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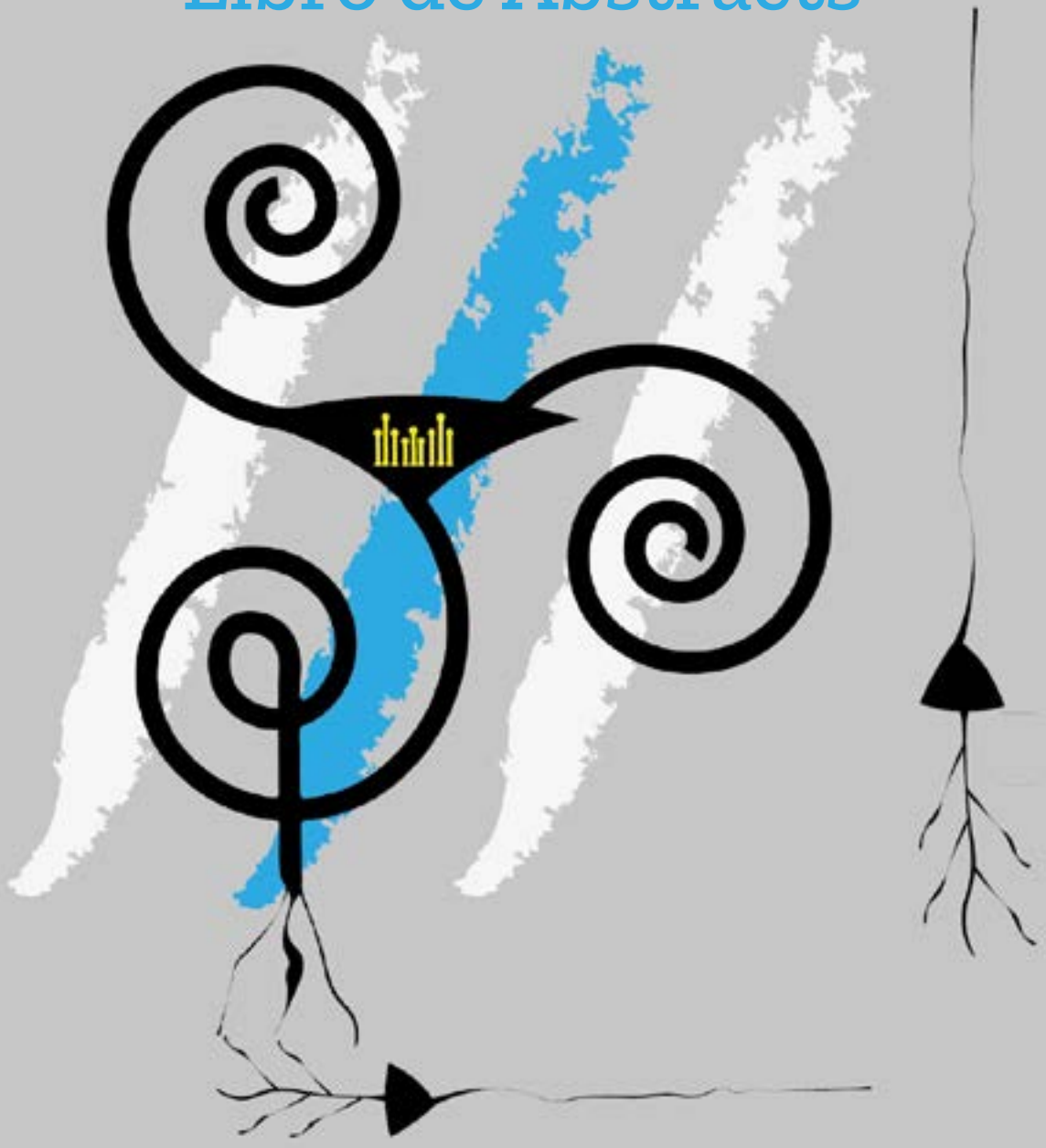
Libro de Abstracts



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SIMPOSIOS

SIMPOSIO I
OSCILACIONES CEREBRALES Y CONECTIVIDAD FUNCIONAL

Moderado por Samuel Suárez López

DISOCIACIÓN DE LOS COMPONENTES FASE Y NO FASE PARA LAS BANDAS GAMMA Y ALFA EN UNA TAREA VISUOESPACIAL

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En el campo de las modulaciones espectrales, los estudios en electroencefalografía (EEG) se han centrado principalmente en aquellas producidas en fase con la llegada de los estímulos. No obstante, estudios recientes han demostrado que el análisis de la actividad no-fase puede mostrar otros roles psicofisiológicos de las distintas bandas del EEG.

Un aspecto relevante en el estudio de las modulaciones fase y no fase es analizar su replicabilidad en medidas consecutivas para su potencial uso como marcadores de progresión en sujetos sanos y pacientes.

En el presente estudio, empleando un montaje de 58 canales de EEG y una tarea visuoespacial (*oddball*), se ha podido observar que la banda gamma presenta un comportamiento estable entre las dos medidas para ambos tipos de actividad (fase y no fase) tanto en su latencia, amplitud y distribución topográfica en el cuero cabelludo.

Un estudio accesorio mostró que la actividad gamma (fase y no fase) no puede ser explicada como un posible efecto armónico de la banda alfa, y sugiere que las distintas actividades (fase y no fase) de ambas bandas muestran distintos correlatos psicofisiológicos en el procesamiento temprano de la información visual.

ALL YOU NEED IS POWER: SPONTANEOUS PRE-STIMULUS ALPHA-BAND AMPLITUDE (BUT NOT PHASE) INFLUENCE CONSCIOUS PERCEPTION

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Pre-stimulus alpha oscillations have been proposed to play an essential role in conscious perception. The pulsed-inhibition theory claims that bouts of inhibition arise in each alpha cycle, being the perceptual outcome influenced by the specific phase prior to the stimulus. However, while previous studies usually conclude that pre-stimulus alpha power is a reliable correlate of perceptual outcome, results regarding alpha phase are controversial. Moreover, drawing conclusions is not easy, as different experimental manipulations (e.g., attentional involvement) and analysis approaches have been applied. Therefore, what do alpha oscillations need to modulate conscious perception, both in terms of power and phase as well as experimental and analysis conditions? In this study, EEG activity was recorded while participants were engaged three near-threshold detection tasks: no-cue, non-informative cue, and informative cue. Pre-stimulus alpha power and phase were analysed by means of cluster-based permutation and Bayesian analyses, additionally differentiating between low and high power trials. Our results show a robust effect of pre-stimulus alpha power on conscious perception only in the absence of attention involvement and provide evidence in favor of the absence of phase effect. Overall, these findings identify alpha power as an index of neural excitability and challenge the pulsed-inhibition framework.

DESIGN AND VALIDATION OF AN FNIRS SYSTEM TO ASSESS FUNCTIONAL ACTIVITY OF THE PREFRONTAL CORTEX

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Functional near-infrared spectroscopy (fNIRS) is a non-invasive optical imaging technology that has been widely used to measure cortical activity inferred through relative concentration changes in oxygenated (HbO) and deoxygenated (HbR) haemoglobin. Unfortunately, fNIRS signals are commonly impaired by undesirable task-evoked and spontaneous hemodynamic oscillations of non-cerebral activity. To address this issue multi-distance measurements have been proposed as a particularly effective strategy. The Theia device is a novel continuous wave-fNIRS instrument with multi-distance measurement, which has been designed with the aim of fulfilling the cutting-edge fNIRS system standard in the context of cognitive neuroscience. The main objective of this work is to validate the Theia device to assess the functional activity of the prefrontal cortex. To this end, we have applied a set of initial tests as well as an experimental validation using a cognitive paradigm of mental arithmetic. Twenty university students underwent an initial testing and a rhythmic mental arithmetic task while hemodynamic changes of the frontopolar cortex were monitored by placing the Theia probe on the forehead. We demonstrate that the performance of the Theia device has been optimal throughout the tests, meeting all the requirements stated in the NIRS literature concerning the validation of new fNIRS instruments.

BIOMARCADORES TEMPRANOS DEL CONSUMO DE ALCOHOL DURANTE LA ADOLESCENCIA Y SU INFLUENCIA EN EL COMPORTAMIENTO

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El consumo de alcohol entre los adolescentes es especialmente preocupante debido a su vulnerabilidad crítica a los efectos neurotóxicos del etanol. El neurodesarrollo adolescente se caracteriza por cambios neurobiológicos en regiones prefrontal, temporal y parietal, importantes para el desarrollo de procesos de control ejecutivo. En el presente estudio de Magnetoencefalografía (MEG), nos propusimos describir la relación entre la Conectividad Funcional (CF) en reposo y el consumo de alcohol durante la adolescencia, así como su impacto en el desarrollo de las funciones ejecutivas, la búsqueda de sensaciones y el control inhibitorio. Para ello realizamos un protocolo longitudinal con dos etapas. 84 adolescentes (edad media = 14,4 ± 0,6) participaron en el estudio MEG y a los dos años se midió mediante la prueba AUDIT y una entrevista semiestructurada

el número de unidades estándar de alcohol consumidas regularmente. A partir de estos datos, se usaron correlación de Spearman y una prueba de permutaciones basada en clúster (CBPT) para describir la relación entre la CF en reposo y el desarrollo de hábitos de consumo de alcohol. Finalmente, las redes de CF significativas en la banda Alpha y Beta se usaron para evaluar la influencia de la CF en distintas escalas de comportamiento.

DESENTRAÑANDO LA NATURALEZA DE LAS RELACIONES ENTRE LA ELECTROFISIOLOGÍA Y EL CONSUMO DE ALCOHOL EN LA ADOLESCENCIA: UN ENFOQUE DE APRENDIZAJE NO SUPERVISADO

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El consumo intensivo de alcohol durante la adolescencia provoca diversas alteraciones neurofisiológicas en el sistema nervioso en desarrollo. Tales diferencias pueden aparecer años antes del inicio en el consumo de alcohol, actuando como factores de predisposición. Es fundamental comprender la naturaleza de la relación entre las variables electrofisiológicas y el desarrollo de conductas de consumo para entender qué mecanismos neurofisiológicos subyacen a este perfil de conducta. Para ello, en este trabajo se estudiaron las relaciones entre la potencia de activación y la conectividad funcional electrofisiológica con la intensidad del consumo futuro en las primeras etapas de la adolescencia. Para ello, se utilizaron algoritmos de aprendizaje automático no supervisado del tipo aglomerativo jerarquizado, clusterizando los grupos de naturaleza similar mediante el método de varianza mínima de Ward. Los resultados para cada banda de frecuencia clásica nos indican la cohesión interna de cada clúster estructurado por el algoritmo, así como la localización, adhesión y relación de los dos tipos de variables dentro de las regiones de interés. Los resultados sugieren relaciones homogéneas de la electrofisiología con el consumo en theta (4-7 Hz), así como heterogéneas, bien diferenciadas en el resto de bandas, con alta clusterización en la banda gamma (30+ Hz).

SIMPOSIO II
ENVEJECIMIENTO PATOLÓGICO

Moderado por Samuel Suárez López

UTILIDAD DE LA ESTIMULACIÓN ELÉCTRICA TRANSCRANEAL POR CORRIENTE ALTERNA EN LA BANDA THETA PARA LA MEJORA COGNITIVA EN PERSONAS CON DECLIVE COGNITIVO SUBJETIVO Y CON DETERIORO COGNITIVO OBJETIVO

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La estimulación transcraneal por corriente alterna de frecuencia theta (tACS-theta) ha demostrado ser capaz de mejorar la función cognitiva en personas adultas sanas, pero no hay datos sobre su eficacia en personas mayores de 50 años con declive cognitivo subjetivo (DCS) o con deterioro cognitivo ligero (DCL) o moderado. En este estudio se aplicó tACS-theta durante 20 minutos sobre el córtex prefrontal dorsolateral izquierdo (CPFDLi), combinada con entrenamiento cognitivo en 6 sesiones de tratamiento, a 27 personas con DCS, DCL o demencia probable (divididos en 2 grupos: tACS-theta, tACS-placebo), con el objeto de mejorar su función cognitiva. Antes y después del tratamiento los y las participantes se sometieron a dos sesiones (pre-T y post-T), en las que se registró su EEG durante una tarea Oddball. Los resultados mostraron una mejora en la ejecución de la tarea, así como un aumento de la actividad theta en el EEG durante la misma, solamente en el grupo que recibió tACS-theta. Por lo tanto, parece que la tACS-theta es capaz de mejorar el rendimiento cognitivo en personas con deterioro cognitivo subjetivo (DCS) y objetivo (DCL, demencia), tanto a nivel conductual como psicofisiológico. Los resultados de este estudio indican que la tACS de frecuencia theta aplicada sobre el CPFDLi muestra un gran potencial como técnica de intervención para la prevención y mejora del declive cognitivo.

ANÁLISIS DE TÉCNICAS DE APRENDIZAJE AUTOMÁTICO PARA LA CLASIFICACIÓN DE DETERIORO COGNITIVO LEVE EN BASE A CONECTIVIDAD FUNCIONAL

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Actualmente, hay un creciente interés en el uso de algoritmos de aprendizaje automático (ML) en combinación con diversas técnicas que podrían servir como nuevos biomarcadores de Alzheimer, siendo la magnetoencefalografía (MEG) una posible alternativa con gran potencial. En el presente estudio, se realizó un registro MEG en estado de reposo con ojos cerrados a 262 participantes (117 controles sanos y 145 con deterioro cognitivo leve (DCL)). Posteriormente, se estimó la conectividad funcional para todas las bandas de frecuencia clásicas utilizando el phase-locking value, seleccionando regiones de la red neuronal por defecto basadas en el atlas AAL. Tras dividir la base de datos en dos grupos (entrenamiento = 80%; test = 20%), se realizó la selección de características, aplicando LASSO y Elastic Nets con 10000 iteraciones y validación cruzada de 5 particiones. A continuación, se realizaron 500 iteraciones para el entrenamiento y validación de varios modelos de clasificación, aplicando una validación cruzada de 5 particiones. El mejor clasificador fue el linear Support Vector Machine para la banda de frecuencia beta (accuracy entrenamiento = 77%±0.03; accuracy test = 77%±0.02). Estos resultados indican que los algoritmos de ML basados en conectividad funcional pueden diferenciar con éxito a pacientes de DCL de controles sanos.

THE MODERATING ROLE OF THE CORTISOL AWAKENING RESPONSE IN THE RELATIONSHIP BETWEEN SUBJECTIVE MEMORY COMPLAINTS AND AUTOBIOGRAPHICAL MEMORIES

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Subjective memory complaints (SMCs) have been related to objective memory functioning although depending on the type of memory assessed. In this context, results about autobiographical memory (AM) are still very scarce. Additionally, proper memory performance would rely on appropriate levels of stress. We aimed to investigate if SMCs can predict the capacity to recall AM. Furthermore, we wanted to explore if this relationship varies across different levels of stress, measured by means of the Cortisol Awakening Response (CAR). To do so, we recruited 60 voluntary participants (18-78 years old) and measured SMCs, AM, and calculated their CAR through saliva cortisol samples on two consecutive days. SMCs are marginally related ($p = 0.06$) to poorer AM performance (more omissions). Moreover, moderation analysis reveals that this effect only occurs when CAR is high ($p=.01$) or medium ($p=.04$). These results suggest that individuals with SMCs may experience deficits in AM, making them less capable of recalling memories from their past when stress experienced is translated to the cortisol response.

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ÍNDICES DE COMPENSACIÓN Y DÉFICIT EN EL DETERIORO COGNITIVO LIGERO AMNÉSICO: UN ESTUDIO DE RESONANCIA MAGNÉTICA FUNCIONAL EN ESTADO DE REPOSO

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Estudios previos muestran inconsistencias en cuanto a la actividad cerebral de la red neural por defecto (DMN) y de la red fronto-parietal de control (FPCN) en pacientes con Deterioro Cognitivo Ligero amnésico (DCLa). Con el objetivo de aclarar estas incongruencias, el presente trabajo evaluó la conectividad de la DMN, así como su relación con el lóbulo temporal medial (LTM), y la conectividad de la FPCN, en una muestra de participantes con DCLa unidominio (DCLau, n=29), DCLa multidominio (DCLam, n=26) y controles (n=30), mediante resonancia magnética funcional en estado de reposo, utilizando análisis de componentes independientes y análisis de semilla a cerebro completo del giro parahipocámpico anterior y posterior. Los resultados mostraron un aumento en la conectividad de la FPCN, en regiones frontales, en el grupo DCLau, y un decremento, en regiones parietoccipitales, en el grupo de DCLam respecto al grupo control, sugiriendo compensación mediada por la FPCN en el grupo DCLau y deterioro de esta red en el grupo DCLam. Además, se encontró una conectividad mayor entre el LTM y la DMN en el grupo DCLam respecto al grupo control, así como una conectividad menor entre el LTM y regiones fuera de la DMN, en los grupos de DCLa respecto al grupo control, lo que puede constituir un marcador de deterioro cognitivo.

SIMPOSIO III
EFECTOS DEL CONSUMO INTENSIVO DE ALCOHOL EN LOS JÓVENES: UNA MIRADA DESDE LA NEUROCIENCIA COGNITIVA

Moderado por Eduardo López Caneda

SESGO ATENCIONAL HACIA ESTÍMULOS RELACIONADOS CON EL ALCOHOL Y CONTEXTOS SOCIALES DE CONSUMO: RESULTADOS PRELIMINARES DE UN ESTUDIO CON JÓVENES *BINGE DRINKERS*

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El sesgo atencional hacia estímulos relacionados con el alcohol es un factor clave en la evolución de trastornos por uso de alcohol (TUA). Modelos recientes sugieren que este sesgo no es una característica permanente, sino que puede estar influenciado por factores motivacionales y contextuales. Esto resulta particularmente relevante en poblaciones de riesgo, como los jóvenes binge drinkers (BD), donde la aparición de dicho sesgo atencional puede constituir un marcador de riesgo para el desarrollo de TUA. Este estudio examina, a través de la técnica de eye-tracking, el impacto de contextos de carácter social en el sesgo atencional hacia estímulos alcohólicos en jóvenes BD. Se diseñó una tarea atencional en la que se evaluaron los tiempos de reacción y movimientos oculares de los participantes mientras observaban imágenes de bebidas en contextos sociales y no sociales. Hipotetizamos que los contextos sociales incrementarán el sesgo atencional hacia bebidas con contenido alcohólico y su intensidad estará asociada al craving y a la motivación para consumir alcohol. Durante el congreso se presentarán resultados preliminares que proporcionarán nueva información sobre la influencia del contexto en el sesgo atencional hacia estímulos alcohólicos, que contribuirá a comprender mejor los mecanismos subyacentes al BD en contextos sociales.

ASSOCIATIVE MEMORY, ALCOHOL-CONTEXT CUES AND THEIR IMPACT ON REWARD CIRCUITRY – AN FMRI STUDY WITH YOUNG *BINGE DRINKERS*

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Binge drinking (BD) is prevalent among youth, and has been associated with behavioral and neurofunctional alterations, including alcohol attentional bias, memory impairments and disrupted activity in both the prefrontal network and the reward circuitry. This study aimed to investigate the potential neurofunctional signatures of BD during an associative memory task, pairing neutral stimuli with alcohol-related cues. University students, BDs (n=20) and alcohol abstainers (n=16), were previously asked to memorize pairs of neutral objects with either alcohol or non-alcohol related contexts. Subsequently, inside the MRI scanner, neutral stimuli were presented, and participants were asked to classify them as being paired with alcohol- or non-alcohol-related contexts. Results revealed that, while behavioral performance was similar in both groups, during the recall of alcohol-related-cues, BDs showed increased activity in two clusters: a) bilateral thalamus and dorsal striatum, and b) cerebellum and occipital fusiform gyrus. These findings suggest that BDs display augmented brain activity in areas responsible for visual and reward processing when trying to recall alcohol-related cues, which may potentially contribute to craving for alcohol and substance-seeking behavior. Understanding the neural mechanisms underlying associative memory processes in BDs may provide valuable insights into the development of targeted-treatment interventions for individuals with alcohol misuse.

ALTERACIONES COGNITIVAS EN JÓVENES *BINGE DRINKERS* RELACIONADAS CON CAMBIOS EN LA MICROBIOTA INTESTINAL

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Recientemente, la gravedad de los trastornos relacionados con el consumo de alcohol (TCA) se ha relacionado con alteraciones del microbioma, lo que sugiere que el microbioma intestinal desempeña un papel en su desarrollo. Además, también ha surgido un fuerte vínculo entre la composición del microbioma y el funcionamiento socioemocional en diferentes trastornos incluyendo la dependencia al alcohol. El objetivo de este estudio era investigar la posible relación entre el perfil microbiano alterado y la cognición social y la impulsividad en jóvenes binge drinkers. Fueron reclutados jóvenes (N = 71) de entre 18 y 25 años con diferentes niveles de consumo. Se realizó una evaluación neuropsicológica y se controló por perfil nutricional. Se midió el craving al inicio del estudio y tres meses más tarde. Se tomaron muestras de sangre, saliva y pelo para determinar diversos biomarcadores. Se tomaron muestras de heces para secuenciación metagenómica y se midieron los ácidos grasos de cadena corta. El consumo excesivo de alcohol se asoció a alteraciones distintivas del microbioma y a dificultades en el reconocimiento emocional. Se hallaron asociaciones de varias especies del microbioma con el procesamiento emocional y la impulsividad. En conclusión, esta investigación demuestra alteraciones en el microbioma intestinal de jóvenes binge drinkers e identifica biomarcadores tempranos del craving. Las asociaciones entre el procesamiento emocional y la composición del microbioma apoyan la creciente literatura sobre el microbioma intestinal como regulador de la cognición social.

