

OCTOBER 19-20, 2009, PRAGUE

PII: ANSR51129N01

## CIANS ABSTRACTS

### EMOTIONS IN COURTING: COMPARISON BETWEEN THE REPRESENTATION IN A TELEVISION SHOW AND EMOTIONS REPORTED BY ADOLESCENTS

---

**Federico COLOMBO**

Milan School of Cognitive-Behavioural Psychotherapy (ASIPSE) – Italy Balbo Marina, Monti Institute, Asti - Italy.

**Background and aims:** The courting, to court and to be courted, is an important experience in adolescence when it often occurs for the first time. This exploratory study aims to compare the representation of emotions in a television show where men court women and vice versa with emotions reported by adolescents in their own experience.

**Methods:** It was identified the television show “Men and Women” as followed by Italian adolescents. Ten daily episodes in a row were video-registered, and then two different observers assessed emotions expressed during courting.

A self-report questionnaire was administered to a sample of 186 adolescents attending high schools to explore frequency of emotions in different settings, including courting.

**Results:** In the television show were represented both negative emotions – as anger and envy – and positive emotions – as joy. Adolescents of our sample reported different emotions, prevalently joy and embarrassment. Gender differences came out: young women reported more courting experiences and express more frequently emotions than young men.

**Conclusions:** In the television show examined courting seems to be characterized by competition while for the adolescents it seems to be an experience of joy. Even when the television wants to show life experiences, it is affected by the search for audience.

### MOTIVATIONAL STRATEGIES FOR THE TREATMENT OF A LONG TIME OBSSIVE COMPULSIVE DISORDER CASE

---

**Beatrice CORSALE**<sup>1,2</sup>

<sup>1</sup> Department of Psychology – Milano-Bicocca University, Milan (Italy).

<sup>2</sup> ASIPSE – Cognitive-Behavioural Psychotherapy School, Milan (Italy).

Evidence based studies recommend cognitive-behavioural therapy (CBT) for treatment of the obsessive-compulsive disorder (OCD), that is a disease difficult to be treated and which only thirty years ago was considered almost untreatable.

Exposure and ritual prevention (EX/RP), are typical procedures of CBT and these are fundamental for the OCD treatment, but patients must have high motivation and zeal to use regularly these strategies.

In fact, literature refers that drop-out or low compliance cases are included into a range between 10% and 30% (Dèttore and Melli, 2005) and some studies consider that at least 50% of OCD patients treated with EX/RP do not respond optimally, even when psychotherapy is combined with pharmacotherapy (Simpson *et al*, 2008).

This work investigates the possibility of improving the treatment adherence and the therapy outcomes supporting the motivation of a OCD patient which did not respond to previous treatments.

The patient was a female, 45 years old, with a OCD since 30 years ago that tried previous psychotherapy (also CBT) and pharmacotherapy without good outcomes.

The Y-BOCS (Yale-Brown Obsessive Compulsive Scale) was given to the patient before and at the end of therapy. The Structured Clinical Interview for DSM-IV was also submitted to the patient before the therapy starting and that confirmed the diagnosis.

The Y-BOCS has a score range 0–40 and a score of 16 is the cut off for the OCD; the patient score was 23 before the therapy, she had a lot of compulsions and had a very low autonomy.

The patient was treated with CBT (with strategies supporting motivation) and pharmacotherapy; at the end of 32 therapy sessions the Y-BOCS score was 8 and the clinical improvement was significant. This work explains the treatment and describes which strategies supported continuously the patient motivation to EX/RP.

## **A SURPRISING RELATIONSHIP BETWEEN PROSOCIAL AND AGGRESSIVE BEHAVIOUR IN PRESCHOOL CHILDREN**

---

**Claudia CAPRIN<sup>1,2</sup>, Beatrice CORSALE<sup>1,2</sup>, Deborah APA<sup>1</sup>, Alessandra SIESA<sup>1</sup>, Angela TAGINI<sup>1</sup>**

<sup>1</sup> Department of Psychology – Milano-Bicocca University, Milan (Italy).

<sup>2</sup> ASIPSE – Cognitive-Behavioural Psychotherapy School, Milan (Italy).

Social Competence is a complex skill and generally prosocial and assertive behaviour is considered to be a high social competence index, while aggressive behaviour is a low social competence index. Previous research on children's social development studied prosocial and aggressive behaviour separately. However they may also be considered as two different modes of interacting with peers that children may use alternatively according to circumstances. This research aims: (1) to examine age and gender effects on prosocial and aggressive behaviour and (2) to explore the relationship between the behaviour classes. 105 preschool children (males 55, females 50) ranged in age from 2 to 5 years (mean age=4,1 sd=0,96 ) were observed twice during free play with peers ( $k=.86$ ). The interactive behaviour was coded in the following categories: (1) prosocial behaviour: altruistic (i.e., sharing, helping), required, non-altruistic (according to role playing, i.e., playing doctor); (2) aggressive behaviour: reactive, hostile and instrumental aggressiveness.

