

treatment, and from this desired VTA to estimate the appropriate DBS parameters. As a first strategy, we introduce a kernel-based approach to learn the DBS parameters from VTA data. Our data-driven methodology employs a kernel-based eigendecomposition from pair-wise Hamming distances to extract relevant VTA patterns into a low-dimensional space. Further, DBS parameter estimation is carried out by employing a kernel-based multi-output regression and classification. The presented methodology is tested under both isotropic and anisotropic conditions to validate its performance under realistic clinical environments. Obtained results show a significant reduction of the input VTA dimensionality after applying our feature extraction scheme, which ensures suitable DBS parameter estimation accuracies and avoids over-fitting. The proposed approach to estimate the stimulation parameters, coupled with the visualization of the VTA as part of anatomically accurate reconstructions of the brain structures surrounding the implanted electrode, constitutes a powerful tool that will allow for a faster adjustment of the DBS parameters saving the patient both time and discomfort.

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Searching for Neurophysiological Evidence for Semantic Prosody: An ERP study using generalized additive mixed models

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The emotion-laden connotations of words modulate ERPs, an early posterior negativity peaking between 200 and 300 ms, and a late positivity peaking between 500 and 800 ms (for reviews, see Kissler et al. 2006; Citron, 2012). Existing ERP research on this topic has largely employed traditional factorial manipulations of stimulus (word) valence and arousal on by-item averaged ERP waveforms (for an exception see Kryuchkova et al, 2012). Factorial manipulations are limited, often resulting in unnatural stimuli lists through matching between conditions and a loss in statistical power through dichotomization of continuous variables (Cohen, 1983; McCallum et al., 2002). This is a particular issue for studies of emotion-linked ERPs evoked by single words, where valence and arousal are routinely dichotomized, and typically strongly emotion-laden words are selected to maximize effects. In addition, several continuous lexical variables have been found to moderate the effects of emotion such as word frequency (Scott et al., 2009) and word concreteness (Kanske & Kotz, 2007). Moreover, participant-level variability and longitudinal effects in experiments are masked through averaging. Generalized additive mixed models allow for analysis of continuous predictors over time in regression design EEG experiments, and analyze the EEG signal at the trial level. Participant-level variability can be explicitly modelled. To demonstrate the utility of this statistical technique in studies of word affect, we attempt to replicate the established effects of emotion-laden words on ERPs using this technique in a lexical decision task while treating valence and arousal as continuous. In addition, we include a novel manipulation contrasting the valence of words with the valence of their typical contexts – a phenomena known in corpus linguistics as semantic prosody (Ellis, et al, 2009; Hunston, 2007; Whitsitt, 2005) which has not been widely studied psycholinguistically. Sneffjella & Kuperman (submitted) found behavioural evidence that semantic prosody, although moderately correlated with valence, plays an independent role in word recognition. In this report, we employ neurophysiological recordings to further examine the role of valence and semantic prosody in word recognition.

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Emotional reactivity at wake-up depends on pre-sleep emotional state

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Previous reports showed that diurnal emotional experiences impact sleep stages distribution. Furthermore, experimental sleep perturbation modifies wake-up emotional reactivity. However, it seems that no study directly assessed the potential links between pre-sleep emotional experiences and post-sleep emotional reactivity.

Objective: The aim was here to explore the effects of pre-sleep induced emotional states on the post-sleep emotional reactivity, without any disturbance of the sleep period.

Method: Twelve volunteers (20.1 ± 1 yo.) slept at the laboratory for a total of 9 nights divided in 3 sessions, one per week. The first night of each session was devoted to baseline recordings. Just before each of the second nights, the participants viewed a negative, neutral, or positive standardized movie (20 min; counterbalanced order) designed to modify the pre-sleep emotional state. The third nights aimed to assess a possible persistence of the induced effect. None of those nights was disturbed by any experimental intervention. At each wake-up, emotional reactivity was measured using a task during which participants evaluated emotional intensities of angry, neutral, and happy facial expressions. Electroencephalographic activity was recorded during the whole task.

Results: We observed a global diminution of post-sleep emotional sensitivity after the second night, compared with the first one. Moreover, the diminution was more pronounced for the emotional facial expressions congruent with the pre-sleep induced emotional state, i.e. the post-sleep emotional sensibility was lower for angry faces after a negative induction, and lower for happy faces after a positive induction. The amplitude of the P100 component evoked by the faces varied in a similar congruent way.

Discussion and conclusion: Firstly, these behavioral and neurocognitive data support the idea that pre-sleep emotional state influences the post-sleep emotional reactivity in a rather congruent manner. Secondly, this emotional influence looks like a specific habituation phenomenon. Considering that habituation is thought to be a REM-sleep dependent process and that we previously reported that pre-sleep emotional movies did increase the rate of this sleep stage, we suggest that the emotional congruent habituation could take place during the REM sleep. Such sleep modifications linked to pre-sleep emotional experiences could be part of a mechanism acting to adapt emotional reactivity for the following period of wake.