RELACIÓN ENTRE LOS PERFILES DE CONECTIVIDAD FUNCIONAL DINÁMICA DE CONTROL INHIBITORIO Y EL DESARROLLO DE CONDUCTAS DE CONSUMO INTENSIVO EN ADOLESCENTES

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Se ha propuesto que la predisposición al consumo intensivo de alcohol puede estar relacionada con una disfunción en las redes funcionales de control inhibitorio (CI). En este trabajo longitudinal, investigamos la relación entre la conectividad funcional dinámica (CFd) durante una tarea de CI y el desarrollo de conductas de consumo en adolescentes no consumidores (n=101). En una primera fase, previa al inicio del consumo, se registró el perfil de CFd mediante MEG durante una tarea go/no-go. Dos años más tarde, se recogió información de los perfiles de consumo de alcohol. Se realizó un análisis basado en semillas (giros frontales inferiores -IFG-, córtex cingulado anterior -ACC- y giros parietales -PG-) utilizando correlaciones parciales entre la CFd de cada semilla en la primera fase y los niveles de consumo de alcohol dos años más tarde (controlado por sexo y edad). Los resultados mostraron que un mayor consumo en el futuro se asociaba con una mayor CFd entre los IFG, entre el ACC y regiones parietales y menor CFd entre el PG izquierdo y el rIFG. La mayor implicación bilateral del IFG, así como una menor integración frontoparietal, puede ser indicativo de una disfunción en los procesos de regulación del comportamiento.

OLVIDANDO EL ALCOHOL: MECANISMOS CEREBRALES SUBYACENTES A LA SUPRESIÓN DE MEMORIAS EN JÓVENES *BINGE DRINKERS*

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Los seres humanos somos capaces de eliminar de forma consciente pensamientos o memorias indeseadas, fenómeno conocido como supresión de memorias (SM). Las conductas adictivas, por su parte, se caracterizan por atribuir una importancia excesiva a los estímulos relacionados con las drogas, así como por una menor capacidad para inhibir respuestas y/o pensamientos inadecuados. A pesar de que el consumo excesivo de alcohol se ha asociado con un deterioro del control inhibitorio (CI) y un mayor sesgo atencional hacia los estímulos alcohólicos, ningún estudio ha evaluado la capacidad de SM frente a señales alcohólicas en los binge drinkers (BDs). Este trabajo examinó los patrones de conectividad funcional (CF) entre el CI y las redes de memoria en 82 participantes (50% mujeres; 42 BDs) durante la tarea Think/No-Think Alcohol. Nuestros resultados revelan que los BDs muestran una mayor CF entre el CI y las redes de memoria durante los intentos de suprimir las memorias alcohólicas, lo que sugiere un mayor sesgo atencional y un mayor esfuerzo cognitivo con el fin de purgar/contrarrestar los pensamientos intrusivos relacionados con el alcohol. La posibilidad de fortalecer el control sobre memorias/recuerdos relacionados con el alcohol puede abrir nuevas vías en el tratamiento/prevención del abuso de alcohol.

SIMPOSIO IV
ATENCIÓN

Moderado por Manuel Vázquez Marrufo

ERPS EVOKED BY ABRUPT OFFSETS OF EMOTIONAL STIMULATION

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Previous data show an advantage of emotional visual stimuli to capture attention. Specifically, the abrupt onset of emotional visual stimuli evokes enhanced amplitudes of ERP components indexing exogenous attention and worse performance in concurrent but distinct target-distractor (CDTD) tasks. However, the potential effects elicited by the abrupt offset of emotional stimuli remain unexplored. Forty-four participants performed a CDTD task employing emotional (positive and negative) and neutral stimuli presented at three different presentation durations (125, 250, and 500 ms). A triphasic component consisting of positive-negative-positive polarity peaks appeared 60 ms after the stimulus offset in every duration and lasted for 200 ms. Mass Univariate Analysis revealed that this offset component was sensitive to emotional content in short and medium-duration exposures: its amplitude was greater for emotional than neutral stimuli in the former, and for positive than neutral in the latter. We hypothesize that this emotional effect on the offset potential of brief stimuli may reflect a reactivation of their sensory representation to complete their processing. Importantly, future studies should take into account that this emotion-sensitive offset component co-occurs at similar latencies of other emotional-related components (P300 or LPP) when stimuli appear during 400 ms and may overlap with them, interfering with their characteristics and functional meaning. Funding: MICINN/AEI (PID2021-124420NB-I00).

CORTICAL TEMPORAL DYNAMICS OF ATTENTIONAL RESOURCE ALLOCATION UNDER COMPETITIVE CONTEXT

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Selective attention refers to our capacity to focus on particular environmental features. However, not all of our attentional selection is voluntary: visual stimuli signalling threat or reward involuntarily capture attention and receive stimulus-driven priority processing associated with heightened activity in the visual cortex, reflecting facilitated processing. Attentional models assume a push/pull effect with time invariant shifts of strictly limited attentional resources. On the basis of this premise, we designed a set of experiments where meaningful and meaningless, emotional and non-emotional stimuli are background presented in Rapid Serial Visual Presentation (RSVP) streams, competing for attentional resources with a foreground flickering Random Dots Kinematogram (RDK) related task. Critically, frequency-tagged Steady-State Visual Evoked Potentials (SSVEP) allow the temporal analysis of simultaneously presented tasks, thus competence in (visual) attentional resource allocation. Our results point to a bi-phasic process, where the withdrawal of attentional resources from selective attention, depicted by decreased RDK-SSVEP amplitudes, occurs only after (~200 ms) a first fast forward sweep driven by attentional capture, reflected by the rapid enhancement of RSVP-SSVEP amplitudes after onset. Moreover, our results suggest that the underlying re-entrant feedback mechanism behind the attentional capture of emotional stimuli would be triggered by the first forward sweep, despite semantic masking.

ERP STUDY ON HOW TASK RELEVANCE CHANGES THE IMPACT OF SALIENT ITEMS ON ATTENTION

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Studies examining attentional salience typically use paradigms with irrelevant salient distractors to isolate salience from top-down processing. Yet, in real life, salient items will sometimes be irrelevant and sometimes be relevant for our tasks. However, the influence of the relevance of the salient item has not been systematically manipulated when investigating the effect of saliency on attention. To address this, we created a letter search task version of the additional singleton paradigm and manipulated both the search mode (type of search array: singleton detection or feature search), and the relevance of the salient item. A salient item was present on 60% of trials, and we manipulated the probability the salient item would be the target (Relevance: 0, 25, 50, 75 or 100% salient item target trials). In a follow-up ERP study, we measured the N2pc and Pd components, to understand early impacts of relevance on covert attention. We observed a significant effect of relevance in both search modes, as reflected by RT costs and benefits and in the ERPs. This suggest that our attention is guided by the integration of bottom-up saliency, selection history, and the top-down attentional set generated by each search mode.

EXPLORING FUNCTIONAL NEURAL CORRELATES OF ATTENTIONAL MECHANISMS TRIGGERED BY GAZE VS. ARROW TARGETS

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Gaze is a powerful attentional cue in social interactions. Although gaze can orient attention like other directional non-social stimuli, such as arrows, it also generates unique responses. Using a spatial interference paradigm, arrow and gaze targets lead to opposite spatial congruency effects. While arrows elicit a standard congruency effect (faster responses for congruent than incongruent trials), gaze elicit a reversed congruency effect (faster responses for incongruent than congruent trials).

The aim of this study was to explore the shared and dissociable neural mechanisms underlying the observed differences between arrows and gaze in the congruency effect. fMRI functional connectivity analyses showed greater co-activation on incongruent versus congruent trials for both stimuli in a set of parieto-temporo-occipital regions. In addition, gaze shows a greater co-activation of the right frontal eye field with parietal and occipital regions on congruent versus incongruent trials. These findings point to the existence of a neural network shared by arrow and gaze stimuli in relation to spatial conflict resolution, and an additional specific network related to gaze stimuli. The results are discussed on the assumption that social attention triggered by gaze activates domain-general attentional mechanisms but also uses social-specific mechanisms that would only be involved in social attention.

PROACTIVE NEURAL MECHANISMS OF COGNITIVE CONTROL IN HIGH AND LOW COMPETITION CONTEXTS

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Every day we come across many stimuli that compete for our cognitive resources. To aid the selection that such competition requires, the brain can make use of proactive mechanisms. These proactive states anticipate overall cognitive control-related neural processes, such as increases in theta-band power or specific preactivations of task-relevant information. However, it is unclear how these measures (theta activity and preactivations) are modulated by the difficulty of the task demands and whether they are related to the efficiency of behavior. To study this, we recorded electroencephalography data during a cue-target paradigm that manipulated the competition between target and distractor stimuli (words vs. faces). As expected, high-competition levels led to worse performance and displayed an effect of interference. Multivariate pattern analyses showed that the category of the upcoming target could be decoded with similar strength in both competition conditions, following a ramping-up pattern towards the end of the preparation interval. Nonetheless, the lack of cross-classification between blocks suggested that the coding underlying the anticipatory patterns was different across competition levels. On the other hand, anticipatory theta-band power was higher on high-competition contexts. Regarding behavioral performance, whereas we did not find a link between preactivations and the speed of responses, theta levels mediated how competition affected reaction times. Our results contribute to the understanding of preparation and propose theta as an important factor on the relationship between competition and behavior.

SIMPOSIO V
POBLACIONES CLÍNICAS

Moderado por Irene Peláez Cordeiro

DIFERENCIAS PSICOFISIOLÓGICAS ENTRE PSICOPATÍA SUBCLÍNICA Y POBLACIÓN GENERAL EN EL MARCO DE LA REGULACIÓN EMOCIONAL

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La psicopatía se caracteriza por alteraciones a nivel conductual, social y afectivo. La finalidad de este estudio fue comprobar las diferencias psicofisiológicas entre psicopatía subclínica y población general, empleando una tarea de regulación emocional. 66 estudiantes de la Universidad de Granada participaron en el estudio, seleccionados en base a su puntuación en la Triarchic Psychopathy Measure. Los participantes realizaron una tarea de regulación emocional ante imágenes del IAPS (valencia agradable y desagradable). Se presentaba un estímulo de sobresalto a los 2, 4 o 7 segundos del comienzo de la imagen. Se registró la actividad electrodérmica y la respuesta subjetiva a arousal y valencia. Los resultados del análisis de la varianza sugieren diferencias en Valencia $F(1, 65) = 8.47$, $p = .005$, $\eta 2p = .114$. y Actividad electrodérmica $F(1.67, 65) = 12.85$, $p < .001$, $\eta 2p = .163$. Se encontraron interacciones entre Valencia y Psicopatía $F(1, 65) = 4.28$, $p = .043$, $\eta 2p = .061$., Actividad electrodérmica y Psicopatía $F(1.66, 65) = 3.65$, $p = .037$, $\eta 2p = .053$, Valencia y Actividad electrodérmica $F(1.75, 65) = 3.78$, $p = .031$, $\eta 2p = .054$. Estos resultados sugieren la existencia de diferencias psicofisiológicas entre los participantes en función de su puntuación en la escala de psicopatía.

MODULACIÓN DE LOS SESGOS ATENCIONALES HACIA LOS ALIMENTOS EN LOS TRASTORNOS DE LA CONDUCTA ALIMENTARIA

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Introducción: Los Trastornos de la Conducta Alimentaria (TCA) son conocidos por una sintomatología conductual característica (desde la restricción alimentaria hasta la realización de conductas compensatorias). Sin embargo, también se han descrito ampliamente diferencias en el procesamiento de los estímulos de comida, tanto a nivel atencional como emocional y motivacional, siendo un auténtico reto el encontrar los mecanismos subyacente y su posible modificación.

Método: Han participado 37 mujeres, de las cuales 12 presentaban síntomas de TCA, medidos a través del cuestionario EDEQ. Todas las participantes realizaron dos tareas en ordenador con registro de movimientos oculares con objeto de medir el posible sesgo atencional existente hacia alimentos con diferentes características hedónicas (sabor dulce vs desagradable, calórico vs acalórico, saludable vs peligroso). Posteriormente realizaban un tratamiento de exposición hacia alimentos (N = 18) o una tarea de control inhibitorio (N = 19) durante una semana y un registro posterior de las tareas atencionales.

Resultados: Los resultados preliminares parecen indicar la existencia de un sesgo atencional diferente hacia alimentos con alto valor calórico y características hedónicas en función de la sintomatología alimentaria del paciente, así como una disminución del mismo tras la aplicación de los diferentes tratamientos según el grupo de población referido.

EVENT-RELATED POTENTIALS AS BIOMARKERS OF SEVERE MENTAL DISORDERS

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Attentional processing plays an important part in different psychiatric disorders. By recording the event-related potentials associated with an oddball task we can measure the different degrees of alteration with N200 (N2) and P300 (P3) waves, which allows us to investigate the alteration in depression, schizophrenia and bipolar disorder associated with attentional performance. The aim of the present work was to study the alterations in the ERPs associated with the attentional processing of auditory stimuli through an oddball task in patients with different psychiatric disorders. We recorded a total of 306 volunteers, divided into control (n=145) and experimental major depression disorder: n= 79; bipolar disorder: n=29; Schizophrenic disorder: n= 20; schizoaffective disorder: n= 10; psychotic disorder: n= 23) groups. The N2b and P3 components were registered during an oddball auditive task. We observed longer N2 latencies and smaller P3 amplitudes for each clinical subgroup. The overall comparison showed greater differences for the bipolar manic group. ERPs could be useful neurophysiological markers of cognitive impairment in psychiatric patients

with attention deficit disorder that could reflect inhibitory failures and dysfunctions in related brain regions, and thus be able to detect more clearly the different profiles of patients with severe psychiatric disorders. We identified early attention deficits, with the limitation that it would be necessary to increase the difficulty of the tasks. Therefore, the main limitation is the need to increase the number of electrodes used to record more brain areas and to be able to perform deeper connectivity studies.

NEUROPHYSIOLOGICAL CORRELATES OF INHIBITORY CONTROL CHANGE AFTER AI-DRIVEN DIGITAL COGNITIVE STIMULATION TREATMENT IN ADHD: A MEG STUDY

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Inhibitory control deficit is one of the core impairments in attention deficit hyperactivity disorder (ADHD). In this study we examined if personalized cognitive stimulation therapy (CST) driven by artificial intelligence (AI) is effective in the neurocognitive rehabilitation of these patients and it correlates with electrophysiological brain changes measured with magnetoencephalography (MEG). A sample of N= 41 subjects with ADHD were randomly distributed in the experimental (N=20) or control group (N=21) and underwent a pre-and-post intervention assessment with MEG records, neuropsychological batteries and clinical questionnaires. We found evidence that personalized digital CST improves inhibitory control (Commissions CPT-III, interaction effect p-value= .0473< 0.05) as well as spatial working memory (Spatial Location Inverse Max Items, p-value= .0012<0.05). These changes in inhibition (CPT-C) were found to be correlated to increases in beta band power in all participants in posterior temporo-occipital brain regions. In addition, the experimental group showed a positive correlation of alpha and beta brain power in fronto-parietal networks with the hyperactivity subscale for clinical assessment of ADHD (EDAH-H). These results point out that personalized AI-assisted CST may be effective for cognitive and neurophysiological rehabilitation of inhibitory processes in patients with ADHD.

A SINGLE DOSE OF LAMOTRIGINE INDUCES A POSITIVE BIAS ON MEMORY RECALL IN A HEALTHY VOLUNTEER SAMPLE

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Background: Most current available treatments for Bipolar Disorder (BD) exert their effects primarily on mania/hypomania, and to a lesser extend in depression. Lamotrigine has been shown to be effective in the long-term treatment and relapse prevention of these depressive episodes, however, reasons for this specific antidepressant effect are not yet clear. Investigating lamotrigine's effects on emotional cognition in healthy volunteers could help understand lamotrigine's antidepressant properties in BD.

Methods: This study investigated the effects of a single dose of lamotrigine (300 mg) on emotional cognition in 36 healthy volunteers (18 lamotrigine; 18 placebo) using the Oxford Emotional Test Battery (ETB) on a double-blind, placebo-controlled randomised design.

Results: Three hours after treatment administration, lamotrigine increased the accuracy for the recall of positive vs. negative self-descriptors, compared to those in the placebo group ($F(1.34)=4.953$, $p=0.03$). No other significant effects arose for the remaining of the ETB tasks.

Conclusions: This study showed that lamotrigine induced a positive bias in emotional memory, which may explain its antidepressant properties for BD. This specific effect of lamotrigine on emotional memory may be related to lamotrigine's glutamatergic properties. Further research should investigate more extended effects of lamotrigine on memory, and test these effects on a BD sample.

SIMPOSIO VI
PERCEPCIONES

Moderado por Kenia Correa Jaraba

NEUROVASCULAR COUPLING DURING AUDITORY STIMULATION: EVENT-RELATED POTENTIALS AND FNIRS HEMODYNAMIC

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Intensity Dependent Amplitude Changes (IDAP) have been extensively studied using Event-Related Potentials (ERPs) and have been linked to several psychiatric disorders. This study aimed to explore the application of functional near-infrared spectroscopy (fNIRS) in IDAP paradigms and to relate it to ERPs. Thirty-three and thirty-one subjects participated in two experiments, respectively. The first experiment consisted of the presentation of three-tone intensities (77.9dB, 84.5dB, and 89.5dB), and the second one of five-tone intensities (70.9dB, 77.9dB, 84.5dB, 89.5dB, and 95.5dB). EEG was used to measure ERP components: N1, P2, and N1-P2 peak-to-peak amplitude. The results showed an increase in N1, P2, and N1-P2 peak-to-peak amplitude with auditory intensity. Similarly, oxyhemoglobin and deoxyhemoglobin concentrations showed amplitude increases and decreases, respectively, with auditory intensity in the auditory and prefrontal cortices. Spearman correlation analysis showed a relationship between the left auditory cortex and N1 and the right dorsolateral cortex and P2 amplitude. These results suggest that there is a brain response to auditory intensity changes that can be obtained by EEG and fNIRS, supporting the neurovascular coupling process. Overall, this study contributes to the understanding and application of fNIRS in auditory paradigms and highlights its potential to be used in a complementary manner to ERPs.

ACOUSTIC PERCEPTION AND EMOTION EVOCATION BY ROCK ART SOUNDSCAPES OF ALTAI (RUSSIA)

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The major goal of psychoarchaeoacoustics is to understand the psychology behind motivations and emotions of past communities when selecting certain acoustic environments to set activities involving the production of paintings and carvings. Within this framework, the present study seeks to explore whether a group of archaeological rock art sites in Altai (Siberia, Russia) are distinguished by particular acoustic imprints that elicit distinct reactions on listeners, in perceptual and emotional terms. Sixty participants were presented with a series of natural sounds convolved with six impulse responses from Altai, three of them recorded in locations in front of rock art panels and three of them in front of similar locations but without any trace of rock art. Participants were interrogated about their subjective perception of the sounds presented, using ten psychoacoustic and emotional scales. The mixed ANOVA analyses carried out revealed that feelings of "presence", "closeness" and "tension" evoked by all sounds were significantly influenced by the location. These effects were attributed to the differences in reverberation between the locations with and without rock art. Our results suggest that the acoustics of archaeological sites could have played a role in the selection of some particular locations for rock art production.

This study is part of the ERC Artsoundscapes project (Grant Agreeement No. 787842) that has received funding from the European Research Council (ERC) under the European Union's Horizon 2020 research and innovation program.

BRAIN RESPONSES RELATED TO GLOBAL/LOCAL PROCESSING IN THE VISUAL PERCEPTION OF "HIERARCHICAL" FACES

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Visual perception of complex stimuli involves the integration of their parts into a whole, with the global vs. local visual processing being one of the processes involved. This process has been studied by using hierarchical letters (large letters composed by the same or different small letters) and a global precedence effect has been reported in young adults, i.e., global items are processed preferentially over local ones. We aim to study this effect in faces designing a high-density EEG/ERP experiment with "hierarchical" faces with distinct degrees of internal congruence (i.e. large faces with small face-eyes+small objects and large faces with small object-eyes+small faces), meant to interfere with the global processing of these stimuli. As expected, we observed a modulation of the amplitude of face-sensitive ERPs (N170/VPP) as a function of their complexity and intrinsic congruency. Intriguingly, a negative deflection emerged between 200-350ms in frontocentral regions (somewhat right-sided), which increased in amplitude as the incongruence between global and local elements of the stimulus did. The observed latency and topography suggest the modulation of attentional processes related to stimuli (faces) evaluation. This experimental paradigm is of particular interest for characterising early neurocognitive markers of typical ageing and neurodegenerative diseases involving visuoperceptive déficits.

UNRAVELING THE NEURAL PATHWAYS FOR EFFICIENT PROCESSING OF NEW FACES: ERPS-BASED EFFECTIVE CONNECTIVITY DURING SEQUENTIAL PROCESSING OF EXTERNAL AND INTERNAL FACIAL FEATURES

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This study regards how both external (i.e. contour/E) and internal (eyes, nose, mouth/I) facial features are integrated into face gestalts when we meet unknown individuals; and whether the order by which such face parts are perceived optimizes the formation of visual face representations. Stimuli were displayed sequentially according to a three-stimuli-per-trial matching task. We analyzed the effective connectivity among 26 brain regions using iCoh (isolated effective coherence) of the activity evoked by matching whole faces that were presented after E-I or I-E. iCoh related to matching faces following the E-I sequence (vs I-E) was significantly larger between left superior parietal and fusiform regions as main sender nodes and right posterior regions as precuneus, parietal inferior and postcentral cortices as main receivers. In turn, iCoh related to matching faces following the I-E sequence was more widespread along the left hemisphere and also involving integrative nodes on the right as the precuneus and the orbitofrontal region. These results derived from a group of typical adults suggest that different, non-overlapping neural pathways are activated according to different sensorial inputs of face components. Our findings are further interpreted in relation to a case of acquired prosopagnosia, in which face perception is markedly altered

MANIPULATING CORTICO-CORTICAL PLASTICITY CHANGES OSCILLATORY COMMUNICATION IN THE HUMAN MOTOR CONTROL SYSTEM

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Oscillatory activity may reflect interactions between brain areas. Here we tested whether inducing corticocortical plasticity in a specific set of connections changes oscillatory activity and cortico-cortical interactions and, if this is the case, whether the changes manifest in a manner that is behaviour state-dependent. We either increased or decreased the influence of activity in human ventral premotor cortex (PMv) over activity in primary motor cortex (M1) using cortico-cortical paired associative stimulation (ccPAS). Before and after stimulation participants performed a Go/No-Go task. While M1 TMS pulses revealed the excitatory state of the motor system at specific time points, the electroencephalogram (EEG) revealed the evolution of oscillatory activity dynamics in the motor system over several hundreds of milliseconds before, during, and after each movement. Augmenting cortical connectivity between PMv and M1, by evoking synchronous pre- and postsynaptic activity in the PMv-M1 pathways, led to a state-dependent modulation of the causal influence of PMv over M1, and at the same time, enhanced oscillatory beta and theta rhythms in Go and No-Go trials, respectively. No changes were observed in the alpha rhythm. The plasticity induction effect was dependent on PMv-M1 stimulation or-

der; the opposite patterns of results were observed after an equal amount of stimulation of PMv and M1 but applied in a temporal pattern that did not augment PMv's influence over M1. These results are consistent with Hebbian principles of synaptic plasticity and show that artificial manipulation of cortico-cortical connectivity produces state-dependent functional changes in the spectral fingerprints of the motor circuit.