Data analyses showed no significant age and gender effects in contrast with previous research. A decrease was found in hostile ( $F(7.97) = 2.7 p=.049$ ) and instrumental ( $F(7.97) = 4.7 p=.004$ ) aggressive behaviour in relation to age. Further there was a gender effect on hostile aggressive behaviour ( $F(7.97) = 6.7 p=.01$ ). Moreover a positive correlation between altruistic behaviour and instrumental aggression was found ( $r = .358 p < .001$ ). This result confirms Hawley's hypothesis that preschool children may be classified in 3 different groups in relation to the interactive strategies used to reach their goals: prosocial, coercive and both prosocial and coercitive. It may also be hypothesised that in these age groups both strategies may be used because of an incomplete verbal and social ability development which does not allow optimal negotiations between peers.

## **INTRACEREBRAL VISUAL P3-LIKE POTENTIAL OF THE HUMAN BRAIN IS A HETEROGENEOUS PHENOMENON**

---

**Alena DAMBORSKÁ, Milan BRÁZDIL, Ivan REKTOR, Miloslav KUKLETA**

Faculty of Medicine, Masaryk University, Brno, Czech Republic.

This study examines the intracerebral event related potentials (ERPs), aiming at the P3-like late component, elicited in response to the target stimuli during visual oddball task. We examined the target ERPs registered in various brain sites of the frontal, parietal, and temporal lobes of 14 epilepsy surgery candidates and classified them according to several aspects: 1/the similarity of their course to the course of the potentials elicited in response to the non-target stimuli, 2/the occurrence of early components, 3/the occurrence of late components, 4/the correlation of the P3 peak latency with the stimulus-response interval(SRI), 5/the stability of the P3 peak position towards triggers of averaging(stimulus and movement onset) in different SRIs, 6/the stability of the slope of the P3-like waveform in different SRIs, 7/the stability of the P3 peak percentage latency in different SRIs. Electri-

cal responses of following characteristics were found in various brain sites: the course of the target and the non-target ERPs was identical in the whole response or in the initial part only, diverging at about 300ms after stimulus onset; the early components occurred either in none or in both of the responses(target and non-target) being always identical; the late component occurred either in one response(usually the target one) or in both responses being identical or different; the P3 peak latency correlated or did not correlate with the SRI; the P3 peak position changed towards one or both triggers of averaging in different SRIs; the P3-like waveform changed or did not change its slope or percentage latency in different SRIs. In conclusion target and non-target intracerebral visual ERPs may show some common characteristics in the early as well as in the late components. The P3-like late component is a heterogeneous phenomenon; it is time-locked to the stimulus or to the movement onset or to neither of them.

## **SUSTAINED MENTAL ATTENTION AND MODALITY OF TEXT PRESENTATIONS AS MANIFESTED IN EEG PARAMETERS**

---

**S.G. DANKO, J.A. BOYTSOVA**

Institute of the Human Brain Russian Academy of Science – RAS, Saint-Petersburg, Russia. dnk@ihb.spb.ru

The purpose of this work was checking the assumption that difference of mental states of attention to coherent texts, delivered by reading or listening to the texts, are reflected in the multiple differences of parameters of oscillatory EEG.

Registration of EEG was carried out in healthy subjects in the following states: a state of rest with eyes open; passive perception of a narrative text either on a screen or via headphones, with no tasks; perception of similar texts in the same ways, but with a task to retell the texts. Estimations of absolute EEG power in each of the derivations, and estimations of EEG coherence in each of the pairs of derivations were made in the frequency bands:  $\delta$ ,  $\theta$ ,  $\alpha 1$ ,  $\alpha 2$ ,  $\beta 1$ ,  $\beta 2$ ,  $\gamma$ .

The results indicate that EEG correlates of visual and auditory attention in the experimental situations are significantly different as for involuntary, so for forced attention. Multiple significant differences of EEG power and coherence take place in the whole complex of frequency bands when comparing states of the presentation of texts and the state of rest. Direct comparison of EEG parameters during visual and auditory presentation of the texts shows that visual attention is characterized by higher EEG power values and lower values of EEG coherence, than auditory attention, in all frequency bands. EEG effects of the presentation modalities are not limited to characteristics of the involvement of the sensory areas, but lead to massive changes in EEG parameters. In the aggregate the changes are observed on the whole surface of the cortex.

It can be concluded that changes in activated functional systems of the brain depending on the modality of attention may be comparable in intensity with changes in these systems during the transition from a rest state to a state of complex cognitive activities.

## **THE LISTENING OF A SOUND STIMULUS REPRODUCED BY A MULTIGRADE HYPER-SYNCHRONIZED SOUND EMISSION SYSTEM (AVS) CAN REDIRECT AUDIO SIGNALS TO TEMPORAL LOBE IF THE USUAL FOLLOWED WAY IS INCORRECT. POSSIBLE HYPOTHESIS EXPLAINING THE PHENOMENON**

---

**Gioacchino AIELLO<sup>1</sup>, Roberta CACIOPPO<sup>2</sup>, Gubert FINSTERLE<sup>3</sup>, Riccardo PIGNATTI<sup>4</sup>, Marta SCONCI<sup>5</sup>**

<sup>1</sup> Neurophysiological Lab Milan – SIPP, Italy.

