

# **EVALUACION NEUROFISIOLOGICA DE LA RESPUESTA A LA TERAPIA ASISTIDA CON DELFINES EN NIÑOS CON TRASTORNO DEL ESPECTRO AUTISTA**

**P. Ortiz Sánchez, F. Mulas Delgado**



# Abordaje Multidisciplinar de los Trastornos del Neurodesarrollo en la Infancia (XIV)

Organizado por:



Servicio de Pediatría. B. García Cuartero. Jefa de Servicio



ORIGINAL PAPER

## Animal-Assisted Intervention for Autism Spectrum Disorder: A Systematic Literature Review

Marguerite E. O'Haire

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**Abstract** The inclusion of animals in therapeutic activities, known as animal-assisted intervention (AAI), has been suggested as a treatment practice for autism spectrum disorder (ASD). This paper presents a systematic review of the empirical research on AAI for ASD. Fourteen studies published in peer-reviewed journals qualified for inclusion. The presentation of AAI was highly variable across the studies. Reported outcomes included improvements for multiple areas of functioning known to be impaired in

inclusion of animals in therapeutic activities is known as *animal-assisted intervention* (AAI), which encompasses both *animal-assisted therapy* and *animal-assisted activities* (Griffin et al. 2011; Kruger and Serpell 2010). It dates back to the late eighteenth century when animals were brought into mental health institutions to increase socialization among patients (Serpell 2006). Its current implementation has been related to positive treatment outcomes in a number of clinical populations, including improved phys-





# Dolphins help treat depression

BMJ 2005 ; 331 doi: <http://dx.doi.org/10.1136/bmj.331.7527.0-a> (Published 24 November 2005)

Cite this as: BMJ 2005;331:0-a

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Dolphins can help alleviate symptoms of depression after two weeks of treatment. In a single blind trial, Antonioli and Reveley (p 1231) randomised 30 people with mild or moderate depression without psychotic features to an outdoor nature programme featuring water activities—with or without bottlenose dolphins. Participants who got to play with the dolphins showed significantly greater reduction in the mean severity of depressive symptoms than those who only enjoyed other aspects of nature. None of the participants took any antidepressants for the four weeks before or during the study.



Credit: NOMI BAUMGARTL/BILDE

## Papers

### Randomised controlled trial of animal facilitated therapy with dolphins in the treatment of depression

Christian Antonioli, Michael A Reveley

## BRITISH MEDICAL JOURNAL:

*Being the Journal of the British Medical Association.*

|                                                                               |                                                                                                                         |                                                                              |                                                    |     |
|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|----------------------------------------------------|-----|
| No. 1186.]                                                                    | { With Twelve Additional Pages. }                                                                                       | SATURDAY, SEPTEMBER 22, 1883.                                                | { Registered as a Newspaper. }                     | 6d. |
| <b>Contents.</b>                                                              | <b>OBSERVATIONS on PRIMARY VENEREAL SORES.</b> By ARMAND BAYARD, M.D., Surgeon to the Liverpool Lock Hospital .. .. 563 | <b>SECTION C: OBSTETRIC MEDICINE.</b>                                        | <b>SECTION D: PUBLIC MEDICINE.</b>                 |     |
| <b>THE FIFTY-FIRST ANNUAL MEETING OF THE BRITISH MEDICAL ASSOCIATION held</b> | <b>VENEREAL and SEXUAL HY.</b>                                                                                          | <b>ON the TREATMENT of CHRONIC METRITIS ASSOCIATED with RETROFLEXION.</b> By | <b>MEDICO-METEOROLOGY OF EPIDEMIC DIARRHOEA IN</b> |     |





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# El Oceanogràfic: Descripción

Uno de los mayores acuarios del mundo (Osaka, Okinawa, Monterey...)

- 42.000.000 l
- Mayor tanque de peces de Europa (6.900.000 l)
- 11 Has



Annual Meeting Mini-Symposium

## Autism and Abnormal Development of Brain Connectivity

Matthew K. Belmonte,<sup>1</sup> Greg Allen,<sup>2</sup> Andrea Beckel-Mitchener,<sup>3</sup> Lisa M. Boulanger,<sup>4</sup> Ruth A. Carper,<sup>5</sup> and Sara J. Webb<sup>6</sup>

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**Key words:** attention; cerebellum; development; EEG; electroencephalogram; frontal; imaging; immunity; network; autism; genetics

It has been said that people with autism suffer from a lack of “central coherence,” the cognitive ability to bind together a jumble of separate features into a single, coherent object or concept (Frith, 1989). Ironically, the same can be said of the field of autism research, which all too often seems a fragmented tapestry stitched from differing analytical threads and theoretical patterns. Defined and diagnosed by purely behavioral criteria, autism was first described and investigated using the tools of behavioral psychology. More recent years have added brain anatomy and physiology, genetics, and biochemistry, but results from these new domains have not been fully integrated with what is known about autistic behavior. The unification of these many levels of analysis will not only provide therapeutic targets for prevention and remediation of autism but can also provide a test case for theories of normal brain and cognitive development. Autism research therefore has much to learn from and much to offer to the broader neuroscience community.

are abstract and complex systems such as computers or role-playing games or very concrete and simple systems such as toilets or washing machines. Critical to identifying the causal factors of autism, and key to its relevance to normal development, is the recognition that autism is actually the extreme of a spectrum of abnormalities. Milder phenotypes on this spectrum include Asperger syndrome (Wing, 1981) in which language is relatively unimpaired, and the “Broader Autism Phenotype” in which characteristic cognitive traits are present subclinically (Dawson et al., 2002). The combination of this broad variation of phenotypes and a 60–90% concordance rate in identical twins (Bailey et al., 1995) suggests a large number of genetic and environmental biasing factors (Muhle et al., 2004).

### A basis in neural connectivity?

In addition to the central coherence paradigm, autism has been variously characterized as a deficit of executive function (Ozonoff et al., 1991), complex information processing (Mishner et al.,



**RESEARCH ARTICLE**

**Open Access**

# A stable pattern of EEG spectral coherence distinguishes children with autism from neurotypical controls - a large case control study

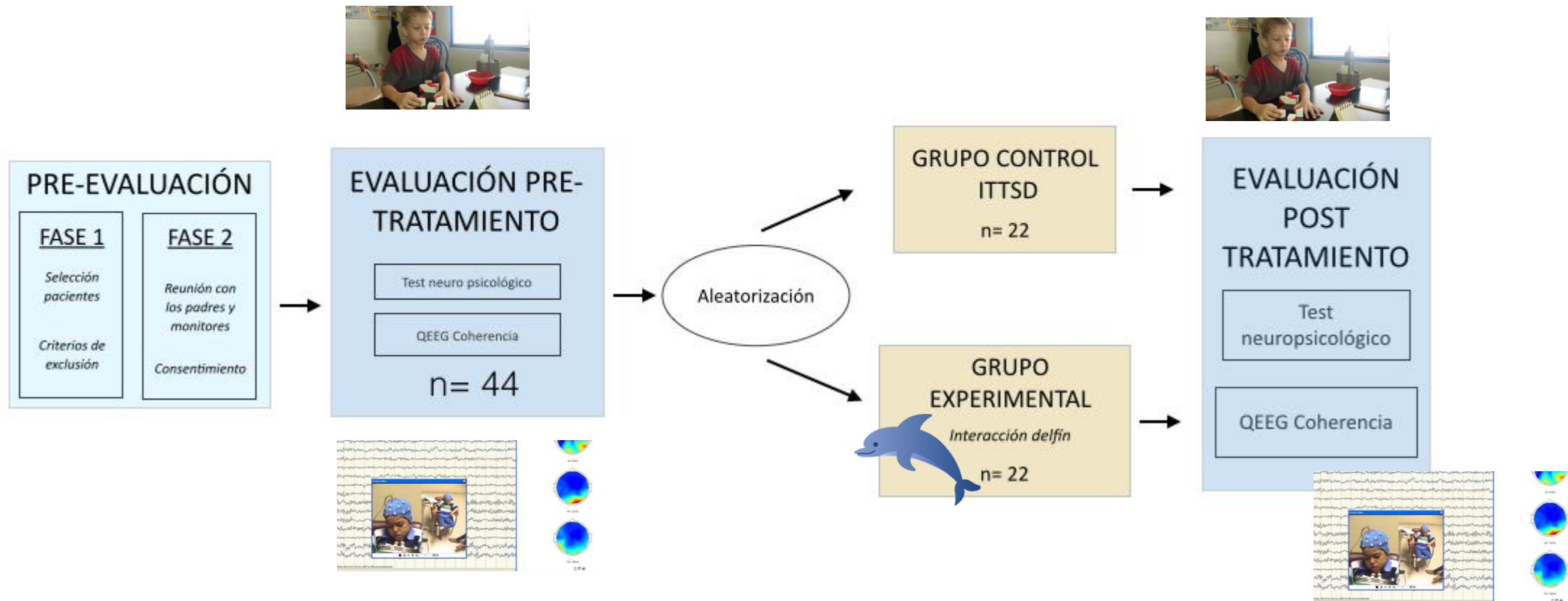
Frank H Duffy<sup>1\*</sup> and Heidelise Als<sup>2</sup>

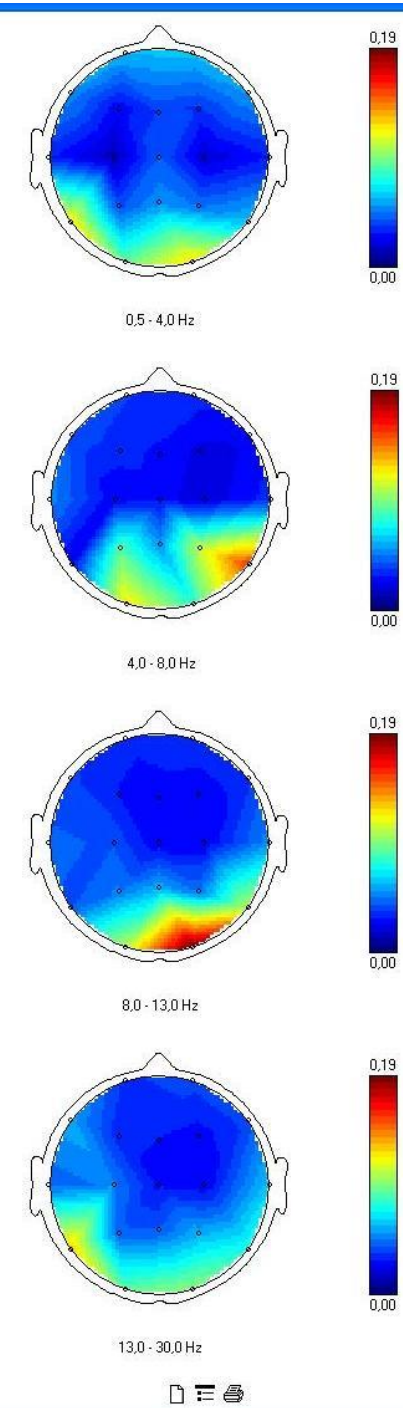
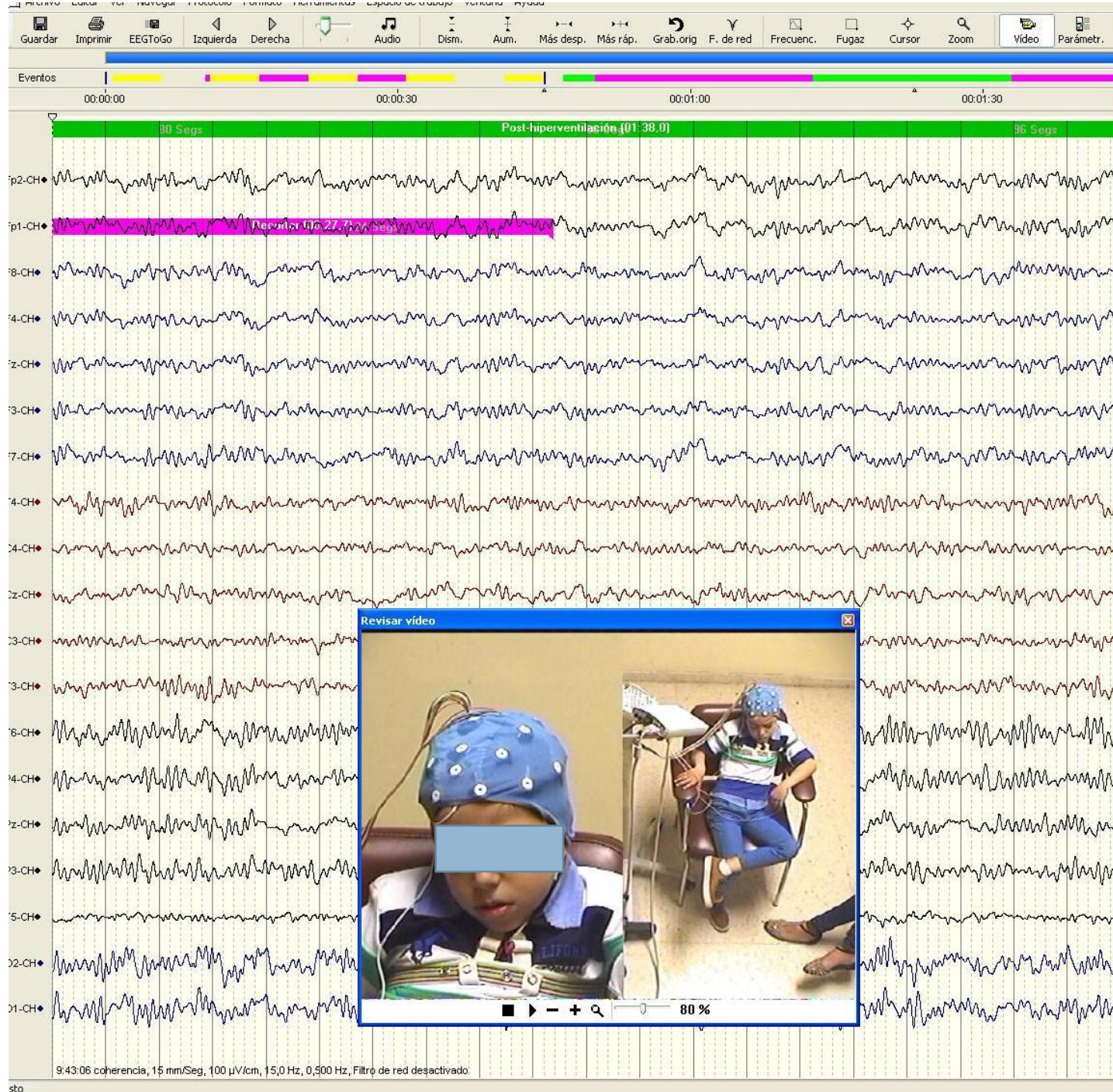
## **Abstract**

