

Neuropsychology

SPONSORED SYMPOSIUM

SPS14

Artificial living environment and Mind (Symposium sponsored by Hitachi, Ltd., Research & Development Group)

Organizer: *Atsushi Maki Hitachi, Ltd., Research & Development Group, Japan*
Session Abstract:

As computational power and data accumulation continue to increase Moore's Law, and technology continues to evolve, humans are faced with an increasing dramatic change in their living environment as symbiosis with machines progress. At the same, psychiatric disease continues to present a major unresolved issue in this modern society. Elucidation and empowerment of the mind needs to be accelerated in order to help people cope with these changes. In this symposium, the first theme is the role of neuroimaging technology for elucidating mental states. The second theme is the reciprocal impact of machine, living environment, society, the mind and the brain. The third theme is the development of an even more effective mind empowerment method which will help us adapt our behavior in this changing world. Human security and well-being in this artificial human-created environment will be discussed from the view point of technology for mind and quality of life.

Development of Mind-Scope and Mind Centric Environment

Atsushi Maki Hitachi, Ltd., Research & Development Group, Japan

Our living environment has been becoming dramatically changing with IT, wearable devices, automatic machines, new materials and new chemical substances are rapidly spread. The assessment of living environment becomes more and more important by the understanding interaction effects between human and spreading artificial living environment. On the other hand, the brain mechanism has been quantitatively elucidated by the development of various technologies which can digitize the human activities. From these backgrounds, neuropsychology must play the role of core for the building of mind centric environment in order to realize the human security and well-being. In this symposium, optical topography which can measure easily brain activity based on near infrared spectroscopy, its applications on medicine and neuroscience, and industrial activity based on neuropsychology are introduced. As future topics, the development of Mind-scope and mind centric environment with multidisciplinary approaches will be discussed.

Stimulating the typical and atypical brain to improve learning and cognition

Roi Cohen Kadosh University of Oxford, United Kingdom

Present understanding of learning and cognition derives mainly from behavioural studies, with a recent surge in the use of neuroimaging to obtain biological correlates. Though useful, the capacity for these techniques to provide evidence of causality is limited. A method that permits causal inferences in brain-behaviour relations is transcranial stimulation. A relatively recent method is the application of a mild, non-invasive electrical current to the human scalp to affect brain functions and influence behaviour. I will present a series of experiments on healthy young adults which demonstrate the potential of brain stimulation to alter neurochemical concentrations, brain structures, and functions, as well as improving learning and cognition. I will conclude by showing how these results serve as the theoretical bases for a proof-of-concept study that examines the potential of brain stimulation to improve learning and cognition in children with learning disabilities.

The Neural Basis of Changing Social Norms through Persuasion

Kenji Matsumoto, Yukihito Yomogida Tamagawa University Brain Science Institute, Japan

Changes in social norms dramatically shapes our social environment and plays a significant role in cultural evolution. In most modern societies, norms change through interpersonal communication and persuasive messages found in media. Here, we examined the neural basis of persuasion-induced changes in attitude toward and away from norms using fMRI. We measured brain activity while participants were exposed to persuasive messages directed toward specific norms. Persuasion directed toward social norms specifically activated a set of brain regions related to social/moral cognition. Beyond these regions, when successful, persuasion away from an accepted norm specifically recruited the left middle temporal and supramarginal gyri. Furthermore, in combination with data from a separate attitude-rating task, we determined that the left supramarginal gyrus tracked the degree of disagreement with accepted norms, suggesting that its role in the norm-changing process may be to represent how opposed we are to a given social norm.

Evolutionary and comparative cognitive neurobiology of human and non-human primates: Interaction of neural, cognitive and ecological niches

Atsushi Iriki RIKEN BSI, Japan

Human evolution has involved a continuous process of addition of new kinds of cognitive capacity. The dramatic expansion of their brains that accompanied additions of new functional areas would have supported such continuous evolution. Extended brain functions have driven rapid and drastic changes in the ecological niche of human ancestors, which in turn demanded further brain resources to adapt to it. In this way, humans have constructed a novel niche in each of the ecological, cognitive and neural domains, namely, "Triadic Niche Construction". I will advance a speculative argument about the origins of its neurobiological mechanisms, as an extension with wider scope of the evolutionary principles of adaptive function in the nervous system of the non-human primates. Neurobiological mechanisms to acquire novel tool-use skills would shed light on such properties of human intelligence developed through the course of evolutionary processes.

INVITED ADDRESS

IA082

Imagine that! The theoretical and neural basis for how rats make decisions under conditions of perceptual ambiguity

Aaron P Blaisdell UCLA, United States of America

When we open our eyes, we see a world filled with objects and events. Yet, due to occlusion of some objects by others, we only have partial perceptual access to the events that transpire around us. I will discuss work from my lab showing that rats can use imagery to fill in missing details of the world that are expected but hidden from perception. My lab has found that rats make use of an active expectation (i.e., an image) of a hidden visual event. I report experiments testing theoretical accounts for decision making under conditions of perceptual ambiguity, and investigating the neural systems involved in the use of imagery by rats. Collectively, these studies offer insights into the cognitive and neural mechanisms that mediate the flexible use of an image during ambiguous situations.

IA083

Validating endophenotypes for schizophrenia spectrum disorders: Evidence from neurological soft signs

Raymond Chan Institute of Psychology, Chinese Academy of Sciences, China

Increasing efforts to identify alternate expressions of mental disorders that are broader than the DSM or ICD diagnostic criteria needed to diagnose them reflects a growing consensus that multidimensional expressions of psychiatric disorders may advance the search

for underlying etiological or modulatory factors. These alternate phenotypes (endophenotypes) of disorders may be more specific and amenable to objective measurement than clinical symptoms, which presumably reflects variation among smaller numbers of genes than more distal clinical symptoms. These features support the current usefulness of endophenotypes in genetic studies, and their potential usefulness in the development of strategies for early intervention. In this talk, I present evidence of validating a promising endophenotype for schizophrenia spectrum disorder, the neurological soft signs, with an emphasis on key conceptual criteria for assessing endophenotypes, including their relationships to schizophrenia, to non-psychotic relatives, and to heritability. Future directions for establishing the validity of endophenotype research are also discussed.

IA084

Emotion evokes anticipation: Event-related potential and fMRI studies

Yasunori Kotani (1), Yoshimi Ohgami (1), Shigeru Kiryu (2), Yusuke Inoue (3)
1. Tokyo Institute of Technology, Japan; 2. The University of Tokyo, Japan; 3. Kitasato University, Japan

The human brain activates even before a stimulus if a person knows that the stimulus will be presented in the near future. We call this psychological function as "anticipation". Conventionally, the brain mechanism of anticipation has been investigated using the stimulus-preceding negativity (SPN) that is a type of event-related potentials (ERPs). In this talk, the following topics will be introduced: 1) the history of ERP research on anticipation, 2) the role of emotion that enhances anticipation, 3) anticipation for different emotive stimuli (face, word, or symbol), and 4) the studies combining the fMRI and the ERP to reveal the neural mechanism of anticipation. In addition to these topics, the involvement of the salience network, particularly the right anterior insular cortex, in anticipation process will be discussed considering the role of emotional valence of the anticipated stimulus.

THEMATIC SESSION

TS094

What kind of neuropsychological approaches are effective in each remission stage of brain injury?

Organizers: Yukari Hashimoto (1), Mitsuyo Shibasaki (2)
1. Fukuyama University, Japan; 2. Meisei University, Japan
Discussant: Mitsuyo Shibasaki

Meisei University, Japan

Session Abstract:

Since common cognitive and social problems addressed by patients with brain injuries are different depending on each stage, so

are the corresponding neuropsychological approaches. When we think of the recovery process in a patient with a brain injury, the treatment should move sequentially from the acute stage to the chronic stage. This symposium invites three neuropsychologists to summarize and share the kind of problems patients have in each stage and discuss the effective approach for each stage in the perspective of assessment and rehabilitation. For example, in the acute stage, although there is need for earlier rehabilitation, more research into this approach must be addressed. In the convalescent or chronic stage, more effective rehabilitation techniques have to be considered in order to support the patient's ADL once they leave the hospital. In conclusion, we must consider the gradation of neuropsychological approaches and discuss the issues concerning the continuity of treatment.

The role of neuropsychological approaches in acute and subacute injury phases

Fumiko Anzaki Yamato University, Japan

Two patients are studied to suggest effective approaches in acute and subacute injury phases. Case 1: After a traffic accident, he underwent a craniotomy for removal of a hematoma and remained in a coma for one month. His brain lesions were in the right broad area. After his recovery from coma, his attention was limited to ten minutes. Attention Process Training was administered, and short-term intervention improved his attention. Case 2: After a traffic accident, he underwent conservative remedy in cerebral surgery. His brain lesions were in the bilateral superior frontal gyri. He demonstrated independence in daily living, and his intellectual level was superior. He was discharged after 10 days. However, the hospital staff could not notice any changes in his personality. Attention training is the first choice for patients with severe cognitive dysfunction. Strengthening powers of observation benefits patients with personality dysfunction.