<sup>2</sup> Dynamic Psychology University Cattolica Milan, Italy.

<sup>3</sup> AVS Research – Research and development in the field of Psychology, SIPP, Italy.

<sup>4</sup> Service of Clinical Psychology, Istituto Auxologico Italiano, Piancavallo (VB), Italy.

<sup>5</sup> Clinical Psychology University Cattolica Bergamo, Italy.

EEG (10–20 System) were administered to three volunteers (age 26–35, 2F 1M, Psychologist-Psychotherapists) in order to evaluate brain reactions while listening to a new sound stimulus created for PAT (Psycho-Acoustical Transitional) sessions.

The protocol foresees the preliminary measurement of auditory evoked potential in a standard way. One subject out of the three (F, affected by a partial bilateral deafness of unknown origin) showed anomalies in the auditory path, as her excited area was located in the occipital (usually devoted to visual recognition) instead of the temporal lobe.

After that, we administered the subject with the same sound-stimulus but this time emitted by the multigradient hyper-synchronized AVS® audio system set as during PAT sessions. The EEG analysis showed us that this time the auditory signal excited the “correct” temporal areas instead of occipito-visual areas.

A possible explanation of this surprising result is that one of the peculiarities of PAT sessions is the “loop deleting and resetting” of dysfunctional neural path. We think that this could be the first real time evidence of this phenomenon, even if the sound stimulus provided was an impulse @1000 Hz instead of the Pink Noise as in PAT sessions.

The subject underwent to six PAT sessions, two before and four after this examination. The hypothesis that PAT Sessions and/or AVS listening of sounds could “open” new neural paths and “reset” dysfunctional paths was made even clearer in this subject, also because she referred increasing of insight capabilities, effectiveness on some muscular pain and emotive-affective reorganization.

In fact, the reactivation of original brain functional patterns is the core-hypothesis of PAT sessions, as they could enable a “prenatal” way of working of subcortical areas, while maintaining a complete functionality of the consciousness.

## **GENDER EVENT-RELATED ELECTROENCEPHALOGRAPHIC DIFFERENCES IN NORMAL ELDERLY POPULATION**

---

**S.Y. GEORGIEV, D.T. PHILIPOVA, Ch. CHRISTOVA, I. IVANOVA**

Institute of Neurobiology – Bulgarian Academy of Science BAS; Acad. G. Bonchev Str. bl. 23, Sofia, Bulgaria.

**Objective:** The problem concerning the psycho-physiological differences between male and female perception and information processing is well known and investigated in the scientific literature. Surprisingly, the data acquired by means of EEG and referred to male and female differences are inconsistent and often contradictory. The aim of this work was to examine the Event-Related phase-locked and time-locked oscillatory differences between male and female individuals in normal elderly population.

**Methods:** The EEG activity of 71 (35 male and 36 female) healthy volunteers was recorded under auditory mental and sensory-motor task conditions. The subjects were right-handed and between 18 and 50 years old. We calculated the Event-Related Potentials (ERPs), absolute and relative Fourier power spectra in time interval between 0 and 500 ms after the auditory stimuli presentation and for the time-frequency analysis we used S-transform. The reaction time to auditory target stimuli was also calculated and compared.

**Results:** The female individuals have generated more absolute theta, alpha 1 and beta 1 spectral power compared to males and they have higher P2 and larger N1 event-related potential components. When normalized the spectral power differences revealed larger relative theta and beta1 for female individuals and larger relative alpha 2 spectral power for male individuals. The S-transform time-frequency analysis showed us a frequency dynamics of gender differences in the time course of the ERPs and allowed us more accurate binding of gender differences found in the components of ERPs with gender differences found by FFT.

**Conclusion:** The differences between genders in the early N1 and P2 ERP components have mainly originated from enhanced theta spectral power found by female compared to male individuals. The differences are discussed in terms of enhanced emotional reactivity in females and gender differences in mental encoding and retrieval.

## RATE OF CARDIOVASCULAR RECOVERY TO COMBINED OR SEPARATE ORTHOSTATIC AND MENTAL CHALLENGES

---

Nandu GOSWAMI<sup>1,3</sup>, Helmut Karl LACKNER<sup>2</sup>, Jean-Pierre MONTANI<sup>3</sup>,  
Helmut G. HINGHOFFER-SZALKAY<sup>1,2</sup>

<sup>1</sup> Institute of Physiology, Medical University of Graz, Austria.

<sup>2</sup> Institute of Adaptive and Spaceflight Physiology, Wormgasse 9, Graz, Austria.