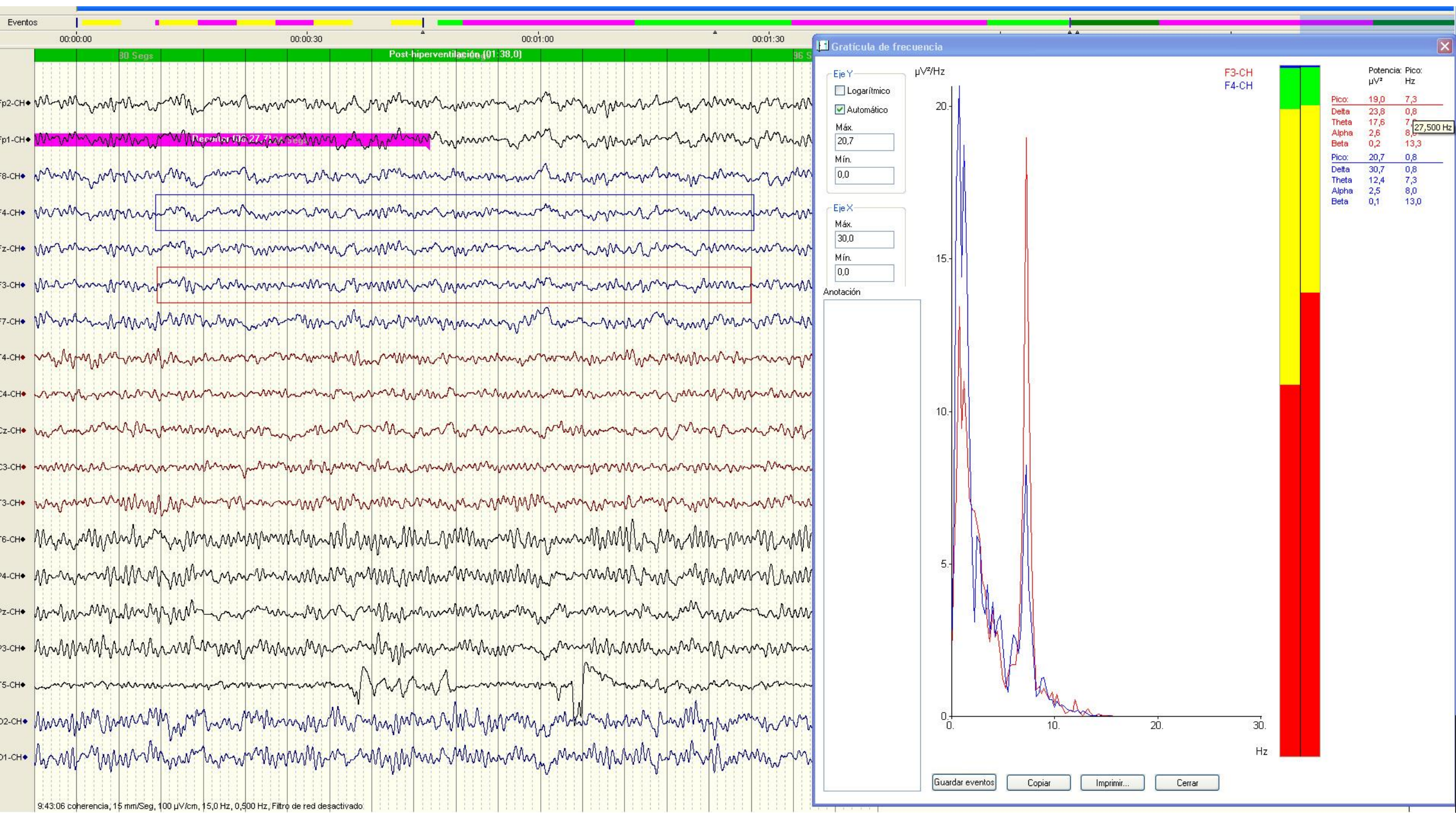
**Background:** The autism rate has recently increased to 1 in 100 children. Genetic studies demonstrate poorly understood complexity. Environmental factors apparently also play a role. Magnetic resonance imaging (MRI) studies demonstrate increased brain sizes and altered connectivity. Electroencephalogram (EEG) coherence studies confirm connectivity changes. However, genetic-, MRI- and/or EEG-based diagnostic tests are not yet available. The varied study results likely reflect methodological and population differences, small samples and, for EEG, lack of attention to group-specific artifact.

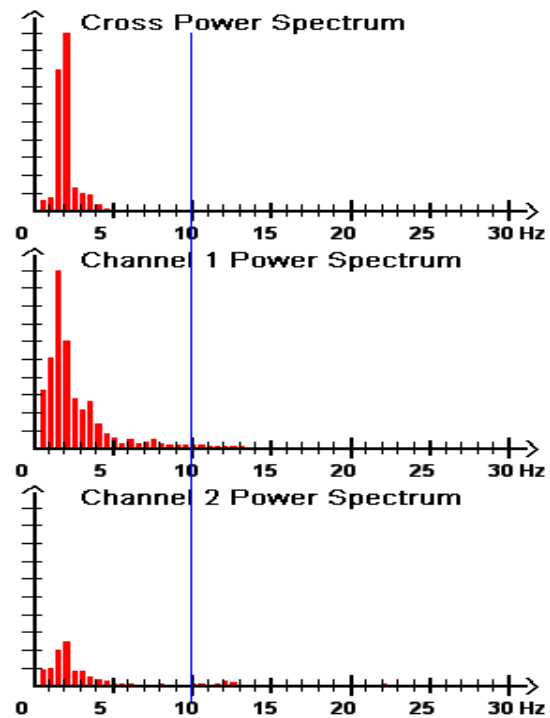
**Methods:** Of the 1,204 subjects who participated in this study, with ages ranging from 1 to 18 years old and



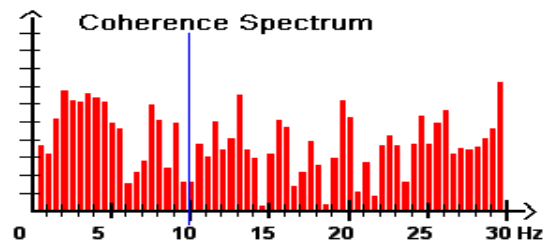




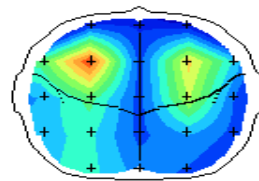




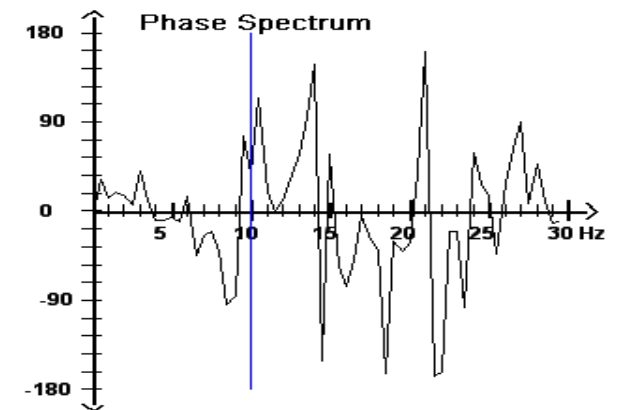
INTER-ELECTRODE COHERENCE  
Selected Epoch: AVG.AVG (Sys Ref)



Channel 1: O1  
Channel 2: O2



FFT Mapping



Frequency: 10.0 Hz.

Coherence: 16.1 %.

Angle: 38.3 grad.

Time: 10.65 ms.



***“ESTUDIO DE LA INFLUENCIA DE LA TERAPIA ASISTIDA POR DELFINES (T.A.D.) SOBRE LA ACTIVIDAD BIOELÉCTRICA CEREBRAL EN SUJETOS CON TRASTORNOS DEL NEURODESARROLLO”***



Intervención terapéutica: **presentación**







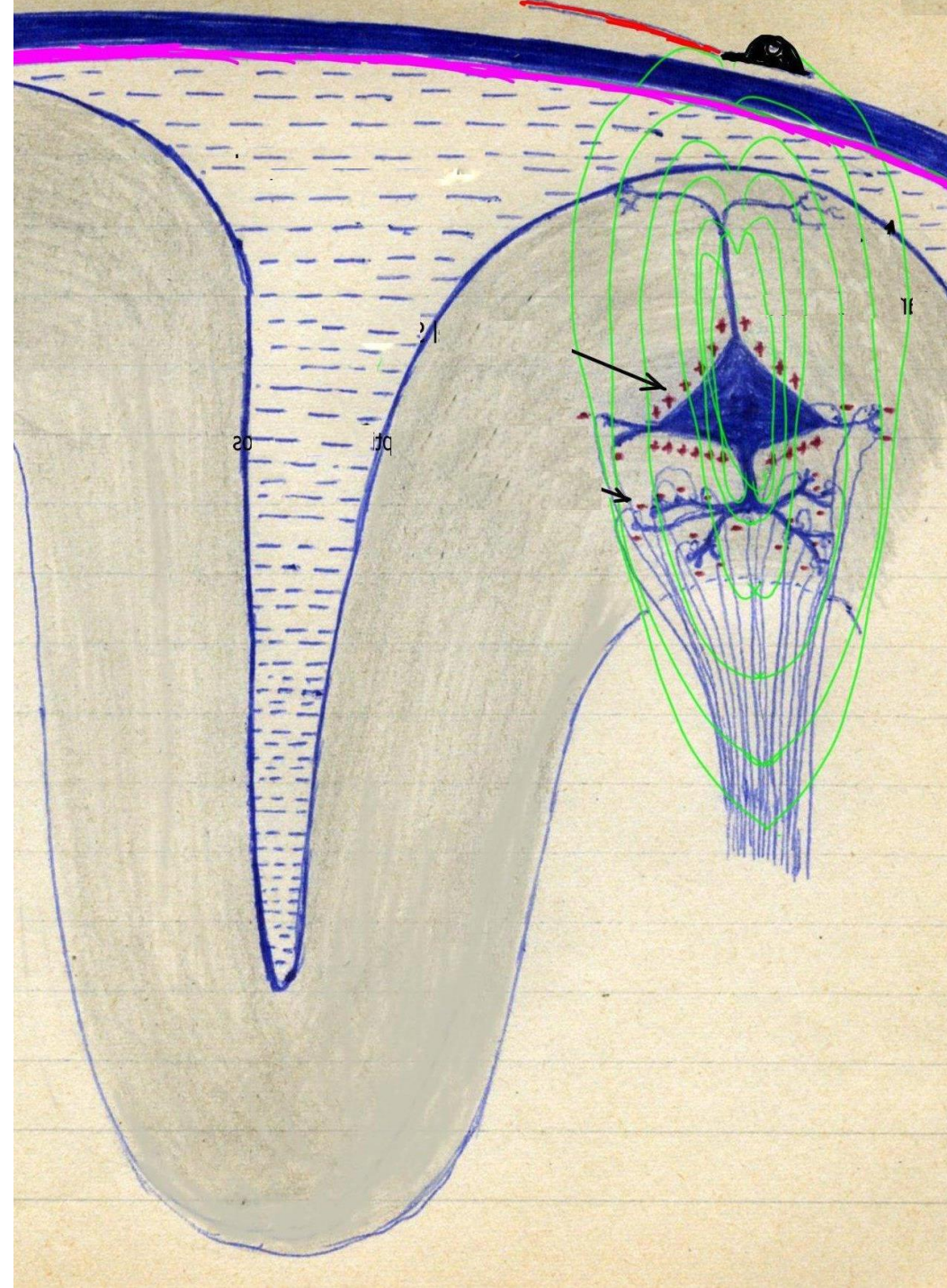
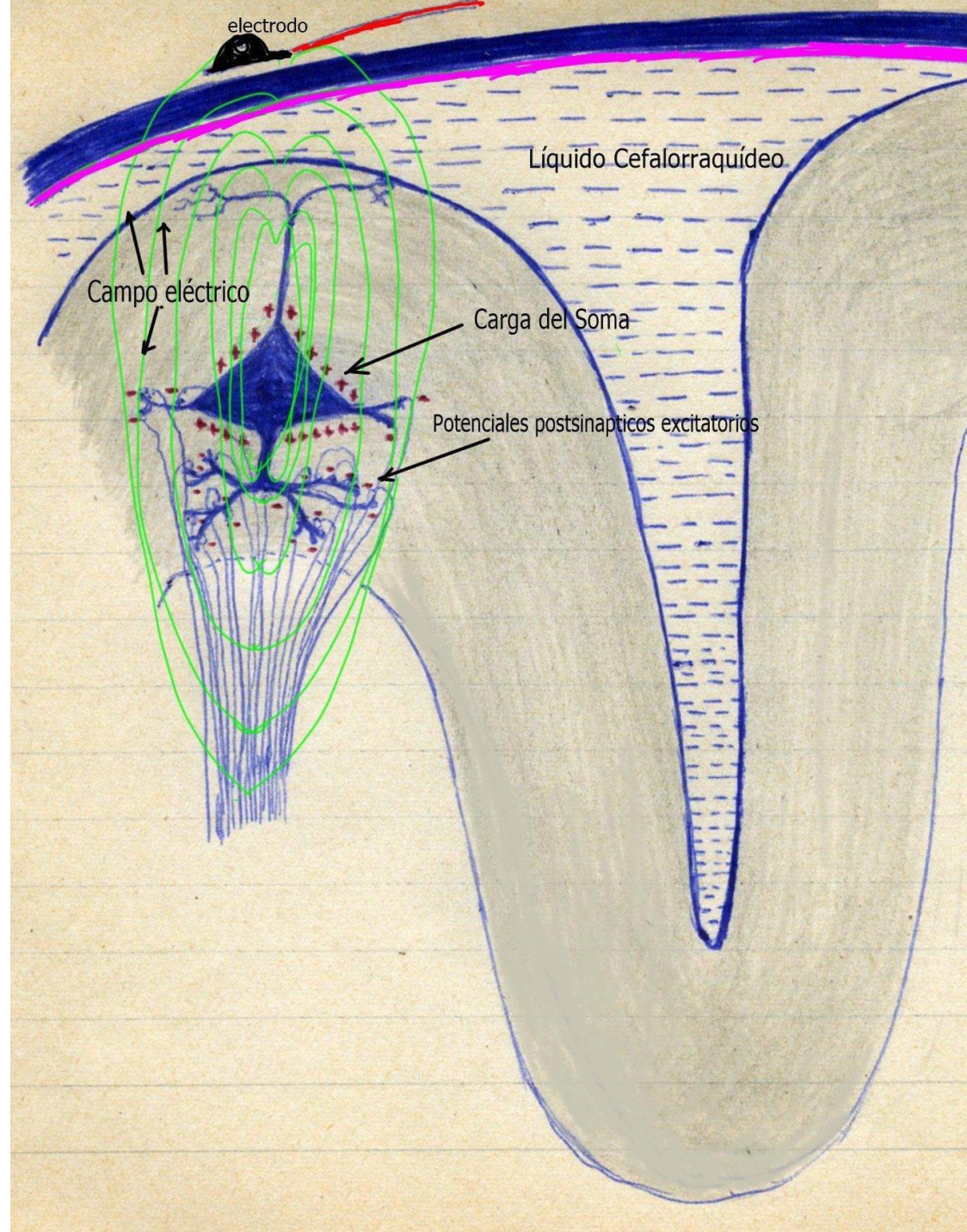