What should we do in the neuropsychological rehabilitation of convalescent stage?

Makoto Ozeki Kumaoto rehabilitation hospital, Japan

In the convalescent stage for people with cognitive impairments the main aims of rehabilitation are to enhance the recovery of cognitive function, assist in the acquisition of cognitive compensation, develop patients' awareness of cognitive decline, and also to increase the chance of community integration. At the same time, it is necessary to build a basis for success in the chronic stage, and it is effective in the long-term perspective. Family is also important in improving a patient's impairment and in preventing psychosocial problems. It is

critical that the staff involved in the convalescent stage work collaboratively with family. I will discuss cases in light of these aspects.

The objectives of neuropsychological approaches for patients with chronic stage brain injury

Kozue Sawada Hiroshima Prefecture Rehabilitation Center, Japan

For patients with chronic stage brain injury, the most important goal in cognitive rehabilitation is to achieve continuous participation in the community. In this stage of rehabilitation, the neuropsychological approaches follow three important objectives: 1) improvement of cognitive function, 2) training the patients to use compensatory behavior in real life, 3) making supportive environment for patients in their community. In order to achieve these objectives in cognitive rehabilitation, psychologists and/or other health care professionals should make the patients, their families and the community aware of the abilities and disabilities facing patients with this kind of impairment. Based on the clinical experiences of this presenter, this symposium will focus on discussing current issues, trends and future prospects relating to cognitive rehabilitation in chronic stage brain injury.

TS095

Axes in our mental time: is there any unique time axis for mankind?

Organizer: Shigeru Kitazawa Osaka University, Japan

Discussant: Yukio Otsu

Meikai University, Japan

Session Abstract:

We refer to the awareness of time, over the past, present and future, as the "mental time". The mental time is a cognitive function that has been evolved in humans in particular. However, recent studies have shown that animals other than humans are also able to memorize an episode with a single exposure, and that some are able to plan for the future. These findings suggest that there is no critical difference between the mental time in the human and those in other species. In this symposium, four speakers present empirical data on the mental time in apes (Satoshi HIRATA), rodents (Yuji IKEGAYA), monkeys and human (Shigeru KITAZAWA) as well as deficits in age awareness found in human patients (Mitsuru KAWAMURA). These data will be discussed in terms of three different time axes (speech time, reference time, and event time) that are discriminated in linguistics (chaired by Yukio OTSU).

Apes remember a movie story

Satoshi Hirata, Fumihiko Kano Kyoto University, Japan

We developed a novel eye-tracking task to examine great apes' anticipatory looks to

the events that they had encountered one time 24-hour earlier. Half-minute movie clips depicted novel and potentially alarming situations to the participant apes. In the Experiment 1 clip, an aggressive character came out from one of two identical doors. While viewing the same movie again, apes anticipatorily looked at the door where the character would show up. In the Experiment 2 clip, the human actor grabbed one of two objects and attacked the character with it. While viewing the same movie again but with object-location switched, apes anticipatorily looked at the object that the human would use. Our results show that great apes, just by watching the events once, encoded particular information (location and content) into long-term memory and later retrieved that information at a particular time in anticipation of the impending events.

Autobiographical age awareness disturbance (AAAD) syndrome in autoimmune limbic encephalitis

Mitsuru Kawamura, Takeshi Kuroda, Akinori Futamura, Azusa Sugimoto, Akira Midorikawa, Motoyasu Honma
Showa University, Japan

Autobiographical memory is a form of episodic memory characterized by a sense of time and consciousness that enables an individual to subjectively re-experience his or her past. As part of this mental re-enactment, the past is recognized relative to the present. Dysfunction of this memory system may lead to confusion regarding the present perception of time. Two Japanese women (42 and 55 years old) temporarily believed they were living in their past during a course of autoimmune limbic encephalitis. Their autobiographical memories and behaviour reflected their self-estimated age, and they could not recall memories experienced beyond that age. More surprisingly, their subjective age estimations and autobiographical memories were transiently corrected when they were made aware of their true age. Neuroimaging suggested disturbances in medial temporal and orbitofrontal brain regions in both cases. This is the first report to focus on the relationship between subjective temporal orientation and self-awareness

Where tactile signals are ordered in time –a comparison among species

Shigeru Kitazawa *Osaka University, Japan*

We found in humans that crossing the arms caused misreporting of the temporal order of successive tactile stimuli that were delivered one to each hand. The result suggests that the tactile signals are ordered in time only after they were localized in space. The claim was later supported by a functional imaging study. By contrast, Japanese monkeys were free from the reversal due to arm crossing. Mice that were trained to discriminate between the orders of

air-puffs delivered to the whiskers expressed c-FOS in layers II-III of the barrel cortex. The results suggest that the mice and monkeys depended on information in the primary sensory cortex where tactile signals were still represented in skin coordinates. We speculate from the difference among species that humans have a particular tendency to isolate events from a sequence of raw sensory signals so that they are localized in space and then ordered in time.

Hippocampal ripples as mechanisms underlying memory formation and extinction

Yuji Ikegaya *University of Tokyo, Japan*

Memories advance time in mind. This insight derives from the clinical evidence showing that patients with memory deficits cannot identify the present time and often lose the sense of time passage. Our study has focused mainly on two points. (1) We study the mechanisms underlying time modulation during ripples. Ripples are oscillations in the hippocampus and contributes to memory consolidation. We will investigate how neurons are selectively reactivated during ripples and how neural information is transformed through this reactivation. (2) We study the mental time of animals. Episodic memory is fundamental to the self-consciousness of humans and mediates mental time travel. However, it is unknown how the brain has developed the concept of "when," which is one of the factors that support episodic memory, through long-term evolution. Out of these two projects, I will explain the former one, that is, our recent findings about the function of ripples.

TS096

Cognitive remediation therapy for schizophrenia

Organizer: Mie Matsui *University of Toyama, Japan*

Discussant: Matthew Kurtz

Wesleyan University, United States of America

Session Abstract:

Cognitive impairments in schizophrenia are evident in a wide range of domains, including attention, memory, and executive functions. Recently, cognitive remediation of training for schizophrenia has been developed as a psychosocial therapeutic approach to directly address as a behavioral training-based intervention that aims to improve cognitive processes with the goal of durability and generalization. The ultimate goal of cognitive remediation is to improve the functional outcome. Several approaches have been reported and have different methods of cognitive remediation, evaluations of outcome studies, and various outcome indices. Cognitive remediation differs according to whether specific cognitions are targeted, and whether a method takes a compensatory or restorative approach. In this symposium we introduce different

methods of cognitive remediation which demonstrated each effect: Neuropsychological Educational Approach to Cognitive Remediation (NEAR), Cognitive, computer-aided training program (CogPack), Compensatory Cognitive Training (CCT) and Meta-Cognitive Training (MCT) and discuss the characteristics and outcomes.

Neuropsychological Educational Approach to Cognitive Remediation (NEAR)

Mogami Tamiko *Tottori University, Japan*

NEAR was developed as a tool to improve cognitive dysfunctions of people with schizophrenia. This method pays attention to the motivational aspects of engagement with cognitive tasks. Many people with schizophrenia tend to have problems with motivation, which in turn affects how they approach cognitive tasks. In an effort to help patients gain motivation for tasks, NEAR uses techniques such as shaping, errorless learning, contextualizing, personalization, and learner control. Many of these tasks are presented on computers, with involvement of mental health professionals who observe and provide feedback to patients' task execution, and make treatment plan. Transfer of skills occur when what one learned in cognitive session are applied in everyday situations. Bridging session is used to facilitate the transfer of learning. NEAR is typically conducted as a group, while allowing for individual task selection and progress.

Compensatory cognitive training for schizophrenia

Mie Matsui, Sadao Otsuka, Takatoshi Hoshino, Kayoko Miura, Michio Takahashi *University of Toyama, Japan*

Although cognitive remediation or training for schizophrenia has been developed, few studies on the subject have focused on Japanese patients. The aim of the present study was to examine the effectiveness and applicability of compensatory cognitive training (CCT) in Japanese patients. Participants diagnosed with schizophrenia were assigned to either the CCT plus treatment as usual group or to the treatment as usual alone group. CCT is a 12-session, manualized, group-based training that coaches compensatory strategies in four cognitive domains (prospective memory, attention, verbal memory, and executive functions). Cognitive, functional, and clinical symptom measures were implemented at baseline, post-treatment, and 3-month follow-up. This study suggests that CCT has beneficial effects on cognitive performance, improving functional outcomes in Japanese patients. Additionally, the high degrees of attendance rates and level of satisfaction rated by the CCT participants ensure the applicability of this methodology to this population.