<sup>3</sup> Department of Medicine/ Physiology, University of Fribourg, Switzerland.

Post-stress neurovascular responses induced by physical and mental stressors are poorly understood. We, therefore, investigated the time course of recovery of the cardiovascular (early and delayed) and autonomic (delayed) responses, induced by orthostatic and mental challenge, using passive head up tilt (HUT) and mental arithmetic (MA), respectively. The stressors were applied singly (MA, HUT) or in combination (MA + HUT). 15 healthy young males were subjected to three protocols: HUT, MA and combined MA + HUT, with sessions randomized and 2 weeks apart. Post-stress responses were studied in first 10 min (early) and 30 min (delayed), in 2.5 min epochs. A detailed analysis of early period was done in 30 sec epochs. Within the first 2.5 min post stress recovery period, the time courses of heart rate ( $p < .01$ ) stroke volume ( $p < .001$ ) and cardiac output ( $p < .001$ ) differed significantly, particularly when comparing HUT vs MA and MA + HUT vs MA. Additionally, the heart rate response differed in HUT vs MA + HUT ( $p < .05$ ). No differences in hemodynamic recovery were seen in the next 2.5 min. Delayed responses of heart rate and cardiac output showed significantly lower values as compared to baseline, especially for HUT and MA + HUT. Sympathovagal balance showed no significant differences against the baseline. Recovery of hemodynamic responses, either due to single or combined stress challenges, showed stressor- and time dependent patterns. Our data provide useful information regarding why a longer recovery period must be assessed and provide novel insights regarding recovery of physical and mental stressors. This may have clinical implications in development of cardiovascular diseases such as hypertension or myocardial ischemia.

## NITRIC OXIDE INFLUENCES ACCURACY OF HUMAN GAZE FIXATIONS AND SPACE MEMORY FUNCTIONS

---

F. JAGLA, O. PECHÁŇOVÁ, B. CIMROVÁ, M. JERGLOVÁ, Š. BENDŽALA

Institute of Normal and Pathological Physiology, Slovak Academy of Sciences, Bratislava, Slovakia.

**Background:** It has been accepted that nitric oxide (NO) release within the brain is necessary for induction of long – term potentiation which involves the electrophysiological events related to synaptic plasticity and learning. Moreover, it was shown that the NO synthase (NOS) inhibitors disrupt the performance of animals in learning tasks while the NO donors display an anti-amnesic action. The study comparing the effects of L-NAME (NOS inhibitor) and molsidomine upon the memory tasks in rat pointed to the fact that the NO is involved in post-training memory processes. It was the reason for selecting the accuracy saccadic eye movements for analyzing the effect of NO synthase activator, Provinols™ upon the visual perception and space memory functions.

**Methods:** The analysis of the accuracy of visually evoked saccades and of saccadic eye movements driven by memory information concerning the eye landing position in space was used. With every healthy volunteer the saccades elicited by the visual targets were followed by the memory-guided saccade task. The whole procedure was repeated 2 hours after, following the Provinols™ administration (4 mg/kg of body weight). According to the clock face the saccadic landing positions were randomly selected at 1, 2, 4, 5, 7, 8, 10 and 11 hour.

**Results and Discussion:** The Provinols™ positively affected the accuracy of both the saccades. The memory-guided saccade task comprises 3 phases: 1. perception, 2. memorization and 3. execution of a saccade. Perception is under control of the network which subserve also the attention mechanisms. Memorization is controlled by the dorsolateral prefrontal cortex and programming and generation of

a MGS involve the working space memory. The question which of the above mechanisms is affected by the Provinols™ is discussed. Different significance of vertical and horizontal as well as right and left visual half-fields is taken into account.

Supported by VEGA grant No. 2/0160/08 and APVV-0538-07.

## **DIFFERENCES IN SYNCHRONIZATION BETWEEN VARIOUS BRAIN REGIONS IN THE BETA-2 BAND EEG FREQUENCIES**

---

**M. KUKLETA<sup>1,3</sup>, P. BOB<sup>1,3</sup>, M. BRÁZDIL<sup>2</sup>, R. ROMAN<sup>1</sup>, I. REKTOR<sup>2</sup>**

<sup>1</sup> Department of Physiology, Faculty of Medicine, Masaryk University, Brno, Czech Republic.

<sup>2</sup> First Department of Neurology, Faculty of Medicine, Masaryk University, Brno, Czech Republic.

<sup>3</sup> Department of Psychiatry, First Faculty of Medicine, Charles University, Prague, Czech Republic.