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Distinct contributions of the sympathetic and parasympathetic pathways to the pupillary response during emotional processing

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Emotions are defined as a set of mental, somatic, and physiological changes that arise when a situation is perceived as significant. The pupillary response (PR) is a well-established index of brain state and autonomic changes linked to emotional experiences. An important question that remains unclear is the particular contribution of the sympathetic and parasympathetic pathways to the dynamics of the PR in an emotional context. In this study, we aimed to address this question by conducting a pharmacological inhibition of the sympathetic and parasympathetic components of the PR to visual emotional stimuli. We used Brimonidine as a sympathetic inhibitor (dilator muscle blocker) and Tropicamide as a parasympathetic inhibitor (sphincter muscle blocker), delivered through an ocular topical solution. While both substances evoked marked anisocoria as an indicator of pharmacological intervention efficacy, the treated pupil remained responsive to the visual stimuli. Prior to the emotional task, we instilled the autonomic modulator in one eye while the other eye was kept untreated to serve as a control. Next, we measured the PR of 26 healthy adults during the free viewing of 180 positive, negative, and neutral images from the International Affective Pictures System database (images were equivalent in both valence and arousal levels). We found differences in the PR to negative versus positive and neutral stimuli, as early as in the constriction phase (approximately 400 ms post-stimulus). These differences could not be only explained by the luminance factor, which was strictly controlled. In addition, the pupillary dynamics were differentially affected by the pharmacological interventions: Post-stimulus pupil constriction across all valences was significantly reduced under the action of the parasympatholytic agent indicating that this initial phase of the PR is under the control of the cholinergic parasympathetic activity. On the contrary, pupil dilation for positive stimuli was considerably affected by the sympatholytic agent, thereby suggesting that the autonomic modulation to positive pictures is mainly sympathetic. As for the PR to negative stimuli, we found a significant modulation as a result of the parasympathetic inhibitor defined by a decrease of pupil constriction and an increase in pupil dilation. These findings reveal that the processing of emotional stimuli with different valences is linked to specific patterns of autonomic activation that can be detected with a good temporal resolution by tracking the dynamics of the PR.

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Optimism and inflammatory markers: A preliminary study in a healthy working population

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Positive disposition, including optimism, hopefulness, life satisfaction, and sense of humor, has been reported to reduce mortality in the healthy and the disease populations. However, little is known about the mechanisms responsible for this association. Although immune activity seems to be a potential pathway, studies regarding optimism-immune relationship has been inconsistent. Hence, we have conducted a preliminary study to explore this relationship. A total of 192 male healthy white-collar employees, aged 20–61 (mean 42) years, underwent a blood draw for the measurement of circulating inflammatory markers (IL-1 β , IL-2, IL-4, IL-6, IL-8, IL-10, IL-12, IL-13, TNF- α , IFN- γ , and CRP) and completed a

self-administered questionnaire. Optimisms-pessimism was evaluated by a question: Please choose your way of thinking when you are situated in a certain condition. Response options were from “I am pessimistic” (coded 1) to “I am optimistic” (coded 5).” Multiple linear regression analyses controlling for age, education, marital status, smoking status, physical activity, drinking habit, sleep duration, body mass index, occupation, work hours, workload, medication usage, chronic conditions, and depression were carried out to examine the relationship. The ethics committee of the University of Occupational and Environmental Health approved the study protocol. In this sample, optimism was positively correlated with IL-10 ($\beta = .189$, $p = .026$), and inversely correlated with IL-10/IL-6 ($\beta = -.204$, $p = .013$). In conclusion, although the connection between optimism and inflammatory markers are not strong in this context, the results suggest that anti-inflammatory cytokine may be a key modulator between the optimism-immune relationships. However, the findings need to be further validated by using a validated questionnaire. Acknowledgement: This work was supported by JSPS KAKENHI Grant Number 26282190 and 26671048.

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Sex differences in inhibition of reflex saccades towards emotional faces. Electrophysiological Study

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Men and women deploy attentional neural resources towards emotional content differently. These differences may impact directly in behavior regulation and decision making given that in daily life we constantly are exposed to emotional valence stimuli. Behavior regulation mostly depends on inhibitory control which can be evaluated through the antisaccade task. The capacity to voluntarily suppress a reflex saccade to relevant emotional faces in the periphery indicates an adequate attentional control and inhibitory processing, hence a good behavior regulation. The objective of the present study was to assess sex differences in the inhibition of reflex saccades to anger faces reflected in the amplitude of the presaccadic component (CPS) of the ERPs. Thirty adults (15 men) underwent an antisaccade task to faces with neutral and anger expressions, while EEG was recorded. Brain activity was analyzed 50 ms previous to the saccade onset in order to obtain the CPS in the prosaccade and antisaccade trials in frontal regions AF3, AF4, F3 y F4. No sex differences were observed in the number of correct responses in prosaccade and antisaccade trials, neither between facial expressions. The interaction between sex x condition x region indicated that women had higher CPS amplitudes both in prosaccade and antisaccade trials to angry faces than men. In addition, only women showed higher CPS amplitudes to angry than neutral faces. In concordance to literature, our results suggest a higher bottom-up impact of angry faces in women than in men. Nevertheless, women exert an inhibitory top-down control of emotional stimuli as efficient as men in order to accomplish the task.

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