Pilot trial of the Japanese version of Metacognitive Training

Akiko Kikuchi (1), Sato Sayaka (1), Yoshida Motoko (2), Koyama Mayuko (1), Kono Toshiaki (1), Ishigaki Takuma (3), Nakagome Kazuyuki (2) 1. National Institute of Mental Health, Japan; 2. National Center of Neurology and Psychiatry Hospital, Japan; 3. University of Tokyo, Japan

Research has shown that patients with schizophrenia show various cognitive biases such as jump to conclusions (JTC), external attribution, in relation to their positive symptoms. The Metacognitive training (MCT) (Moritz et al., 2007) was developed to improve metacognition on the dysfunctional aspect of such biases. In the present study, outpatients with schizophrenia were randomly allocated to either the Japanese version MCT (Ishigaki et al., 2012) or a treatment as usual (TAU) waitlist group. Baseline and post assessments were performed blind to the allocation status except for the PANSS. Interim analysis has suggested significant improvement on the JTC in the MCT group relative to the TAU group. No difference were found in the PANSS, cognitive flexibility (BCIS), and positive symptom distress (PSYRATS). Scores of the Intrinsic Motivation Inventory was significantly higher in the MCT group. Clinical implications of MCT-J in the Japanese outpatient context will be discussed.

Effects of the program that combined cognitive rehabilitation and supportive employment-RCT study about Thinking Skills for Work in Japan

Sayaka Sato (1), Sosei Yamaguchi (1), Michiyo Shimodaira (2), Ayano Taneda (1), Ken Ichikawa (3), Naoko Satake (4), Masuhiro Sakata (4), Msaaki Nishio (5), Emi Ikebuchi (6), Junichiro Ito (7) 1. National Institute of Mental Health NCNP Japan, Japan; 2. Home visit nursing station ACT-J, Japan; 3. Division of health services promotion the university of Tokyo, Japan; 4. National Center Hospital NCNP Japan, Japan; 5. Department of Social Welfare Tohoku Fukushi University School of Welfare, Japan; 6. Department of Psychiatry Teikyo University School of Medicine, Japan; 7. Clinic for mental health SI PUO FARE, Japan

The objective of this study was to examine effects of Thinking Skills for Work (TSW) program in Japan (study 1), weights of contributions about Cognitive Remediation (CR) and Supported Employment (SE) for the employment rate (study 2). For study 1, participants (n=94) were randomly assigned to the TSW group or the Traditional Vocational Services (TVS) group. Clinical and vocational related outcomes have examined. For study 2, the regression analysis was conducted to examine

weighting coefficients. We used the employment rate as the objective variable and the amounts of change of neuro-cognitive functions and the presence or absence of SE as explanatory variables. From results of these analyses, TSW a program appears to be effective not only for cognitive functioning but also for working outcomes. I also would like to discuss how CR and SE have impacted on the employment rate respectively basing on the results of study 2.

TS097

Do neuropsychological case studies belong to the past? Why are case studies majorities in Japan?

Organizer: Akira Midorikawa Chuo University, Japan

Discussant: Mie Matsui
University of Toyama, Japan

Session Abstract:

In neuropsychology, clinical case studies with brain-damaged patient had contributed to the growth of neuropsychology. For example, one of the most important case reports was about a patient (H.M.) who developed dense amnesia after resection of the medial temporal lobes. After his report, our knowledge about memory system had much progressed. However, in these days, mainstream of the neuropsychological studies have shifted to group studies or imaging studies. In contrast to the trend of international neuropsychological studies, a lot of neuropsychologists in Japan have remained unchanged. In annual meeting of Japanese neuropsychological association, for instance, the majority of the presentations were single case reports. In the symposium, we will focus on the difference between Japanese and international trend of neuropsychology and discuss about the difference from perspectives of cultural difference, educational system and the future of neuropsychology.

The current state of neuropsychology in Japan

Akira Midorikawa Chuo University, Japan

As a form of scientific research, case studies usually include little evidence. Therefore, it is almost impossible to publish a single case report in a major international journal. Similarly, relatively few single case reports are presented at international neuropsychology conferences. On the other hand, many single case studies are published in journals and reported at conferences in Japan. In this session, I introduce the current state of neuropsychology in Japan and discuss it from the perspectives of the cultural and educational systems.

Research and educational environment for Japanese neuropsychologists

Shinichi Koyama Chiba University, Japan

In these days, the mainstream of the neuropsychological studies have shifted from single-case studies to group studies or imaging studies. Despite the international trends, single-case studies are still majorities in Japan, because of its strength and research/educational environment for Japanese neuropsychologists. In my talk, I will introduce single-case and group studies conducted by our group (e.g., Koyama et al. 2006 "The evaluation of cerebral dyschromatopsia using color afterimage", Koyama et al. 2013 "Selective impairment of race perception following bilateral damage in the fusiform and parahippocampal gyri", and Koyama and Kawamura 2007 "Persistent visual aura following catheter ablation in a patient with WPW syndrome") and other groups in Japan, and report how the studies were conducted in collaboration with medical doctors. Finally, I will discuss the strength, issues, and the future of single-case studies and research and educational environment for Japanese neuropsychologists.

Neuroimaging of single cases: when is once enough?

Ramon Landin-Romero Neuroscience Research Australia/UNSW, Australia

From the behavioural changes of Phineas Gage to the amnesia of HM, single patients have been extremely influential in neuroscience. In current times when neuroimaging studies are omnipresent in the neuroscience literature, can single case studies still offer potential to advance our understanding of brain disorders? Neuroimaging studies typically involve a comparison between groups of individuals. This approach, however, does not allow inferences to be made at the individual level. Conversely, single-case studies involve comparisons between a single subject and a control group. However, the interpretation of the results is problematic since the observed differences might be driven by individual variability in neuroanatomy rather than the neuropathology of the disease under investigation, or might represent a false positive due to the data being sampled from non-normally distributed populations. In this talk, the methodological problems of neuroimaging in single cases and guidelines to conduct relevant single case research will be discussed.

ORAL PRESENTATION

OR1568

The role of culture and psychoeducation in definition of stroke symptoms, treatment selection and perceived recovery: A case study of the Ghanaian stroke patient.

Delphine Bruce (1), David L Sam (2), Adotey Anum (1), J Y Opoku (1), Samuel A Danquah (1) 1. University of Ghana,

Legon, Ghana; 2. University of Bergen, Bergen, Norway

Background: The cultural meanings applied to sickness determine the selection of treatment options (Fabrega, 1974). The aims of the study were: (i) to investigate the extent to which culture influence experiences of perceived symptoms, selection of treatment options. (ii) To examine the role of psychoeducation in reducing healer shopping behavior, increasing compliance and perceived recovery. Method: 24 post-stroke patients who have been taken through 7-week of neurocognitive rehabilitation and psychoeducation were interviewed before intervention and five-week post-intervention to determine the role of culture and psychoeducation in symptoms definition, treatment selection, and perceived recovery. Results: Some stroke patients regardless of their level of education perceived stroke as a curse from gods in punishment for wrong doing. Neurocognitive Rehabilitation when combined with psychoeducation effectively reduced apprehension about recovery, negative perceptions about stroke cause, healer shopping behaviours, and increase compliance in participants. Participants also reported perceived improvement in cognition, emotion and general well-being.

OR1569

Do tests of pre-morbid ability feature a Flynn effect?

Simon F Crowe, Stephanie Watt, Bennie Gow, Kate Norton La Trobe University, Australia

Performance on intelligence tests significantly increases over time, a phenomenon labelled the Flynn effect. This study investigated whether a Flynn effect would be observed in tests used to estimate premorbid ability. It was hypothesised that the four tests of premorbid functioning (NART, NART-2, WTAR and TOPF) which were normed to predict each of the last four revisions of the Wechsler scales would predict different IQ scores, with the NART predicting the highest scores, followed by the NART-2, the WTAR, with the TOPF predicting the lowest scores. A range of premorbid and literacy tests were administered to 95 male and female participants aged between 18 and 65. The results indicated that there was a Flynn effect noted with the pre-morbid estimates supporting the hypotheses. The implications for these findings indicate that the Flynn effect must be controlled for in estimating pre-injury level of functioning.