The selective neuronal inter-regional synchronization is thought to reflect specific communication among brain structures. In eight adult epileptic patients with intracerebral electrodes we calculated the correlation coefficients between 180 pairs of loci in the frontal and temporal lobes during a visual oddball task with the aim to assess regional differences of synchronisation in the beta- 2 band EEG (25–35 Hz). The mean r-value from 30 s segments selected in order to represent the whole experiment (1), the mean r-value from 1 s segment preceding (2) and following (3) the non-target stimulus were analyzed. In all three cases, the pairs with frontal electrode in the gyrus cinguli exhibited higher mean r-values than pairs with frontal electrodes in other parts of the frontal cortex (0.23±0.14 versus 0.16±0.13 in the first case; 0.35 ± 0.24 versus 0.14 ± 0.22 in the second case; 0.40 ± 0.21 versus 0.21 ± 0.24 in the third case; ANOVA,  $p < 0.001$  in all three cases). A significant correlation was found between indicator 1 on the one hand, and indicators 2 and 3 on the other hand (Spearman R 0.49 in the first case and 0.51 in the second case;  $p < 0.001$  in both cases; N 180), which suggested their common origin. In summary, the results demonstrated significant regional differences in activity synchronization throughout the whole experiment, during the period of heightened expectation of the stimulus and during its cognitive processing. In all three conditions the level of synchrony was highest in pairs with one electrode in the gyrus cinguli.

## **A SENSE OF COHERENCE TYPE RESISTANCE IN GLAUCOMA PATIENTS WITH DIFFERENT LEVEL OF PHYSICAL ACTIVITY**

---

**\*Janka LIPKOVÁ<sup>1</sup>, Alena VOSEČKOVÁ<sup>2</sup>, Olĝa KYSELOVIČOVÁ<sup>1</sup>, Miriam ŠKODOVÁ<sup>3</sup>**

<sup>1</sup> Comenius University, Faculty of Physical Education and Sports, Bratislava, Slovakia.

<sup>2</sup> Faculty of Military Health Sciences, University of Defence, Hradec Králové, Czech Republic.

<sup>3</sup> Medical Center Fedinova, Bratislava, Slovakia.

The aim of this study was to assess the impact of physical activity on dimensions of S.O.C. type resistance in glaucoma patients. The study group consisted of 19 glaucoma patients – women, mean age 51, 4 years. Eleven of them (the exercise group) were in the years 2004 – 2008 enrolled in the 3-month aerobic exercise program 2 times a year. Eight patients – women, matched in age without any organized physical activity serve as control.

The questionnaire method (Questionnaire – The S.O.C. type resistance) was used to objectify the individual predisposition to manage stress and perceived life sense.

The results showed that at the onset of the experiment the summary values and the comprehensibility (C) and meaningfulness (ME) dimensions of S.O.C. as well were higher in exercise group in comparison with control group, but the differences were not statistically significant. In comparison with the group of no clinical population (Vosečková, 2001) the experimental group of glaucoma patients presents higher S.O.C. dimension values. The values of control group were similar to those of clinical group (diabetes and AIM patients). Because of the low number of the subjects we could not give a final conclusion, although the suggestion exists, that the exercise group has higher predispositions for managing the chronicity of disease.

The study was supported by VEGA grant 1/4508/07.

**ERROR DETECTION AND BRAIN CONTROL OF HUMAN ACTIVITIES**

---

**S.V. MEDVEDEV**

Institute of the Human Brain Russian Academy of Science - RAS, Saint-Petersburg, Russia.

Error detection (ED) apparently is one of the basic brain regulatory mechanisms. Physiological manifestations of its existence were first revealed by Bechtereva and Gretchin in 1968 in studies where deep intrabrain electrodes were used for diagnostics and treatment of severe brain diseases. In certain basal structures a local blood flow was reproducibly changed only in situations when patients was mistaken at performance of the test

Much later the phenomenon was confirmed by many experimental paradigms and by every method of physiological access to active brain.

To the present moment we know that it is mechanism of ED that controls stereotyped forms of human behavior and responds to discrepancy between real situation and its brain model. This mechanism is a common one for different kinds of human activities. It can act subconsciously and precede voluntary actions. ED is involved also in dispensing brain resources between different kinds of simultaneous human activities. In our recent studies it has been shown that signals of error appeared even when a person tells lies deliberately and profitably.

Now our studies of error detection mechanism are also related to those forms of brain pathologies where malfunction of this mechanism is especially important. Different forms of obsessive-compulsive disorders, including drug addiction, are among evident examples of such pathologies. ED mechanism can stabilize a pathological situation in the same way as a normal one. Our approach is to suppress excessive ED functions by means of stereotactic neurosurgery which proved to be rather effective in extreme situations. Our recent studies have shown that this was possible to do even without operation.