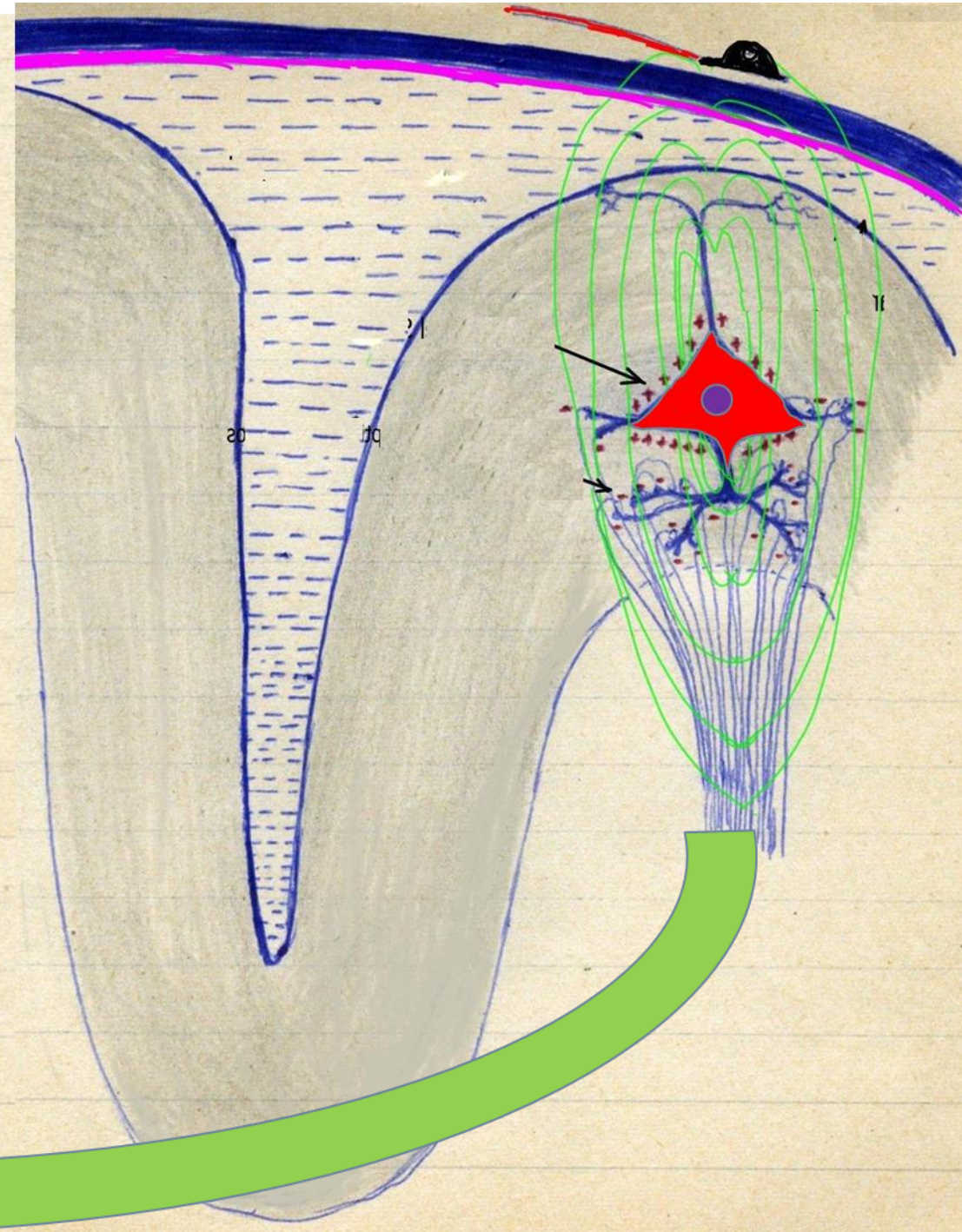
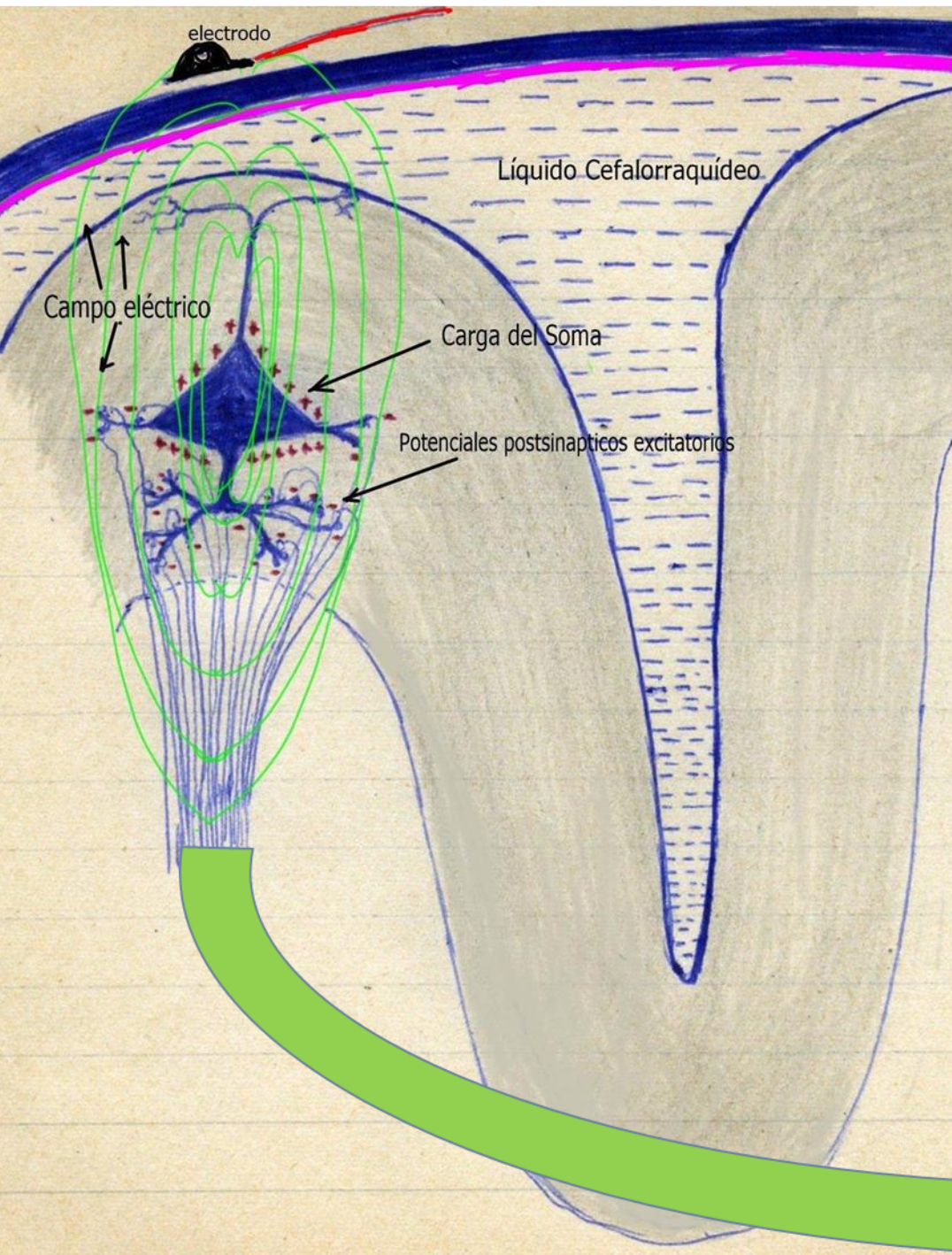


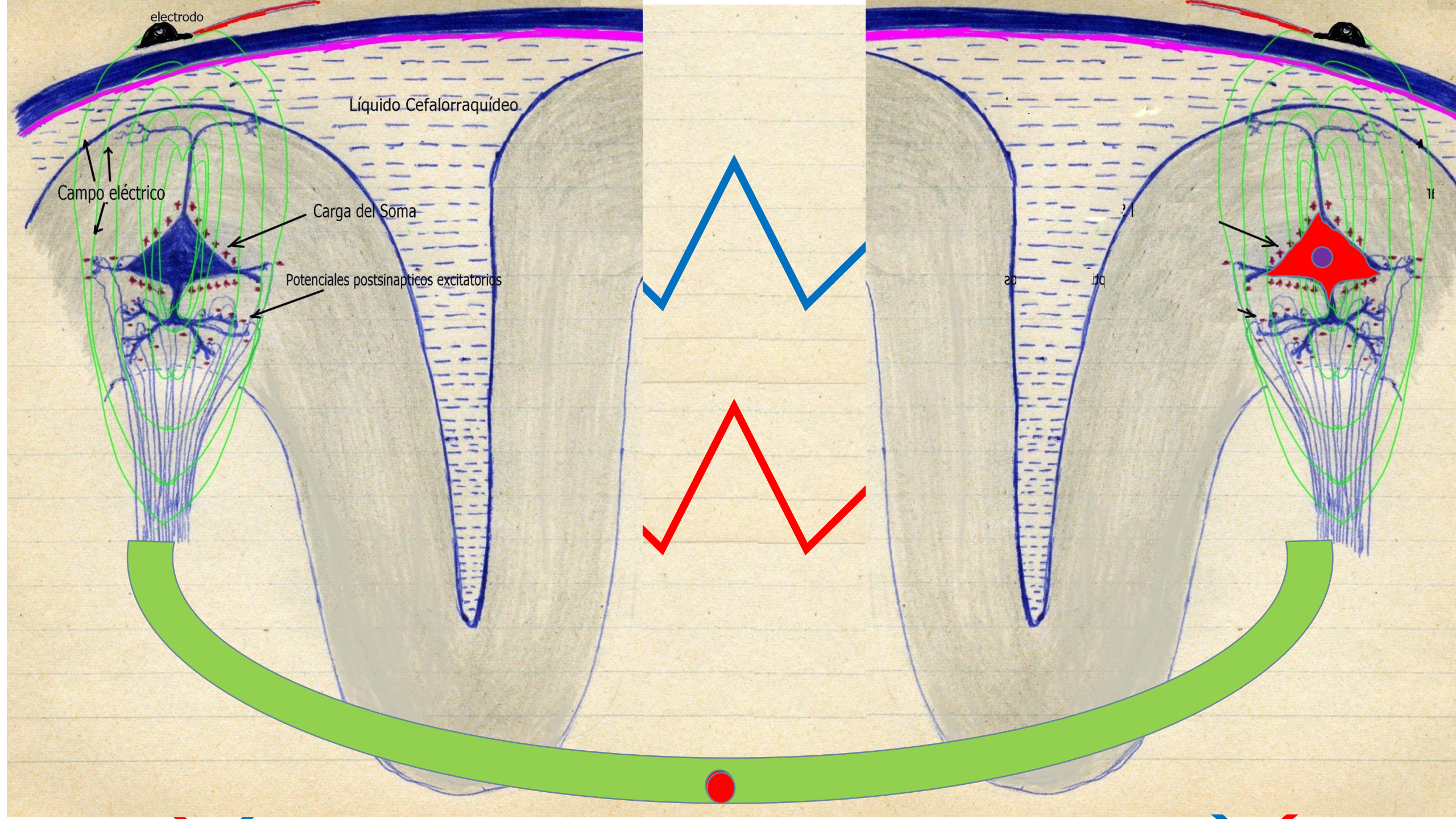
***“ESTUDIO DE LA INFLUENCIA DE LA TERAPIA ASISTIDA POR DELFINES (T.A.D.) SOBRE LA ACTIVIDAD BIOELÉCTRICA CEREBRAL EN SUJETOS CON TRASTORNOS DEL NEURODESARROLLO”***

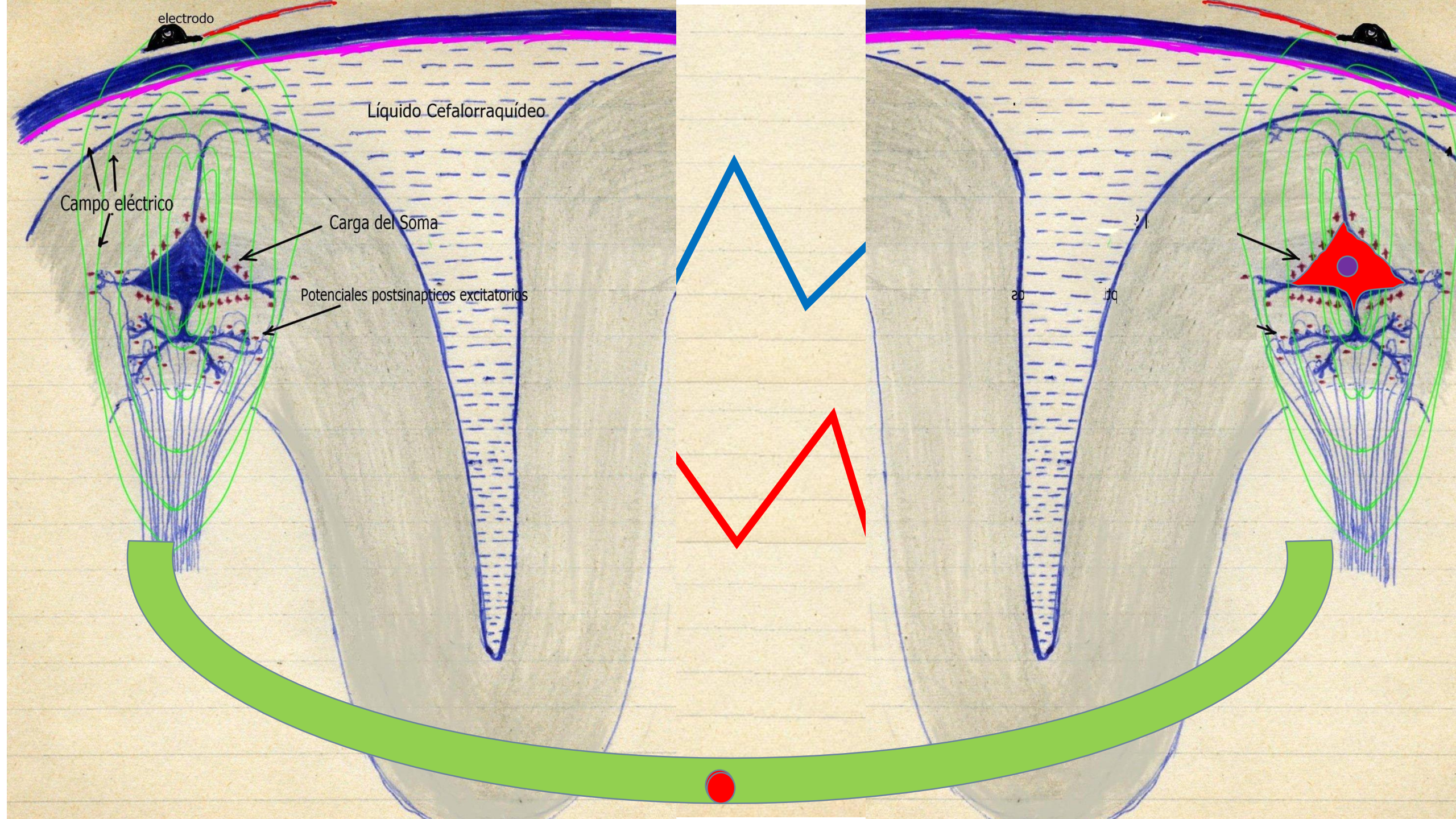
**Intervención terapéutica: desarrollo**