SIMPOSIO VII
MEMORIA

Moderado por Susana Cid Fernández

EEG RESTING STATE AND MEMORY PERFORMANCE: THE ROLE OF THE NEED FOR COGNITION AND AFFECT

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In this study we explored the relationship between EEG power bands and memory performance, employing health messages with the aim to assess memory about more ecological and quotidian information. We also aimed to study the importance of some individual characteristics, such as the need for cognition and affect. The first is the tendency for an individual to engage in and enjoy thinking, and the latter is the motivation to approach or avoid emotion-inducing situations. Fifty-five young adults underwent a 6-minute EEG resting state recording, with eyes open (EO) and eyes closed (EC), and a memory assessment which consisted of a delayed (30-minute) recognition task of the health-related messages. We analyzed the predictive role of EEG resting state for memory performance, as well as the importance of some participants' tendencies. Results showed that lower theta power in the temporal lobe during EC predicted a higher recognition of emotionally framed messages and also a higher need for cognition and affect. No other significant results were found. These findings challenge previous research and suggest that greater recognition of emotionally framed messages may be explained by a higher tendency for both, the need for cognition and affect.

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LONELINESS AND SOCIAL SUPPORT DURING PANDEMIC PERIOD: IMPORTANCE OF THE FACE-TO-FACE SOCIAL CONTACT FOR STRESS BIOMARKERS AND MEMORY

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This study examined the impact of COVID-19 lockdown on loneliness, social contact, and various health factors. We investigated if living situation and reduced face-to-face contact affected psychological well-being, stress biomarkers, and cognitive performance during late pandemic restrictions. The participants were divided into two groups: Alone Group (AG) consisted of individuals who changed their nuclear family and moved away from their home country, while the Not Alone Group (NAG) included individuals who maintained their nuclear family and lived with relatives, friends, or a spouse in their home country. Heart rate variability (HRV), measured by frequency-domain (high-frequency - HF, low-frequency - LF) and time-domain (root mean square of successive differences - RMSSD) was assessed before, during, and after the memory evaluation. Both groups had a similar "virtual" contact with their family and friends, and similar perceived stress and depression. However, AG participants reported significant less face-to-face contact, higher loneliness and also hair cortisol concentrations. Also, the AG participants had lower LF during the entire session and performed worse in memory (working, declarative and prospective). These findings highlight the importance of face-to-face contact as a clear social support in mitigating loneliness and reducing negative cognitive effects during pandemic-related restrictive measures.

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EFECTOS DEL ESTRÉS PSICOSOCIAL AGUDO EN LA MEMORIA PROSPECTIVA

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Recordar realizar acciones en un futuro se conoce como memoria prospectiva (MP), función de gran importancia en la vida cotidiana, y que podría verse afectada por el estrés, como otros tipos de memoria. Este estudio examina la influencia del estrés psicosocial agudo en la MP. Los participantes (N=65) fueron divididos según la edad (jóvenes) vs. mayores) y condición experimental (estrés: exposición al Trier Social Stress Test (TSST) vs. control). La variabilidad de la frecuencia cardiaca (VFC) se utilizó para evaluar la respuesta cardiovascular al estresor. Tras la exposición al estresor, los participantes realizaron el Cambridge Prospective Memory Test (CAMPROMPT). Los resultados mostraron que los participantes de la condición estresante presentaron mayor respuesta cardiovascular durante el TSST que en el resto de fases de la sesión experimental, aunque no encontramos diferencias significativas según la condición. Además, el grupo estrés mostró peor rendimiento en la MP. Respecto a la edad, los jóvenes (18-37 años) presentaron menor respuesta cardiovascular al estrés y mejor rendimiento en la MP que los mayores (56-88 años). Estos resultados sugieren un efecto negativo del estrés psicosocial en la MP, y destacan el papel de la edad en la respuesta cardiovascular al estresor y el rendimiento en la MP.

FUNCTIONAL AND STRUCTURAL SIGNATURES OF ENCODING VISUAL WORKING MEMORY IMPAIRMENT IN NEWLY DIAGNOSED PATIENTS WITH RELAPSING REMITTING MULTIPLE SCLEROSIS

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Objectives: Impairments in working memory (WM) are common and disabling symptoms of multiple sclerosis (MS), frequently manifesting in the early stages of the disease. Here, we aimed to investigate brain functional and structural correlates underlying encoding of visual WM performance in these patients.

Methods: Thirty-four newly diagnosed patients with relapsing-remitting multiple sclerosis (RRMS) were split into two groups based on their WM task performance and compared to 18 healthy controls (HC). Visual WM was evaluated by manipulating stimuli congruence and cognitive load. Cortical current density modelling of the resulting event-related potentials components was measured to disentangle the dynamic neural modulations involved in encoding WM process. Quantification of regional gray matter (GM) volumes and cortical thickness were also explored.

Results: Memory impaired (MI) patients were less accurate than memory preserved (MP) patients and HC. During encoding WM, HC and MP groups elicited a larger P3 amplitude than MI patients and exhibited increased activations of inferior and superior parietal areas, while MI patients displayed abnormal enhanced prefrontal activations. Further, MI patients showed reduced bilateral thalamic GM volumes and a cortical

thinning in right parietal areas. Collectively, visual WM accuracy was negatively correlated with both increased P3 amplitudes and increased thickness in parietal cortex.

Conclusions: These results highlight spatiotemporal brain dynamics underlying impaired visual WM and provide updated structural and functional evidence that supports critical frontal-parietal network interactions during WM impairments in newly diagnosed MS patients, which may depend on the underlying parietal thinning.

SIMPOSIO VIII
ESTIMULACIÓN CEREBRAL INVASIVA Y NO INVASIVA

Moderado por María Teresa Carrillo de la Peña

MODULACIÓN DIFERENCIAL DE LA TAVNS SOBRE LA AMPLITUD DEL COMPONENTE MMN EN PACIENTES EN ESTADO DE MÍNIMA CONSCIENCIA

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Introducción. Escasos estudios han evaluado el efecto de la Estimulación Transauricular del Nervio Vago (taVNS) en Síndrome de Vigilia sin Respuesta (SVSR) y Estado de Mínima Consciencia (EMC).

Objetivo. Evaluar el efecto de la taVNS sobre el componente MMN en SVSR y EMC.

Métodos. Se registró la actividad electroencefalográfica en ocho pacientes SVSR y doce EMC durante un paradigma oddball auditivo, para aplicar posteriormente la taVNS durante 20 sesiones y realizar un segundo registro electroencefalográfico. Se analizó amplitud de MMN, según tono, sesión y diagnóstico.

Resultados. SVSR mostró un aumento de amplitud de MMN para el tono desviante durante el registro previo a la taVNS, en comparación con el estándar ($pBonferroni = 0{,}003$), sin obtenerse diferencias tras la estimulación entre ambos tonos. EMC presentó un aumento de amplitud de MMN para el tono desviante tras la taVNS ($pTukey = 0{,}03$), así como una mayor amplitud para el tono desviante en comparación con el estándar ($pBonferroni < 0{,}001$) durante esta segunda sesión.

Conclusión. Sólo EMC mostró un aumento de amplitud de MMN para el tono desviante al finalizar la taVNS, así como una modulación diferencial para ambos tonos, indicando mayor capacidad para orientarse auditivamente al entorno tras la estimulación.

STIMULATION OF THE SUBTHALAMIC NUCLEUS IMPAIRS ACTIVATION IN THE CORTICAL NETWORKS RESPONSIBLE FOR PROACTIVE RESPONSE INHIBITION

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Objectives: We investigated the underlying electrophysiological mechanisms characteristic of deep brain stimulation (DBS) of the subthalamic nucleus (STN) over context processing and inhibition control in unmedicated Parkinson Disease (PD) patients.

Methods: Fifteen healthy volunteers (HC) and ten PD patients treated with DBS (<5 years of DBS treatment) were evaluated by recording of event-related brain potentials (ERPs) during a cued Go and NoGo task. Performed overnight in a randomized order after antiparkinson medication withdrawal. Neural correlates by ERPs and source localization analyses underlying "Go-P3 as an electrophysiological index of proactive response inhibition were analyzed and contrasted amongst DBS states and controls.

Results: Patients presented increased reaction times and committed more errors compared to HC, particularly during Go trials (proactive impulsivity), which was increased by STN-DBS. Cluster-based permutation tests of individual Go-P3 source activity revealed that healthy controls displayed increased activation in right inferior and middle frontal gyri compared to patients during DBS-Off and particularly to DBS-On, whereas PD patients enhanced activations in a network that included 'visual/posterior regions'.

Conclusions: The current findings imply that, while PD patients' motor functions are improved, stimulating STN hyperactivity with DBS may concurrently promote the manifestation of impulsive behavior by abnormal physiological recruitment of prefrontal and posterior brain networks in PD patients necessary for correct proactive responses.

INTERMITTENT THETA BURST STIMULATION TO THE PRIMARY MOTOR CORTEX PROMOTES SYMPTOMATIC ALLEVIATION OF NON-MOTOR SYMPTOMS IN PARKINSON'S DISEASE

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Objectives: Neuropsychiatric symptoms are a common manifestation of non-motor symptoms in Parkinson's Disease (PD). Recent evidence proposes intermittent theta burst stimulation (iTBS) as a cutting-edge non-invasive neuromodulation therapy to improve brain function in PD, although the relevance of its efficacy is still unknown. Here, we conducted this research to study the effects on neuropsychiatric symptomatology after iTBS over primary motor cortex (M1).

Methods: Sixteen PD patients performed a randomized double-blind sham-controlled crossover study of 5 continuous sessions of iTBS over bilateral M1. Patients were randomly divided into two groups (1:1): real iTBS and control (sham) stimulation. Posteriorly, groups were counterbalanced after 3-months washout. A full clinical, cognitive, and neuropsychiatric examination occurred prior and posterior (in different follow-ups moments) to stimulation.

Results: Real bilateral M1, but not sham, improved mood, concretely depression and anxiety, as well as some domains of quality of life, psychotic and frontal symptomatology. Cortical excitability changed for no-healthy hemisphere, as resting and active motor thresholds, showed significant differences for real stimulation and not sham. Cortical excitability could partially explain non-motor improvement after real iTBS.

Conclusions: Bilateral M1 iTBS might also be used as an effective method to treat some frontal signs and mood symptomatology, particularly for the alleviation of depression and anxiety. Further investigation is needed in order to fully exploit active M1 iTBS as an adjunctive treatment for management of non-motor symptoms of PD.

PUPIL RESPONSE DURING EMOTIONAL PROCESSING IN PARKINSON'S DISEASE: EFFECTS OF DOPAMINERGIC STATE, SUBTHALAMIC STIMULATION, AND ELECTRODE IMPLANTATION

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Objectives: We aimed to understand the effects of subthalamic nucleus deep brain stimulation (STN-DBS), STN-microlesions, and levodopa administration on the relationship between phasic fluctuations in pupil diameter and emotional processing type in PD patients.

Methods: The participants were divided into five groups: STN-DBS On/Med-Off (n=12), STN-DBS Off/Med-Off (n=12), STN-microlesions/Med-Off (n=8), Med-On (n=12), and healthy controls (HC) (n=14). Participants' initial constriction and later pupil dilation were recorded by an eye-tracker while viewing emotional scenes under varying explicit (emotional valence) and implicit (stimuli characteristics) attention demands.

Results: STN-DBS On/Med-Off produced significantly different transient pupil constriction compared to other experimental groups. These differences in pupillary responses were particularly marked between implicit and explicit processing. Besides, "On" stimulation and medication conditions elicited significant differences of late pupillary dilation responses involving valence and processing type. Remarkably, although STN-microlesions/Med-Off produced a similar early pupil response compared to

STN-DBS On/Med-On and Med-On states, late pupillary responses were magnified compared to 'On-Off' states.

Conclusions: Collectively, these results suggest that STN-DBS, local STN-microlesions ("insertion effect"), and dopamine replacement display similar modulation of the autonomic nervous system in PD patients, reflected in the recovery of initial pupillary function to normal levels. Remarkably, our results also show the role of STN stimulation and "Off-Off" states in autonomic-dopaminergic function and its cortical influences when attention demands are manipulated.

SIMPOSIO IX
EMOCIÓN

Moderado por María del Carmen Pastor Verchili

NON-INVASIVE EXCITATORY STIMULATION OF THE VENTROMEDIAL PREFRONTAL CORTEX MODULATES SELF-OTHER-PERCEPTION

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Both our capacity for self-reference and the way we perceive others are reflected in all aspects of our lives. The positive and negative attributes that define us as individuals are also those that make us empathize with others. Hence, any pathological disturbance in this cognitive process has the potential to become a risk factor for precipitating clinical conditions like depression. The ventromedial prefrontal cortex (vmPFC) has been identified as the core region underlying self-others-perception by positive and negative adjectives in healthy adults. Therefore, we aimed to investigate the effects that non-invasive stimulation of the vmPFC by transcranial direct current stimulation (tDCS) could potentially influence on self-reference and others-perception. On the behavioral level, excitatory vmPFC stimulation induced a more positive self-evaluation and a more negative evaluation of others while inhibitory stimulation resulted in the inverse pattern. Magnetoencephalographic correlates supported these findings, showing a stronger neural processing of self-referenced positive adjectives and a decrease of negative adjectives after excitatory stimulation, besides the opposite pattern after inhibitory stimulation in temporal and parietal regions of the left hemisphere. These results raise hopes for clinical applications of brain stimulation in psychological disorders with altered self-others-perception or empathy, such as major depression.

MAGNETOENCEPHALOGRAPHIC CORRELATES OF PORNOGRAPHY CONSUMPTION: ASSOCIATIONS BETWEEN THE NEURAL ACTIVATION AND RISK FACTORS FOR COMPULSIVE SEXUAL BEHAVIOR

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Pornography has grown in popularity, however, its consumption can be associated with negative sexual and emotional outcomes. Neurobiological studies suggest that compulsive sexual behaviors (CSB) may be linked to altered processing of sexual material. This study investigated neuroaffective mechanisms underlying exposure to pornographic and erotic images and the relationship to risk factors for CSB. High-density magnetoencephalography (MEG) was employed to study brain activity during a passive viewing task (opposite- and same-sex pornographic and erotic images) in healthy hetero- and homosexual women and men (N = 50). Correlations to indicators of CSB (sexual sensation seeking, hypersexuality, problematic pornography use, time spent on pornography) were analyzed with neural source-estimations of event-related magnetic fields. For erotic images significant associations were found with hypersexuality, as well as time spent on pornography. Regarding pornographic images, strong associations of neural responses with hypersexuality, problematic pornography consumption and time spent on pornography were found. More hypersexuality and time spent on pornography led to less neural activation in temporal-parietal brain regions (0-600ms). Activation of prefrontal brain regions –only to pornography stimuli– showed a positive linear correlation with problematic pornography consumption scores (300-600ms). Insight into neurobiological factors underlying CSB may promote the development of more effective therapeutic interventions.

CORRELATOS MAGNETOENCEFALOGRÁFICOS DEL "SESGO DE NEGATIVIDAD" EVOCADO POR ESTIMULACIÓN MAGNÉTICA ESTÁTICA TRANSCRANEAL DE LA CORTEZA PREFRONTAL VENTROMEDIAL DURANTE EL PROCESAMIENTO DE ESCENAS EMOCIONALES

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La estimulación transcraneal mediante un campo magnético estático (tSMS, de sus siglas en inglés) es un método de estimulación cerebral no invasiva bastante novedoso que se ha aplicado recientemente en la neurociencia afectiva y cognitiva. Se ha demostrado que la tSMS, independientemente de su polaridad (sur, norte), puede atenuar la excitabilidad de las regiones de la corteza visual y prefrontal. Mediante fMRI y MEG demostramos en estudios previos que la estimulación transcraneal de corriente directa excitatoria (tDCS, de sus siglas en inglés) –comparada con la inhibitoria de la corteza prefrontal ventromedial (vmPFC)– mejoraba el procesamiento de escenas y caras emocionales positivas en comparación con las negativas, predominantemente en las regiones de la corteza visual del hemisferio derecho. En este estudio exploramos si la tSMS inhibitoria comparada con la tSMS simulada podría provocar una depresión inversa como "sesgo de negatividad". Dos grupos independientes de participantes fueron estimulados durante 20 minutos en dos días diferentes con tSMS verdadera o simulada (Grupo1: polo sur vs. simulada; Grupo2: polo norte vs. simulada; orden equilibrado de estimulación verdadera o simulada), y vieron pasivamente escenas emocionales negativas y positivas antes e inmediatamente después de la estimulación. Los resultados de la actividad MEG mostraron que tanto el tSMS del polo sur como el del polo norte aumentaron el procesamiento de escenas negativas, en comparación con las positivas, en las regiones de la corteza visual del hemisferio derecho.

El momento y la localización del grupo neuronal que mostraba un sesgo de negatividad tras la tSMS verdadera y un sesgo de positividad tras la tSMS simulada en ambos grupos coincidían en gran medida con nuestros hallazgos anteriores sobre la tSMS. Se discutirán las implicaciones para la seguridad ocupacional, pero también la relevancia clínica para los trastornos del estado de ánimo.

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MODULACIÓN EMOCIONAL DE LA RESPUESTA DE SOBRESALTO EN PARTICIPANTES SANOS CON ALTA Y BAJA INFLEXIBILIDAD COGNITIVA

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La inflexibilidad cognitiva es la tendencia de un individuo a no cambiar y a perseverar en su comportamiento a pesar de obtener resultados negativos. Existen estudios que vinculan la inflexibilidad cognitiva con una peor toma de decisiones, y por tanto, con una deficiente modulación emocional.

El objetivo es estudiar la inflexibilidad cognitiva y su relación con la toma de decisiones y con la modulación emocional, en concreto, investigar la respuesta de sobresalto (EMG) y el proceso de toma de decisiones.

Participaron 45 estudiantes (13 hombres) de la Universidad de Granada entre 18 y 37 años (N = 20,6; SD = 4,0), que realizaron la Iowa Gambling Task (IGT). La prueba Iowa Gambling Task consistió en 100 ensayos en los cuales los participantes tenían que elegir una carta con el objetivo de determinar qué mazo proporciona mayor ganancia. La muestra general se dividió en dos submuestras, teniendo en cuenta la puntuación del rendimiento en la prueba: grupo de alta inflexibilidad cognitiva/menor rendimiento en la IGT (M = 46,48; SD = 14,794; N = 21) y el grupo de baja inflexibilidad cognitiva/mayor rendmiento en la IGT (M = 59,68; SD = 15,451; N = 25). Posteriormente los participantes realizaron la tarea de modulación emocional de la respuesta de sobresalto que consistió en la

presentación de un ruído (ruido blanco de 105 dB de intensidad, 50 ms de duración y tiempo de subida instantáneo), durante una tarea de visualización de imágenes que incluía 42 imágenes (14 agradables, 14 neutras y 14 aversivas) seleccionadas del Sistema Internacional de Imágenes Afectivas (International Affective Picture System, Moltó et al., 1999).

Los resultados muestran: a) Modulación del reflejo motor de sobresalto con mayor respuesta de sobresalto en la categoría de imágenes aversivas, seguida por la neutra y agradable b) mayor respuesta de sobresalto en las diferentes categorías en el grupo de baja inflexibilidad cognitiva; c) diferencias significativas en la respuesta de sobresalto entre los grupos de inflexibilidad cognitiva.

Palabras clave: Inflexibilidad Cognitiva, Modulación Emocional, Iowa Gambling Task, EMG, IAPS.

THE ROLE OF GENDER IN MUSIC-INDUCED EMOTIONS: SELF-REPORTS, AUTONOMIC REACTIVITY AND FACIAL EMG

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Prior literature within the field of emotions has shown mixed findings regarding the differences between women and men in emotional reactivity. Most of such studies have mainly used emotional scenes, facial expressions or movies, but few works have used music as emotional stimuli, even though its capacity of prompting strong emotional reactions in the listeners, measurable at different levels. This study aimed to investigate the role of gender in emotion responses elicited by music. A sample of 110 healthy participants (60 women) listened to 42 standardized musical excerpts (14 pleasant, 14 neutral, 14 unpleasant) from the Film Music Stimulus Set (FMSS) during 8 s, while autonomic reactivity and facial EMG were continuously recorded. Then, affective dimensions (hedonic valence, tension arousal, energy arousal), discrete emotions (happiness, anger, fear, tenderness, sadness), musical preference and familiarity were rated. Results showed that women presented greater cardiac deceleration during the listening of emotional and neutral music, and rated unpleasant excerpts as less preferred. Additionally, women scored higher in trait anxiety in compariso to men. Taken together, our findings suggest a greater negativity bias toward emotional stimuli by women, which could be related to the development and maintenance of affective disorders such as anxiety.

SIMPOSIO X
LENGUAJE

Moderado por Santiago Galdo-Álvarez

BILINGUAL ENVIRONMENT DURING PREGNANCY: HOW DOES IT IMPACT THE NEWBORN'S NEURAL SPEECH ENCODING?

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Language acquisition process begins before birth, and prenatal fetal environment can influence newborns' musical and linguistic preferences, as proved by several studies showing that neonates can recognize their mother's voice and exhibit a preference for their native language. Since bilingualism has been found to enhance speech processing, this study investigates whether a bilingual environment during the third trimester of pregnancy could modulate the neonate's ability to encode speech sounds. For this purpose, we recorded the frequency-following response (FFR) elicited to the stimulus /oa/, in 131 healthy-term newborns divided according to their prenatal language exposure into monolingual (n=53) and bilingual-exposed (n=78) groups based on maternal questionnaire responses. Surprisingly, monolingual-exposed newborns exhibited larger signal-to-noise ratio (SNR) at the fundamental frequency (F0) and greater spectral amplitudes to the vowels formant structure as compared to the bilingual group. Results suggest that prenatal language experience could modulate neural responses at birth, and specifically, that monolingual fetal environment generates a less variable background for processing speech sounds. Therefore, data support the idea that prenatal monolingual exposure would produce more robust and larger amplitude responses at cer-

tain specific frequencies, while bilingual exposure may enhance sensitivity to a wider frequency range without a particularly strong response at any of them.