**THE TIME-DEPENDENT EFFECT OF PROVINOLS ON BRAIN NO SYNTHASE ACTIVITY IN L-NAME-INDUCED HYPERTENSION**

---

**Olga PECHÁNOVÁ<sup>a</sup>, Lídia JENDEKOVÁ<sup>a</sup>, Stanislava VRANKOVÁ<sup>a</sup>, Andrej BARTA<sup>a</sup>, Daniel BARTKO<sup>b</sup>**<sup>a</sup> Institute of Normal and Pathological Physiology, Slovak Academy of Sciences, Bratislava,<sup>b</sup> Central Military University Hospital, Ruzomberok, Slovak Republic

Red wine polyphenols have been reported to possess beneficial properties for preventing cardiovascular diseases but their neuroprotective effects during chronic L-NAME treatment have not been elucidated. The aim of this study was to analyze a time course of Provinols effects on brain NO synthase activity and oxidative damage in L-NAME-induced hypertension. Male Wistar rats, 12 weeks old, were divided into six groups: control groups, groups treated with N(G)-nitro-L-arginine methyl ester (L-NAME, 40 mg/kg/day) for 4 or 7 weeks and groups receiving Provinols (40 mg/kg/day) plus L-NAME for 4 or 7 weeks. At the end of the treatment, marker of membrane oxidative damage - conjugated dienes (CD) in the brain and NO synthase activity in the cerebral cortex, cerebellum and brainstem were determined. L-NAME treatment for 4 or 7 weeks led to the increase in blood pressure, elevation of CD concentration and decrease of NO synthase activity in the brain parts investigated. Provinols partially prevented blood pressure rise and elevation of CD concentration. Comparing to the L-NAME treated group, Provinols increased NO synthase activity after 4 weeks of treatment. However, the prolonged Provinols treatment for 7 weeks had no effect on NO synthase activity decreased by L-NAME treatment. In conclusion, Provinols partially prevents L-NAME induced hypertension via the different mechanisms depending on the duration of treatment. Prevention of oxidative damage in the brain with modulating effect on NO synthase activity is suggested.

This study was supported by the grants VEGA 2/0178/09, 1/0187/09 and APVV-0538-07, APVV-0586-06.

## THE LATERALIZED READINESS POTENTIALS AND MOTOR SLOWING IN PARKINSON'S DISEASE

---

D. PHILIPOVA, S. GEORGIEV, I. IVANOVA

Institute of Neurobiology, Bulgarian Academy of Science, Sofia 1113, Bulgaria

Impairment of movement executions and slower reactions in Parkinson's disease patients could be due to disorders of cognitive and /or motor information processing.

**The purpose of the study was** to assess the both premotor (cognitive) and motor contributions to the response in Parkinsonian patients (PPs) by using Event related potentials (ERPs), Lateralized readiness potentials (LRP) and reaction time (RT) investigations.

**Methods:** PPs with a moderate tremor-rigid form and a healthy persons (HPs) matched for age, sex and education to the patients, were investigated. The acoustic ERPs reflecting the central processes (recorded from Fz, Cz, Pz, C3' and C4'), the force profile as the peripheral (effector) signals and electromyogram activity pattern of the first dorsal interosseus muscles were recorded simultaneously in RT experiments. Response locked LRP indicating the differential activation processes of the contralateral motor cortex was defined as the difference – C3' – C4' for right hand responses, C4' – C3' for left hand responses (Mordkoff, Cianaroff, 2000). PPs and HPs operating with two force keys with the index fingers were asked to make fast and accurate choice responses with the left and right hand to high (1000 Hz) or low (800) tone respectively.

**Results:** Behavioral responses – RT of PPs were slower than those of HPs, the significant force peak latency differences and response force duration differences were found between two groups. PPs showed also a delayed onset of LRP and exhibited lower P3 amplitude at Fz position.

**Conclusions:** The data obtained confirm the presence of qualitative differences in the processing of stimulus information during sensorimotor performing between PPs and HPs and suggest that slower motor processing at central brain level contributed to the slower RT for the PPs.

## I THINK IT SOUNDS DISGUSTING BUT I CAN'T SAY IT: EMOTIONAL PROCESSING IN MILD ALZHEIMER'S DISEASE

---

A. PINI<sup>a,e,f</sup>, D. BIELLI<sup>e,f</sup>, F. OLIVOTTO<sup>a</sup>, E. IMBORNONE<sup>b</sup>, M. RABUFFETTI<sup>c</sup>, P. NICHELLI<sup>d</sup>, L. CHIAVARI<sup>a</sup>, R. NEMNI<sup>a</sup>, E. FARINA<sup>a</sup>, M. ALBERONI<sup>a</sup>

<sup>a</sup> Fondazione Don Gnocchi, Centro IRCCS S. Maria Nascente, Milano, Italy.

<sup>b</sup> Fondazione Istituto San Raffaele G. Giglio di Cefalù, Servizio di Psicologia Clinica, Italy.

<sup>c</sup> Polo Tecnologico, Fondazione Don Gnocchi, I.R.C.C.S. Santa Maria Nascente, Milano, Italy.

<sup>d</sup> Dipartimento di Neuroscienze, Università di Modena, Regione Emilia, Italy.

<sup>e</sup> AIAMC, Associazione Italiana Analisi e Modificazione del Comportamento, Italy.

<sup>f</sup> ASIPSE, Associazione per lo Studio e l'Insegnamento Psico-Socio-Educativo, Italy.