OR1570

CROSSED LATERALITY IN PARKINSON DISEASE

Nina N Danilova (1), Janna M Glozman (1), Marina R Nodel (2), Nikolay N Yakhno (2) 1. Moscow State University, Russia; 2. Department of Neurology, Moscow Medical University, Russia

Aim. Human laterality - a preference or higher locomotive or sensor performance is a multidimensional trait (Rigal, 1992). Few studies focused on the link between crossed laterality and brain pathologies, like Parkinson's disease (PD) causing both motor and cognitive disturbances. The aim of the study was to precise brain mechanisms of PD through its comprehensive (neuropsychological, psychophysiological and neurological) study. Material and methods. 11 PD patients (4 males and 7 females, 47–68 years old, all right handed) with initial stage of disease (1 and 2 upon Hoehn-Yahr) had a comprehensive neuropsychological and neurological assessment using Luria's battery, laterality profile, EEG registration, Stroop test, depression, anxiety and apathy measures. Results All but one patients had crossed laterality. Types of crossed laterality differently correlated with patterns of cognitive, emotional, psychophysiological and neurological symptoms. Conclusion Crossed laterality is a significant pathological factor The study is founded by RSF project #14-18-03253

OR1571

Investigation of Voltage Value Changes on Human Brain during Video Gaming. A Brain Capacitometer Study

Rizki Edmi Edison (1,2), Yayu Hizza Anisa (2), Muhammad Fathul Ihsan (1), Rizki Nurfauzi (1), Rizky Maharani (1) 1. CTECH Labs Edwar Technology, Indonesia; 2. HAMKA Muhammadiyah University, Indonesia

Human brain activities in video gamings had been studied by using many kinds neuroimaging such as EEG and fNIRS. Electric-field-based neuroimaging is a novel emerging method of functional neuroimaging that particularly suited to clinical neuroscience research. It has major advantages like non-invasive and real time measurement. In this study we investigated for the first time the voltage value changes of adolescent while playing video game. Two-electrodes brain capacitometer was placed over Fp1 region, which represent prefrontal cortex of left hemisphere, during video gaming. We found same pattern of voltage value changes in two kinds of video games played. Both of them showed increase of voltage value in tasking period followed by decrease of voltage value on resting period. Based on this study, we propose that voltage value changes detected by brain capacitometer would be an alternative method to assess brain activity during video gaming.

OR1572

CASE REPORTS: TRY OUT OF SMART PHONE APPLICATIONS FOR NEURO-PSYCHOLOGICAL

REHABILITATION IN TRAUMATIC BRAIN INJURY

Yashodhara Kumar G. Y. (1), Venkatesan S (2), Lancy D' Souza (3) 1. All India Institute of Speech and Hearing (AIISH), India; 2. All India Institute of Speech and Hearing (AIISH), India; 3. University of Mysore, Mysore, India

Traumatic Brain Injury (TBI) results in impairments to several neuro-cognitive functions that impact the social-occupational functioning of affected individuals. While traditional procedures have shown improvements in cognitive status of such patients following therapy, the use of assistive technology for neuro-rehabilitation is not fully explored. This study uses a pre-post test based randomized case study design to evaluate the effectiveness of smart phone applications for cognitive training in TBI. Six such participants in 17–29 years age range were assessed on an idiomatically based battery of neuropsychological tests before initiating the tailor made intervention based on smart phone gaming applications spread over 3 hourly sessions each day and extended over 2 months. The qualitative reports from caregivers on daily life functioning and quantitative test scores gained between pre-post intervention phase reflect significant gains. The promise and challenges in using assistive technologies for improving cognitive-behavioral functioning in persons affected by TBI are discussed.

OR1573

Loss of Glial cells of the hippocampus in a rat model of post-traumatic stress disorder

Fang Han, Jiang Jingzhi, Shi Yuxiu China Medical University, China

Single prolonged stress (SPS) rats is a rodent model of post traumatic stress disorder (PTSD). Abnormal hippocampal morphology and function were found in the PTSD patients. Our previous study has shown that SPS induce loss of hippocampal neurons. But the effects of SPS on glial cells in the hippocampus have not been evaluated. In this study, MWM test showed increased escape latency in SPS group. The significant reductions in N-acetylaspartate (NAA), creatine (Cr), and choline-containing compounds (Cho) in the hippocampus of SPS rats were found. Moreover, TEM revealed abnormal morphological characteristics in glial cells of the SPS group. The number of GFAP-positive cells, intensity of GFAP-ir and GFAP-protein within the hippocampus increased after SPS at 1 day, and then decreased. The findings indicated that the glial cell reduction in the hippocampus of SPS rats; also astrocytes maybe contribute with loss of glial cells within the hippocampus of SPS rats.

OR1574

Undervaluing future rewards

explains adolescents impulsivity in intertemporal choice: results from an event-related potential study

Yunyun Huang, Ping Hu *Renmin University of China, China*

Adolescence has frequently been characterized as a period of increased impulsivity, which may be driven partly by age-related difference of reward sensitivity. In particular, adolescents may value immediate rewards more strongly or instead disregard of future rewards. To investigate this issue, we recorded event-related potentials (ERPs) from 18 adolescents and 18 adults in a gambling task, in which monetary gains and losses were either immediate or delayed. The participants also completed a temporal discounting task without ERP recording. Results showed that both groups valued immediate rewards over delayed rewards, producing larger FRN effect to the immediate as compared to the future outcomes. Besides, adolescents produced smaller FRN effect to future outcomes than did adults. Furthermore, there is a significant association between overall discounting rates and FRN amplitude to delayed outcomes. Taken together, these results suggest that adolescents' impulsivity might be driven partly by their devaluation for future rewards.

OR1575

The Other Race Effect for Facial Expression Processing in Women: Behavioral and ERP Evidence from a Balanced Cross-Cultural Study

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Presented with pictures of East Asian (EA) and European Caucasian (EC) posers displaying sadness, happiness, anger, or neutral expressions, EA and EC Participants were to 1) categorize the expressions; 2) rate the emotional arousal displayed in pictures, or 3) subjective felt arousal in the participants. Accuracy of categorization task showed a cross-verified other race disadvantage in judging other race anger than in own race stimuli. This result was supported by EA participants' LPC, which was larger for the anger than the neutral in their own race stimuli, but no difference in the other race stimuli. Consistently, the N170 and EPN of anger in arousal rating task were more negative in both group of participants while processing stimuli of their own race face instead of the other race face stimuli. The behaviour data showed higher arousal rating for other race

happiness, sadness, and neutral than for own race face.

OR1576

Probabilistic syntax model of the birdsong using a simple artificial neural network with feedback of the previous sequences

Takuya Koumura, Kazuo Okanoya *University of Tokyo, Japan*

Learned sequential vocalizations, such as language and birdsong, requires highly complex cognitive skills. Especially, songs in Bengalese finches are excellent models of complex sequential vocalizations because song elements are sequenced according to certain probabilistic rules, referred to as song syntax. Conventionally, song syntax is modeled by conditional probabilities of element types given the previous element sequences. However, such symbol-based models are not very much informative about the neural mechanisms of song syntax. In this study, to bridge the gap between observed symbol sequences and the recorded neural activities, we designed a probabilistic model of the song syntax using a simple artificial neural network with feedback of the previous sequences. We found neural activities in anesthetized birds that were correlated with the model inputs. These results suggested that the complex sequencing pattern could be controlled by the feedback of the previous vocalizations. (Supported by Kakenhi #26240019 & #15J09948).

OR1577

An ERP research of subthreshold depression individual cognitive processing characteristics on different affective picture stimulus

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Purpose: To analysis the effect of different valence emotional picture stimuli characteristics on behavioral and cognitive processing effects of subthreshold depression group, and the differences between SD group and normal group in the behavioral and ERP research. Methods: Students selected from Beijing University of Chinese Medicine who met the inclusion criteria was divided into two groups, matched the behavioral experiment and ERP experiment designed following the Oddball paradigm and using emotional picture selected from tCAPS as the target stimulus. Results: the main effect of group was significant at the RT. The main effect of stimulus type was significant. Analysing the results of ERP research, the group differences of the amplitude and latency of N2 and P3 between the two groups were not significant. Conclusion: This research was unable to verify the SD group was different from normal group in lacking of cognition control. Reasons for the result need further study.

OR1578

Alcohol use severity in young adults is related to poorer affective regulation and drink-driving risk perception

Cristina Martín-Perez (1), Juan F Navas (1), Ana Perandrés (1), Cristian Martínez-Ruiz De Lara (1), Angela López-Martin (1), Antonio Verdejo-Garcia (2), Raquel Vilar-Lopez (1) 1. University of Granada, Spain; 2. Monash University, Australia

Introduction: According to WHO, alcohol-related road traffic accidents are a major problem in global public health. Objective: To explore the relationship between alcohol use, drinking and driving risk perception, and alterations in affective regulation. Methods: A sample of 231 young adults, divided into two groups by their score in severity of alcohol use (AUDIT) was evaluated in drunk-driving and alcohol consumption risk perception, impulsivity (UPPS-P) and emotional regulation (ERQ). Results: The group with greater severity of alcohol-use showed higher impulsivity [$F(1,121) = 32.240$; $p < 0.001$], poorer emotional regulation [$F(1,121) = 4.120$; $p = 0.044$], less perception of alcohol-related risk [$F(1,121) = 10.827$; $p = 0.001$] and lower perceived danger of driving under the influence of alcohol and other drugs [$F(1,121) = 10.420$; $p = 0.002$]. Conclusions: Improvement of emotional regulation, impulse control and alcohol-related risk awareness should be considered as possible targets for prevention programs to reduce alcohol-related damages.