CAMBIOS NEUROESTRUCTURALES EN EL HEMISFERIO IPSILATERAL Y CONTRALATERAL A LA LESIÓN EN PACIENTES CON AFASIA TRAS ACCIDENTE CEREBROVASCULAR

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La afasia es un trastorno del lenguaje causado por lesiones en la estructura cerebral, como las causadas tras un accidente cerebrovascular (ACV). Pocos estudios de neuroimagen con resonancia magnética nuclear estructural (RMNe) han evaluado el impacto que tiene el ACV sobre el hemisferio contralesional. El presente estudio tiene dos objetivos: 1) caracterizar el impacto del ACV en el hemisferio ipsilesional en nueve pacientes afásicos tras un ACV en el hemisferio izquierdo; 2) evaluar los cambios neuroestructurales que muestran estos pacientes en el hemisferio contralesional respecto a un grupo control.

Los resultados revelaron que las estructuras cerebrales más afectadas en el hemisferio ipsilesional de los pacientes fueron: cisura de rolando, pars opercularis (giro frontal inferior), ínsula y giro de Heschl. Además, en comparación con el grupo control, los pacientes con afasia mostraron un menor grosor cortical en ínsula y menor girificación del giro frontal medio del hemisferio contralesional.

Los resultados obtenidos evidencian que el ACV produjo alteraciones que afectan tanto la integridad estructural de diversas regiones cerebrales en el hemisferio ipsilateral a la lesión como en regiones análogas del hemisferio contralesional, mostrando un impacto significativo en la conectividad estructural de las redes cerebrales implicadas en el lenguaje y otros procesos cognitivos.

NEURAL MATURATION OF SPEECH ENCODING MECHANISMS DURING THE FIRST YEAR OF DEVELOPMENT

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Although language milestones are well depicted across literature for the first stages of development, neural mechanisms underlying these maturational processes are still poorly understood. Here, we use an auditory evoked potential termed frequency-following response (FFR) to unravel the developmental trajectory of the neural encoding of speech sounds during the first year of life. The FFR is generated by periodic sounds such as speech or music, and allows evaluating the tracking accuracy of complex sound features along the auditory hierarchy. Here, the FFR was elicited by the /oa/ stimulus in a sample of 41 healthy-term neonates that were tested at birth and retested at the ages of 6 and 12 months. Results revealed a shortened neural latency for the first 6 months of development that stabilizes up to the age of 12 months, with a similar trend depicted for the formant structure encoding. Remarkably, no significantly different stimulus envelope encoding was observed across the three time-point measurements. This study characterizes the neural developmental trajectory behind speech perception abilities during the very early stages of life, depicting a striking maturation of the fine structure encoding abilities along the first 6 postnatal months.

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RELATIONSHIP BETWEEN PRENATAL CORPUS CALLOSUM SIZE AND SPEECH SOUND ENCODING AT BIRTH: A NEUROSONOGRAPHY AND EEG STUDY

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Language networks start to develop and become functional in prenatal stages, despite they have not yet reached full anatomical maturation at gestational term. The corpus callosum (CC), the brain's largest white matter structure, is key for interhemispheric connectivity, allowing integration and temporal coherence in the encoding of speech signals. The present study aims to investigate the relationship of CC size and speech neural encoding at birth. We obtained neurosonographic images and recorded the frequency-following response (FFR), an auditory evoked potential elicited to complex sounds, in a sample of 61 healthy term neonates at 32 gestational weeks and during their first days of life, respectively. Pearson partial correlations were used to assess the relationship between CC Witelson's areas and FFR parameters. Results revealed significant negative correlations between the neural lag of the auditory brain responses at birth with the prenatal total area of the CC, particularly in its posterior areas, which are related to auditory processing. These results confirm the previous hypothesis that the development of the central components of the auditory system rely on neuronal formation and growth and the myelinization of neural fibers, and support the idea that appropriate neural speech encoding depends on the functionality of white matter.

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ANATOMICAL CORRELATES OF THE NEONATAL FREQUENCY-FOLLOWING RESPONSE (FFR)

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During the third trimester of pregnancy, the human brain experiences developmental processes such as myelination, gyrification and an increase in gray matter volume. These patterns can be depicted and related to auditory functionality using MRI and EEG techniques at birth. This study aims to investigate the previously unexplored relationship between the brain volume of language and speech perception regions and an auditory evoked potential termed Frequency-Following Response (FFR) at birth. Structural MRI and FFR data were collected from 41 healthy-term neonates. The FFR was elicited to the speech sound /oa/ and analyzed in terms of pitch tracking and encoding of both its fundamental frequency and temporal fine structure. MRI neuroimages were processed using a semi-automatic structural pipeline from the Developing Human Connectome Project to obtain volume indices of specific ROIs. Pearson partial correlations were conducted to establish the relationship between the volume indices and the FFR parameters. General Linear Models were subsequently constructed using statistically relevant FFR parameters as a response and significant ROIs as predictors. Results revealed that volume in white matter subregions contributes more than gray matter to the neural encoding of speech sounds, particularly to their temporal fine structure, with the posterior midbody of the corpus callosum exhibiting a negative contribution.

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SESIONES DE PÓSTER

SESIONES DE PÓSTER CORRESPONDIENTES AL SIMPOSIO I: OSCILACIONES CEREBRALES Y CONECTIVIDAD FUNCIONAL

S1P1. THE PREFRONTAL CORTEX ACTIVITY, PERSONALITY AND DECISION MAKING: WAS RECORDED USING SPECTROSCOPY TECHNIQUE (FNIR)

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The present study examined the association between decision-making, personality, and prefrontal activity. 87 healthy women were investigated (Mage = 38.93; SD = 10.51). Study participants completed a situational assessment task in which they had to indicate whether the situation was dangerous or safe. Seven scenes were used, each manipulated so that there were five levels of danger. During this task, prefrontal cortex (PFC) activity was recorded using spectroscopy. Subsequently, the subjects filled out questionnaires about personality (ZKA-PQ) and decision-making (MDMQ). The results showed a positive relationship between the number of danger choices and oxygenation in the right dorsolateral (r = .28; p = .009), dorsomedial (r = .25; p = .02) and ventrocentral PFC (r = .22; p = .042). No significant differences were observed on measures of personality or decision-making. These results reiterate the importance of the dorsal PFC in decision-making but indicate that the situational assessment task used was not affected by personality variables.

S1P2. ELECTROENCEPHALOGRAPHIC FUNCTIONAL CHANGES AFTER OF THE EMBODYING OF A RUBBER HAND: EFFECT ON RESTING-STATE SENSORIMOTOR RHYTHM

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The sense of one's own body, known as embodiment, plays a critical role in adaptive behaviors. The rubber-hand illusion (RHI) paradigm has been a valuable tool for investigating embodiment and shows promise in the clinical treatment of sensory and motor impairments. Several studies have established links between RHI and sensorimotor rhythm (SMR) neurofeedback training, which is widely used to treat various pathologies. However, limited knowledge exists regarding the role of RHI in clinical treatment, and the long-term effects of RHI on SMR remain unclear. This study induced RHI in healthy participants and recorded their resting-state SMR power and functional connectivity. Compared to the control condition, RHI resulted in decreased SMR power and increased SMR connectivity during the resting-state. Our results reveal that RHI can produce SMR alterations long after the illusion induction has ended. These findings indicate that the RHI could be used to predict SMR neurofeedback training performance or even to treat pathologies associated with SMR abnormalities.

S1P3. UNVEILING THE HIDDEN RHYTHMS: APERIODIC ANALYSIS OF EEG ACTIVITY IN HEALTHY SUBJECTS

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The present study analyses power spectral density (PSD) and aperiodic (AP) and periodic (P) electroencephalogram (EEG) activity in the open-eyes condition. We analyzed 240 healthy subjects aged 6-29 years, divided into 4 groups (6-9; 10-13; 14-17; 18-29). We calculated PSD and aperiodic and periodic activity with Fitting Oscillations and One-Over-f (FOOOF), a function adapted from Python to EEGLAB. The following FOOOF group settings were used: peak_width_limits=[1, 8], min_peak_height=0.05, peak_threshold=0.5, max_n_peaks=6, aperiodic_mode= 'fixed'. The PSD, AP and P component were calculated from 1 to 45 Hz and averaged over three frequency windows. Topography, Spearman correlation and regression analysis (with age) of the components were performed. The results show a good fit of the function to the proposed power spectrum model. Aperiodic activity shows a different topography from periodic activity over a wide range of frequencies and a decrease with age. Therefore, we confirm the difference between the aperiodic and periodic component of the PSD and their possible structural and functional changes.

S1P4. ANSIEDAD MATEMÁTICA Y MONITORIZACIÓN DE ERRORES EN UNA TAREA ARITMÉTICA: UN ESTUDIO CON POTENCIALES EVOCADOS

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En este estudio examinamos la respuesta electrofisiológica de 22 individuos con alta ansiedad matemática (AAM) y 22 con baja ansiedad matemática (BAM) durante la realización de una tarea de verificación de sumas de un dígito. En concreto, se analizaron dos potenciales cerebrales asociados al procesamiento del error y que se relacionan con el ajuste conductual tras cometerlo: la error-related negativity (ERN) y la error-related positivity (Pe). Se ha sugerido que la ERN refleja la evaluación de acciones que requieren una acción correctiva y la Pe refleja la detección consciente de errores. También se estudió la correct-related negativity (CRN), un potencial que se produce tras una respuesta correcta y que refleja la incertidumbre respecto a la precisión de la respuesta o la activación simultánea de respuestas correctas e incorrectas. Nuestros resultados mostraron que los individuos con AAM y BAM no diferían en la amplitud de la ERN, pero sí en la de la CRN y Pe. Concretamente, los individuos BAM mostraron una CRN menos negativa y una Pe más positiva que sus compañeros de AAM, sugiriendo una mayor incertidumbre respecto a la precisión de la respuesta y un peor ajuste conductual tras cometer errores en la tarea aritmética en estos últimos.

S1P5. INHIBICIÓN DE LA RESPUESTA EN PERSONAS CON ANSIEDAD A LAS MATEMÁTICAS EN UNA TAREA GO/NOGO

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En este estudio, 16 participantes con alta ansiedad matemática (AAM) y 19 con baja ansiedad matemática (BAM) realizaron dos tareas Go/NoGo. En la tarea numérica se presentaron números de un dígito y se les pidió que presionaran un botón en números pares. En la no numérica se presentaban letras y se debía pulsar el botón en las vocales. Los grupos no difirieron en el tiempo de respuesta para los ensayos Go, y las respuestas fueron más lentas en la tarea numérica. Ambos grupos cometieron más errores en los ensayos NoGo que en los Go en las dos tareas. Sin embargo, la diferencia Go menos NoGo en la tasa de aciertos fue mayor en la tarea numérica que en la no numérica sólo para el grupo de AAM. Por otra parte, las diferencias entre los grupos en su respuesta cerebral se observaron sólo en la tarea numérica, donde las personas de AAM mostraron un N2-NoGo y un P3-NoGo de menor amplitud que las de BAM. Estos resultados sugieren que las personas con AAM podrían tener un déficit en la inhibición de la respuesta asociada a las tareas con estímulos numéricos, lo que podría contribuir a su bajo rendimiento en tareas matemáticas.

S1P6. REORGANIZACIÓN DE LAS CARACTERÍSTICAS OSCILATORIAS DEL CEREBRO HUMANO DURANTE LA ACTIVIDAD COGNITIVA

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La activación sincrónica de grupos de neuronas da lugar a oscilaciones electromagnéticas, que han sido vinculadas a diferentes estados y funciones cerebrales. Su principal importancia reside en su hipotético potencial explicativo como mecanismo para la comunicación entre circuitos neuronales, creando ventanas de oportunidad para la transmisión de información a múltiples escalas. En un trabajo anterior, nuestro equipo desarrolló un atlas de las frecuencias típicas del cerebro humano en estado de reposo, lo que se ha denominado frecuencia natural. Partiendo de la observación de que diferentes regiones cerebrales tienen distintas características oscilatorias, en este estudio nos preguntamos cómo variará la organización de las frecuencias naturales durante la ejecución de una tarea cognitiva. Para ello, utilizamos la base de datos de magnetoencefalografía (MEG) del Human Connectome Project (HCP) durante la ejecución de distintas tareas (motora, memoria operativa y lenguaje). Las frecuencias naturales de cada participante fueron extraídas empleando el algoritmo de agrupación k-medias sobre los espectros de potencia calculados para cada vóxel del cerebro. Las diferencias con respecto al estado de reposo se asemejan a aquellas encontradas con estudios de resonancia magnética funcional y abren paso a estudiar cómo las regiones involucradas se comunican entre sí a través de la reorganización oscilatoria.

S1P7. APLICACIÓN DE LAS FRECUENCIAS NATURALES DEL CEREBRO HUMANO: DEL MAPA GRUPAL AL INDIVIDUAL

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Las frecuencias típicas de cada zona del cerebro humano han sido detalladas recientemente a partir de una muestra amplia de individuos sanos. Este mapa cerebral de frecuencias naturales podría constituir un buen punto de partida para detectar desviaciones de la actividad oscilatoria que pueda presentar una persona en áreas concretas de su cerebro, e incluso actuar como biomarcador de los distintos trastornos neurológicos o psiquiátricos conocidos como "oscilopatías". Sin embargo, para lograr este objetivo, es necesario mejorar la resolución del mapa a nivel de sujeto individual. Este fue, precisamente, el objetivo del presente trabajo. Para ello, se entrenó primero un algoritmo de agrupamiento k-medias con 128 participantes y 150 espectros de potencia, con el objetivo de hallar espectros con características similares para cada vóxel cerebral. Después, para optimizar los mapas individuales, se seleccionaron aleatoriamente hasta 2000 nuevos espectros de potencia por participante y vóxel, que se clasificaron en los grupos previamente entrenados. La frecuencia natural de cada vóxel se definió como el pico de frecuencia del espectro más prevalente, normalizado. Nuestros resultados muestran una clara mejora en la resolución de los mapas a nivel individual, un paso crítico para incorporar esta técnica al ámbito clínico.

S1P8. REPRODUCCIÓN DE MECANISMOS COLINÉRGICOS SUBYACENTES AL CONDICIONAMIENTO DE MIEDO EN LA CORTEZA VISUAL HUMANA USANDO REDES NEURONALES SPIKING

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Estudios previos de electrofisiología M/EEG han demostrado que la banda gamma de la corteza visual humana se excita o inhibe cuando perciben señales que predicen miedo o no, respectivamente, en un condicionamiento de miedo. Teorías neurobiológicas sugieren la implicación de mecanismos colinergicos de neuronas inhibidoras, pero su preciso funcionamiento y explicación en el caso de señales de seguridad no están claros. Aquí desarrollamos una red neuronal spiking de la corteza visual que reproduce la señal eléctrica postsináptica comparable a la obtenida en experimentos empíricos M/EEG. Esta red cuenta con un mecanismo colinérgico que media las neuronas inhibidoras. Después de entrenar la red neuronal con ensayos de miedo y seguridad en un paradigma de condicionamiento, se obtiene la respuesta oscilatoria gamma de la respuesta visual simulada. Los resultados indican un aumento y disminución de la respuesta gamma visual durante la adquisición del miedo de forma análoga a como se ha encontrado en experimentos M/EEG. Este trabajo ofrece plausibilidad a la hipótesis colinérgica tanto para el aprendizaje de miedo como de seguridad. Además, este trabajo muestra la utilidad de la simulación de redes neuronales spiking para explicar las bases biológicas de procesos estudiados desde la neurociencia cognitiva y afectiva.

S1P9. IT SOUNDS LIKE CONNECTIVITY: EEG HYPERSYNCHRONY IN A MUSICAL DUET

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While the fact that different brain regions synchronize to perform cognitive tasks (functional connectivity) is well known, the possibility of brains of different individuals synchronizing to perform joint tasks (hypersynchrony) is a novel and interesting idea. Here we present a suitable paradigm to study this scenario.

In this pilot, two individuals performed a join task where their behavior required perfect synchronization (playing a musical piece), while we recorded their brain activity by means of a high-density (64-channel, dry electrodes) electroencephalogram, monitored their eye movements via an electrooculogram, and recorded their heart activity by means of an electrocardiogram. In addition to physiological activity, we acquired audio and video to monitor the level of performance and the possible movements affecting the recordings.

In our paradigm we aimed to record electrophysiological activity and behavior in four different conditions: a task-free condition; a passive condition, where both simultaneously individuals listened to the same musical recording; a passive-active condition, where one of the individuals played a musical piece while the other listened to it (not recorded in this pilot); and an active condition, where both performers played a musical piece as a duet in a complementary way (one playing the main melody while the other served as rhythmic support).

While the designed paradigm facilitated the recording of the data, a key challenge was to ensure the cleanliness of the data, by minimizing the body movements. To address this challenge, we recruited a duet of proficiency trained performers. This allowed to examine both intra-brain (functional connectivity) and between-brains (hypersynchrony) synchronization.

When comparing the different tasks, we found differences in both intra- and inter-brain synchronization in the active task when compared to both the passive task and the task-free recording. Contrary to what was expected, this difference presented as a reduction of synchronization in the active condition, which motivate further study in this line.

S1P10. ESTUDIO DE LA REPLICABILIDAD DE LA BANDA MU (FASE Y NO FASE) DURANTE LA EJECUCIÓN DE UNA RESPUESTA MANUAL VOLUNTARIA

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En el análisis de la actividad espectral del EEG, aún no conocemos con precisión el rol psicofisiológico que pueden cumplir las modulaciones no fase. En el caso particular de la banda MU, ha sido descrita una modulación de la respuesta fase (evocada), previa a la ejecución de la misma, pero no la posible presencia de una respuesta no fase (inducida). Para poder observar si se produce esta modulación, se analizaron los datos de EEG en 58 canales de 21 sujetos sanos, y en dos sesiones diferentes separadas por una media de 49.5 días, durante la realización de una tarea oddball visual. Encontramos que la latencia para la fracción evocada de la señal EEG entre ambas sesiones mostraba una diferencia de 10 ms. En cuanto a la amplitud de la onda, encontramos que hay un efecto entre sesiones $F(30, 600)=2{,}6735$, $p=0{,}00005$, siendo la actividad evocada mayor que la inducida. Los resultados del estudio nos indican que aparece una modulación no fase antes de la aparición de la modulación evocada, no descrita hasta la fecha y de la que desconocemos cuál puede ser su rol psicofisiológico en la preparación del acto motor, así como una alta replicabilidad de ambas fracciones (evocada e inducida).

S1P11. CARACTERIZACIÓN DEL COMPONENTE OSCILATORIO DEL CEREBRO HUMANO: CUÁNTO, DÓNDE Y CÓMO

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Las oscilaciones electromagnéticas se consideran un mecanismo fundamental para la comunicación cerebral. No obstante, en los últimos años, se ha empezado a señalar que no toda la actividad electromagnética cerebral es oscilatoria, sino que existe un componente aperiódico o "ruido" sobre el que emergen las oscilaciones. El objetivo de este trabajo fue determinar cuánto tiempo se encuentran realmente las distintas regiones del cerebro en modo oscilatorio y cuáles son sus frecuencias más características. Para ello, partimos de una muestra de 128 registros de magnetoencefalografía en estado de reposo, obtenidos de la base de datos OMEGA. Sobre estos datos aplicamos, vóxel a vóxel, el método "better oscillation detection" (BOSC), que permite identificar los momentos de actividad oscilatoria a lo largo del tiempo. Nuestros resultados muestran que el cerebro se encuentra predominantemente en estado oscilatorio y que la distribución regional de las frecuencias típicas se asemeja a la descrita previamente por nuestro grupo, a pesar de emplear una metodología diferente. Además, esta aproximación presenta varias ventajas, como un menor tiempo de computación y una menor selección a priori de parámetros. La caracterización de la actividad oscilatoria a nivel de vóxel abre nuevas posibilidades en la comprensión de la conectividad cerebral.

S1P12. TOWARDS STABILITY OF DYNAMIC FUNCTIONAL CONNECTIVITY ESTIMATES IN NEUROIMAGING AND ELECTROPHYSIOLOGY: SOLUTIONS AND LIMITS

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Time-varying functional connectivity (FC) methods are used to map the spatiotemporal organization of brain activity. However, their estimation can be unstable, in the sense that different runs of the inference may yield different solutions. But to draw meaningful relations to behaviour, estimates must be robust and reproducible. Here, we propose two solutions using the Hidden Markov Model (HMM) as a descriptive model of time-varying FC. The first, best-ranked HMM, involves running the inference multiple times and selecting the best model based on a quantitative measure combining fitness and model complexity. The second, hierarchical clustered HMM, generates stable aggregated state timeseries by applying hierarchical clustering to the state timeseries obtained from multiple runs. Experimental results on fMRI and MEG data demonstrate that these approaches substantially improve the stability of time-varying FC estimations. Overall, hierarchical clustered HMM is preferred when the inference variability is high, while the best-ranked HMM performs better otherwise.

SESIONES DE PÓSTER CORRESPONDIENTES AL SIMPOSIO II: ENVEJECIMIENTO PATOLÓGICO

S2P1. CHANGES IN THE PATTERNS OF FUNCTIONAL CONNECTIVITY IN INDIVIDUALS AT RISK OF DEVELOPING ALZHEIMER'S DISEASE

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Alzheimer's disease is diagnosed after sufficient cognitive impairment and clinical dysfunction are manifest. At this point, the underlying neuropathological processes have been going on for decades. Recent research has been focused on the identification of early biomarkers.

The main objective was to evaluate longitudinal changes in the connectivity of three regions known to be affected in the progression of AD. 69 subjects with family history (FH+) of AD were included in the study. A CBPT was used to measure longitudinal connectivity changes, and significant clusters were correlated with p-tau231 levels.