**Background and aims:** recent studies on emotional processing focused on demented patients; most of authors assert that impairment in processing emotions in patients with dementia is subordinated to cognitive decline, while others believe that this is a primary deficit, which suggests the existence of a specific centre for the elaboration of emotional stimuli. Aim of this study is to assess the ability to recognize emotions expressed through faces and voices in patients affected by mild Alzheimer Disease (AD).

**Methods:** 25 AD patients and 25 normal elderly controls (CTR) were administered a battery of tasks to investigate: discrimination of visual and vocal identities, discrimination and naming of visual and auditory emotions, discrimination of prosodic intonations, and identification of visual emotions. Auditory tasks consisted of semantically neutral sentences read with different emotional intonations and presented via computer; visual tasks employed pictures from Ekman and Friesen set on a paper support. Included emotions were happiness, sadness, disgust, fear and anger.

**Results:** data analysis showed in AD a preserved ability in discriminating different emotions, both visually and auditorily. In contrast, AD showed worse performances than CTR in discriminating



visual and auditory identities, and in naming emotions presented vocally. In emotions naming, “fear” was the less recognized in both CTR and AD when presented visually and “disgust” when presented auditorily.

**Conclusions:** AD subjects showed preserved implicit emotional discrimination which is possibly connected to the functioning of sub-cortical areas (i.e. amygdala), phylogenetically more antique, not involved by the pathological process at least in the earliest stages of the disease. Emotion naming, instead, which involves explicit processes and cognitive abilities of cortical origin (first of all language), phylogenetically recent, is more precociously damaged in dementia. This may be also the reason of the early deficit in discrimination of vocal and visual identities in AD.

## OSCILLATORY PATTERNS IN FLUCTUATIONS OF SUSTAINED ATTENTION

---

Igor RIEČANSKÝ<sup>1,2</sup>, Jana EŠTOČINOVÁ<sup>1</sup>

<sup>1</sup> Institute of Normal and Pathological Physiology, Slovak Academy of Sciences, Bratislava, Slovakia;

<sup>2</sup> Institute of Clinical, Biological and Differential Psychology, Faculty of Psychology, University of Vienna, Austria

**Background and aims:** Sustained attention is a fundamental cognitive process that supports goal-directed behavior. Typically, performance in continuous tasks does not remain constant, but fluctuates around certain level. Exploration of patterns of these fluctuations may help to disclose the origins of the behavioral variability.

**Methods:** Seventeen healthy young subjects were asked to watch carefully vertical stripes that moved horizontally over a wide screen (95 × 35 deg) at speed of 30 deg/s for 60 or 90 seconds. Speed of slow (pursuit) phases of the optokinetic nystagmus (OKN), a measure of performance of the optokinetic system, was analyzed using spectral analysis.

**Results:** Changes of OKN speed occurred predominantly at frequencies below 0.1 Hz.

**Conclusions:** Fluctuations of sustained performance as assessed by OKN speed are not random, but show slow oscillations.

## CORTICAL EVOKED POTENTIALS RELATED WITH MEMORY-GUIDED SACCADIC PROGRAMMING

---

Maria SLAVUTSKAYA, Victoria MOISEEVA, Aleksey KOTENEV, Valeriy SHULGOVSKIY

Lomonosov Moscow State University, biological faculty, Moscow, Russia.

The paradigm of memory-guided saccades enables to study participation of cognitive processes of attention and memory in the saccade generation. In 10 healthy subjects were studied saccadic latencies of the visually- and memory-guided saccades at the 10° to the left and to the right and averaged presaccadic EEG-potentials. The increase of the memory-guided saccade latent period in comparison with visually-guided saccades is established. Our findings indicate that saccade programming on the basis of extraction of information from working memory slows down.

The reduction of peak latencies of presaccadic potentials of initiation N-1 and P-1 in case with memory-guided saccades in comparison with visually-guided saccades has been shown. We studied event related potentials N1 and P1 on a signal to begin a saccade (offset of the central stimulus for memory-guided saccade and onset of visual stimulus for visually-guided saccade). It was necessary for investigation of early stages of saccade programming connected with processes of attention, processing of the information and decision-making. Reduction of peak latencies of potentials N1 and P1 for memory-guided saccades in comparison with visually-guided saccades is shown. That can testify the acceleration of early stage of saccade programming connected with processes of extraction of the information from memory and with attention. Spatial-temporal dynamics of the event-related potentials N1 and P1 have allowed assuming that the early stage of memory-guided saccade programming is realized by means of the top-down mechanism of attention, and for saccades on visual stimulus – the bottom-up mechanism. Obtained data specify, what the increase of the memory-guided saccade latent period can be connected with the slowdown of the central stage of saccade programming – stage of decision-making (the correlate is a potential N2 developing in the middle of the latent period).

Spatial-temporal dynamics of event related potentials N1, P1 and N2 testifies that memory-guided saccade programming is under the control of frontal-medial-thalamic systems of selective attention and also left hemisphere mechanisms of motor attention.