OR1579

Updating is related to treatment adherence in substance use disorders patients

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Introduction: High drop-out rates in substance-use disorders patients (SUDP) require identifying early predictors of treatment outcome. Objective: To investigate the relationship between executive functioning and treatment adherence in SUDP. Method: Thirty-nine outpatients were evaluated at the initiation of a cognitive-behavioral treatment (CBT) in executive functions, including: updating (Letter-Number Sequencing; LNS), inhibition (Stroop Task) and shifting (Reversal Learning Task). A measure of self-reported craving was taken. Logistic regression analyses were used to explore the predictive capability of executive functions over treatment adherence in a 2 month follow-up. Results: Greater score in LNS was the best predictor of treatment adherence ($B = 0.094$; $p = 0.022$). No other executive functions, nor craving, could

predict this variable. Conclusions: Updating seems to be a critical skill to cope with the high cognitive demands of CBT. Patients with alterations in this executive function could benefit from a specific neuropsychological rehabilitation, improving adherence to treatment for SUDP.

OR1580**Neurobiological Bases of Aggression and Related Neuropsychological Deficits in Violent Criminal and Forensic Populations**

David Nussbaum *University of Toronto Scarborough, Canada*

Crime and especially violent crime is a major global problem. This talk will present a broad literature review of published empirical studies demonstrating the high prevalence of executive function and other neuropsychological deficits in criminal populations. Next, a neurobiological-based aggression typology will be presented, with specific neuroanatomical and explanatory neuropsychological deficits linked to a) Predatory/Instrumental, b) Irritable/Anger-Based, and c) Defensive/Fear-Based aggression types. Existing neuropsychological methods for assessing ventromedial, orbital and dorsolateral regulatory deficits will be described. Supportive empirical data will then be presented. Implications for electrophysiological assessment refinements and implications for individually designed interventions and change monitoring will be discussed.

OR1581**Prospective Memory in Amnesic Mild Cognitive Impairment: in pursuit of an Early Diagnosis**

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Prospective memory (PM) is a fundamental requirement for an autonomous lifespan that might be prematurely compromised in the neurodegenerative process, namely in amnesic mild cognitive impairment (aMCI), severely affecting an independent lifestyle. We have used a behavioural experimental paradigm to explore PM as a non-invasive neuropsychological tool for an earlier aMCI diagnosis while assessing the potential benefits of the use of enactment at encoding to sustain an autonomous performance despite neuronal degeneration. PM was consistently identified as a particularly sensitive and specific indicator of cognitive impairment. Importantly, observed beneficial effects of enacted encoding have unveiled the potential of this encoding technique to optimize attentional demands through an adaptive allocation of strategic resources

across both a healthy and cognitively impaired lifespan.

OR1582**Virtual reality as an ecologically valid tool for assessing multifaceted episodic memory in a lifespan approach and in lesioned patients**

Pascale Piolino (1,2) *1. University Paris Descartes, France; 2. Center of Psychiatry and Neurosciences, INSERM 894, France*

Virtual reality is a new technology that allows neuropsychological assessments and remediation methods close from what we experience in daily life. More especially, the majority of episodic memory tests is far from the definition of this type of memory while it is one of the most frequent sources of memory complaints. We have developed a new virtual episodic memory test that assesses the main aspects of episodic memory-what, where, and when-and of feature binding in a naturalistic virtual environment. We will review the main findings using this virtual test from a developmental perspective (from children to old adults) and in the domain of pathological aging and psychiatry. The conclusion will highlight that virtual reality appears to be an appropriate technique to assess crucial aspects of episodic memory in daily life and it should provide helpful tools for remediation of memory deficits.

OR1583**The social neuropsychology of homelessness**

Graham Pluck (1), Yuko Sato (2) *1. Universidad San Francisco de Quito, Ecuador; 2. Chuo University, Japan*

Homelessness is a common feature of many developed countries. Some homeless adults may be at risk of developing neuropsychological disorders due to factors associated with homelessness, such as substance abuse. Alternatively, homelessness may be a consequence of acquired neuropsychological impairment for some individuals. We have taken a social neuropsychological perspective to these issues and present cognitive test data on homeless adults from the UK and Japan. In both groups we found evidence of frontal-lobe related cognitive impairment as measured by the Wisconsin Card Sorting Test, and those with the longest periods of homelessness showed the greatest levels of impairment. However, the two groups differed on the basis of estimated intelligence, and in fact, lower fluid intelligence may underlie the apparent frontal-lobe impairment. Implications for understanding homelessness are discussed. In addition, this neuropsychological approach to understanding homelessness is explored as an example of a new field of academic study-social neuropsychology.

OR1584**Antagonism of dorsohippocampal orexin-2 receptors suppresses drug-seeking behavior: A neuropharmacological study**

Bahman Sadeghi Shahid Beheshti *University of Medical Sciences, Department of Physiology, School of Allied medical Sciences, Iran*

Orexinergic system is engaged in reward circuitry and drug addiction. Here, effect of intrahippocampal CA1 administration of orexin-2 receptor (OX2r) antagonist, TC/SOX229, on the acquisition and extinction of morphine conditioned place preference (CPP) was investigated in rats. CPP was induced by subcutaneous morphine injection during conditioning and TC/SOX229 was bilaterally microinjected into the CA1. Conditioning scores and locomotor activities were recorded. Administration of the antagonist dose-dependently attenuates the induction of morphine CPP during acquisition while TC/SOX229 did not have any influence on locomotor activity of all phases. At higher concentrations, TC/SOX229 facilitated extinction of morphine CPP and decreased extinction latency period. OX2rs in the CA1 are involved in development of the acquisition and play a role in the extinction of morphine-seeking behavior. Blockade of OX2rs facilitates extinction and extinguishes the ability of drug-related cues, implicating that the antagonist might be considered as a propitious therapeutic agent in suppressing drug-seeking behavior.

OR1585**Crime, cognitive dysfunction, and mental disorders: The utility and implications for rehabilitation of cognitive testing in a forensic psychiatric population**

Erin J Shumlich (1), Rod Balsom (2), Kelsey Gould (1), Peter N.s Hoaken (1) *1. The University of Western Ontario, Canada; 2. St. Joseph's Health Care London, Canada*

Individual differences in Executive Functioning (EF) - memory, cognitive shifting, and inhibition - are starting to be investigated in relation to aggression. The current study found EF deficits are related to criminality in forensic psychiatric patients, individuals who have come in contact with the law due to severe mental disorders. The Delis-Kaplan Executive Functions System (D-KEFS) was administered on-site to 45 forensic psychiatric patients in a medium-security hospital. It was found that this population displayed EF deficits compared to the general public. Specifically, this research suggests deficits in inhibition are postdictive of a violent index offence and rule breaking within the hospital. This research may

provide a basis for individualized rehabilitation programs that specifically target cognitive deficits. Violence and crime have immense social impact; understanding and treating specific cognitive deficits underpinning aggression and crime is essential in ensuring the successful reintegration of forensic psychiatric patients and overall public safety.

OR1586

Memory functioning in Schizophrenia: a comparative study with DOC and normal subjects

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Introduction: Scientific literature concerning the neuropsychological functioning in schizophrenic patients established the damage of memory system and its role on central coherence. Methods: 30 schizophrenic patients were tested by the Wechsler Memory Scale-IV (WMS-IV) and then compared with an Obsessive-compulsive disorder (DOC) group (n.=30) and a Non-clinical control group (n.=30). A Dependent T-Test for Paired Samples within schizophrenic group and two Independent Samples T-Tests to compare performances between groups have been made. Results: Schizophrenic patients presented an impairment of visual working memory, as confirmed by scores on Visual Working Memory Index and Design I ($p < .05$). Even though both schizophrenic and DOC groups performed worse than controls ($p < .05$), their memory profile significantly differs in WMS-IV Design I and Visual Reproduction I ($p < .05$). Conclusion: Our study indicates the strict relationship existing between working memory and central coherence and its importance for cognitive remediation strategies.

OR1587

The Neural Mechanisms of Human Mate Copying

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The study aimed to investigate the neural mechanisms of human mate copying by manipulating same-sex models' attitude towards potential mates. Firstly, we conducted a behavioral-only experiment: participants were asked to rate the attractiveness of isolated opposite-sex faces, then shown the targets associating with a neutral-faced model with textual cues indicating the models' attitude (interested vs. not-interested), and then re-evaluate the potential mates' attractiveness. Then, a functional magnetic resonance imaging (fMRI) study was conducted using the similar procedure as the behavioral-only experiment. The mate copying effect was confirmed in the behavioral-only experiment -greater increase

in attractiveness ratings in the interested condition. fMRI results showed that the dorsolateral prefrontal gyrus was significantly active in the comparison of interested > not-interested conditions, and the activation of rostral medial prefrontal gyrus was significantly positively correlated with the effect of mate copying. These results suggested a key role of prefrontal cortex in human mate coping.