Results show three significant clusters of longitudinal change that closely resemble those obtained by Ramírez-Toranõ et al. (2021) and present an increase in connectivity. A positive correlation was found between the connectivity values at the second MEG recording and p-tau231 in the left precuneus.

This is the first longitudinal study performed on cognitively unimpaired subjects, addressing connectivity changes and studying the relationship between those values and plasma biomarkers. The precuneus is one of the areas that accumulates early damage due to the pathology of AD. The hyperconnectivity found in both precuneus can be considered an early biomarker of AD risk, and the correlation with p-tau231 levels support its pathological nature.

S2P2. CHRONIC PAIN IN AGING ALTERS DESCENDING NOCICEPTIVE MODULATORY PATHWAYS: AN FMRI RESTING-STATE STUDY

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It is well known that aging and chronic pain present mutual interactions, as chronic pain accelerates brain aging, but also that aging affects pain experience and its neural substrates. Therefore, this study examined fMRI resting-state functional connectivity (rsFC) and descending nociceptive modulatory pathways in chronic pain older adults (POA) in comparison to older adults (OA) and younger adults (YA) without pain. Thirty POA (69,5±6.58 years), 29 OA (70.483±4.60 years) and 30 YA (20.0 ±1.58 years) were enrolled. In addition to rsFC, descending nociceptive inhibitory and facilitatory mechanisms were examined, by using a conditioned pain modulation paradigm (CPM) and a temporal summation (TS) test, respectively. rsFC analyses depicted that POA displayed enhanced connectivity between the nucleus accumbens and the primary somatosensory cortex in comparison to OA. In comparison to YA, POA showed reduced rsFC between pain inhibitory regions (bilateral thalamus-periaqueductal grey matter) as well increased connectivity between dorsolateral prefrontal cortex (DLPFC)- amygdala (AMY). Furthermore, in POA this increased DLPFC-AMY connectivity was associated to lower analgesia in the CPM. Altogether suggest that suffering from pain in older adults leads to a dysfunction of pain inhibitory processes which significantly surpass those produced by normal aging. Supported by the Spanish Ministry (PID2019-110096GB-I00/AEI/10.13039/501100011033).

S2P3. ALTERACIONES DEL EXPONENTE APERIÓDICO DE LA ACTIVIDAD MAGNETOENCEFALOGRÁFICA ESPONTÁNEA ASOCIADAS AL DESARROLLO DE LA ENFERMEDAD DE ALZHEIMER

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La enfermedad de Alzheimer es la forma de demencia más prevalente a nivel mundial, y suele diagnosticarse en personas mayores de 65 años. Sin embargo, los cambios cerebrales pueden manifestarse hasta 20 años antes de la aparición de los síntomas clínicos. Recientemente, investigadores de la UCSD han desarrollado un algoritmo (FOOOF) capaz de determinar el exponente aperiódico (ExpA) de los espectros de potencia, el cual se ha visto relacionado con el balance excitación/inhibición (E/I) de la actividad neuronal. En este estudio de magnetoencefalografía (MEG), comparamos a nivel de fuentes de actividad electromagnética los valores de este ExpA de pacientes con deterioro cognitivo leve (DCL) y controles sanos. El análisis reveló que los pacientes con DCL exhibían valores mayores del ExpA bilateralmente en la región parieto-central, lo que indicaría un menor balance E/I en esa región para los pacientes con DCL. Además, también se han encontrado correlaciones significativas entre el ExpA y diversos marcadores de salud cerebral en toda la población y el grupo control. Las implicaciones de estos resultados aún se siguen investigando, pero estos descubrimientos podrían ser útiles a la hora de identificar biomarcadores para el diagnóstico temprano de esta patología.

S2P4. LA DEDUCCIÓN AUTOMÁTICA SE PRESERVA EN LA VEJEZ: UN ESTUDIO NEURO-ELÉCTRICO

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Determinadas formas básicas de razonamiento deductivo se realizan automáticamente en el córtex cerebral por debajo del umbral de conciencia. Este trabajo pretende verificar experimentalmente si esta capacidad deductiva se preserva en la vejez y qué perfiles neuroeléctricos adoptan con la edad los procesos deductivos. 32 sujetos mayores sanos (edad media 74.20 ± 6.74) y 35 jóvenes (20.35 ± 3.23) cumplimentaron en E-Prime la tarea de razonamiento automático diseñada por Reverberi mientras se registraba su actividad cerebral con Sistema EEG/ERP's actiCHAMP de 64 canales. La tarea de razonamiento se compuso de tres condiciones que corresponden a Modus Ponens (MP), Afirmación del Consecuente (AC) y Condicional no integrable (NI). Los resultados evidencian que tanto en jóvenes como en mayores: (i) sólo MP es automático, (ii) las latencias de N2 y P3 distingue NI de las otras inferencias, (iii) P6, LPW son significativamente distintas en MP y AC, (iii) el análisis tiempo/frecuencia en beta-2 distingue MP de las otras condiciones. Es destacable que la inferencia MP preserve su automaticidad en la vejez debido a que el razonamiento es considerada una habilidad fluida que se pierde con la edad.

S2P5. CAMBIOS EN LA CONECTIVIDAD FUNCIONAL ASOCIADOS AL PROCESO DE RECUPERACIÓN EN MEMORIA EPISÓDICA EN ADULTOS CON ATROFIA DEL LÓBULO TEMPORAL MEDIAL

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La memoria episódica (ME) es uno de los sistemas neurocognitivos más alterados dentro del continuo de la Enfermedad de Alzheimer, por lo que su estudio mediante Resonancia Magética funcional (fMRI) constituye un prometedor campo de estudio. El objetivo de este trabajo fue investigar los patrones de conectividad de la señal fMRI durante una tarea de reconocimiento nuevo/viejo utilizando un análisis bilateral basado en semillas del hipocampo. Empleando AVRA (Automatic Visual Ratings of Atrophy), una herramienta de predicción de atrofia basada en machine learning, con secuencias ponderadas en T1 de resonancia magnética, se identificó un grupo control (N=23) y un grupo con atrofia del lóbulo temporal medial (N=21).

Durante la condición de reconocimiento exitoso de estímulos previamente codificados, el grupo control mostró mayor conectividad entre el hipocampo izquierdo y las regiones parieto-centrales del cerebro. Por el contrario, el grupo con atrofia mostró una conectividad reducida entre el hipocampo izquierdo y el córtex cingulado medio derecho. No se observaron resultados significativos en la condición de rechazo correcto de estímulos nuevos, ni en la interacción acierto>RC. Este estudio proporciona evidencias sobre los patrones de conectividad alterados en individuos con atrofia del lóbulo temporal medial durante la fase de recuperación de la memoria.

S2P6. ELECTROPHYSIOLOGICAL CHANGES ASSOCIATED WITH MEMORY ALTERATION IN MILD COGNITIVE IMPAIRMENT

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Background: MCI diagnosis does not necessarily imply the development of dementia. For this reason, characterizing the MCI profile is fundamental to the early identification of electrophysiological markers associated with a higher risk of developing Alzheimer's Disease (AD). Longitudinal studies demonstrated that the delay recall measure is a good predictor of conversion and is one of the most common manifestations of the preclinical stage. This study has for purpose compared the power spectrum in the resting-state of MCI and their relationship with neuropsychological and structural measures.

Method: We compared the power spectrum in resting-state eyes-closed magnetoencephalographic of 93 MCI participants (aged from 64 to 87) recruited from the Hospital Universitario San Carlos (Madrid, Spain). According to their memory performance in delay recall, the sample was split into (i) 'moderate' MCI (n = 52) group and (ii) 'severe' MCI (n = 41) group. The groups did not differ in age or years of education.

Results: The severe MCI patients showed higher theta power than patients with moderate MCI were significant differences between both.

Also, moderate MCI correlated significantly with years of education (rho = -0.31, $p < 0.02$) and TMT A time (rho = 0.40, $p < 0.004$). In the Severe MCI group, the theta power showed significant correlation with MMSE (rho = -0.43, $p < 0.001$) and total hippocampus (rho = 0.41, $p < 0.001$).

Conclusion: Loss of delay recall performance seems to be associated with electrophysiological alterations that can be used as non-invasive markers of AD progression.

SESIONES DE PÓSTER CORRESPONDIENTES AL SIMPOSIO III: EFECTOS DEL CONSUMO INTENSIVO DE ALCOHOL EN LOS JÓVENES: UNA MIRADA DESDE LA NEUROCIENCIA COGNITIVA

S3P1. DIFERENCIAS EN RENDIMIENTO EN LA IOWA GAMBLING TASK EN POBLACIÓN PENITENCIARIA CON ALTOS Y BAJOS NIVELES DE INFLEXIBILIDAD COGNITIVA

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En los últimos años se ha incrementado el interés por investigar las funciones ejecutivas. El déficit en función ejecutiva se reflejaría en un mal desempeño en un proceso de toma de decisiones. Existen estudios que vinculan la inflexibilidad cognitiva con una peor toma de decisiones.

El objetivo es estudiar la inflexibilidad cognitiva y su relación con la toma de decisiones. Seleccionamos 40 reclusos (hombres) entre los 23 y los 52 años (M = 36.60; DT = 8.348) por sus puntuaciones altas y bajas en la escala de persistencia medida a través del cuestionario TCI-R (Temperament and Character Inventory-Revisited; Gutiérrez-Zotes et al., 2004); creando dos grupos : grupo de alta inflexibilidad cognitiva (M = 143,45; SD = 9,72; N = 20) y el grupo de baja inflexibilidad cognitiva (M = 109,25; SD = 13,81; N = 20). Posteriormente, estos participantes realizaron la Iowa Gambling Task (IGT), a través de la cuál se evaluó la toma de decisiones. La IGT está compuesta por 4 mazos (A y B: mazos desventajosos, C y D: ventajosos). En la prueba se realizan unos 100 ensayos (divididos en 5 bloques de 20 ensayos).

Los resultados muestran : a) diferencias significativas en la elección tipo de mazo con una clara preferencia por el mazo B (desventajoso), b) diferencias significativas en la elección de tipo de mazo a lo largo de los blo-

ques de la IGT manteniendo la preferencia por los mazos desventajosos, c) no se encuentran diferencias significativas en el rendimiento (aprendizaje) de la IGT entre los dos grupos de inflexibilidad cognitiva.

S3P2. FACTORS OF VULNERABILITY TO ALCOHOLISM AND PREFRONTAL OXYGENATION DURING ALCOHOL-RELATED IMAGERY IN MEN

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Different personality traits and poor decision-making have been indicated as vulnerability factors for alcoholism. The prefrontal cortex (PFC) is involved in the regulation of these factors. The aim of the present study is to analyse PFC response to the viewing of emotional pictures in at-risk drinkers. Thirty-two participants (40.8 + 14.5 years) were selected from a sample of the general population with high AUDIT scores. Six blocks of pictures each were presented (Two blocks of alcohol-related pictures, two traffic accidents pictures and two with neutral pictures). Participants answered personality (ZKA-PQ) and decision-making (MDMQ) questionnaires. PFC activity was recorded using an fNIRs device. Repeated measures analysis showed no effect of either type of pictures or blocks presented in any of the four quadrants. Negative relationships between left rostral oxygenation during the viewing of alcohol-related images and the facets of aggression and sensation seeking (all $p < .04$), whereas with the vigilance scale, the correlations were a positive tendency ($p < .06$). No significant correlations were observed between PFC activity and personality and decision-making variables during the viewing of neutral or traffic accident pictures. These data indicate that rostral oxygenation during the viewing of alcohol-related images may be related to vulnerability factors for alcoholism.

S3P3. RELACIÓN ENTRE LAS CARACTERÍSTICAS NEUROESTRUCTURALES Y EL MANTENIMIENTO DEL CONSUMO DE ALCOHOL EN JÓVENES UNIVERSITARIOS BINGE DRINKERS: UN ESTUDIO CON SEGUIMIENTO A 5 AÑOS

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Este estudio examinó la relación entre diferentes métricas neuroestructurales de regiones implicadas en procesos ejecutivos y emocionales/motivacionales, previamente identificadas como sensibles al binge drinking (BD), y el mantenimiento de dicho patrón de consumo de alcohol a medio/largo plazo. Se evaluó a 60 estudiantes universitarios (24 BDs, 36 controles [CN]), a los que se realizó una resonancia magnética a los 18-19 años y que mantuvieron un patrón consistente de consumo durante al menos 5 años, hasta los 23-24. Los análisis de regiones de interés (valores p corregidos mediante Bonferroni) revelaron diferencias de grupo en el volumen de la amígdala izquierda (BDs < CN; $F(1,55) = 7{,}27$, $p = 0{,}009$), y una interacción grupo por sexo en el giro frontal medio rostral izquierdo ($F(1,55) = 6{,}75$, $p = 0{,}012$), donde los hombres BDs presentaron menor área de superficie que los hombres CN ($p = 0{,}016$) y las mujeres BDs ($p = 0{,}019$). Estos resultados apuntan a características neuroestructurales que podrían estar asociadas con el mantenimiento del consumo intensivo de alcohol en una etapa vital en la que se empieza a diverger hacia un abandono del BD o hacia una persistencia con alto riesgo de incursión en trastorno por abuso de alcohol.

S3P4. UNDERSTANDING THE NEUROCOGNITIVE PROCESSES OF MEMORY INHIBITION IN BINGE DRINKERS: INSIGHTS FROM EVENT-RELATED POTENTIALS

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The study of memory inhibition (MI) – i.e., voluntary suppression of unwanted thoughts/memories- constitutes a promising way to explore the interplay between altered inhibitory control and heightened alcohol-cue reactivity, characteristic of young binge drinkers (BDs). The present study aimed to evaluate potential electrophysiological and behavioral abnormalities associated with MI, specifically those related to suppression of alcohol-related memories, in BDs. Electroencephalographic activity was recorded while 81 college students (45.7% females; 39 non/low-drinkers [N/LDS] and 42 BDs) performed the Think/No-Think Alcohol task, which evaluates MI in alcohol-related contexts. The event-related potentials (ERPs) typically linked to memory suppression were analyzed: N2, Late Parietal Positivity (LPP) and Frontal Slow Wave (FSW). Findings revealed that BDs had greater difficulty suppressing non-alcoholic memories than N/LDs, but similar performance during the suppression of alcohol-related memories. At the electrophysiological level, BDs showed increased FSW during memory inhibition in comparison with N/LDs, suggesting that BDs need to recruit additional control resources to decrease the accessibility of unwanted memories. In addition, BDs showed larger LPP for alcohol relative to non-alcohol images, revealing increased conscious recollection of alcohol-related memories. Our results are the first ERP evidence showing anomalous memory suppression mechanisms in young BDs, which may have important implications for alcohol research.

S3P5. EXPLORANDO LOS EFECTOS DEL BINGE DRINKING EN LA CONECTIVIDAD FUNCIONAL CEREBRAL EN ESTADO DE REPOSO EN ESTUDIANTES UNIVERSITARIOS: UN ANÁLISIS DESDE LA TEORÍA DE GRAFOS

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Este estudio examina los efectos de la persistencia del binge drinking (BD) durante al menos 2 años en la conectividad funcional en estado de reposo del cerebro de 35 estudiantes universitarios (14 BDs, 21 controles). Cada participante fue sometido a una resonancia magnética funcional en su primer y tercer curso académico. A partir de métricas derivadas de la teoría de grafos (p.ej., modularidad, clustering y eficiencia global y local), se analizó la topología de la red cerebral como una red compleja y se realizaron análisis específicos de la conectividad de la amígdala, una región clave implicada en procesos emocionales. Los resultados revelaron diferencias significativas entre los grupos. Los BDs mostraron mayor fragmentación y menor integración de la red global (mayor modularidad). Además, se observó menor clustering y menor eficiencia local en la amígdala de los BDs en comparación con los controles. Estos hallazgos indican que mantener un patrón BD se asocia con cambios en la forma en que el cerebro se organiza a nivel global y local. Además, la menor eficiencia local de la amígdala sugiere una alteración en la conectividad entre esta y otras regiones cerebrales que podría relacionarse con las dificultades para la regulación emocional en jóvenes BDs.

SESIONES DE PÓSTER CORRESPONDIENTES AL SIMPOSIO IV: ATENCIÓN

S4P1. EVENT PREDICTABILITY IN RHYTHM LEARNING MODULATES PERFORMANCE MONITORING

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Performance monitoring is essential in rhythm learning, but the modulation of this process by predictability at different levels such as motor or perceptual has been scarcely studied. The goal of the present study was to determine different components of performance monitoring with predictability of rhythm expectations and motor learning.

EEG was recorded from 74 healthy participants while they were performing a rhythm synchronization task in that they had to learn to tap along with the notes of rhythms that varied in predictability. We analysed rhythm predictability using information content (IC) and provided visual images with different information on the rhythm to decode.

Note-by-note asynchrony decreased with repetitions and increased for more unpredictable notes. A visual representation mapping time as space reduced asynchrony. Amplitude of Error Negativity (Ne) and Error Positivity (Pe) components were associated with the degree of predictability of the notes. Repetitions reduced Ne when images provided during learning were meaningless. These results support that asynchrony in rhythm learning and the neurophysiological responses of performance monitoring are driven by the predictability of the events.

S4P2. "GOTTA LOVE YOUR HATERS": ELECTROPHYSIOLOGICAL CORRELATES OF SOCIAL REWARD AND SOCIAL PUNISHMENT ON INSTAGRAM

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Despite a growing interest in social reward, existing studies are constrained by the challenges of replicating real social interactions in the laboratory. However, with social interactions increasingly taking place online, a more ecological approach would be to use stimuli adapted from popular social media platforms such as Instagram. To address this, we developed a novel electroencephalography-compatible paradigm, where scalp-EEG responses were recorded from 30 healthy young adults, as they viewed their own or others' Instagram photos and responded to a target after seeing a cue indicating potential reward or punishment. Depending on their reaction times to the target, participants received "Likes" and positive comments if they won in reward conditions and "Dislikes" and negative comments if they lost on punishment conditions. Reaction times were significantly slower for punishment vs reward cues only when participants viewed their own photos, suggesting a deliberate response slowdown to see negative comments. Coherently, the punishment loss condition for participants' own photos showed the largest feedback-P3 amplitude and the smallest FRN amplitude, indicating heightened salience of negative feedback and an absence of "worse than expected" perception. These results align with recent studies emphasizing the attention-grabbing nature of negative comments on social media.

S4P3. EXTERNALIZING PRONENESS AND THE N2: DIFFERENTIAL CONTRIBUTIONS OF INHIBITORY AND NOVELTY PROCESSING

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The N2 component has been associated with different cognitive operations, including novelty, conflict, and inhibitory processing, depending on task demands. Prior research has reported inconsistent associations between N2 amplitudes and externalizing problems and traits. To clarify the relationship between the N2 and externalizing proneness, 142 participants (118 females) performed a novelty-oddball task and a three-stimuli go/no-go task, from which three N2 variants were extracted: novelty N2, low frequency N2, and no-go N2. Externalizing proneness was operationalized as the shared variance across disinhibitory traits, substance abuse, and antisocial behavior problems. The three N2 variants exhibited substantial overlap (rs = .48 – .71). However, despite this observed covariation, only the no-go N2 significantly correlated with externalizing scores (r = .18, p = .03), indicative of reduced amplitudes. Interestingly, a multiple regression analysis with the three N2 variants introduced as concurrent predictors of externalizing scores, revealed unique and opposing predictive contributions for both no-go N2 (β = .32) and novelty N2 (β = -.28) amplitudes (ps < .03). These findings suggest that reduced inhibitory processing and enhanced novelty processing independently contribute to externalizing, highlighting the importance of considering task contexts to better understand the neurocognitive processing deviations associated with this psychopathology construct.

SESIONES DE PÓSTER CORRESPONDIENTES AL SIMPOSIO V: POBLACIONES CLÍNICAS

S5P1. DIFERENCIAS CLÍNICAS ENTRE MUJERES Y HOMBRES CON FIBROMIALGIA [CLINICAL SEX DIFFERENCES IN FIBROMYALGIA PATIENTS]

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Introducción: Son muchos los estudios que han examinado las características clínicas a nivel psiconeurofisiológico en mujeres con fibromialgia (FM). Sin embargo, se aprecia un vacío en la literatura respecto a la replicación de gran parte de estos resultados en población de sexo masculino. El objetivo del presente estudio persigue explorar si nuestros resultados en los últimos años estudiando mujeres con FM (menores umbrales y mayor sensibilización al dolor, y menor actividad y reactividad sudomotora) son corroborados en pacientes hombres.

Método: En una primera fase del estudio, 20 hombres con FM y 20 controles sanos se evaluaron para recoger las siguientes variables: 1) Factores clínico-psicológicos (dolor clínico, catastrofización, ansiedad, depresión, fatiga y medicación), 2) Medidas de algometría (umbral, tolerancia y sensibilización al dolor), y 3) Parámetros psicofisiológicos (tasa cardíaca, actividad y reactividad electrodermal). Adicionalmente, nos servimos de los datos de nuestros anteriores estudios en mujeres para explorar las posibles diferencias debidas al sexo.

Resultados: Se observó una mayor tolerancia y una menor sensibilización al dolor, mientras que no se observaron diferencias en los factores clínico-psicológicos en las comparaciones entre pacientes hombres y mujeres. Una mayor tasa cardíaca fue encontrada en pacientes de ambos sexos respecto a controles. Se encontraron diferencias, pero no estadísticamente significativas, entre pacientes y controles hombres en actividad y reactividad electrodermal.

Discusión: A falta de obtener un mayor tamaño muestral, parece apreciarse en hombres una corroboración parcial de nuestros resultados previos en mujeres, destacando una menor tendencia a la sensibilización al

dolor por parte del sexo masculino (tanto en pacientes como en controles), la cual debería ser tenida en cuenta en los protocolos diagnósticos basados en el uso de algometría. El conjunto de estos datos ayudará a configurar un perfil psiconeurofisiológico para los hombres con FM.