## INTERCONNECTION BETWEEN AUDIOGENIC EPILEPSY AND AUDIOGENIC CATALEPTIC STATES, ATTEMPT OF ANALYSIS

---

**N.M. SURINA, I.B. FEDOTOVA, I.I. POLETAEVA**

Biology faculty, Lomonosov Moscow State University, 119991, Moscow, Leninskie Gory, 1/12, Russia.

Opera\_ghost@inbox.ru

Catalepsy is a state of pronounced motor inhibition with plastic muscle tonus and areflexia, often associated with severe nervous and mental disorders in human. The model of cataleptic state after audiogenic seizure fit (AF) – postictal catalepsy (PC) was analyzed. In work rats of several genetic groups with different predisposition to AF were involved: high susceptible rats of KM strain, Wistar rats, hybrids from interbreeding KM×Wistar, selected for maximum AF severity (substrain «4») and absence of susceptibility (substrain «0») and outbred white rats. Correlation between AF intensity and intensity and time course of subsequent cataleptic freezing was demonstrated. The data, obtained on intact animals were confirmed in pharmacological experiments with injections of agents, altering seizure proneness. Thus, caffeine injection to rats of nonsusceptible «0» substrain caused to appearance of AF and attended by this PC in these rats. Moreover, levetiracetam injection to KM rats, being accompanied by decrease of AF intensity and modifying its pattern (so called inhibitory phase appeared) led to decrease of interconnected PC. Besides, in the ontogenetic dynamics of AF parameters and catalepsy proneness was investigated. From the age of 1 to 4 months the steady decrease in AF latency occurs, as well as the increase of AF intensity. At the same time age dependent increase in PC intensity also took place. Wistar rats were subdivided into two groups – developing AF in response to sound and nonsusceptible. Among Wistars, developing AF, no systematic modifications in AF parameters or subsequent catalepsy were observed. We'd like to point out that «nonsusceptible» Wistar rats also demonstrated cataleptic reactions in response to sound, but such reactions were qualitatively less intensive. The percentage of rats, developing such catalepsy, decreased in series from 81 to 40% in period from 1 to 4 months age. The parallelism in the manifestations of audiogenic epilepsy and PC indicates, that in pathogenesis of these states could be the common link, potentially the dopamine system of striatum.

The work is supported by RFBR grant №09-04-00481-a.

## SUB-CHRONIC LEAD EXPOSURE DOES NOT IMPAIR SPONTANEOUS BEHAVIOUR AND SPATIAL LEARNING IN ADULT WILD TYPE AND LURCHER MUTANT MICE

---

**Jan TŮMA<sup>1</sup>, Jana PATKOVÁ<sup>2</sup>, Max VOJTÍŠEK<sup>3</sup>, František VOŽEH<sup>1</sup>**

<sup>1</sup> Department of Pathological Physiology, Faculty of Medicine in Pilsen, Charles University in Prague, Lidická 1, 301 66 Pilsen, Czech Republic.

<sup>2,3</sup> Department of Pysiology, Faculty of Science, Charles University in Prague, Albertov 6, 128 43 Prague, Czech Republic.

**Background:** The lead (Pb<sup>2+</sup>) exposure during the developmental stage of life produced impairments in learning processes, motor skills and induced hyperactivity in rodents and humans. However, information on the effect of lead exposure in adults is inconsistent (e.g. Jett *et al.* 1997). The aim of our study was to test the effect of sub-chronic (84 days) lead exposure on spontaneous behaviour and spatial learning in adult mice without previous toxicological affection during their development.

**Material and methods:** The young adult (28 days old) wild type and Lurcher mutant males of B6CBA strain of mice were exposed to Pb-acetate (0.2%) via drinking water for 12 weeks. Control mice received the drinking water only. Their spontaneous behaviour was tested using the open field method and the spatial learning was examined in the Morris water maze. The mice were sacrificed after tests and the content of Pb in their brains was measured.

**Results:** The exposed animals (wild type and Lurchers) had significantly higher level of Pb in the brain tissue than control subjects. In the open field test the animals of lead exposed groups did not exert any changes in their anxious behaviour. Nevertheless, while in Lurcher mutant mice there were no significant differences in distance they moved between lead exposed and control animals, in wild type mice the lead exposed animals had significantly shorter ones ( $p = 0.014$ ) in second day of test. No lead induced changes were detected in the water maze spatial learning in both types of mice.

**Conclusions:** Despite mild behavioural differences we found in the open field test between lead exposed and control wild type mice, we incline to the following opinion. The relatively not very high level of Pb-acetate in drinking water (together with naturally enhanced resistance of rodents to metal toxicity) did not produce cognitive changes in adult mice on opposite to in literature sources described lead effects in young animals.

Literature:

Jett D.A., Kuhlmann A.C., Farmer S.J., Guilarte T.R. (1997) Age-dependent effects of developmental lead exposure on performance in the Morris water maze. *Pharmacol. Biochem. Behav.* 57(1–2): 271–279.