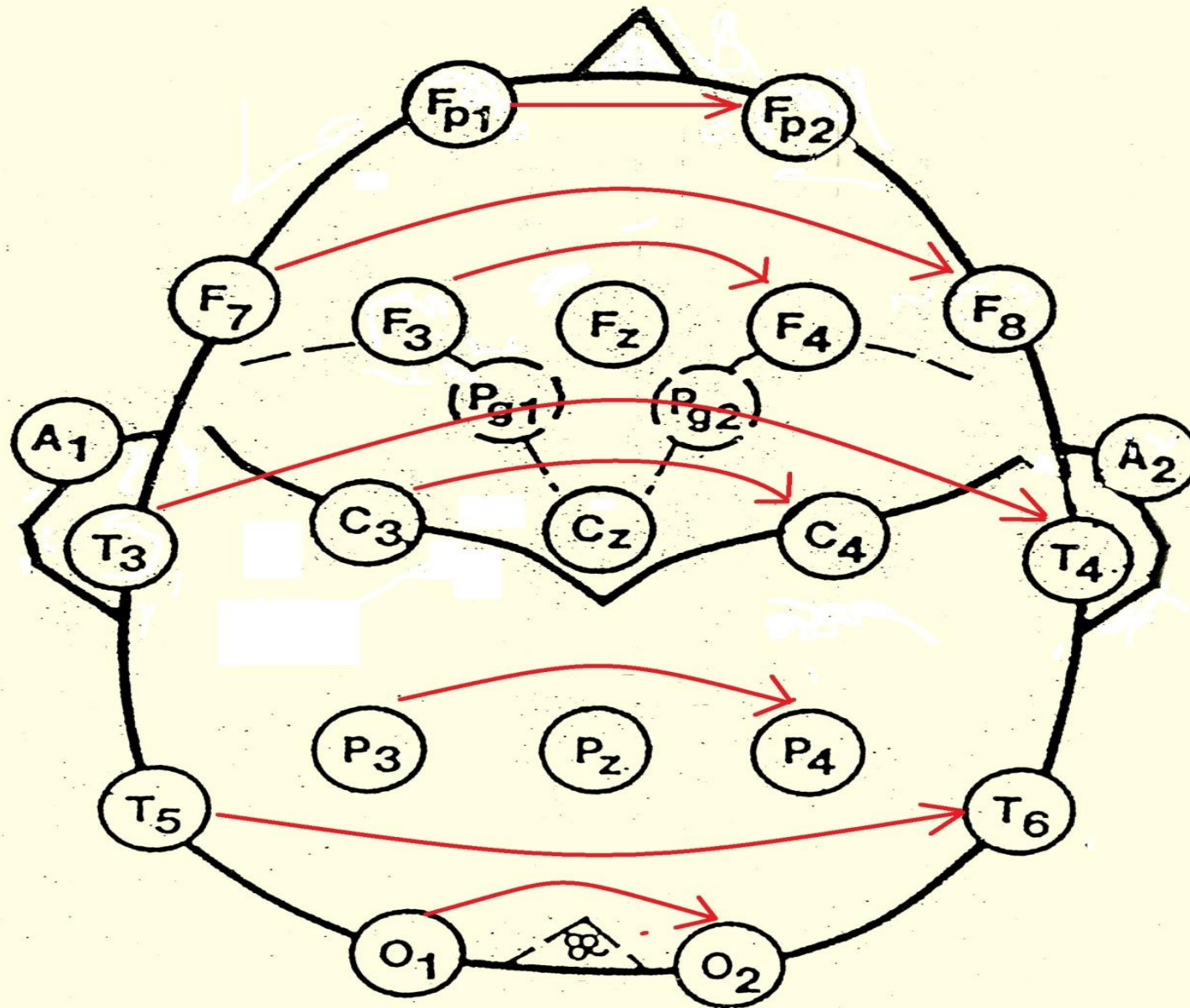


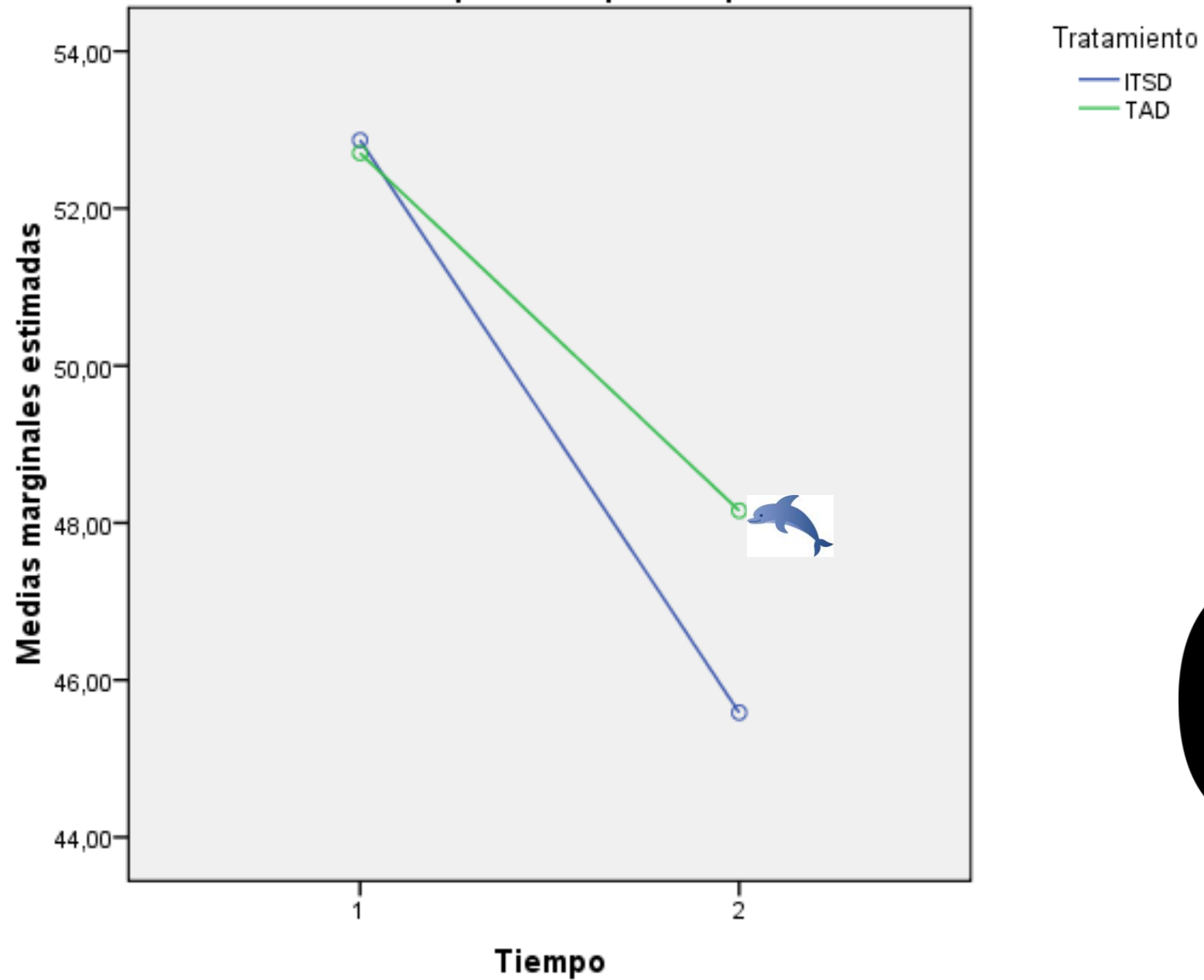
Tabla 1. Coherencia interhemisférica de cada banda de frecuencias en las regiones analizadas.

|         |      | Delta            |                  | Theta            |                  | Alfa             |                  | Beta             |                  |
|---------|------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
|         |      | ITSD             | TAD              | ITSD             | TAD              | ITSD             | TAD              | ITSD             | TAD              |
| Fp1-Fp2 | Pre  | 81,14<br>(71-90) | 77,42<br>(68-86) | 81,16<br>(71-91) | 79,45<br>(69-89) | 80,07<br>(70-89) | 76,00<br>(66-85) | 67,16<br>(60-73) | 74,16<br>(67-80) |
|         | Post | 75,24<br>(67-82) | 85,06<br>(77-92) | 75,22<br>(66-83) | 81,28<br>(78-95) | 69,09<br>(59-78) | 82,91<br>(73-92) | 61,63<br>(53-69) | 73,91<br>(65-81) |
|         | p    | ns               |                  | ns               |                  | §                |                  | ns               |                  |
| F3-F4   | Pre  | 70,07<br>(62-78) | 71,79<br>(63-79) | 67,45<br>(58-76) | 72,38<br>(63-81) | 64,04<br>(54-73) | 69,33<br>(60-78) | 50,37<br>(41-58) | 71,72<br>(53-70) |
|         | Post | 54,30<br>(42-66) | 69,18<br>(56-81) | 52,30<br>(39-64) | 69,64<br>(57-82) | 49,80<br>(38-61) | 65,42<br>(53-76) | 43,02<br>(33-52) | 57,99<br>(48-67) |
|         | p    | * §              |                  | *                |                  | *                |                  | **               |                  |
| F7-F8   | Pre  | 51,93<br>(44-59) | 54,64<br>(47-61) | 55,66<br>(47-64) | 59,59<br>(51-67) | 54,89<br>(46-63) | 56,82<br>(48-65) | 42,70<br>(35-50) | 44,65<br>(37-51) |
|         | Post | 52,87<br>(44-61) | 63,10<br>(54-71) | 56,71<br>(47-66) | 66,69<br>(57-76) | 51,27<br>(42-59) | 60,95<br>(52-69) | 42,45<br>(35-49) | 50,21<br>(43-56) |
|         | p    | ns               |                  | ns               |                  | ns               |                  | ns               |                  |
| C3-C4   | Pre  | 61,92<br>(56-67) | 59,96<br>(54-65) | 58,27<br>(52-63) | 59,48<br>(54-64) | 54,69<br>(48-61) | 55,42<br>(49-61) | 51,84<br>(47-56) | 51,49<br>(46-56) |
|         | Post | 59,54<br>(52-67) | 57,65<br>(50-65) | 54,75<br>(48-61) | 53,77<br>(47-60) | 50,45<br>(43-56) | 49,00<br>(42-55) | 51,34<br>(44-58) | 47,94<br>(41-54) |
|         | p    | ns               |                  | ns               |                  | *                |                  | ns               |                  |
| T3-T4   | Pre  | 53,69<br>(48-58) | 53,50<br>(48-58) | 55,71<br>(50-61) | 55,96<br>(50-61) | 52,87<br>(46-58) | 52,70<br>(46-58) | 39,91<br>(36-43) | 42,65<br>(39-46) |
|         | Post | 54,65<br>(48-61) | 56,47<br>(50-62) | 52,19<br>(45-59) | 56,58<br>(49-63) | 45,58<br>(39-51) | 48,15<br>(41-54) | 34,12<br>(29-38) | 36,82<br>(32-41) |
|         | p    | ns               |                  | ns               |                  | *                |                  | **               |                  |
| T5-T6   | Pre  | 49,79<br>(42-57) | 45,64<br>(38-52) | 50,48<br>(43-57) | 48,11<br>(40-55) | 44,86<br>(37-52) | 43,07<br>(35-50) | 37,00<br>(30-43) | 36,33<br>(29-42) |
|         | Post | 53,75<br>(47-59) | 45,58<br>(39-52) | 49,51<br>(42-56) | 46,01<br>(39-52) | 40,90<br>(34-57) | 39,35<br>(33-45) | 38,72<br>(32-44) | 34,06<br>(27-40) |
|         | p    | ns               |                  | ns               |                  | ns               |                  | ns               |                  |
| P3-P4   | Pre  | 64,13<br>(53-74) | 55,79<br>(45-66) | 60,02<br>(48-71) | 54,71<br>(43-66) | 57,24<br>(45-68) | 49,51<br>(37-61) | 56,12<br>(48-63) | 46,50<br>(39-53) |
|         | Post | 66,71<br>(59-73) | 54,68<br>(47-61) | 64,56<br>(56-72) | 53,59<br>(45-71) | 56,82<br>(49-64) | 47,36<br>(39-55) | 55,50<br>(47-63) | 43,83<br>(35-52) |
|         | p    | ns               |                  | ns               |                  | ns               |                  | ns               |                  |
| O1-O2   | Pre  | 46,60<br>(37-55) | 38,74<br>(29-47) | 46,08<br>(37-55) | 41,44<br>(32-50) | 41,38<br>(32-50) | 39,81<br>(31-48) | 44,78<br>(38-50) | 39,34<br>(33-45) |
|         | Post | 50,37<br>(42-57) | 41,98<br>(34-49) | 46,74<br>(39-54) | 39,65<br>(32-47) | 43,00<br>(36-49) | 34,42<br>(27-41) | 46,92<br>(39-54) | 38,90<br>(31-46) |
|         | p    | ns               |                  | ns               |                  | ns               |                  | ns               |                  |

(\*) ITSD &amp; TAD p&lt;0'05    (\*\*) ITSD &amp; TAD p&lt;0'001    (§) TAD p&lt;0'05