S5P2. MÁS EVIDENCIA DE NEUROPATÍA DE LAS FIBRAS PEQUEÑAS EN FIBROMIALGIA [MORE EVIDENCE OF SMALL FIBER NEUROPATHY IN FIBROMYALGIA PATIENTS]

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Introducción. La neuropatía de fibras pequeñas se ha observado en subgrupos de pacientes con fibromialgia (FM). La función sudomotora, comúnmente alterada en esta neuropatía, se puede evaluar mediante la conductancia electroquímica distal no invasiva de la piel (CEQ). Se tuvo como objetivo explorar la CEQ en pacientes con FM en comparación con participantes sanos.

Métodos. Participaron 30 mujeres con FM y 30 mujeres sanas. Se exploró la CEQ, medidas mecánicas de dolor evocado y la sintomatología clínica.

Resultados. Preliminarmente, la CEQ parece ser significativamente más baja en pacientes con FM que en las controles. Además, las pacientes con FM mostraron una mayor prevalencia de disfunción moderada a severa en comparación con las participantes sanas (50% vs 17% respectivamente). En cuanto a las medidas de dolor evocado y sintomatología clínica, no se encontraron diferencias significativas entre las pacientes que presentaron disfunción de la CEQ y las que no, excepto en los niveles de la depresión.

Conclusiones. La mayor presencia de disfunción de CEQ en la muestra de FM es consistente con la presencia de neuropatía de las fibras pequeñas en subgrupos de pacientes con FM y la conocida heterogeneidad del fenotipo de este síndrome de dolor.

Sin embargo, esta disfunción no parece ser significativamente útil para determinar las características clínicas de este trastorno.

S5P3. BRAIN ACTIVITY IS UNAFFECTED BY THE REAPPRAISAL AND SUPPRESSION OF THE PHOBIC OBJECT IN BLOOD-INJECTION-INJURY PHOBIA

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Blood-injection-injury phobia (BII) could be related to a deficit in the regulation of the emotional reaction elicited by the phobic object. Hence, we studied whether brain activity would be attenuated while participants reappraised or suppressed the emotions provoked by pictures depicting their phobic stimuli. We selected 13 BII phobia and 12 spider phobia participants. The experimental task was an S1-S2 paradigm. The S1 was a label (blood, spider or neutral), displayed for 2 s on the screen, indicating an upcoming picture (displayed for 6s). The task was divided in 3 blocks. The block 1 consisted in the passive viewing of the pictures (40 per category). The blocks 2 and 3 were counterbalanced and consisted in the reappraisal or the emotional suppression provoked by blood and spider pictures (40 pictures per category and condition). We recorded the EEG activity and focused our analyses on parietal electrodes after picture onset. The reappraisal of spider pictures provoked a reduction of the LPP in spider phobia, but not in BII phobia. Overall, emotion regulation has not an effect on the brain activity provoked by phobic stimuli in BII phobia, whereas spider phobia benefits from the reappraisal of the phobic object.

S5P4. INDIVIDUAL CLASSIFICATION OF ADHD CHILDREN BY PREFRONTAL HEMODYNAMIC RESPONSES DURING A FNIRS-ASSESSED RHYTHMIC MENTAL ARITHMETIC TASK

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Few studies have focused on functional near-infrared spectroscopy (fNIRS) data to discriminate attention-deficit/hyperactivity disorder (ADHD) condition at the individual level. This work aims to develop an fNIRS-based methodological approach for effective identification of ADHD boys via technically feasible and explainable methods. fNIRS signals recorded from superficial and deep tissue layers of the forehead were collected from 15 clinically referred ADHD boys and 15 healthy controls during the execution of a rhythmic mental arithmetic task. Synchronization measures in the time-frequency plane were computed to find frequency-specific oscillatory patterns maximally representative of the ADHD or control group. Time series distance-based features were fed into four popular machine-learning linear models (support vector machine, logistic regression, discriminant analysis and naïve Bayes) for binary classification. Classifiers performance was evaluated through 5-fold and leave-one-out cross-validation and statistical significance by non-parametric resampling procedures. Logistic regression and linear discriminant analysis achieved accuracy, sensitivity, and specificity scores of near 100% for both cross-validation schemes when trained with only three key wrapper-selected features, arising from surface and deep oscillatory components of very low frequency. We provide preliminary evidence that very-low frequency fNIRS fluctuations induced/modulated by a rhythmic mental task accurately differentiate ADHD boys from healthy controls, outperforming other similar studies.

S5P5. LONG-TERM FINDINGS ON WORKING MEMORY NEURAL DYNAMICS IN HEALTHCARE WORKERS AFTER MILD COVID-19

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Apart from the respiratory and neurological problems associated with COVID-19, cognitive difficulties, such as working memory alterations, have been reported as important symptoms that can significantly interfere with a person's daily life. Understanding the long-term impact of infection on cognitive function, even in mild cases, is critical to the well-being of individuals, especially for healthcare workers who are at increased risk of exposure to the virus. To our knowledge, the electrophysiological activity underlying working memory has not yet been explored. Seventy-seven healthcare workers took part in the study (43 with mild infection about one year before the study and 34 uninfected). Event-related potentials (ERPs) and behavioural responses were recorded while participants performed a working memory (n-back) task. Behavioural measures showed no significant differences between groups. Notably, COVID-19 patients exhibited lower parieto-occipital N1 amplitudes and higher frontal P2 amplitudes as compared to non-infected healthcare workers. This abnormal neural pattern encompasses the presence of a dysfunctional encoding of sensory information (N1) followed by an enhancement of attentional control processes (P2) that suggests the activation of an effective compensation mechanism. Current findings indicate that ERPs might be a useful neural index to detect cognitive disturbances in COVID-19 patients, even in mild cases.

S5P6. ANATOMICAL BRAIN CORRELATES OF WORKING MEMORY IN FIBROMYALGIA: MODERATING EFFECT OF YEARS OF DISEASE SYMPTOMS

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Patients with fibromyalgia are characterised by having, along with persistent chronic pain, an impairment in cognitive processes such as working memory (WM), which appears to be supported by frontoparietal networks. In this study we examined the existence of brain anatomical and neuropsychological differences between fibromyalgia patients and control subjects along with its potential relationships. For this purpose, thirty patients and twenty-seven control participants took part in the experiment. Brain morphology was explored by using Voxel-Based Morphometry analyses (VBM) and working memory was assessed by means different neuropsychological tests belonging to the WAIS-III. As expected, fibromyalgia patients scored lower on arithmetic, letter-number sequencing, and WM index, however we found no differences in grey matter volume between groups. Moderation analyses highlighted the importance of considering the first years of symptoms to better understand the interaction of the grey volume in insular and dorsolateral prefrontal cortex with the performance on arithmetic subtest of working memory. These findings could be relevant to describe the anatomical substrate underlying working memory deficits in fibromyalgia in order to develop future intervention tools more adapted to these patients.

S5P7. EXPLORANDO LA MIGRAÑA INFANTIL MEDIANTE LA VARIACIÓN NEGATIVA CONTINGENTE (VNC)

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Diversos estudios sugieren que la Variación Negativa Contingente Temprana (-VNCt-) puede ser un índice electrofisiológico asociado a la migraña. Si bien en adultos su significado funcional está en debate, en niños su relación con esta cefalea aún se desconoce. En este estudio participaron 15 niños y niñas con migraña sin aura y 12 controles entre 7 y 12 años (edad media: 9,67 ± 1,47). Se registró la respuesta eléctrica cerebral a estímulos auditivos (agudos y graves) emparejados durante una tarea S1-S2. Dos estímulos de aviso (S1: 100Hz/2000Hz) se asociaron a dos estímulos diana (S2: 200Hz/4000Hz). Los participantes debían presionar una tecla cuando S1 y S2 eran congruentes (ambos de baja o alta frecuencia). Los ANOVAs mostraron menor amplitud de la VNCt en zonas frontales para niños con migraña [$F(1,25) = 4,61$, $p = .042$]. Sin embargo, no se encontraron diferencias conductuales entre grupos. Los resultados del presente estudio sugieren la existencia de un patrón neural distintivo en niños con migraña reflejado en la modulación anómala de la VNCt durante la anticipación de estímulos sensoriales. La realización de futuros estudios es necesaria para precisar el significado funcional de la VNC en la migraña infantil.

S5P8. DIFERENCIAS SEXUALES EN EL IMPACTO DEL PERFIL VESPERTINO DEL CORTISOL SOBRE EL AFECTO NEGATIVO Y LA CALIDAD DE VIDA EN PACIENTES CON EPILEPSIA FARMACORRESISTENTE

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Objetivo. Determinar si fenotipos en función del perfil vespertino del cortisol y el sexo difieren en el afecto negativo y la calidad de vida (CV) en pacientes con epilepsia. Método. 143 pacientes (edad media= 38.12, DT= 11.43) realizaron una evaluación en la que se midió cortisol salivar, ansiedad rasgo, depresión y CV. Se realizaron ANOVAs univariados para las comparaciones.

Resultados. Se encontraron dos clústeres en función de los niveles de cortisol: el grupo con niveles altos (C+, n = 69, 35 hombres y 34 mujeres) y el grupo con niveles bajos (C-, n = 74, 35 hombres y 39 mujeres). En el grupo C-, las mujeres mostraron menor afecto negativo y mayor bienestar emocional asociado a la CV que los hombres (para todos, $p < 0.05$), sin diferencias en otras subescalas de CV. Sin embargo, en el grupo C+, son los hombres los que muestran mayor bienestar emocional asociado a la CV y menor afecto negativo respecto a las mujeres.

Conclusiones. Los resultados sugieren un efecto diferencial del cortisol en función del sexo sobre variables emocionales, incluso cuando son asociadas a la CV, en pacientes con epilepsia, poniendo de manifiesto su relevancia en la toma de decisiones clínicas.

S5P9. PERFIL DE CORTISOL COMO PREDICTOR DE MEJORAS EN LA CALIDAD DE VIDA DE PACIENTES CON EPILEPSIA FARMACORRESISTENTE SOMETIDOS A LA CIRUGÍA

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Objetivo. Determinar si fenotipos realizados a partir del perfil vespertino de cortisol prequirúrgico explican el cambio en la calidad de vida (CV) de pacientes con epilepsia sometidos a cirugía.

Método. A 92 pacientes (49 hombres y 43 mujeres, edad media= 38.49, DT= 11.99) se les midió el cortisol salivar antes de someterse a cirugía de la epilepsia, del que se extrajo el área bajo la curva, que se utilizó para realizar un clúster jerárquico. Antes y después de la cirugía se evaluó también la CV. Para determinar si estos clústeres explicaban el cambio en la CV, se realizaron ANOVAs de medidas repetidas.

Resultados. Se encontraron dos clústeres: el grupo con niveles altos de cortisol (n = 27) y con niveles bajos (n = 65). Para ambos grupos, se encontró una mejora significativa en la CV, concretamente en CV general, función social y puntuación global ($p < 0.055$). No obstante, en el grupo con niveles de cortisol prequirúrgicos altos, la mejora en CV tras la cirugía fue más pronunciada.

Conclusiones. Los resultados sugieren una asociación entre niveles altos de cortisol prequirúrgico, probablemente como anticipación a la cirugía, y mejoras en la CV postquirúrgica en pacientes con epilepsia farmacorresistente.

S5P10. ARE RESTING-STATE THETA AND BETA POWER SPECIFIC BIOMARKERS OF CHRONIC PAIN?

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Recent systematic reviews on resting-state EEG (rs-EEG) changes associated with chronic and neuropathic pain suggest that increased Theta and Beta activity are common and robust findings when comparing patients with healthy controls. Nonetheless, it is unclear whether these changes may serve as specific markers of chronic pain. Here, we assessed rs-EEG activity in 59 chronic pain patients (mean age: 49 ± 7.98, 78% females) and 41 healthy controls (mean age: 33 ± 7.9, 73% females). Logistic regression results showed that Beta power significantly predicted participants' pain status (Odd ratio -OR- = 10.98, p = 0.009), while Theta power did not (OR = 1.41 p = 0.277). Further, when considering regional differences for Beta power, a backward logistic regression yielded a statistically significant model comprising only parietal Beta power (OR = 18.46, p = 0.003). Finally, Receiver Operating Characteristic curves showed a poor area under the curve (AUC = 0.67), indicating that parietal Beta power lacks enough specificity and sensitivity to be used as a chronic pain diagnostic marker. Future studies should focus on other rs-EEG parameters (e.g., connectivity measures) and compare specific chronic pain conditions to shed light on rs-EEG Theta and Beta activity potential use as chronic pain biomarkers.

S5P11. CORTISOL LEVELS IN POST-SURGICAL DRUG-RESISTANT EPILEPSY PATIENTS: THE IMPORTANCE OF AGE

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Purpose. To analyze the impact of age, negative affectivity, and general cognitive performance on cortisol levels during a neuropsychological assessment in a sample of post-surgical patients with drug-resistant epilepsy. Method. 55 patients (28 men and 27 women; mean age=39.67, SD= 12.24) underwent a neuropsychological assessment in which cortisol levels were measured at 9 different time points. Two clusters were formed: younger age (mean= 30.13, SD= 5.30) and older age (mean= 51.12, SD=7.27). Repeated measures ANOVA, t-tests for independent samples and hierarchical regressions were performed. Results. The older age group showed higher cortisol levels (p=0.001) and higher depression levels. On the other hand, age together with negative affectivity were shown to be plausible predictors of total cortisol production, but overall cognitive performance was not. Conclusions. Taken together, these results suggest that age could have a relevant impact on the hypothalamic-pituitary-adrenal axis as well as on negative affectivity in this population, highlighting the need to consider it in clinical decision making.

S5P12. SELF-GENERATION EFFECTS AND ITS CORRELATION WITH SCHIZOTYPAL PERSONALITY AND LOCUS OF CONTROL

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We investigated the inter-individual variability of the self-generation effects, which refer to attenuated sensory responses to actively produced sounds compared to external sounds. In schizophrenia, these effects are often diminished or absent, potentially due to the delusion of attributing internal experiences to external sources. We explored the influence of personality traits associated with schizotypal features and measures of sense of agency on self-generation effects. Correlations were examined using data from four experiments, analyzing electrophysiological measures of self-generation effects on various event-related potential components, along with scores from four personality questionnaires assessing schizotypal traits and sense of agency. Negative correlations were observed between the N1 self-generation effect and the Schizotypal Personality Questionnaire, as well as between the Magic Ideation Scale and P2 and N1-P2 Peak-to-Peak self-generation effects. However, the sense of agency, measured by the Locus of Control scale, was not significantly correlated with the self-generation effects. These findings suggest that individuals with higher schizotypal traits exhibit reduced self-generation effects, indicating a continuous phenotype that is normally distributed in the population and blurs the distinction between self- and externally generated stimuli. However, the degree of self-generation effects does not necessarily correspond to a higher sense of agency over one's own actions.

S5P13. RETRIEVAL SUPPRESSION-INDUCED FORGETTING AND DEPRESSIVE RUMINATIONS. A PRELIMINARY BEHAVIOURAL STUDY FOR AN EEG STUDY

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Retrieval suppression of undesired memories, and their associated forgetting, has been linked to the individual tendency to ruminate. High ruminators and people with subthreshold depression seem to experience decreased suppression-induced forgetting (SIF), which would make them more vulnerable to depressive symptoms. However, other experiments have reported equivalent forgetting in ruminators, dysphoric and even depressive patients. Indeed, some evidence has suggested that depressive individuals can achieve forgetting by using compensatory neurocognitive mechanisms.

In this behavioural, preliminary study, we compared healthy Low-Ruminators (LR), High-Ruminators with Dysphoria (HRD), and High-Ruminators with no depressive symptomatology (HRnD) while they accomplished a retrieval suppression task, aiming to clarify whether the tendency to ruminate, as well as the depressive symptomatology, are linked with reduce SIF.

Preliminary data shows that both, HR and LR achieve equivalent SIF effects, and that they are similarly able to reduce intrusions along the task, as measured through phenomenological reports. The strategies reported by participants revealed that HR tend to use alternative thoughts to prevent intrusions, more often than LR, suggesting that they might rely on non-inhibitory mechanisms to control their memories. A follow-up EEG study will clarify the oscillatory underpinnings of these different strategies, linking them with SIF and clinical measures.

S5P14. THE LINGERING NEUROLOGICAL CONSEQUENCES OF ALCOHOL USE DISORDER: AN EXPLORATORY TRACT-BASED SPATIAL STATISTICS ANALYSIS

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Alcohol Use Disorder (AUD) is a disabling condition with a prevalence of 5.1% worldwide. The toxic effects of ethanol lead to neural impairments, including demyelination and axonal damage. Despite the growing number of evidence supporting the existence of white matter (WM) abnormalities in individuals with AUD, further studies are needed to generate robust results of the WM microstructure on AUD.

In this study we analyzed the WM integrity, using an exploratory Tract-Based Spatial Statistics (TBSS) analysis, in a sample of 66 participants (mean age = 48.5y), 30 controls and 36 abstinent alcoholics. Our results showed lower values of fractional anisotropy in the pontine crossing tract, and increased mean, axial, and radial diffusivity in the left anterior corona radiata, left fornix, and genu of the corpus callosum respectively, in the AUD group when compared to their control counterparts.

Our findings are in line with recent evidence of convergent macro- and microstructural WM alterations in tracts involved in movement and coordination, memory, and inter-hemispheric communication in AUD. This data highlights that alcohol-induced damage may last even after alcohol abstinence, opening new avenues on how multiple factors such as dose, duration of exposure, treatment or abstinence might account for neurodegeneration in AUD.

S5P15. RESTING STATE INTRINSIC FUNCTIONAL CONNECTIVITY PATTERNS IN ALCOHOL USE DISORDER

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Alcohol use is responsible for 3.8% of all global deaths as well as the loss of 4.6% of total years of full health. Alcohol use disorder (AUD), the most extreme and problematic form of alcohol use, is a highly prevalent medical condition representing a leading cause of severe health consequences worldwide. It is a complex phenomenon with an intricate etiology and pathophysiology whose neurotoxic effects have been widely investigated. However, specific neuroimaging-based biomarkers that could determine alcohol dependence and its relapse remain poorly explored.

Analysis of resting-state networks (RSNs) provides valuable contributions in exploring the network-level disruptions in multiple psychiatric conditions, including addiction. This study will assess the brain functional connectivity at rest using functional magnetic resonance imaging (fMRI) in a group of 63 adults, 33 with AUD and 30 non-AUD controls. Specifically, we will analyze the functional connectivity of the executive control, the salience, the default mode and the sensorimotor RSNs implicated in a wide range of cognitive processes, including stimuli appraisal, decision-making, reward and self-control, all of them commonly impaired in alcohol-dependent individuals. We expect to find altered patterns of intrinsic functional connectivity in these RSNs in the group of AUDs when compared with the non-alcoholic population.

S5P16. DETERMINATION OF CENTRAL PAIN MODULATION BIOMARKERS TO CHARACTERIZE AND PROFILE CANCER PATIENTS WITH REFRACTORY PAIN: A STUDY PROTOCOL

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Pain is highly prevalent in patients with cancer and negatively impacts their well-being. This multicentric, case-control, cross-sectional study attempts to identify biomarkers of pain modulation and processing that help expand knowledge on the mechanisms underlying oncological pain and improve the stratification of patients. Therefore, we will assess non-hospitalized patients with cancer, 500 suffering from pain (cases) and 250 without pain (controls). We will perform a complete sociodemographic and clinical evaluation assessing the type of tumor and treatment, patients' quality of life, functionality, mood, sleep, and pain intensity, among others. Likewise, Quantitative Sensory Testing (QST) protocols including Temporal Summation of Pain, Conditioned Pain Modulation, Offset Analgesia, and cold and hot pain thresholds, as well as resting state EEG with and without sustained painful stimulation, and Contact-Heat Evoked Potentials will be assessed. Planned outputs include a standard assessment protocol, a database of cancer pain biomarkers, and valua-

ble artificial intelligence algorithms to characterize patients with cancer pain. Our hypothesis is that the identification of QST and EEG-based biomarkers, together with a deeper understanding of the moderator role of other variables (e.g., age, gender, type of tumour, treatment, etc.), will be useful to stratify oncological patients, enhancing prognosis and optimizing therapy and patient-centered interventions.

S5P17. VALIDITY OF A PANEL OF CENTRAL PAIN PROCESSING AND MODULATION BIOMARKERS TO PREDICT THE OCCURRENCE OF CHRONIC PAIN IN PATIENTS WITH CANCER: A STUDY PROTOCOL

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The experience of pain is frequent in persons with cancer, either due to the treatment or the oncological process itself. To better understand the variables that predict oncological pain, we will conduct a multicenter longitudinal cohort study of 450 patients with a recent diagnosis of cancer (breast, lung, colon, or pancreas). The first evaluation will be performed before starting the oncological treatment, and follow-up evaluations will be performed 6 and 12 months later. During each evaluation, we will assess the presence of clinical pain as well as sociodemographic and clinical variables (cancer type, tumour's characteristics, treatment, quality of life,...), and central pain modulation and perception mechanisms with quantitative sensory testing (QST) and EEG. We will measure dynamic (temporal summation of pain, conditioned pain modulation, and offset analgesia) and static (cold/heat pain thresholds) QST measures. Resting-state EEG with and without sustained cold pain stimulation and Contact-Heat Evoked Potentials will be recorded. Applying artificial intelligence algorithms, we will analyze which variables best predict the future occurrence

of pain and propose a prediction tool for oncological pain. Our hypothesis is that poorer pain modulation mechanisms and increased brain response to painful stimuli at the first assessment will predict the development of chronic pain.

S5P18. MARKED IMPROVEMENT OF POSTURAL AND GAIT DISTURBANCES IN PARKINSON'S DISEASE AFTER BILATERAL PRIMARY MOTOR AREA INTERMITTENT THETA-BURST STIMULATION MAY BE LINKED TO INCREASED PUTAMEN-CORTICO-CEREBELLAR FUNCTIONAL CONNECTIVITY: A CASE REPORT

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Objectives: Evidence suggests that intermittent theta burst stimulation (iTBS) might be an effective non-invasive neuromodulation therapy for PD, but the structural and functional basis of these changes remain unclear.

Methods: We present the case of a right-handed, 66-year-old man with PD, receiving long-term treatment with levodopa and with patent symptoms of bradykinesia, altered stability, and gait disturbances. He was recruited for a double-blind, randomized, sham-controlled pilot study of iTBS over bilateral primary motor cortex (M1). Motor evaluation was performed at different follow-ups. Neurocognitive assessment, cortical excitability, and structural and resting-state functional MRI testing were performed initially and at the end (1wk) of the therapeutic course. MRI data were compared relative to 17 PD control patients.

