of physical activity and exercise addiction (EA) especially in body builders. Here we tested the link between AC and EA in body builders in contrast to soccer players, who represented an athletic control group. *Methods:* Regularly training male subjects ($n = 152$, mean age = 24.0, SD = 6.0) completed the Spanish versions of the Exercise Addiction Inventory (EAI – Szabo et al., 2013) and the Adonis Complex Questionnaire (ACQ – Latorre-Román et al., 2014) in their training environment. *Results:* Body builders scored higher on the ACQ in contrast to soccer players ($p < .001$), while an opposite trend emerged for EAI

($p = .089$). These results confirmed the difference between the two athletic groups. A simple linear regression was calculated to predict EA based on AC that yielded a statistically significant regression equation ($F(1,151) = 31.2$, $p < .001$) with an $R^2 = .172$. However, with statistically significant two separate regression equations ($p < .001$) the R^2 for body builders alone was .461, and .140 for soccer players. *Conclusions:* These findings confirm that the AC in body builders is higher than in soccer players. They also confirm that nearly half (46%) of the total variance in EA is accounted by AC in the former group. Future studies examining EA should keep in perspective that the key reason for EA in body builders may be linked to the subjective perception of the physical self.

PO-34

Characteristics of self-identified patients with sexual addiction in an outpatient clinic

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Background and aims: Research on sexual addiction (SA) has flourished during the last decade, supported by the development of Internet and online sexual activities (e.g., sex chat and webcam, free access pornography). However, despite the increasing number of SA researches, few empirical data are available on the characteristics of treatment seeking self-defined ‘‘sex addicts’’. The purpose of this study is to describe the characteristics, habits, and comorbidities in a sample of people seeking-treatment in a specialized outpatient program. *Methods:* This study included 72 patients who consulted the Department of Addictology and Psychiatry in the University Hospital of Nantes (France) from April 2010 to December 2014. Measures included self-reports and hetero-questionnaires

completed by a psychologist of the outpatient program. *Results:* The majority of the 72 patients were middle-aged (M: 40.33; SD: 10.93) men consulting mainly for hypersexuality, risky sexual behaviors, and overuse of cybersex. Some patients presented paraphilia and sexual dysfunctions. The majority of the sample presented comorbid psychiatric or addictive diagnosis, low self-esteem, and a history of trauma. *Conclusions:* The current study highlighted that SA is related to heterogeneous risk factors (e.g., traumatic events, comorbid states, psychosocial variables) often characterized by multiple SA-related behaviors, whose interrelations are complex. Treatment programs should take into account this heterogeneity and favor tailored rather than standardized.

PO-35

Addictive features, aggression and empathy in excessive users of first person shooter games

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Background and aims: The question whether playing First-Person-Shooter games (FPS) has an effect on real aggressive behavior, has not been answered conclusively and is still controversially discussed. In this context, there is a lack of knowledge, in how far quantitative aspects of excessive use of FPS are of concern. The presented study deals with addictive features of excessive users and their

relation to factors of aggressiveness and empathy. *Methods:* A group of 25 young men playing FPS at least 4h/d during the preceding 2 years were examined psychometrically and compared with male controls equally distributed in terms of sex, age and education. *Results:* The excessive users (mean age 23.5 years) mainly play online-FPS and exhibit significantly higher values for Internet addiction on the

German Internetsucht Scale (ISS) than the control group. Within the group of excessive players the ISS-values correlate positively with the global scale of the factors of aggression questionnaire (FAF). The findings are complex concerning aspects of aggressiveness and empathy. For the excessive users the results of the FAF-subscale for aggressive inhibition and for the Eysenck Empathy Scale are significantly lower and correlate with each other positively.

The 8 excessive players (32%), who fulfilled the criteria for Internet addiction, showed significantly higher scores for spontaneous aggression, hostility and antisocial tendencies. *Conclusions:* The results suggest that online-FPS contain an addictive potential. This has to be taken into account when further discussing violent video games' effects on aggressiveness in terms of treatment, and further research and prevention.

PO-36

Are all compulsive buyers created equal? The speed of automatic activation of coping versus enhancement motive of buying

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Background and aim: Although psychiatric research on compulsive buying exclusively focuses on coping motive (i.e., the need to escape negative affect; Black, 2007; Faber and O'Guinn, 2007), social psychological and consumer research suggests that the motive of approaching ideal self and positive feelings (i.e. enhancement motive) may be important for some compulsive buyers (e.g., Dittmar, 2005). Although the possibility that compulsive buyers may consist of subgroups that differ in needs and motives has recently been raised (e.g., Mueller et al., 2013; Yi, 2013), extant findings have been limited to self-report methodology. Applying response time techniques used in cognitive psychology, we hypothesize that brief exposure to negative affect words (versus positive affect words) will more strongly activate the concept of buying (versus the control

concept) among buyers with a strong escape buying motive, whereas this tendency will be minimal among buyers with a strong enhancement motive. *Methods and Results:* 50 compulsive buyers and 50 control individuals participated in a lab experiment. Coping and enhancement motives were measured with a scale derived from Gambling Motive Questionnaire. A primed version of the Stroop task (Segal et al., 1995) was used to measure the speed with which affective words (i.e., prime: positive vs. negative) activated the shopping versus control concept to the millisecond accuracy. Data collection has just terminated and analyses are underway. *Discussion and Conclusion:* Our finding would support the idea that coping motive may not be shared by all compulsive buyers and that some of them may have strong enhancement motive instead.

PO-37

A clinical approach towards problem gamblers' concerned significant others: Demographic and clinical features

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Background and aims: Scientific literature shows that problem gambling (PG) affects not only player but also people who are close to them. The impact is economic, emotional and social. Some studies suggest that involving one or more "Concerned significant other(s)" (CSO) in the treatment shows changes in the behavior of the problem gambler (such as decrease in gambling) and also in the family system (such as better communication and decreased violence). The aim of this presentation is to document the socio-demographic and clinical characteristics of CSOs who have received support from a specialised programme, and to discuss the principal forms of support. *Methods:* Data were collected from the medical records of CSOs (N = 74)

receiving treatment at the Centre du jeu excessif between 2003 and 2015. *Results and discussion:* The socio-demographic characteristics (gender, age, relationship to problem gambler) of consulting CSOs will be presented as well as certain clinical characteristics such as crisis preceding first consultation, debt, nature of request, parallel support for the gambler. The preliminary results suggest that CSOs have varied needs, calling for flexible support coordinated with that of the person with PG. The reception of CSOs should become a systematic part of treatment for PG. Research on the impact of these interventions should receive more attention.

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