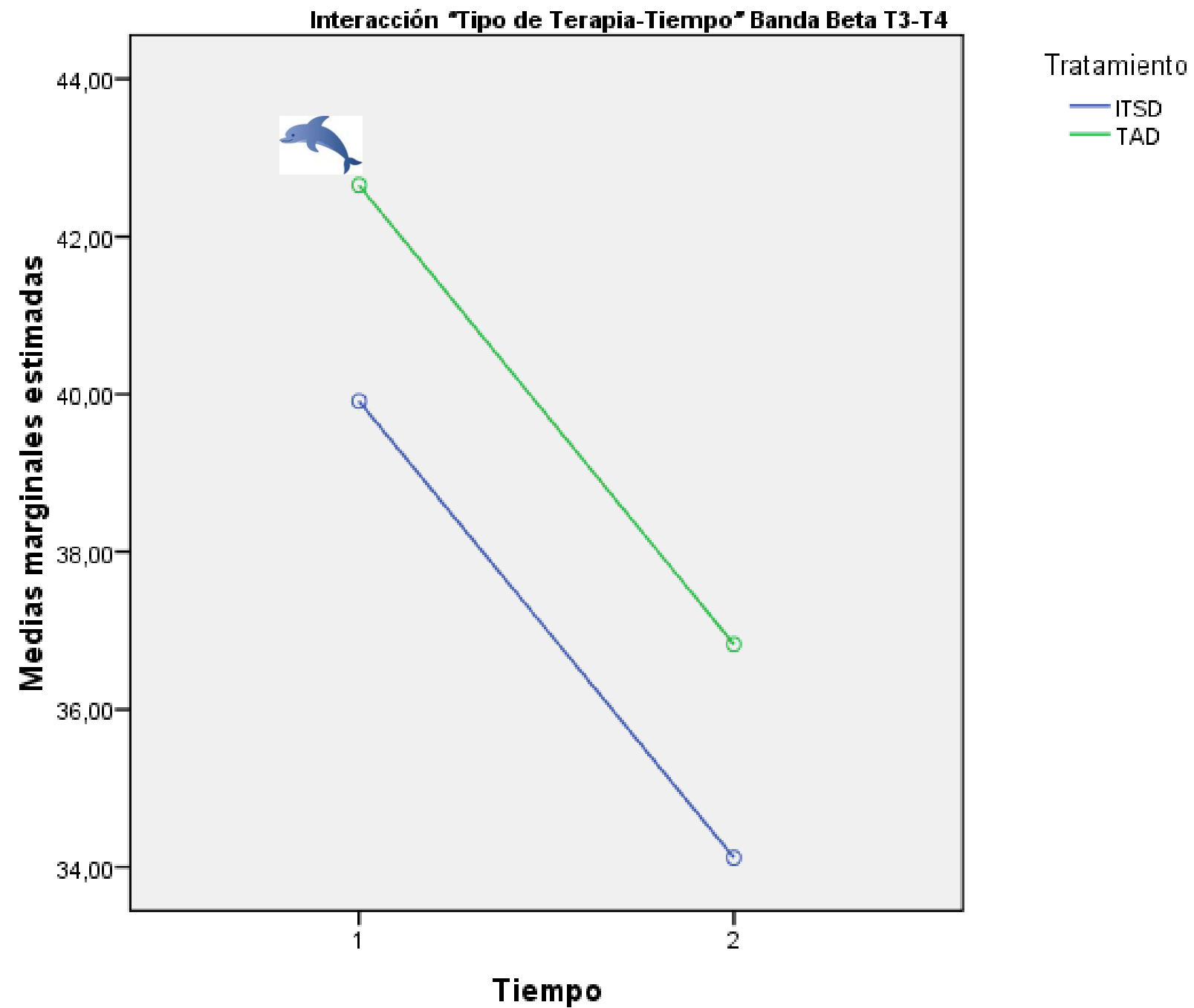


Interacción "Tipo de Terapia-Tiempo" Banda Alfa T3-T4



$\alpha$

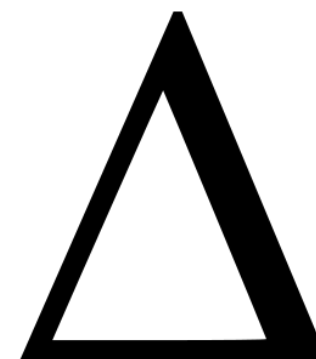
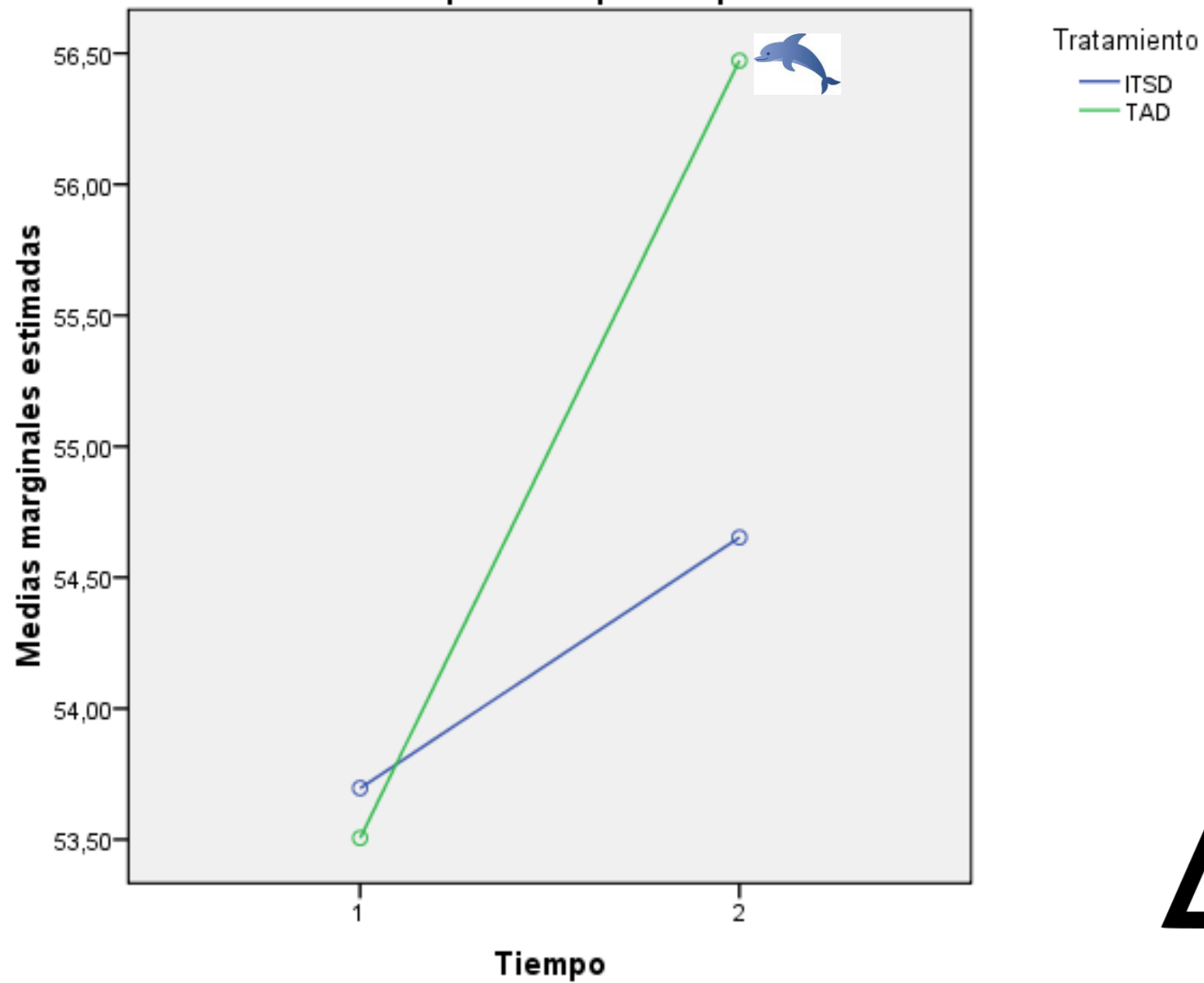




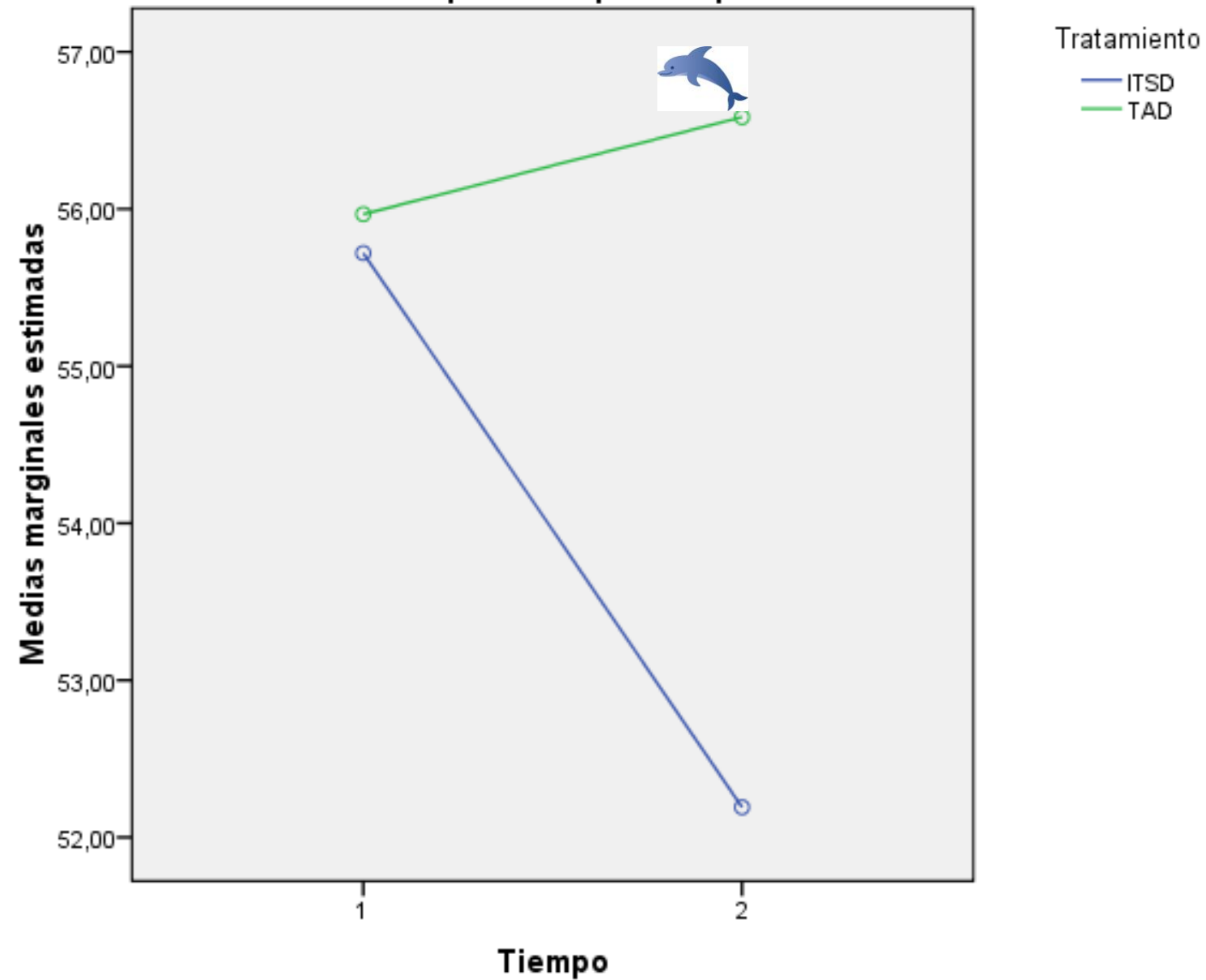
$\beta$



Interacción "Tipo de Terapia-Tiempo" Banda Delta T3-T4



Interacción "Tipo de Terapia-Tiempo" Banda Theta T3-T4



$\theta$

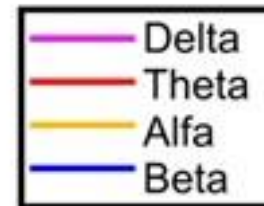
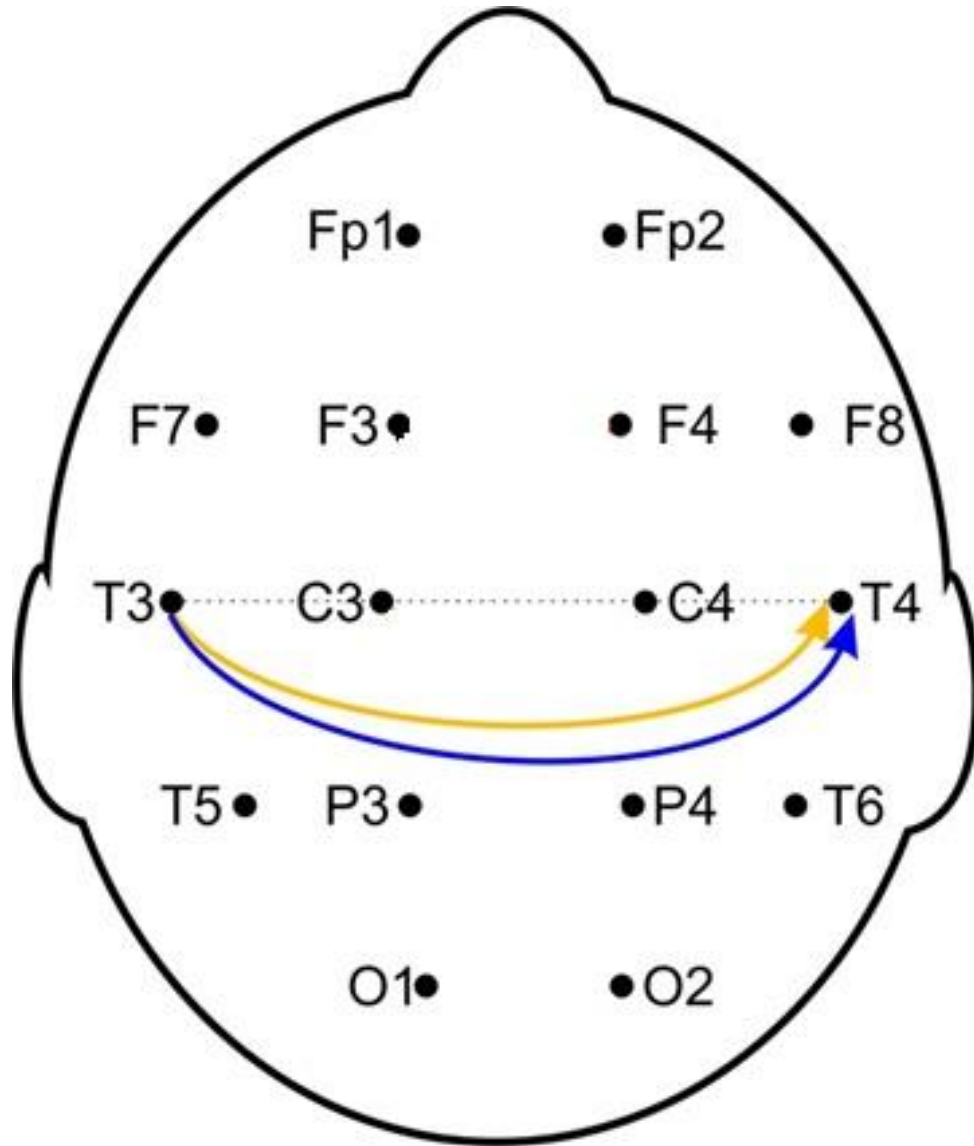