Results: Compared to baseline and sham stimulation, iTBS produced a manifest improvement of postural and gait disturbances and a reduction of upper/lower limbs bradykinesia that lasted up to 1 month after treatment. Interestingly, iTBS resulted both in increased putamen-parietal-cerebellar and supplementary motor area-prefrontal functional connectivi-

ty, as well as in a decreased left caudate volume. All these changes turned to baseline values during pre- and post-sham evaluations.

Conclusions: The present case demonstrates that PD axial symptoms may be successfully treated with short series of bilateral M1 iTBS and that increased putamen-cerebellar and prefrontal functional connectivity may reflect a compensatory mechanism underlying improvement of transient postural and gait disturbances in PD.

S5P19. CORTICO-SUBTHALAMIC INTERPLAY DURING OPEN-EYES AND CLOSED-EYES RESTING STATE IN PARKINSON'S DISEASE PATIENTS

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Objectives: We sought to characterize the changes in electrophysiological activity patterns of the subthalamic nucleus (STN) and its functional interactions with cortical regions during different eyes states at rest.

Methods: Spontaneous local field potentials in the STN (STN-LFP) and surface electroencephalogram (EEG) activity were simultaneously recorded during eyes-closed (EC) and eyes-open (EO) resting-state conditions in 12 Parkinson's' disease (PD) patients undergoing deep brain stimulation surgery. All patients performed the experimental session without medication on the 2-3 postoperative day. Power spectral density (PSD) and connectivity measures between the STN-LFPs and frontal-occipital cortical areas were analyzed for both resting conditions.

Results: Normalized PSD and coherence of STN-LFP and EEG differed between EC and EO conditions, mainly within the low-frequency (LF, 4–12Hz) bands. Although all the regions of interest showed increased LF power during EC compared with OE, only a statistically significant difference was exhibited at the level of STN and frontal-EEG. Interestingly, a significant enhancement in coherence in the LF range was found between frontal and STN regions during CE condition. Furthermore, coherence was also significantly increased between occipital and STN regions in the beta frequency range (13-35Hz).

Conclusions: These findings confirm that opening or closing the eyes may set different brain functional connectivity changes by widespread cortical and subthalamic-cortical interactions, and suggests, at least in patients with PD without dopaminergic medication, that EC and EO resting-state conditions can influence dynamic modulations of large-scale cortical-STN network activity.

S5P20. SUBTHALAMIC STIMULATION INDUCES MODULATION OF RESTING-STATE FUNCTIONAL CONNECTIVITY IN PARKINSON'S DISEASE PATIENTS

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Objectives: The purpose of this study was to investigate the dynamic nature of brain activity in different eyes-open (EO) and eyes-closed (EO) resting conditions and the transient effects on sensorimotor and cortical networks in response to subthalamic stimulation (STN-DBS) in Parkinson disease (PD) patients.

Methods: Fifteen PD patients Off antiparkinsonian medication treated with bilateral DBS-STN and 17 matched-healthy controls were recruited. Spontaneous electroencephalographic (EEG) activity at rest were recorded during STN-DBS On/Off states. Robust detrend and Laplacian reference was computed for frequency analysis, and relative power for each frequency band was extracted at sites of interest. Scalp current density transformed values were employed for coherence calculation between anterior, central and posterior electrode clusters.

Results: DBS-STN On significantly increased relative alpha (7-13 Hz) power activity at right posterior sites during resting EO. In both functional resting-state conditions, antero-posterior coherence in the alpha band was reduced for STN-DBS Off patients, while it increased and matched control values when the stimulator was turned On. Moreover, brain connectivity between central and anterior-posterior regions in the beta range (18-25 Hz) was increased by STN stimulation for EC but not EO resting conditions. Interestingly, these increased brain and functional connectivity changes were associated with longer period of use of DBS therapy.

Conclusions: We suggest STN-DBS can selectively regulate cortical activity particularly for posterior cortical alpha power and central beta coherence, which are affected during PD disease progression, and may help pinpoint resting-state related brain activity in DBS PD patients.

SESIONES DE PÓSTER CORRESPONDIENTES AL SIMPOSIO VI: PERCEPCIÓN

S6P1. MODULATION OF SUBCORTICAL CODING OF PERIODIC SOUNDS BY THE DEGREE OF CONTROL OVER SOUND PITCH PRODUCTION

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Humans exert exquisite control over the pitch of produced sounds. Pitch is the perceptual attribute of the repetition rate of a sound waveform and its neural representation entails phase-locked neural firing to sound periodicity (temporal code). As predictive mechanisms on the sensory outcome of own actions (corollary discharges) result in attenuated neural responses to self-generated stimuli, we here sought to reveal whether temporal coding of periodic sounds is affected by the degree of control over pitch modulation following sensory-motor learning. We collected EEG data from young participants during an audio-motor task consisting in matching target pitched-vowel sounds by controlling pitch-vowel production through a touchpad (X/Y axes) in two experimental conditions: 1) Constant (predictable, fixed touchpad's axes mapping for pitch/vowel); and 2) Random (unpredictable mapping variation). Preliminary analyses show that, as expected, participants performed better in the Constant condition. Cross-correlation values between brain activity and audio waveforms peaked around a 9ms lag, indicating subcortical activity origins, and were lower in the Constant condition, in line with expected effects due to corollary discharges. Interestingly, we found larger effects between conditions at the top of the neck, suggesting a potential source originating in the cerebellum, a structure well known to support sensory-motor learning.

S6P2. TRANSLATION AND VALIDATION OF THE TOUCH EXPERIENCES AND ATTITUDES QUESTIONNAIRE (TEAQ) FOR THE SPANISH POPULATION

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Touch has been a fundamental communication channel since we were born and continues to play an important role throughout our lives. Positive touch experiences can shape social reward, attachment, and emotional regulation. Despite its importance, there are currently no questionnaires available that measure dimensions related to touch for the Spanish population. The aim of this study was to translate and validate the Touch Experiences and Attitudes Questionnaire (TEAQ). A preliminary online sample of 134 participants was collected. Thereafter, we performed the multidimensional Rasch Model and confirmatory factor analysis, and the reliability of the six dimensions of the TEAQ. Results showed good fit indexes for the six-factor model structure (friends and family touch, current intimate touch, childhood touch, attitudes to self-care, attitudes to intimate touch, and attitudes to unfamiliar touch). This instrument also showed good reliability. In conclusion, preliminary analysis of the Spanish version of the TEAQ demonstrated good psychometric properties for the six-factor model structure, allowing to measure both touch experiences and attitudes toward touch. The use of this instrument may increase knowledge about cultural aspects of affective touch, as well as be very useful in research and clinical contexts.

S6P3. DECODING VISIBLE AND INVISIBLE PERCEPTUAL STIMULI FROM EEG DATA USING MACHINE LEARNING

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In recent years, the field of cognitive neuroscience has witnessed a remarkable surge in the utilization of machine learning (ML) techniques, particularly in the analysis of neuroimaging data. This burgeoning interest in ML models has significantly contributed to advancing our understanding of the inner workings of the human brain.

Within this research line, we employed a task designed to study conscious perception. Participants had to discriminate the orientation of the Gabor lines (if the Gabor was not perceived they were asked to guess) and then indicate if they had consciously detected the appearance of the Gabor. Simultaneously, we recorded electroencephalography (EEG) data during task performance, utilizing ML algorithms to decode distinctive task-related parameters.

Our preliminary findings demonstrate the feasibility of decoding various factors from EEG data, such as the presence or absence of the stimuli, participants' reported perception of the stimuli, and the perceived orientation (clockwise or counter-clockwise). Moreover, we conducted a comparative analysis of the decoding performance when employing either raw voltage data or time-frequency features as input, revealing a substantial improvement in decoding accuracy when using time-frequency representations. Moving forward, our project will encompass further analyses aimed at generalization across different blocks and participants, as well as the adaptation of the analysis pipeline for real-time applications.

S6P4. EXPLORING THE LINK BETWEEN NEURAL ENTRAINMENT AND ALTERED STATES OF CONSCIOUSNESS THROUGH ELECTRONIC MUSIC

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Electronic dance music festivals use the repetitive beats inherent to electronic music to induce altered states of consciousness (ASCs) and enable the transformative experiences sought by attendees. Neuroscientifically, various mechanisms have been proposed to explain how exposure to repetitive sounds can trigger ASCs, with particular attention given to entrainment, the brain's synchronization with periodic external stimuli. However, the relationship between entrainment and ASCs has not been thoroughly explored. This study aims to illuminate this connection for the first time using naturalistic electronic music and electroencephalography. Drawing from the observation that the presentation rate of repetitive sounds modulates the extent of entrainment, peaking around 2 Hz, we investigated whether changes in entrainment magnitude, induced by six songs played at three different tempos (i.e., 1.65 Hz, 2.25 Hz and 2.85 Hz), were linked to ASCs, measured through cognitive tasks and a retrospective questionnaire capturing participants' phenomenological experiences. Overall, our findings (n = 20) propose entrainment as a potential phy-

siological mechanism underlying the use of repetitive sounds to induce ASCs. This study was part of the ERC Artsoundscapes project (Grant Agreeement No. 787842) that has received funding from the European Research Council under the European Union's Horizon 2020 research and innovation program.

SESIONES DE PÓSTER CORRESPONDIENTES AL SIMPOSIO VII: MEMORIA

S7P1. FRONTO-POSTERIOR PHASE COUPLING DOWNREGULATES SENSORY CORTICES TO COPE WITH EMOTIONAL DISTRACTION IN WORKING MEMORY

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We investigated the impact of affective information on working memory (WM) and how cognitive control can mitigate its effects. Using MEG, we studied a group of volunteers while they accomplished a delayed-recognition WM task in which neutral, positive and negative pictures interrupted the maintenance of faces. Negative distractors were harder to override than neutral and positive distractors. The oscillatory activity showed a decreased event-related desynchronization between 11-21 Hz over the temporal and occipital cortex, following the presentation of negative distractors. This effect correlated with accuracy and reaction times. Alpha-beta desynchronization is associated with the neocortical capacity to represent information, suggesting a downregulation of the sensory aspects of the distractor representation, which might reduce the influence of negative distractors before recognition occurs. Further connectivity analysis revealed a strong phase coupling between the right dorsolateral prefrontal cortex and the posterior areas. This suggests that this executive region modulates the oscillatory activity of posterior cortices to diminish the interfering effects of negative distractors. In summary, our findings demonstrate that fronto-posterior phase coupling plays a crucial role in controlling emotional distraction by downregulating sensory cortices. This

modulation eases the maintenance of relevant information in working memory despite the presence of powerful interferences.

S7P2. THE ROLE OF DECISION-MAKING STYLES IN PREDICTING RESTING HEART RATE VARIABILITY

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Life as humans being is characterized by constant decision-making, defined as a learned habitual response pattern, general tendencies that critically influence daily life. Some of these styles (rational, intuitive) have been associated with good mental health, meanwhile others (dependent, avoidant) the contrary. Adaptive decision making requires an integration of psychological and biological processes. High basal levels of heart rate variability (HRV) have been proposed as a marker of health, executive and emotional control, although investigation about its relationship with decision-making styles is scarce. The aim of this study is to analyze whether decision making styles can predict resting HRV. A sample of 199 (119 women) young university students participate in the study. Resting ECG was recorded to extract frequency domain HRV variables. Then, participants fulfilled sociodemographic data and the General Decision-Making Style questionnaire. Results showed that intuitive style predicted High frequency HRV, while avoidant style predicted less Low frequency HRV; suggesting that intuitive style is related to healthier resting cardiovascular levels, whereas avoidant styles are associated with worse resting cardiovascular levels. In conclusion, the proneness to utilization of intuitive style may play a role on HRV and, therefore, on superior brain structures related to behavior organization and cognitive processes.

SESIONES DE PÓSTER CORRESPONDIENTES AL SIMPOSIO VIII: ESTIMULACIÓN CEREBRAL INVASIVA Y NO INVASIVA

S8P1. PROTOCOLO DEL ESTUDIO ONCODEP: INTERVENCIÓN CON ESTIMULACIÓN CEREBRAL NO INVASIVA Y ENTRENAMIENTO COGNITIVO PARA LA SINTOMATOLOGÍA DEPRESIVA ASOCIADA AL CÁNCER DE MAMA

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La sintomatología depresiva y el deterioro cognitivo son dos de las secuelas más habituales e incapacitantes asociadas al cáncer de mama. Las técnicas de neuroestimulación están recomendadas para el tratamiento de la depresión y mejoran los síntomas cognitivos asociados a este cuadro. Además, el Entrenamiento Cognitivo (EC) se ha relacionado con una mejora anímica y cognitiva en pacientes oncológicos con síntomas depresivos y quejas cognitivas. ONCODEP propone una intervención domiciliaria que combina ambas estrategias terapéuticas para tratar estas condiciones: la neuroestimulación eléctrica transcraneal (por corriente directa -tDCS- y alterna -tACS-) y el EC. Para ello, se realizará una exploración clínica y neuropsicológica en tres momentos (pre y post tratamiento y seguimiento a los 3 meses) y se empleará un programa de EC online y un sistema de tDCS/tACS inalámbrico portátil para su uso en el hogar. Se dividirá a las pacientes en cuatro grupos de tratamiento y se analizará el impacto de la intervención en el funcionamiento afectivo y cognitivo, teniendo en cuenta las diferencias estadística y clínicamente significativas. También se explorará la relación entre el estado afectivo y cognitivo de las participantes y se identificarán biomarcadores en saliva y variables clínicas que resulten ser predictores de la eficacia del tratamiento.

S8P2. EFFECTS OF TRANSCRANIAL DIRECT CURRENT STIMULATION (TDCS) ON PAIN MODULATION IN ELDERLY PEOPLE WITH CHRONIC PAIN

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Chronic pain is one of the main obstacles for healthy aging affecting over 50% of the elderly. Transcranial direct current stimulation (tDCS) over the primary motor cortex (M1) and/or dorsolateral prefrontal cortex (DLPFC) has been postulated as innovative intervention to relieve pain. However, little is known about the underlying neurophysiological correlates of tDCS and its efficacy in aging. This study aims to explore tDCS effects on pain processing and perception in elderly. Twenty-four older adults with chronic pain (60-79 years, 12 women) were enrolled in a single-session of M1 (n=12) or DLPFC (n=12) tDCS (1,5 mA). Pain-related evoked potentials (PREP) elicited by electrical stimuli, pressure and electrical pain thresholds as well as pain perception (spontaneous and evoked pain ratings) were registered before and after the stimulation. All participants showed reduced N1 amplitudes to PREP and augmented electrical pain thresholds, after the stimulation. Moreover, they also showed a relieve in their spontaneous pain after tDCS (regardless of the stimulation site). These results suggest that tDCS has an effect on attentional components of pain processing in older with chronic pain, in addition to decreasing pain perception and spontaneous pain. However, no differential advantage was observed between stimulating M1 or DLPFC. Supported by PostDoc (Margalida Comas, PD/018/2021).

S8P3. LA TACS DE FRECUENCIA THETA EN LOCALIZACIONES FRONTALES MEJORA LA EJECUCIÓN DE PERSONAS ADULTAS JÓVENES EN MEMORIA DE TRABAJO, MIENTRAS QUE EN FRECUENCIA GAMMA EMPEORA SU EJECUCIÓN EN MEMORIA EPISÓDICA

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La estimulación transcraneal con corriente alterna (tACS) es una técnica no invasiva capaz de interaccionar con las oscilaciones cerebrales, observándose que en frecuencia theta (tACS-theta) puede mejorar el desempeño en memoria de trabajo (MT) en personas sanas. Por otra parte, la tACS en frecuencia gamma (tACS-gamma) ha mostrado efectos contradictorios para modular la memoria episódica (ME) en personas jóvenes. Este estudio piloto tuvo como objetivos aplicar, sobre AF3, tACS-theta para mejorar el desempeño en MT, y tACS-gamma para mejorar el desempeño en ME. Veinte jóvenes se sometieron a 3 sesiones en las que recibieron un tipo diferente de tACS durante 28 minutos: tACS-theta, tACS-gamma y tACS-placebo. En cada sesión, se aplicó la tACS durante una tarea de MT y la fase de codificación de una tarea de ME. Los resultados mostraron una mejora en el rendimiento de MT en la condición tACS-theta, en consonancia con las hipótesis planteadas. Este protocolo podría ser valorado para su aplicación a personas mayores con o sin deterioro cognitivo en proyectos futuros. Sin embargo, en la condición tACS-gamma se observó un empeoramiento en el rendimiento en la fase de reconocimiento de tarea de ME, lo que parece indicar que la estimulación sobre AF3 en esta frecuencia interfiere con los procesos llevados a cabo durante la fase de codificación de esta tarea en personas jóvenes, dificultando el proceso posterior de recuperación de la información.

S8P4. WORKING MEMORY TRAINING ASSOCIATED WITH TDCS INCREASES SALIVARY IGF-1 LEVELS IN OLDER ADULTS

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Transcranial direct current stimulation (tDCS) and working memory training (WMT) have shown protective effects on aging-related cognitive decline. Evidence from both animal and human studies suggest that even slight increases in insulin-like growth factor-1 (IGF-1) improves cognition, which consequently may serve as a putative marker of cognitive enhancement in older adults. We performed a double-blind randomized sham-controlled experiment in 43 participants aged 60-88 years old, divided into three groups: double-sham, sham-tDCS+WMT and anodal-tDCS+WMT. Five sessions of tDCS (2 mA, 20 min) were applied over the left dorsolateral prefrontal cortex. Saliva was collected before the beginning of the experiment and after the training period. Samples were lyophilized to concentrate 4x and IGF-1 was detected by ELISA (#ADI-900-150, Enzo). Statistical analysis was performed using R package lme4 to build a generalized mixed model with log distribution to test for changes in IGF-1 levels, controlling for age and gender. We found a significant interaction between group and time: after the 5-session period, anodal-tDCS + WMT induced a significant increase in salivary IGF-1 levels, compared to the double-sham procedure (0.88 [0.51-1.15] vs. 0.53 [0.31-0.62] μg/L, $p = 0.0048$), suggesting that IGF-1 may be involved in the positive effects of tDCS in cognition.

S8P5. tDCS OVER LEFT DORSOLATERAL PREFRONTAL CORTEX ENHANCES VISUAL WORKING MEMORY AND MODULATES EYE GAZE IN ELDERLY HEALTHY ADULTS

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Objectives: To provide new insight into the benefits of transcranial direct current stimulation (tDCS), the aim of this study was quantifying the effects of single-session of anodal tDCS over the left dorsolateral prefrontal cortex (dlPFC) to improve visual working memory (WM) performance in elderly people.

Methods: Sixteen elderly (age range: 60-77 years) participants were randomized to receive 20 min of either anodal (1.5 mA) or control (i.e., sham) tDCS applied to the left dlPFC in a randomized, double-blind design. WM was evaluated through the Sternberg task and by manipulating stimuli congruence and cognitive load during online (i.e., ongoing stimulation) application of tDCS. Changes on pupil diameter and gaze points were also collected by eye-tracking and further analyzed during encoding and maintenance WM periods.

Results: After real anodal tDCS, but not sham stimulation, participants significantly improved WM performance by increasing accuracy, particularly for those task conditions with lower cognitive demands. Interestingly, anodal dlPFC tDCS significantly increased the fixation time during encoding WM, while there was a trend to enhance pupil dilation during maintenance WM.

Conclusions: Applying single-session anodal tDCS to the left dlPFC is effective in improving visual working memory in elderly healthy adults, which may be linked to selectively facilitate eye gaze and attentional capacities during visual encoding stimuli.

SESIONES DE PÓSTER CORRESPONDIENTES AL SIMPOSIO IX: EMOCIÓN

S9P1. GREATER HIGH FREQUENCY HEART RATE VARIABILITY PREDICTS HIGHER DONATIONS IN A COMPASSION TASK AMONG OFFENDERS

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The autonomic nervous system (ANS) has been identified as a mechanism underlying the offending phenomenon. Specifically, High Frequency Heart Rate Variability (HF-HRV), a biomarker associated with the parasympathetic outflow, has been linked to compassion and prosocial behavior. Compassion, defined as sensitivity to others' suffering and motivation to alleviate it, has been proposed as a protective factor against violence. This study aims to explore the relationship between resting HF-HRV levels and prosocial actions (donations to NGOs) during a Compassion Task (CT) involving 100 offenders (75 men, 25 women aged 18-62). Physiological data was collected using VU-AMS during a 5-minute baseline period. The CT included an emotional induction through a virtual reality paradigm, followed by an opportunity to make a donation (using the economic compensation provided for the study). Pearson's correlation analysis revealed a positive association between higher HF-HRV levels and greater donations. Furthermore, a multiple regression model demonstrated that HF-HRV predicts prosocial actions in the CT while controlling for gender. These findings suggest that tonic HR-HRV may influence offenders' compassionate responses, particularly in terms of their behavioral outcomes. These results emphasize the importance of a multifactorial approach to understanding protective factors against violence, aiding in the improvement of intervention programs' effectiveness.

S9P2. INCREASED POSITIVE EMOTION EXPRESSION TO VIOLENCE IN IPV PERPETRATORS: IMPORTANCE OF EMOTIONAL DECODING

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Facial expressions are conceived as biologically primed responses to external emotional cues, with important implications for social interactions. It has been suggested that intimate partner violence (IPV) perpetrators may have a maladaptive affective response to others' negative emotions. We aim to investigate the emotional facial expressions of IPV perpetrators to an empathic induction task compared to a control group and to explore their relationship with emotional decoding. The study included 55 IPV perpetrators, from the CONTEXTO IPV-intervention program, and 48 non-violent men. The empathic induction was accomplished through the visualization of 4 violence-focused clips. Facial recognition was registered through the "Noldus FaceReader Software" and emotional decoding was assessed using the "Reading the Mind in The Eyes". IPV perpetrators reported a diminished sad facial expression and increased happy facial expression after the empathic task compared to controls. A negative correlation was found between happy expressions and emotional decoding scores for the entire sample. Our results suggest a greater tendency in IPV perpetrators to express positive emotions in response to the suffering of others. Besides, difficulties in emotional decoding were related to positive emotional expression. Together, these results may contribute to the characterization of the therapeutic needs of IPV perpetrators.