OR1588

The Influence of Alexithymia on Hypothalamic-Pituitary-Adrenal Axis Reaction in Irritable Bowel Syndrome

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Aim: We tested the hypothesis that alexithymic factors affect adrenocorticotrophic hormone (ACTH) and cortisol reactions after administering corticotropine-releasing hormone (CRH) in the subjects with irritable bowel syndrome (IBS). Methods: Twenty seven IBS subjects and 33 healthy controls participated in this study. After colorectum viscerosensory examination, plasma ACTH and serum cortisol were measured at baseline and at 15, 30, 60, and 120 min followed by CRH (2 µg/kg) administration. Alexithymia was assessed with the 20-item of Toronto alexithymia scale (TAS-20). Results: In IBS, regression analyses revealed that TAS total score ($R^2 = 0.22$, $p < 0.05$) and its subscales, difficulty identifying feelings ($R^2 = 0.23$, $p < 0.05$) and externally oriented thinking ($R^2 = 0.24$, $p < 0.05$), predicted the area under the curve (AUC) of ACTH, but not in controls. Neither in controls nor IBS, any of alexithymic factors predicted AUC of cortisol. Conclusion: These findings suggest that alexithymic factors may influence hypothalamic-pituitary reactivity in IBS subjects.

OR1589

Neural social stress processing in first-episode, treatment-naive patients with major depressive disorder

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Background: Psychosocial stress has been consistently linked to major depressive disorder (MDD). However, neural mechanisms

of psychosocial stress remain largely unclear. The present study thus examined the neural responses to an acute laboratory-based social stressor in MDD patients. Methods: First-episode, treatment-naive patients with MDD (n=30) and age, gender matched healthy controls (n=30) performed the Montreal Imaging Stress Task (MIST) during functional magnetic resonance imaging (fMRI) scan. Stress was induced by experimental conditions of MIST. Results: Across groups, MDD patients showed significantly reduced activation in the medial prefrontal cortex (mPFC) and the anterior cingulate cortex (ACC) during experimental versus control conditions of MIST. Conclusion: Our results indicate that the mPFC and ACC of depressed individuals may have a limited capacity to modulate stress responses. The current study represent a step toward elucidating the neural mechanisms of social stress processing in depression.

POSTER PRESENTATION

P2117

Executive function and emotional facial expression recognition in Parkinson disease

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Executive function and emotional recognition are relatively frequent in Parkinson disease (PD). However, it is not determined whether these problems are independent, or if cognitive problems cause emotional recognition deficiencies. We analyze the interrelationship between them by comparing 43 PD and 31 healthy control (HC) performance. Five tasks assessing discrimination, categorization, inhibition, selective attention and working memory abilities, both to emotional (facial expression) and to comparable non-emotional stimuli, were designed. One mixed ANOVA 2 (Group) x 5 (Task) x 2 (Stimuli) was performed, and a statistically significant Group*Task*Stimuli interaction effect was found. Post hoc analysis revealed that PD patients showed a worse performance than HC in categorization and working memory tasks, but only with emotional stimuli. These results suggest that there is a specific deficit in emotional recognition. However, emotional problems were not found in all tasks, suggesting that cognitive demands are also relevant in the recognition of emotions.

P2118

Impact of Worry on Frontal Lobe Activity in relation to Working Memory in ADHD Students

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Frontal lobe plays a crucial role in cognitive processes and memories associated with emotions. This paper examines the relationship of worry and working memory on frontal lobe activity with one month relaxation therapy in ADHD (ADHD-HI & ADHD-C) students. Quasi-Experimental design with pre and post-tests having control group was adopted for the single case studies. Eight students under each category were selected randomly (control group, N=8) and the one who had high test anxiety from each category was selected for the intervention. Worry, working memory scores and electroencephalogram were recorded before and after relaxation therapy. Significant relationship was found in post-test, on frontal lobe activity-worry, frontal lobe activity-working memory in both the cases. Results suggest that relaxation therapy impacted the worry component by increased left frontal activity which showed its effects on improvement in working memory functioning and a model has been developed for enhancement in working memory processing.

P2119

Is Tower of London Assessing Planning?

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Several studies have used Tower of London as a measure of planning which is further used as an index of executive functioning (e.g., Cutting et al., 2009; Sesma et al., 2009). However, to date, the validity of Tower of London as a measure of planning remains unknown. Thus, the purpose of this study was to examine the relationship between Tower of London and measures of planning. 109 undergraduate students (79 females and 30 males; mean age = 20.81 years, SD = 0.85) from Beijing Normal University were assessed on operation planning (Matching Numbers, Planned Codes, and Planned Connections), action planning (Crack the Code) and on Tower of London. Results of factor analysis revealed two factors: one for operation planning and one for action planning. Tower of London loaded equally, but weakly, on both factors. This suggests that Tower of London is not a pure measure of planning or problem solving.

P2120

Set Shifting and Central Coherence in Eating Disorders

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The purpose of this study was to investigate the characteristics of set-shifting and central coherence in patients with eating disorders (ED). 16 female patients with ED (mean age = 34.4 ± 8.5 years) and 9 healthy females (mean age = 34.6 ± 8.8 years) participated in the study. Their set-shifting and central coherence were assessed using the Wisconsin Card Sorting Test Keio version (WCST-K) and the Rey-Osterrieth Complex Figure Test (RCFT), respectively. The results showed that scores of categories achieved, total errors, perseverative errors of Milner, perseverative errors of Nelson, and difficulty maintaining set of the WCST-K and copy accuracy, 3 min accuracy and 30 min accuracy of the RCFT in ED group were significantly lower than control group. The results may explain some symptoms of ED such as poor cognitive flexibility and excessive attention to details.

P2121

Social Cognition in women with Eating Disorders

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The purpose of this study was to investigate the characteristics of social cognition in patients with eating disorders (ED). 16 female patients with ED (mean age = 34.4 ± 8.5 years) and 12 healthy females (mean age = 34.3 ± 9.0 years) participated in the study. Their social cognition was assessed using the Social Cognition Screening Questionnaire Japanese version (SCSQ-J). The results showed that total score of the SCSQ-J of ED group was significantly lower than control group. As for the differences in each domain, score of metacognition was significantly lower than control group. However, any significant differences were not found in verbal memory, schematic inference, theory of mind and hostility bias. It is suggested that

patients with ED are not good at monitoring and evaluating their own cognitive activities. The results may explain some symptoms of ED such as distortion of body image.

P2122

Neural correlates for preventing the production of lexicalization errors in non-word reading

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Japanese patients with phonological alexia show a 'lexicalization error', that is, reading a non-word into a similar looking real-word. The neural correlates of this error, however, are not well understood. Using functional MRI, we addressed this issue. Twenty-four right-handed healthy volunteers (mean-age 21.4 years) participated in this study. While being scanned, participants were presented with real-words, transposed-letter non-words, and random-letter non-words. They were asked to judge whether each word was real-word or non-word. We classified participants' responses to transposed-letter non-words into two categories: 'Exact read', correctly judged as "non-word" and 'Lexicalized read', incorrectly judged as "word". Brain regions where activity was greater in Exact read than Lexicalized read included the left middle part of the precentral gyrus, supplementary motor area, and intraparietal sulcus, suggesting that these brain regions play important roles in preventing lexicalization errors in non-word reading.

P2123

The influence of pitch accent on word comprehension

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The Japanese Tokyo dialect has homophones with different accents (e.g., *ame* for rain and *amé* for candy). Pitch accent plays a vital role in conveying the meanings of words (Hirose, 2015). We examined a patient with a fluent type of aphasia. He had a cerebral infarction that caused damage to the left superior and middle temporal gyrus, and the supramarginal gyrus. His hearing was intact. His conceptual knowledge was intact because his visual word comprehension of word was excellent. When

the patient was given an assignment to test his understanding of homophones with different accents, he showed the difficulty to identify the meaning of words, although he could repeat the words with the correct accent. The error showed a disorder of the process that the identified word form is to be united to its accent type. This gives a unique insight into the mechanism of the word comprehension process.

P2124

Dysfunctional counting of mental time in Parkinson's disease with striatal dopamine transporter deficit

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Patients with Parkinson's disease (PD) often underestimate time intervals, however it remains unclear why patients underestimate, rather than overestimate, time intervals. The current study examined the neural mechanisms of distorted time underestimation and counting in patients with PD, on the basis of a dopamine transporter (DaT) located on presynaptic nerve endings in the striatum. Twenty patients with PD and 20 healthy controls performed time production task and tapping task of 1 sec cycle. The patients, compared to controls, underestimated time intervals on time production task, and they had fast cycle on tapping task. Furthermore, the DaT level strongly correlated to the underestimation of the time intervals and the tapping speed. These findings suggest that striatal DaT protein deficit causes fast counting for time estimation, and that distorted underestimation of time interval is guided by cumulative output of fast cycle based on disordered time counting.