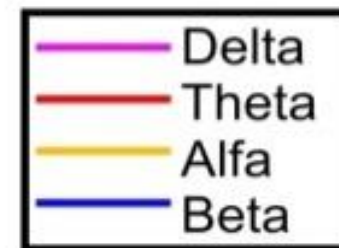
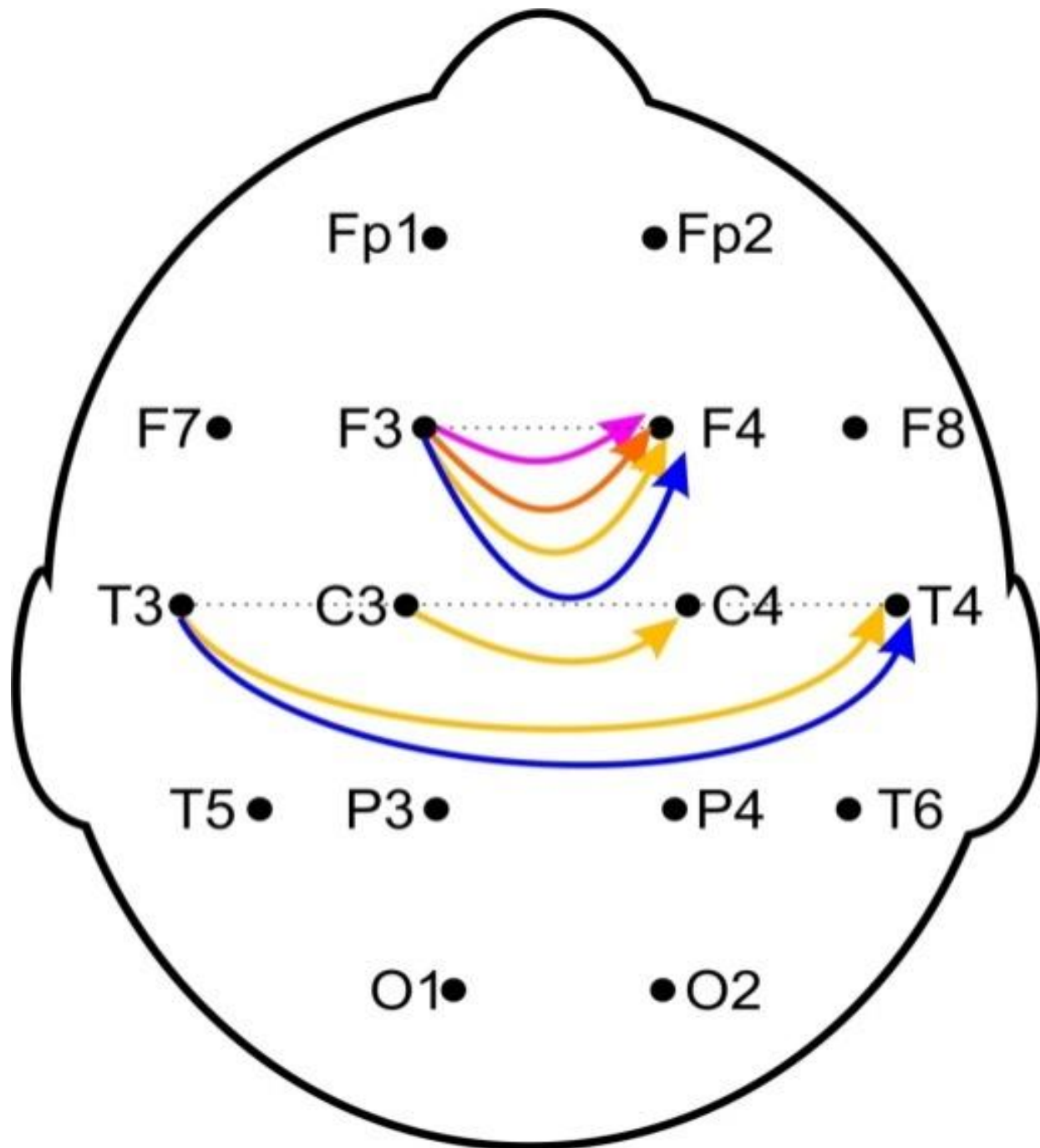
**Tabla**

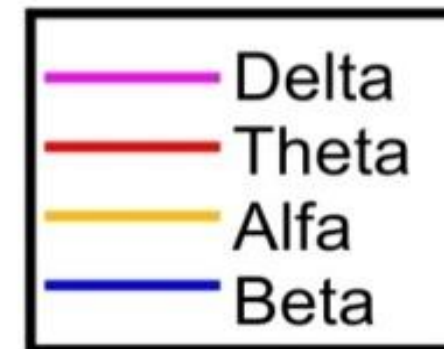
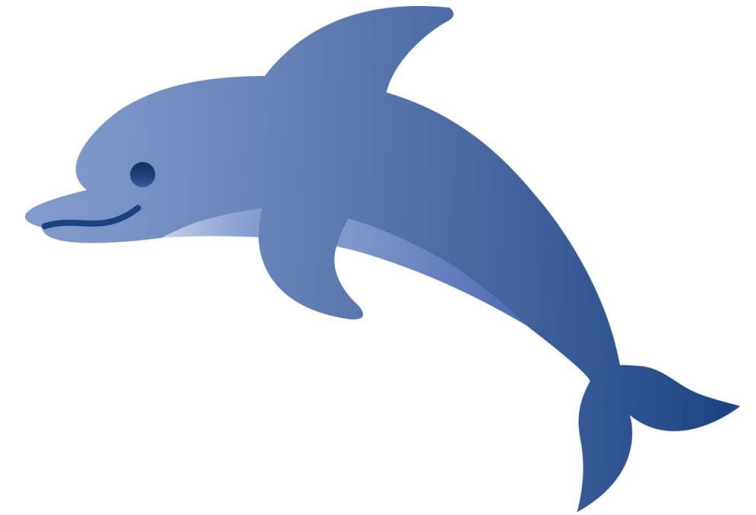
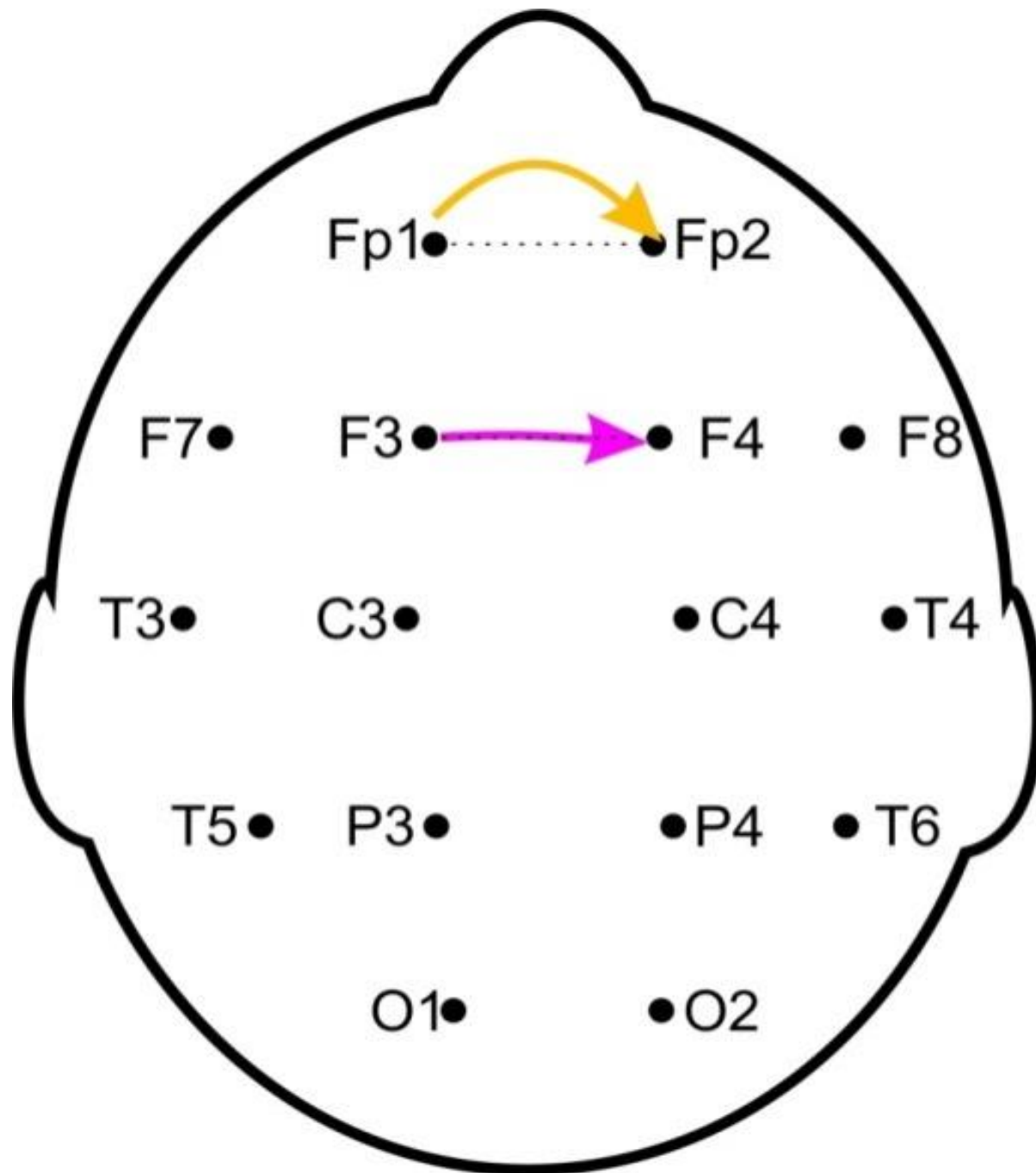
**Pruebas de contrastes intra-sujetos**

| Origen                |       |        | Suma de cuadrados<br>tipo III | gl | Media cuadrática | F      | Sig. |
|-----------------------|-------|--------|-------------------------------|----|------------------|--------|------|
| Prepost               | Delta | Lineal | 84,657                        | 1  | 84,657           | ,492   | ,487 |
|                       | Theta | Lineal | 46,564                        | 1  | 46,564           | ,212   | ,647 |
|                       | Alfa  | Lineal | 770,311                       | 1  | 770,311          | 4,463  | ,041 |
|                       | Beta  | Lineal | 742,522                       | 1  | 742,522          | 25,283 | ,000 |
| Prepost * Tratamiento | Delta | Lineal | 22,213                        | 1  | 22,213           | ,129   | ,721 |
|                       | Theta | Lineal | 94,542                        | 1  | 94,542           | ,431   | ,515 |
|                       | Alfa  | Lineal | 41,128                        | 1  | 41,128           | ,238   | ,628 |
|                       | Beta  | Lineal | ,006                          | 1  | ,006             | ,000   | ,988 |
| Error(Prepost)        | Delta | Lineal | 7231,213                      | 42 | 172,172          |        |      |
|                       | Theta | Lineal | 9217,788                      | 42 | 219,471          |        |      |
|                       | Alfa  | Lineal | 7249,693                      | 42 | 172,612          |        |      |
|                       | Beta  | Lineal | 1233,460                      | 42 | 29,368           |        |      |

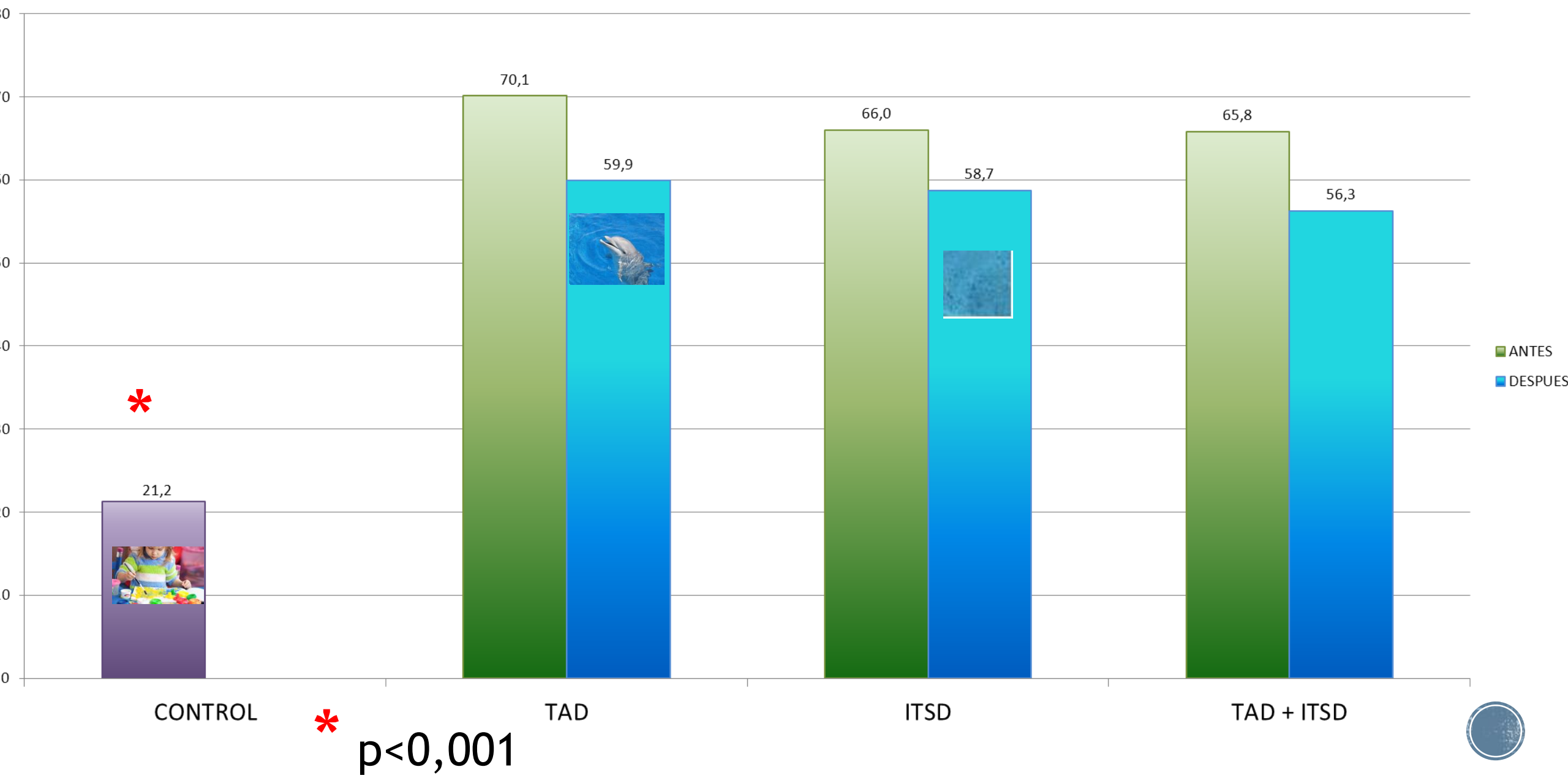








## COHERENCIA MEDIA alfa en grupo TEA y grupo control





# **Efectos de la Terapia asistida con Delfines en las habilidades de comunicación de niños con Trastorno del Espectro Autista**

Effects of Dolphins-Assisted Therapy in the communication skills  
of children with Autism Spectrum Disorder