S9P3. THE OSCILLATORY FREQUENCIES OF THE BRAIN DURING LISTENING TO PLEASANT AND UNPLEASANT FILM MUSIC EXCERPTS

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Past research has demonstrated that listening to music involves the activation of both cortical and subcortical regions. Nevertheless, relevant factors such as music duration or the specific induced emotion have not been consistently considered. Here we investigated the magnetoencephalographic and subjective correlates of emotions elicited by music listening. A total of 30 volunteers listened to 60 film musical excerpts (30 unpleasant, 30 pleasant) during 8s each, whereas MEG and subjective ratings (affective valence, arousal, happiness, fear, preference and familiarity) were collected. Results revealed that pleasant music was rated as more pleasant and happier compared to unpleasant music, which was rated higher in arousal and fear. Regarding the neural correlates, we investigated frequency-specific whole brain synchronization during pleasant in contrast to unpleasant music listening. We found differences of synchronization between the two conditions in the theta and beta frequency bands. For Theta, stronger neural synchronization occurred for pleasant music predominantly in frontal, temporal and occipital areas of the right hemisphere. For Beta, a convergent positivity bias in parietal and occipital areas of both hemispheres was observed. These findings contribute to a better understanding of music-induced emotions and could provide a foundation for clinical treatment of patients suffering from affective disorders.

S9P4. EMOTIONAL PROCESSING AND GENDER: DIFFERENCES IN REGULATORY STRATEGIES BUT NOT EMOTIONALITY

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Prior literature regarding gender differences in emotion processing argues that the differences between women and men lies not in their emotional reactivity but in the way they regulate their emotions. Our study aims to investigate gender differences in emotionality and emotion regulation based on the subjective experience of a sample of 75 volunteers (50 women) that answered different questionnaires focused on affect and emotion regulation strategies. Results showed that both men and women had similar levels of trait-anxiety, depression, and positive and negative affect but they regulate their emotions differently. Specifically, men tend to suppress their emotions more and have a higher tendency to perceive difficult situations as manageable in comparison to women, who have a tendency to ruminate more. Taken together, our findings may suggest that the gender differences in emotion regulation may lay in the selection of the strategies utilized to regulate emotions, but also in the way they perceive the situations. These results have clinical implications for the development of therapies intended to the successful regulation of negative emotions, and open the question whether gender differences in emotional processing lay at a biological level or it's a matter of learning.

S9P5. ¿HAS PILLADO EL CHISTE? TUS RESPUESTAS FISIOLÓGICAS TE DELATAN

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El humor, como emoción positiva que aparece al "pillar un chiste", requiere la participación de un proceso cognitivo (comprensión del humor) y otro emocional (apreciación del humor) que hacen que una situación incongruente se resuelva de manera lúdica. En este estudio se registraron respuestas fisiológicas (EMG del músculo cigomático, tasa cardíaca [TC] y conductancia eléctrica de la piel [CEP]), conductuales (tiempo de visualización libre) y subjetivas (evaluaciones de comicidad) de 63 participantes en una tarea de visualización de imágenes graciosas, incongruentes, neutrales y eróticas con el objetivo de definir ambos procesos. Los resultados mostraron mayores respuestas de EMG y TC ante las imágenes graciosas respecto a las demás y mayor CEP ante las graciosas frente a las incongruentes y neutrales. El análisis del curso temporal de estas respuestas sugiere que la comprensión del humor ocurre en torno a los 1000-1500 ms y la apreciación del humor en torno a 3500 ms después del inicio del estímulo. Además, se observó gran variabilidad en comprensión del humor y en el tipo de imágenes que provocaba este proceso. Todo ello apunta a la complejidad de esta emoción y señala la importancia de investigar los factores subyacentes a las diferencias individuales en humor.

S9P6. THE EXPLICIT PORNOGRAPHIC STIMULI SET (EPSS) IN A SPANISH AND GERMAN SAMPLE: CROSS-CULTURAL DIFFERENCES

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The diversity of cultural backgrounds produces variation in how humans experience, express and perceive emotions. Nevertheless, there is especially little data on understanding the cultural factors that may play an important role in the processing of visual sexual stimuli. Data obtained during an experimental study developed in Germany were compared with affective ratings of valence and arousal collected during the standardization process of a new explicit pornographic stimuli set (EPSS) in Spain. Hetero- and homosexual participants rated diverse pornographic pictures (N = 54) showing scenes of masturbation, oral sex, vaginal sex, anal sex and group sex of same-sex and opposite-sex content. Analyses of the individual affective ratings indicate that Spanish hetero and homosexual participants rated the majority of the pictures significantly more pleasant and more emotionally arousing than the German participants. A small number of pictures mainly depicting same-sex content of males engaged in different sexual practices revealed no cross-cultural differences. Thus, regardless of Spanish or German cultural background, same-sex imagery of males seem to be perceived as less pleasant and less arousing. Cultural differences in emotional stimuli processing should be more broadly considered and play a role in adequate selection of emotional sexual stimuli.

S9P7. DOES PERSPECTIVE MATTER? ELECTROCORTICAL RESPONSES IN PAIN PROCESSING AND PSYCHOPATHIC CALLOUSNESS

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Psychopathy is a multifaceted personality disorder characterized by callousness-unemotionality/meanness traits, which can be considered as the archetypal empathic disorder. It has been posited that the processing of others' pain could play an important role in the capacity for empathy. This study aimed to examine the influence of perspective taking on electrocortical responses to pain processing in relation to psychopathic callousness. The Late Positive Potential (LPP) —a well-validated electrophysiological indicator of sustained attention to motivationally significant stimuli— was measured while 100 female undergraduates viewed pictures of bodily injuries, adopting an imagine-self or an imagine-other perspective. Callousness factor scores —computed as regression-based component scores from EFA on three relevant self-report measures of this dimension— predicted reduced LPP amplitudes to pain pictures under the imagine-other (but not imagine-self) perspective, even after controlling for the other LPP conditions, β =-.14. These results suggest that high-callous individuals exhibit diminished brain responsiveness to other's distress, which could be related to the empathic deficits characterizing psychopathy. This finding highlights the utility of electrocortical studies on pain processing in providing insights into the selfish and remorseless traits of psychopathy, by incorporating new physiological indicators of affiliative capacity, which is proposed as the biobehavioral counterpart of the meanness/callousness dimension.

S9P8. ARE THERE DIFFERENCES IN IDENTIFYING EMOTIONS AND IN THE AREA OF INTEREST THEY FOCUS ON BETWEEN CHILDREN WITH AND WITHOUT CONDUCT PROBLEMS? A STUDY BASED ON EYE-TRACKING

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Throughout childhood, recognizing facial emotion cues is crucial for children's social competence and to decrease conduct problems [CP] by regulating one's own behaviour. Corresponding to this, we aim to study whether children with moderate and severe CP accurately identified facial emotions and whether their attention to areas of interest [AOI] (eyes and mouth) was different from children without CP. For this purpose, a sample of 104 children (44% girls) with an average age of 10.09 years (SD = 1.07) was selected from the longitudinal ELISA project (N = 2,471). The parent-reported Conduct Problem Scale was used to classify children according to their CP. To assess emotion recognition, an experimental task was conducted consisting on the random presentation of 40 pictures of faces of adults (half female) and children depicting happiness, sadness, fear, anger and neutral emotions. A non-invasive eye tracker was used to target the different AOI. Results suggest that children with CP are less accurate in identifying emotional facial expressions than children without CP and that there are differences in the fixation rates in the different AOI. Current findings underline the importance of studying emotion recognition for enhanced emotional development and social adjustment of CP children.

S9P9. THE ROLE OF MATERNAL DISTRESS AND EARLY AFFECTIVE TOUCH EXPERIENCES DURING COVID-19 ON INFANT'S NEGATIVE EMOTIONALITY

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Objective of the study: Touch plays a key role for the foundation of infants' social bonding and emotional communication. During the COVID-19 pandemic mother-newborn separation, no (in)direct breastfeeding, and no skin-to-skin contact after birth were implemented in some healthcare facilities. In addition to this tactile deprivation, the COVID-19 pandemic context may have contributed to higher levels of perinatal distress. This study aims to analyse: 1) the association between COVID-19-related perinatal distress and infant negative emotionality; 2) the mediating role of COVID-19 impact on early life affective touch experiences on the association between COVID-19-related perinatal distress and infant negative emotionality; and the contribution of epigenetic mechanisms for infant's negative emotionality.

Methodology: Women within the first year of postpartum with infants older than 3 months of age reported, using online surveys, on socio-demographic information, distress level about changes in birth and postnatal experiences due to COVID-19 pandemic ("In general, what is the level of distress you have experienced about changes to your birth and postnatal experiences due to COVID-19?"); and impact of COVID-19 pandemic on mother-newborn affective touch experiences during hospitalization ("To what extent do you think COVID-19 had a positive or negative impact on your experiences of touch with your baby (e.g. stroking, kissing) during hospitalization?"). Infant negative emotionality (i.e. distress, sadness, and fear) was assessed based on the Infant Behavior Questionnaire–Revised Very Short Form. In a sub-sample of children the methylation profile of the NR3C1 gene was analysed from DNA extracted from buccal swabs at 6 and 12 moths of age. Analyses were performed using IBM SPSS Statistics software. Descriptive statistics were conducted to describe participants' social and demographic characteristics. Mediation analysis was conducted

using models 4 from PROCESS macro, version 4.2, which allows to calculate heteroscedasticity consistent standard errors and also to use bootstrapping to calculate model coefficients and confidence intervals. The model was adjusted for mother's age, education and professional status.

Results: The sample comprised 353 Portuguese mothers and their infants, whose childbirth occurred during the COVID-19 pandemic. Mothers were aged between 23 and 46 years old (M = 33.55; SD = 4.40). For 201 (56.9%) of them, this was the first pregnancy. Most of these women are employed (n= 315, 89.2%) and finished a higher education degree (n = 289, 81.9%). Infants were aged between 3 and 12 months old (M = 6.59; SD = 2.55), of which 178 (50.4%) were males. The infant's score for negative emotionality varied between 1.38 and 6.57 (M = 4.00; SD = 1.11). The percentage of women reporting some to high level of COVID-19-related perinatal distress was 48% and 24% reported that the COVID-19 pandemic had a negative impact on their experiences of affective touch with their newborn during hospitalization. COVID-19-related perinatal distress was a significant predictor of negative emotionality (B = 0.13, SE = .03, 95% CI: 0.07 – 0.19). Additionally, COVID-19 impact on early life affective touch experiences mediated the association between perinatal distress and infant negative emotionality (indirect effect = 0.04, SE = .01, 95% CI: 0.01 – 0.06).

Conclusion: Favorable environments within maternal and newborn healthcare services are critical to promote positive experiences in the first hours of life with potential short-term impact on infant developmental outcomes. The possible epigenetic mechanisms associated with children's negative emotionality will be also discussed.

S9P10. REGISTERED REPORT: DECISION-MAKING UNDER UNCERTAINTY – ERP CORRELATES OF RISK AND AMBIGUITY PROCESSING IN AN ECONOMIC DECISION-MAKING TASK

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Introduction: Decision-making under uncertainty takes an inherent part of human daily life. Uncertainty refers to scenarios where the decision-maker is ill-informed about relevant information regarding the outcomes of alternative options, and it comprises two distinct concepts – risk (defined as an explicit variability of the likelihood of outcomes) and ambiguity (defined as imperfect or limited knowledge about the likelihood of outcomes). It is still unclear whether risk and ambiguity processing rely on shared or non-shared neuronal mechanisms. The present study aims to experimentally dissociate the neuronal correlates of risk and ambiguity processing in decision-making.

Method: Eighty community-dwelling volunteers will be recruited. Participants will fill out self-report measures on attitudes towards uncertainty and risk and perform a behavioral economic decision-making task designed to dissociate risk and ambiguity. Event-Related Potentials will be recorded during the behavioral decision-making task and analyzed using a hierarchical mass univariate general linear modeling approach implemented in LIMO.

Expected results: (a) ambiguity variations will be positively associated with increased negativity in the 200-400 ms time window at the frontal electrodes; (b) ambiguity variations will be positively associated with increased positivity in the 400-650 ms time window at the centroparietal electrodes, and c) risk variations will be negatively associated with increased positivity in the 400-650 ms time window at the centroparietal electrodes.

S9P11. IDENTIFYING DIRECT SUBCORTICAL PATHWAYS TO THE AMYGDALA IN THE HUMAN AUDITORY SYSTEM USING DIFFUSION WEIGHTED IMAGING TRACTOGRAPHY: PRELIMINARY RESULTS

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Quick and efficient detection of threat is critical for survival. To serve this ability, a visual subcortical pathway, is believed to function in humans as a shortcut to the amygdala (a key structure for threat detection), with direct neural projections from the retina, superior colliculus and the pulvinar of the thalamus. Similarly, evidence from non-human animals suggests the existence of a homologous subcortical pathway in audition, but this pathway remains unknown in humans. To address this question, we applied probabilistic tractography and fixel based analysis to diffusion-weighted images obtained from the Human Connectome Project, and reconstructed candidate pathways which may be compatible with a human auditory subcortical route to the amygdala. Preliminary data suggest the existence of white matter tracks directly projecting to the amygdala from the medial geniculate body of the thalamus and the auditory and audiovisual portions of the pulvinar (i.e. anterior and medial) showing left-right asymmetries ($p<0.001$ and $p<0.001$, respectively). These results suggest the existence of a human auditory pathway for fast threat detection that may be homologous to that in the visual system.

S9P12. DOES AFFECTIVE TOUCH INFLUENCE CARDIAC AUTONOMIC RESPONSES IN A PAIN PARADIGM?

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Affective touch (AT) is associated with pleasant or emotionally related responses. AT is presumably conveyed by specialized receptors called C-tactile afferents, which are sensitive to gentle and slow touch. Recent evidence suggests that AT has analgesic effects which can be reflected in an altered pattern of the autonomic reactivity typically associated with pain. Specifically, AT may lead to alterations in heart rate (HR) and heart rate variability (HRV).

This study aimed to explore how AT touch can have homeostatic effects -that can be reflected in alterations of HR and HRV- during a paradigm of temporal summation of second pain (TSSP) -an increase in pain perception due to repeated noxious stimuli-, potentially reflecting central sensitization processes.

Twenty-eight participants received trains of 11 heat pulses at a stimulation frequency of 0.33Hz on their volar forearm, while being exposed to stroking, vibration, or no touch.

Our results revealed significant differences in HR, with a lower HR in the condition with pain stimuli combined with AT vs pain stimuli alone. No differences were observed in HRV.

These findings suggest that AT may modulate HR responses during pain, providing insights into the potential physiological mechanisms underlying the analgesic effects of AT.

S9P13. EXPLORING THE INVERTED U-SHAPED ACTIVATION OF THE REWARD NETWORK IN RESPONSE TO THE COMPLEXITY OF PSEUDORANDOMLY GENERATED MUSIC EXCERPTS

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Expectations play a crucial role in musical pleasure. Melodies of intermediate complexity are preferred over highly predictable or unpredictable excerpts. This preference arises from the ability of moderately complex melodies to fulfil certain expectations while also introducing unexpected moments that elicit novelty and engage curiosity and learning. However, the neural mechanisms underlying the relationship between musical pleasure and stimuli predictability are not yet fully understood. In the present fMRI study, 29 people listened to musical excerpts and rated their experienced pleasure levels. The stimuli were artificially generated based on the transitional probabilities of a Western musical grammar and classified into different levels of predictability based on their information content. Behavioural results replicated the well-known inverted U-shape relationship between liking and complexity. Importantly, a similar pattern was also found in the activity of the auditory cortex and areas of the reward network, with higher activation of stimuli with medium complexity compared to those with high and low complexity. Thus, the present results show that perceptual and reward-related areas are involved in the processing of the predictability of musical stimuli that is on the basis of music reward.

S9P14. DOES AFFECTIVE TOUCH MODULATE SENSORY EVOKED POTENCIALS?

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The activation of C-tactile low-threshold mechanoreceptors of the skin is related to pleasant sensations and analgesic effects over nociceptive input. However, it isn't known whether such inhibition is specific to the nociceptive modality or generalized to other somatosensory modalities. In this experiment, we aim to clarify whether activation of C-tactile receptors produces a reduction of the somatosensory input (assessed by somatosensory evoked potentials - SEPs). To test this hypothesis, electrical stimuli was delivered over the median nerve of the left hand to 17 healthy participants. SEPs were recorded during three different conditions: SEPs with concomitant C-tactile stimulation (using a soft brush moved by a robot arm); SEPs with concomitant discriminative touch (using a vibratory linear resonant actuator); and SEPs alone. We analyzed the amplitude of N20, P25, N30 and P45 components recorded over the C4 electrode. Preliminary results showed no differences between conditions in the amplitudes of these SEPs, indicating that C-tactile stimulation doesn't affect early cortical processing of somatosensory information. Although C-tactile activation can reduce nociceptive input, our results suggest that C-tactile modulation may be specific to information transmitted by small nociceptive fibers, but not to other somatosensory afferent neurons.

S9P15. MENTAL STATE RECOGNITION IN PARENTS THROUGH GESTATIONAL SURROGACY

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Effectively processing and recognizing emotions is crucial for parents as it directly influences the quality of the parent-child relationship, healthy emotional development, and well-being of children. To our knowledge no studies have evaluated this issue in parents from gestational surrogacy families (GS). For this reason, this exploratory study compared GS (27 homosexual fathers and 11 heterosexual mothers) with unassisted reproduction families (CO; 40 heterosexual fathers and 16 heterosexual mothers). Differences in mental state recognition between sexes and sexual orientation in the entire sample were also investigated. Participants completed the Reading the Mind in the Eyes Test.

Kruskal-Wallis Test showed that GS fathers outperformed CO fathers in overall scores, while GS mothers achieved higher scores compared to CO mothers. CO fathers scored lower than GS fathers and GS mothers when identifying women's emotions, while recognizing men's emotions, CO women had lower scores than CO men. In line with the existing literature, men scored significantly lower than women, indicating a sex difference in the performance.

These differences could be attributed to sexual orientation as well as the psychological screening processes involved in the selection of gestational surrogacy participants. Further research is needed to explore the underlying mechanisms behind these findings.

S9P16. DIFFERENTIAL AUDITORY, PUPILLARY AND PREMOTOR RESPONSES TO HIGH VERSUS LOW TEMPORALLY MODULATED THREAT SOUNDS IN A FEAR CONDITIONING PARADIGM

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Neural models for emotional processing in vision suggest the existence of an ultrafast magnocellular route to the amygdala, which allows for efficient detection of threat and subsequent adaptive behavior in humans. This route is known to mediate coarse visual processing, eliciting differential responses to threat than other more fine-grained pathways. In the auditory domain, animal evidence suggests the existence of a similar route for threat detection, but it still remains unknown in humans. We investigated with fear conditioning whether a magnocellular pathway to the amygdala, particularly sensitive to high temporal modulations, mediates auditory responses to threat that differ from a parvocellular pathway, sensitive to low temporal modulations. We recorded electroencephalography and pupillometry of 28 healthy participants while they detected voices. Voices were either paired (conditioned) or unpaired (non-conditioned) with an unpleasant white noise, which determined their threatening significance. Results suggest that fear conditioning was effective, and threatening stimuli at high versus low temporal modulations elicited earlier neural and pupillary responses. In turn, high versus low modulated conditioned voices elicited stronger alpha power decrease, prior to the response. These results are compatible with differential neural responses to threat when encoded through magnocellular versus parvocellular inputs to the amygdala.

SESIONES DE PÓSTER CORRESPONDIENTES AL SIMPOSIO X: LENGUAJE

S10P1. EFECTO DEL CONTEXTO TURÍSTICO EN LA VALENCIA Y EXCITACIÓN DE LAS PALABRAS: IMPACTO PARA EL MARKETING TURÍSTICO

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Desde comienzo del siglo XXI psicólogos e investigadores del comportamiento del consumidor han unido fuerzas para entender las respuestas psicofisiológicas, y neurológicas, que se producen cuando un consumidor recibe un estímulo. En el área de la psicología se han llevado a cabo numerosas investigaciones que estudian el valor afectivo de las palabras y se han creado bases de datos normativas para el uso de este tipo de estímulo. En el ámbito de la psicología en un estudio realizado por Delatorre et al. (2019) se llegó a la conclusión de que las calificaciones afectivas dadas por los participantes variaban significativamente respecto a las bases de datos anteriores al estar muy influenciadas por el contexto en el que se presentaban, en su caso fue el suspense.

En este trabajo se analiza la valencia y excitación que generan 720 palabras en español cuando son presentadas en el contexto de búsqueda de productos turísticos. Asimismo, se han añadido 128 palabras vinculadas al entorno del comercio que no estaban reflejadas en bases de datos anteriores. Esta investigación, además de aportar un mayor conocimiento sobre el comportamiento humano durante el consumo, generará una herramienta para simplificar la investigación en psicología y neuromarketing en aquellos estudios que versen sobre las palabras y turismo.

S10P2. MATURATION OF THE FREQUENCY-FOLLOWING RESPONSE (FFR) DURING THE SECOND YEAR OF LIFE: A LONGITUDINAL STUDY

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The frequency-following response (FFR) is an auditory evoked potential elicited by complex auditory stimuli that mimics the spectro-temporal characteristics of the sound, therefore giving information of its neural encoding. Previous studies have described a rapid maturation of the FFR during the first 6 months of life followed by a stabilization, thus suggesting a complete maturation by the end of the first year. Nonetheless, language development accelerates during the second year of a child's life. One-year-old toddlers can understand simple commands and communicate using gestures, while 24-month toddlers rely on approximately 50-word vocabulary and may initiate storytelling. Considering the previously observed effects of auditory experiences such as music and language on the FFR, our study aims to explore the speech encoding attunement related to this rich language exposure. To this aim, we analyzed the FFR of 20 infants that were measured longitudinally at 12 and 21 months of life. Results disclosed a lack of significant differences in the FFR parameters obtained at the two developmental moments, leading us to conclude that this language-specific attunement is not yet noticeable and that speech neural encoding mechanisms are already mature at one year of life in order to support posterior development of language perception.