P2125

Increased Resting-state Functional Connectivity of Visual Cortex in Non-clinical Populations with Dissociative Experiences

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Normative dissociative experiences are defined as experiences of absorption or concentration that are often revealed by imaginative content and include daydreaming, fantasy, out-of-body experience and reverie. These experiences also accompany significant alteration in awareness of external environment, time or self. Nineteen subjects with high scores of Dissociative Experience Scale (DES) and 19 controls with low scores of DES, who were matched in demographic data, underwent a resting-state fMRI scan. Using a seed-to-voxel analysis, the posterior cingulate cortex (seed region, a key

hub of resting-state network) and visual cortex showed increased connectivity [a height-level threshold corrected with the FDR of 0.01 (uncorrected $P < 0.0005$), and cluster threshold FDR of 0.05]. Present findings provide the first evidences that may explain the neuronal process underlying normative dissociative experiences, typically experienced in the format of imagery. Those individuals with enhanced resting-state connectivity of visual cortex may be more prone to dissociative experiences.

P2126

Syndromic analysis of the psychological rehabilitation of higher mental functions (HMF) in L.S. Vygotsky- A.R. Luria approach **Maria S Kovyazina (1), Nataliya A Varako (1), Yuri P Zinchenko (1), Galina E Ivanova (2)** *1. Lomonosov Moscow State University, Russia; 2. Pirogov Russian National Research Medical University, Russia*

The binary neuropsychological syndrome structure (symptoms, abnormal factor) allows to define two strategies of rehabilitation programs. The first strategy involves choice as a "target" of the most destroyed mental function. We use the safe components of HMF or replaces them by another, not previously included in this HMF. The second strategy could be directed to the rehabilitation of abnormal neuropsychological factor that should be accompanied by the rehabilitation of several systemic interrelated mental functions. In this case it is necessary to resort to the ontogenetic stages factor development, to define its safe level and recognize the pathological process localization. The possibility of mental functions restructuring and self-development syndrome of HMF disorders in the positive logic of the rehabilitation process is based on the principles of plasticity, complementarity of brain structures, cerebral functional gradient transitions. This suggests that HMF during the rehabilitation using both strategies.

P2127

Neural Correlates to Text-Picture Integration

Songqing Li, Qingbai Zhao, Zhijin Zhou *School of Psychology, Central China Normal University, China*

Text-picture integration is a crucial cognitive process in multimedia learning. This study aims to explore its underlying neural mechanisms. Participants were asked to estimate whether two sequentially presented stimuli (text-picture or text-text) could be integrated into a reasonable context. The Event-related potentials of the second stimulus were recorded and analyzed. Results showed that, compared with the text-text condition, text-picture evoked a more negative N200-300 over the prefrontal sites, a more negative N150-250 over the occipital sites and a more positive LPC

over the central-parietal scalp with the latency 400-900 ms. It is suggested that the early negative components and the late LPC may reflect the semantic activation in picture processing and the semantic integration process respectively. In addition, for the LPC, text-text showed a left hemisphere lateralization, while text-picture showed no difference in amplitude between hemispheres. These results indicate that inter-hemispheric coordination is of great importance and necessity to text-picture integration.

P2128

The Raw Score Share of the Attention & Calculation (Serial 7s) Task in the MMSE-2 Total Raw Score Clinical Interpretation

Cornelia E Munteanu *The Medical Center of Diagnosis and Treatment, Romania*

The purpose of this paper is to demonstrate the way in which the low raw score of the Attention & Calculation (Serial 7s) task influences the MMSE-2 total raw score. The psychodiagnostic significance of the MMSE-2:SV and MMSE -2:EV total raw score is underlined by interpretations of clinical cases selected from current practice. The pathology covers both neurodegenerative and psychiatric disorders with cognitive impairment. The results suggest that the interpretation of the MMSE-2 total raw score, it must always be done in the clinical context.

P2129

Sweet taste threshold for sucrose inversely correlates with depression symptoms and anxiety trait in female college students in the luteal phase

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Influences of depression symptoms on the sweet taste threshold were investigated in healthy college students. Students were divided into 3 groups, i.e. males (M, $n = 30$), females in the luteal phase (FL, $n = 22$), and females in the follicular phase (FF, $n = 18$). Depression symptoms were scored by Self-rating Depression Scale, and anxiety levels by State- and Trait-Anxiety Inventory. Depression symptoms, anxiety levels, and the recognition thresholds for sucrose were not different among three groups. Depression symptoms were positively correlated with state and trait anxiety in all groups. The sweet taste threshold was inversely correlated with depression symptoms ($r = -0.471$, $p = 0.031$) and trait anxiety ($r = -0.506$, $p = 0.019$) in FL. In M and FF,

however, there were no such correlations. The results show that the recognition threshold for sucrose reduces with increased depression in females with a higher anxiety trait, but only in the luteal phase.

P2130

Experimental study of the Concealed Information Test using Near Infra-Red Spectroscopy- Cerebral blood flow dynamics reaction sees through the truth

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Several physiological indices are used to determine whether the statements of the suspect are true or false in the police investigation process. The Concealed Information Test (CIT) is a polygraph technique that focuses on whether the suspect has a detailed knowledge of the crime. If the suspect actually committed the crime, physiological responses induced from a crime-relevant questions are greater than those from several crime-irrelevant questions. Traditionally, peripheral nervous reactions have been used to detect concealed information. Recently, however, many researchers have been considering central nervous reactions. Near Infra-Red Spectroscopy has advantages to apply in real investigation, such as causing less fatigue. In this study, we examined how the cerebral blood-flow-dynamics-reaction in the frontotemporal area of the brain after the mock crime changed when a crime-relevant question and several crime-irrelevant questions were posed. Our results suggest that the concentration of oxy-hemoglobin significantly increases when a crime-relevant question is asked.

P2131

Influence of avoidance behavior on extinction training during memory reconsolidation

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Conditioned fear responses return even after standard extinction training, because it is not possible to affect the fear memory trace. However, post-retrieval extinction training can prevent the fear from coming back. It relates to a neural mechanism, called memory reconsolidation. Providing new information during reconsolidation may alter the original memory trace. When used during reconsolidation, the role of extinction training is not to establish extinction learning, but to integrate safety information into the fear memory. This study

examined whether avoidance behaviors prevent receiving such information during reconsolidation. Avoidance CS+ (ACS+) and control CS+ (CCS+) were paired with US. When ACS+ was presented during post-retrieval extinction training, participants pressed the Enter-key to avoid US. There was a significant difference between fear responses to ACS+ and CCS+ after the extinction training. This study indicates that avoidance behaviors prevent a decrease in fear responses by post-retrieval extinction training.

P2132

Predicting the type and strength of emotions using brain activity: An fMRI study

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Researches about predicting the emotions using brain activity are widely performed. However, most of the research has only measured the type of emotion, but it's also important to predict their strength to predict KANSEI VALUE. We now report an approach focused on brain regions to evaluate the type and strength of emotions. We focused on the brain activities and emotions using fMRI and visual stimuli called IAPS (International Affective Picture System). The emotion was detected by using questionnaire which represents pleasure and arousal. Then, we searched brain regions associated with the type and strength of emotions. Our experimental results revealed that temporal pole and right amygdala were related to the strength of the pleasure and displeasure. Also, left thalamus and anterior cingulate cortex were related to the strength of arousal and sleep. Our findings provide valuable insight to predict the type and strength of emotions by focusing on these regions.

P2133

MapCog Spectra©, a new approach to measure Attention and first clinical trials

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Background Attentional lapses in ADHD and Autism Spectrum Disorder (ASD) are 1. Not always detected by traditional tests (reaction time), 2. Not well understood in terms of visual perception. We therefore present data with a new method (MapCog Spectra, MCS) showing that aberrant pause time variability during serial naming can reliably identify attentional lapses, and show how such lapses fragment the perception of printed information.

Method MCS was used as ad on in the clinical neuropsychological assessment of adult ADHD and/or ASD (n=32). Results were compared with a reference group of healthy subjects (n=313). MCS and CANTAB were assessed in 38 healthy elders. Results MCS identified ADHD/ASD with high sensitivity (95.8 %) and specificity (96.3%). Attentional lapses were correlated with text fragmentation ($p < 0.0001$), while CANTAB subtests and the MCS were unrelated. Conclusion The present findings demonstrate for the first time that attentional lapses mediate perceptual fragmentation in neurodevelopmental disorders.