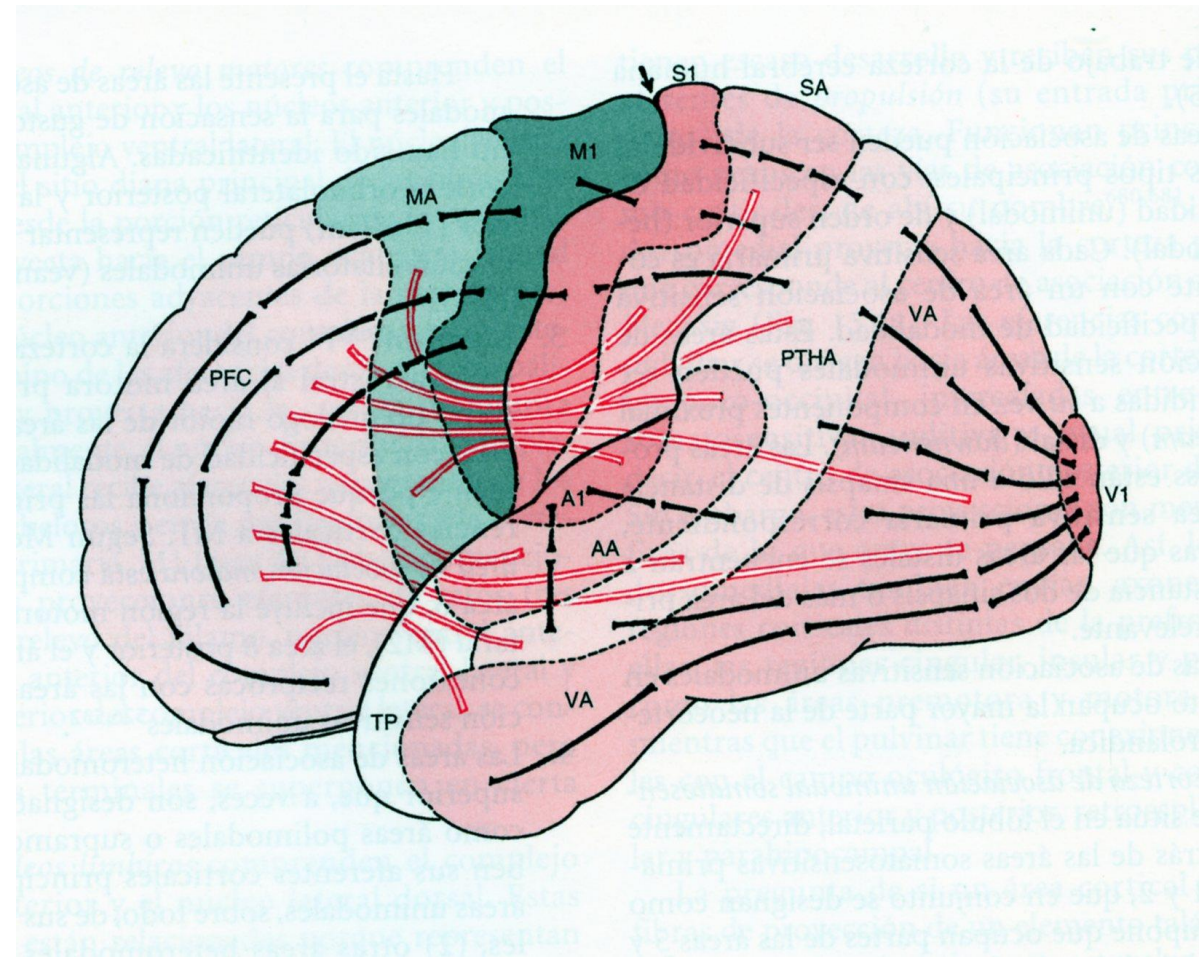
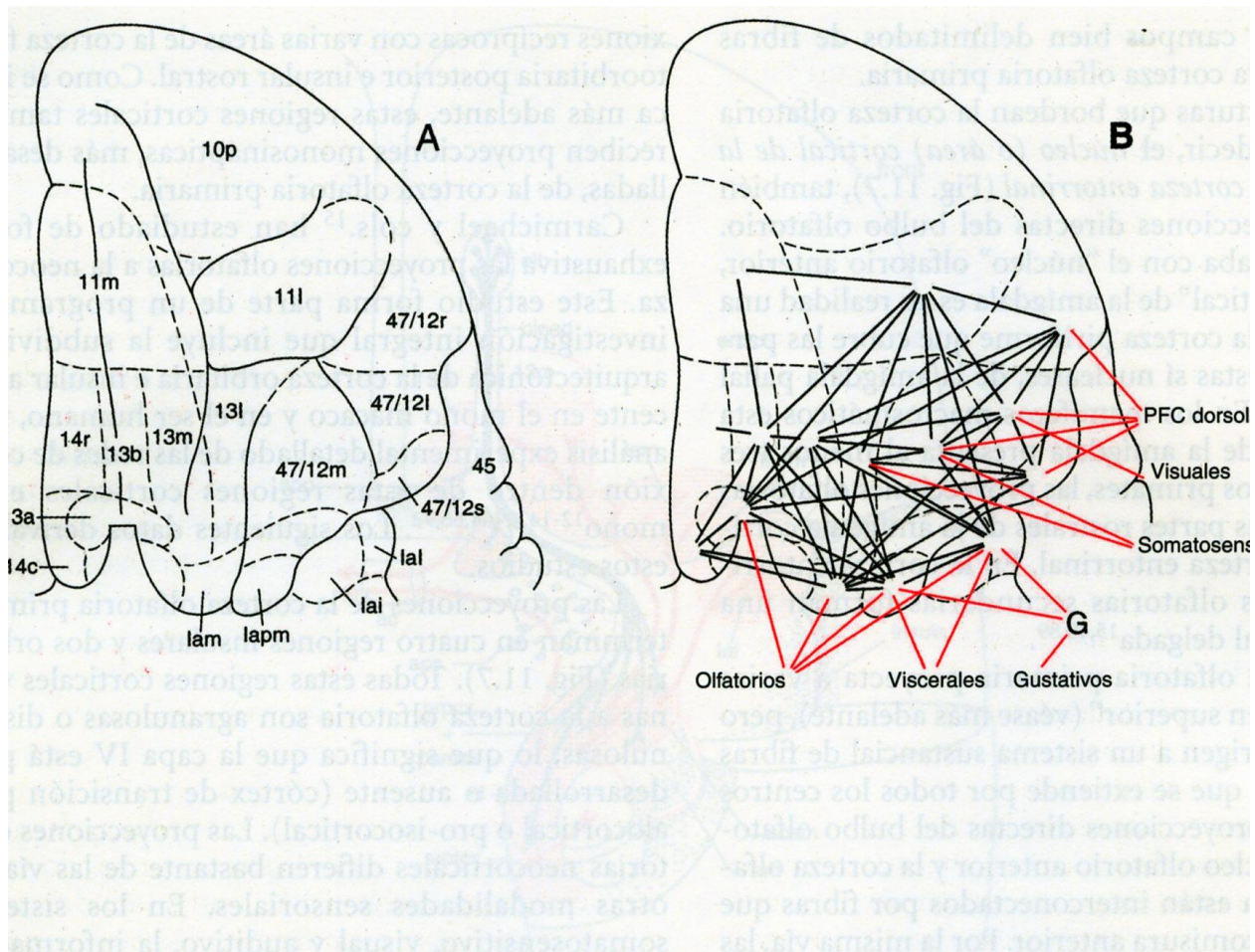
NAZARET HERNÁNDEZ ESPESO  
EVA ROSA MARTÍNEZ  
M<sup>a</sup> DOLORES GRAU SEVILLA  
MARGARITA CAÑADAS PÉREZ

\*\*\*\*\*



- Autism Diagnostic Observation Schedule-Generic (ADOS-G)
- **Psycho-Educational Profile Schedule (PEP)**
- **Escala Reynell (Developmental Language Scale)**
- **Madurez Social de Vineland**





## DISCUSIÓN Y CONCLUSIONES

A través del análisis de las puntuaciones globales de las cuatro escalas utilizadas (ADOS, PEP, REYNELL y Vineland), se observaron mejoras significativas en las evaluaciones post tratamiento con respecto a las evaluaciones pre tratamiento, tanto para el grupo de TAD como para el de ITSD. En estas puntuaciones globales los cambios producidos fueron equivalentes para ambos grupos, no apareciendo ventajas significativas de uno frente a otro. Los dos tipos de terapia poseen elementos comunes altamente motivacionales (metodología de intervención adaptada a niños con TEA a través de la anticipación visual, entorno acuático y al aire libre, carácter lúdico y novedoso para la rutina de los participantes) lo que podría explicar el funcionamiento similar de ambas.

La presencia del delfín fue el único elemento motivador que diferenciaba el grupo TAD del grupo ITSD. Por tanto, la presencia de delfines supuso, en esta experiencia, un elemento motivador extra que, en las puntuaciones globales de las escalas, no generó beneficios adicionales.

No obstante, cabe destacar que en el análisis más pormenorizado de las puntuaciones por ítems sí que encontraron algunos efectos significativos debidos a la presencia del animal. Concretamente, en las puntuaciones de dos aspectos específicos de la escala ADOS relacionados con la comunicación: "frecuencia de vocalizaciones hacia otros" y "gestos". Estos resultados pueden explicarse analizando la naturaleza de la actividad realizada con los delfines, que implicaba dirigirse a éstos a través de vocalizaciones y de comandos gestuales, a los que el animal respondía

8 y 9 marzo 2019

genética

TEA

intervención

LENGUAJE

Discapacidad  
intelectual

**PROGRAMA**  
**XXI CONGRESO**  
INTERNACIONAL DE ACTUALIZACIÓN EN  
**TRASTORNOS DEL NEURODESARROLLO**

Valencia , 8 y 9 de marzo de 2019  
Colegio Oficial de Médicos de Valencia



BLOQUES TEMÁTICOS (19 conferencias plenarias)

TRASTORNO DEL ESPECTRO AUTISTA (TEA) - PREVALENCIA E INTERVENCIÓN - NEUROPEDESA  
AS AVANZADAS - DISCAPACIDAD INTELECTUAL - ALTAS CAPACIDADES - APRENDIZAJE -  
IE - TRASTORNO DEFICIT ATENCIÓN /E HIPERACTIVIDAD (TDAH) - FAMILIA - HÁBITOS E  
ENTORNOS ACTUALES - TDAH DEL ADULTO - ENTORNOS VIRTUALES EN NEURODESAR

**INVITADO ESPECIAL:** Roberto Tuchman,

Jefe Departamento Neuropediatría. Nicklaus Children's Hospital, Miami (EE.UU.)

**ORGANIZACIÓN:** Instituto Valenciano de Neurología Pediátrica (INVANEP).

<http://www.invanep.com/congresos>

Valencia

Dificultades  
aprendizaje

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o

TDAH  
familia

SUEÑO

Tdah adulto

**FIN**



8 y 9 marzo 2019

genética

TEA

intervención

LENGUAJE

Discapacidad  
intelectual



**PROGRAMA**  
**XXI CONGRESO**  
INTERNACIONAL DE ACTUALIZACIÓN EN  
**TRASTORNOS DEL NEURODESARROLLO**

Valencia, 8 y 9 de marzo de 2019  
Colegio Oficial de Médicos de Valencia



BLOQUES TEMÁTICOS (19 conferencias plenarias)

TRASTORNO DEL ESPECTRO AUTISTA (TEA) - PREVALENCIA E INTERVENCIÓN - NEURODESARROLLO Y TERAPIAS AVANZADAS - DISCAPACIDAD INTELECTUAL - ALTAS CAPACIDADES - APRENDIZAJE - SUEÑO LENGUAJE - TRASTORNO DÉFICIT DE ATENCIÓN E HIPERACTIVIDAD (TDAH) - FAMILIA - HÁBITOS ESTUDIO TRATAMIENTOS ACTUALES - TDAH DEL ADULTO - ENTORNOS VIRTUALES EN NEURODESARROLLO

**INVITADO ESPECIAL:** Roberto Tuchman,  
Jefe Departamento Neuropediatría, Nicklaus Children's Hospital, Miami (EE.UU.)  
**ORGANIZACIÓN:** Instituto Valenciano de Neurología Pediátrica (INVANEP).

<http://invanep.com/cursos/formacion-continuada>

CONGRESO DECLARADO DE INTERÉS CINETÍFICO SANITARIO Y ACREDITADO  
CON 2,8 CRÉDITOS (2018) POR LA COMISIÓN DE FORMACIÓN CONTINUADA C.V. (SIN)

Valencia

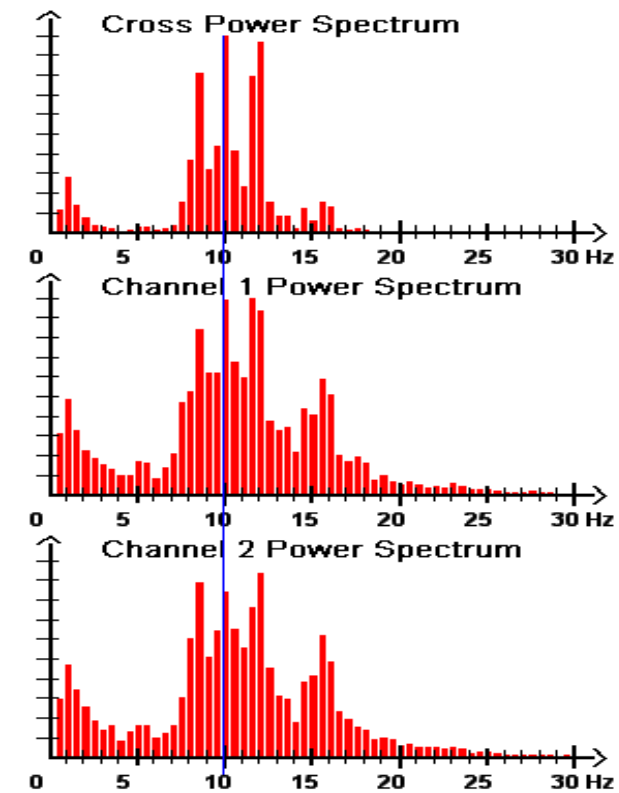
neurodesarrollo  
Dificultades  
aprendizaje

TDAH

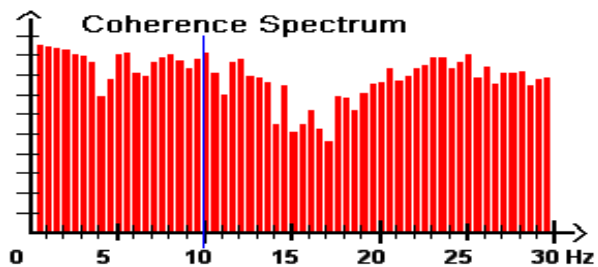
familia

SUEÑO

TDAH adulto

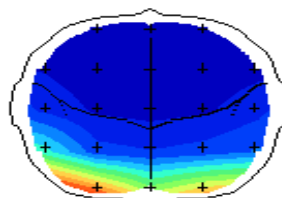


INTER-ELECTRODE COHERENCE  
Selected Epoch: AVG1.AVG (Sys Ref)

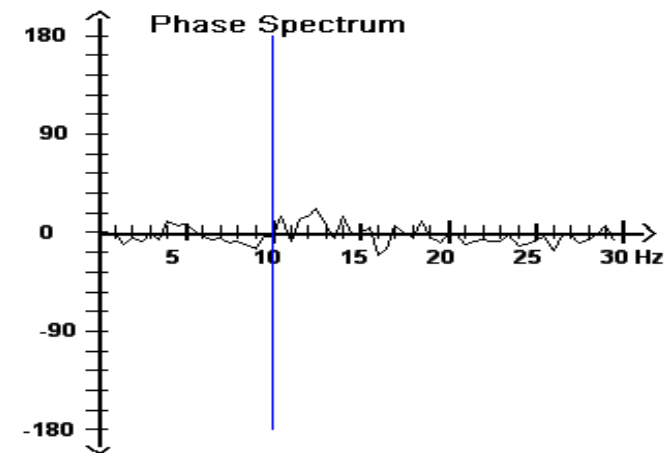


Channel 1: O1

Channel 2: O2



FFT Mapping



Frequency: 10.0 Hz.