P2134

A new, fast, culture-free, and free to use assessment of intellectual functioning- The Matrix Matching Tasks

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Frequently in research there is a need to assess general intellectual functioning. However, commercial tests are expensive and available only in the main world languages. This can stifle research in many poorer countries. Here we present a new free-to-use test, the Matrix Matching Tasks. Language free and administrable in 10–20 minutes, it is composed of two parts, one a visuo-spatial matrix type task and the other a semantic matrix matching task using photographs. Both parts are designed to be generally culture free and neither part requires familiarity with any particular language. Preliminary data from Ecuador suggest that this test has adequate internal consistency and test-retest reliability. Furthermore, its validity as a measure of general intellectual functioning is demonstrated by robust correlations with a gold-standard measure (the Wechsler Adult Intelligence Scale) and with academic achievement (GPA scores) in higher education. This new test may benefit researchers in many different countries.

P2135

Conscientiousness distracts the concealment of deception

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Although detection of deception by monitoring physiological response is important in a crime investigation, the expression of such response

is differ from person to person. Several studies have shown that some personality traits can affect the expression of autonomic nervous system activity caused by lying, but only two studies have examined the effect of brain activation in deception. Furthermore, those studies used the somewhat rare psychopathic personality traits. Thus, in this study, we have examined the relationship between brain activation caused by lying and general personality traits by the Big Five inventory, which is widely used. We recorded prefrontal brain activation of participants using fNIRS while they committed the task to give both honest and deceptive answers for questions about playing cards. As a result, we have found a positive correlation between the Conscientiousness score and the level of brain activation caused by telling a lie.

P2136

Long-Term Neuropsychological Deficits in Concussed Athletes

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Primary objective: To examine the long-term effects of concussions on athletes' cognitive functions. Methods and procedures: 20 concussed athletes (post-concussion period $>=$ 3 months) were carefully matched and compared to 20 non-concussed athletes, in a battery of neuropsychological tests assessing information processing speed, attentional, mnemonic and executive functions as well as scales exploring emotional and behavioral disorders. Main outcomes and results: Concussed athletes scored significantly lower than non concussed athletes on almost all neuropsychological tests and are selectively deficient in mental flexibility. Conclusions: our study provides preliminary evidence to support the use of neuropsychological assessment in the management and return to play decision making of concussed athletes. The findings suggest that postconcussive sequelae, despite their subtlety could persist beyond three months; and tasks evaluating mental flexibility might be most sensitive to long-term cognitive changes following concussions.

P2137

Experimental study of disturbance in maintaining consciousness

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Mechanisms and functions of consciousness were investigated through a rehabilitation method designed for treating disturbances in brain functions related to maintaining consciousness. Moreover, a method for assessing the efficacy of the rehabilitation technique was developed. Patients with disturbances in maintaining consciousness due to brain damage (N = 10) participated in the study. Results

indicated that interventions including changing a patient's position, stretching, and massage were effective for promoting arousal. Moreover, patient's memories, including hobbies and family were effective stimuli for cognitive rehabilitation. Cognitive rehabilitation could be effectively conducted after confirming patients' arousal level. Moreover, it was indicated that increasing cerebral blood flow was correlated with patients' level of arousal. Therefore, oxygen quotient, which is indicative of cerebral blood flow could be a marker of cognitive activation, indicative of the efficacy of rehabilitation. It is concluded that the state of arousal and cognitive activity could be determined by assessing brain activation.

P2138

Profile of cognitive functions in adults with Dystrophinopathy

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BACKGROUND: A number of studies have been conducted on intellectual functioning of boys with dystrophinopathy. However, little is known about the remaining cognitive weaknesses in adults with dystrophinopathy. OBJECTIVE: The purpose of this study was to investigate the profile of cognitive functions that is characteristics of adults with dystrophinopathy. METHODS: Twenty four subscales from the Wechsler Adult Intelligence scale, the Clinical Assessment for Attention, and the Wechsler Memory Scale were used for assessing the participants with dystrophinopathy (N = 15; Mean age 30.4 years). RESULTS: Scores for Picture Completion, Arithmetic, Matrix Reasoning Symbol search, Letter-Number Sequencing, and Digit Span of the WAIS-III; all subsets of CAT; and Logical Memory, and Delayed Logical Memory in the WMS-R were significantly deficient in adults with dystrophinopathy in comparison to the normal population. CONCLUSION: The ability to sequentially process auditory and visual information remains impaired in adults with dystrophinopathy.

P2139

Psychological "Instant" and "Continuance": An event-related potential study of duration selective attention

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We perceive "instancy" to events that occur below about 100 ms, even if they actually have some amount of physical time. The present study explored neural bases of the perception of psychological time of instant and continuance when matching to the attentional

time templates, by using event-related potentials (ERPs). Sixteen healthy participants were required to detect target stimuli with particular shapes and durations of 83 ms (short) or 133 ms (long), when stimuli defined by combinations of these dimensions were randomly presented in given blocks. As a result, the short-duration stimuli elicited more negative ERPs in 220–480 ms post-stimulus in the right hemisphere when they had task-relevant duration rather than irrelevant duration (selection negativity), while the long-duration stimuli did not. The results suggest that different neural bases are involved in attentional template matching for the psychological instant and continuance.

P2140

The effects of self-monitoring by sleep diaries on sleep and mental health in primiparas.

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This study examined the effectiveness of self-monitoring using sleep diaries on sleep and mental health in primiparas in Japan. The subjects of this study were twenty-five primiparas (32.1 ± 4.8 years) who gave informed consent for participation. Participants in self-monitoring (SM, n = 10) wrote sleep diaries, whereas those in control group (CG, n = 15) were not. Sleep was assessed using PSQI, mental health was assessed using Hospital Anxiety and Depression Scale (HAD) twice in a medical check for 1 month (Postpartum) and the third trimester (Pregnancy). Sleep (PSQI score) deteriorated conspicuously with 8.1 of Postpartum from 4.7 of Pregnancy in CG, but it was 6.0 after 5.4 of Pregnancy and Postpartum in SM. Sleep were aggravated in Postpartum compared with Pregnancy for CG ($p < .05$), whereas SM were not. Depression were lower in SM than in CG ($p < .10$). These results suggested self-monitoring by sleep diaries were effective in improving sleep quality, mental health.

P2141

Goal-Directed, Top-Down Signals Distributed to Primary and Higher Visual Areas Revealed by Functional Magnetic Resonance Imaging Using a Standard Task Paradigm in Visual Attention

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A network approach to the localization of attention in human brain has been proposed. Here we reexamined the attentional network using ANT (Fan et al., 2002; 2005). Characteristic cortical activations have been revealed, which are not consistent with the results reported so far. In alerting, cortical areas associated with both the dorsal and ventral fronto-parietal networks, reported by a meta-analysis by Corbetta et al. (2008), were activated in both hemispheres. In orienting, large clusters extending from the primary visual area to the superior parietal lobule were activated in both hemispheres. In conflict, the anterior cingulate in the right hemisphere was confirmed to be activated. Moreover, prominent activations were observed in the higher visual area (V4 homologue) both in alerting and in conflict, and also in the primary visual area (V1) in orienting. These activations are most likely caused by strong top-down signals from the fronto-parietal network for selection of information.

P2142

N400 or LPC? Neural Correlates to the Processing of NetSpeak

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The present study is to reveal the reasons for the extension of N400 effect in NetSpeak and to identify the key ERPs reflecting the successful understanding of NetSpeak. The semantic processing of NetSpeak and standard Chinese was compared in the classic semantic incongruity paradigm. Results showed that compared to standard Chinese, the N400 effect in NetSpeak was characterized by a delayed peak latency and an extended duration; however, both the N400 effects were located at the thalamus in early period and the anterior cingulate cortex in late period. Under the condition of congruity, NetSpeak elicited a more negative N400 and a more positive LPC than standard Chinese, respectively located at the anterior cingulate cortex and hippocampus. These findings implies that the differences in N400 effect between NetSpeak and standard Chinese derive from the different fluency, and that the LPC plays a crucial role in the semantic integration in NetSpeak.

P2143

Neurophysiological Correlates

between the Event-related Potential of Feedback Processing and the trait extraversion in children

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To investigate the role of neural mechanisms of feedback processing in predicting the children's trait extraversion, we examined feedback-related negativity (FRN) and P300 components in 41 children (9–12 years) during a guessing game task. After completion of the EEG recording and experimental task, children were required to complete the Chinese Children's version of Eysenck Personality Inventory. Linear regression analyses showed that both smaller FRN amplitude in social reward feedback and larger FRN amplitude in social loss feedback predicted higher extraversion scores. Moreover, the FRN difference wave amplitude during social condition was negatively correlated with extraversion scores. In contrast, both larger P300 amplitude in social reward feedback and smaller P300 amplitude in social loss feedback predicted higher extraversion scores. This study has proved that FRN and P300 of reward and loss feedback processing could be significant predictors of children's trait extraversion only during social condition.