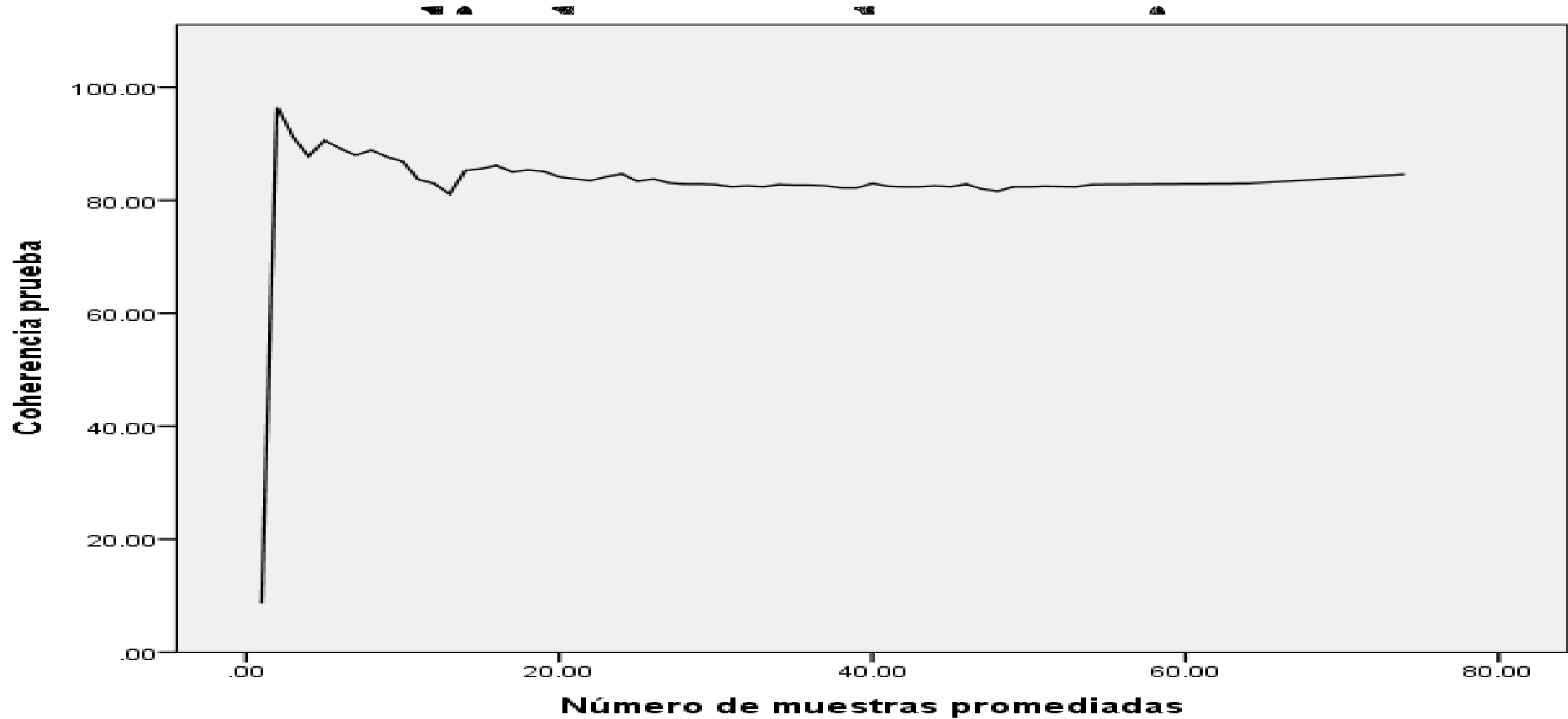
Coherence: 91.6 %.

Angle: -3.7 grad.

Time: -1.04 ms.



# Relación muestras

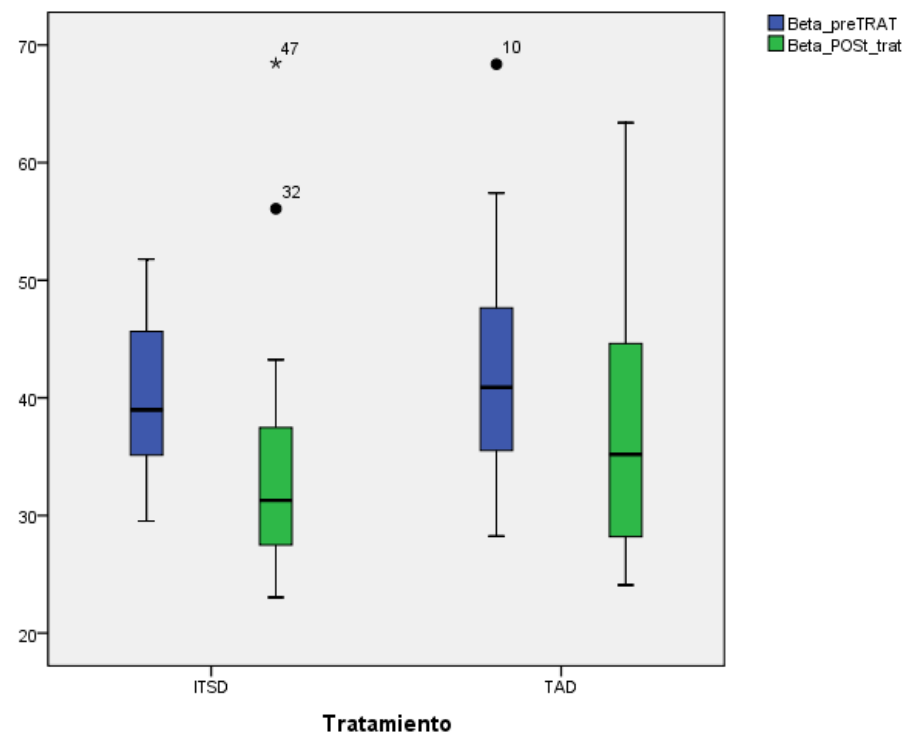
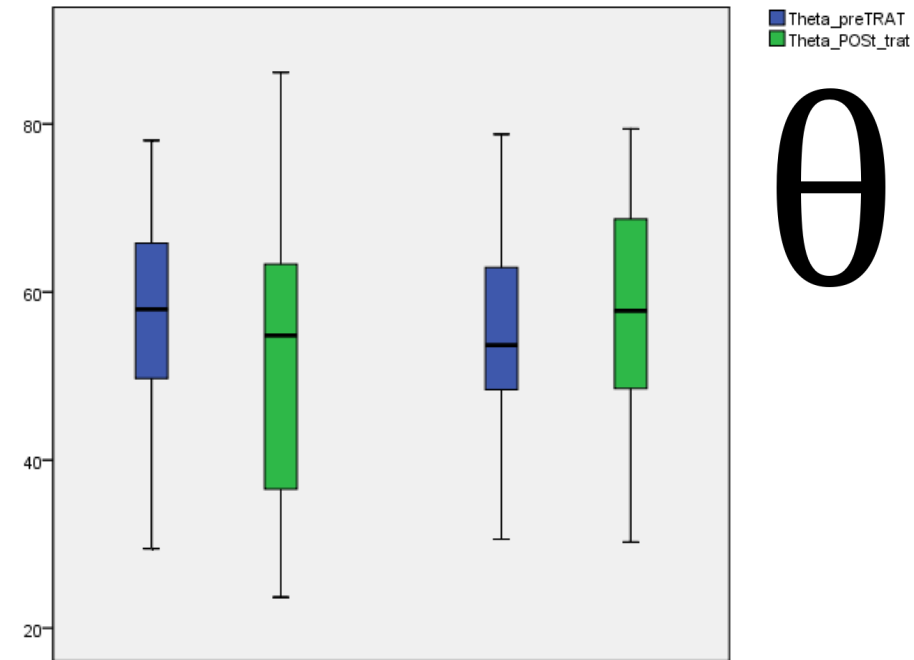
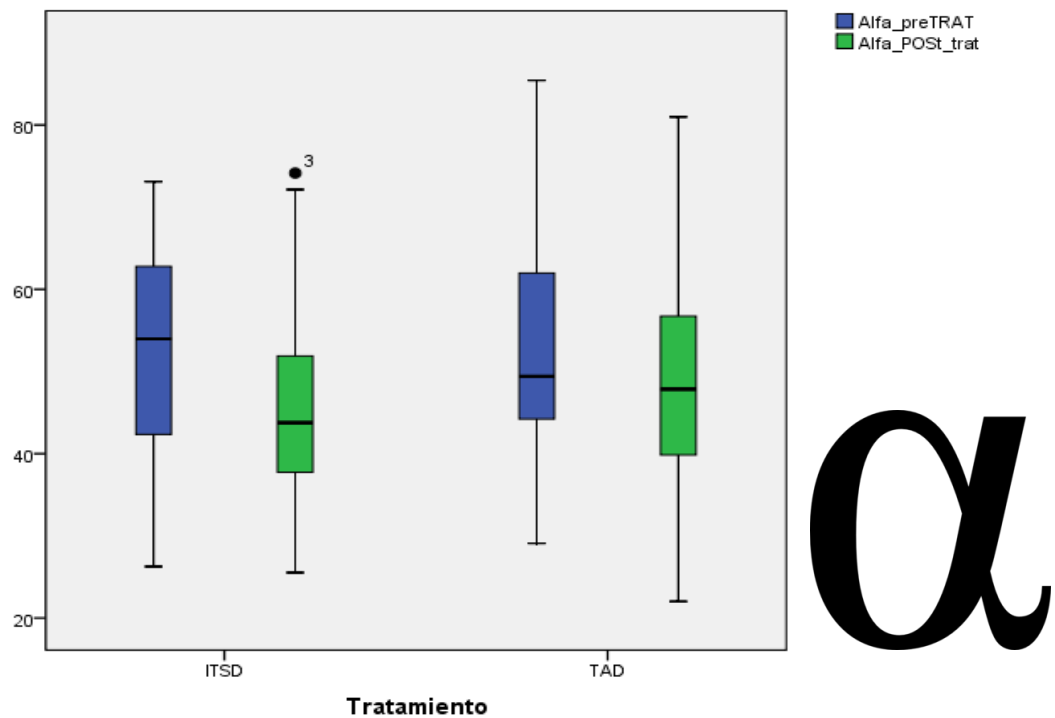
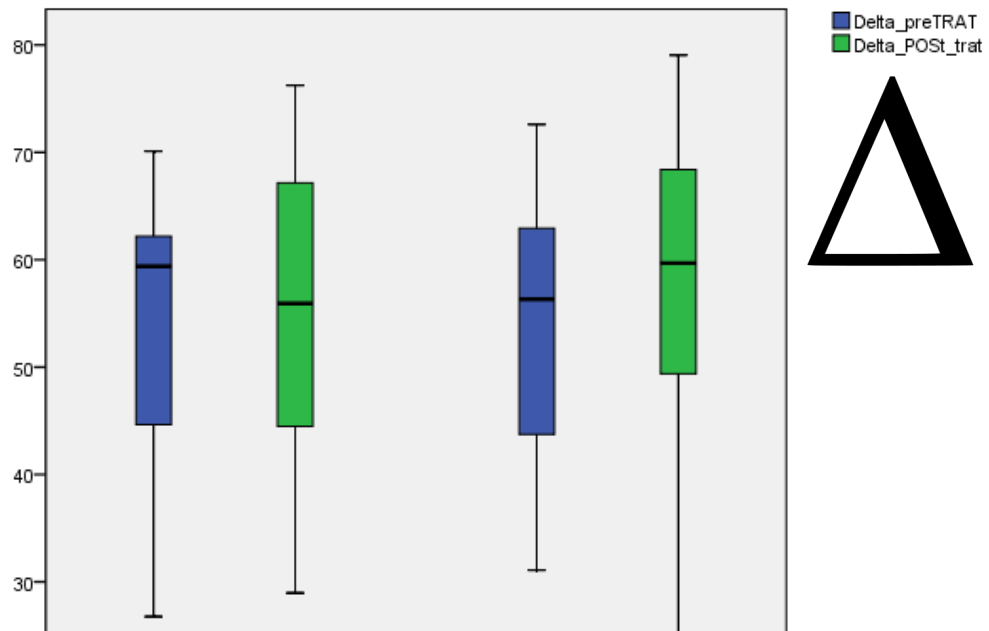


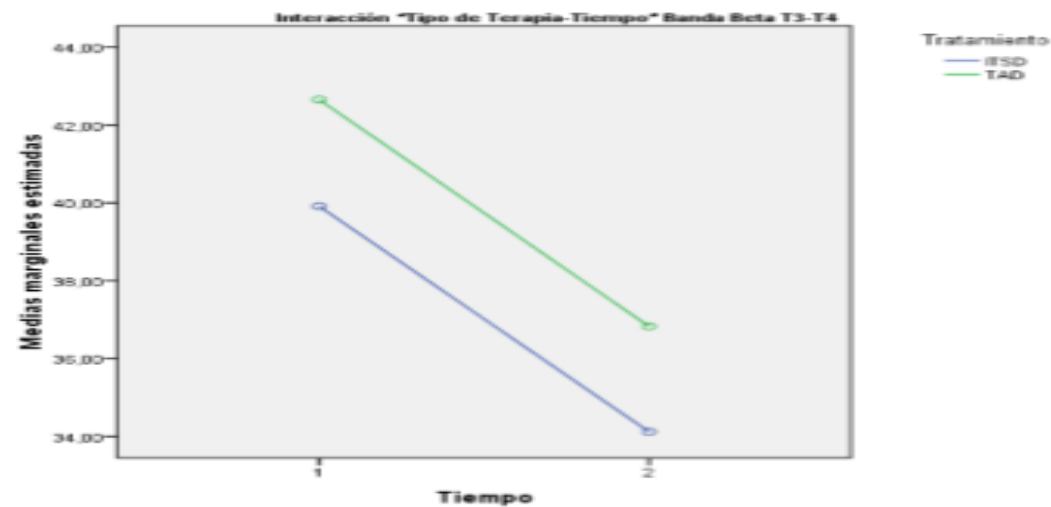
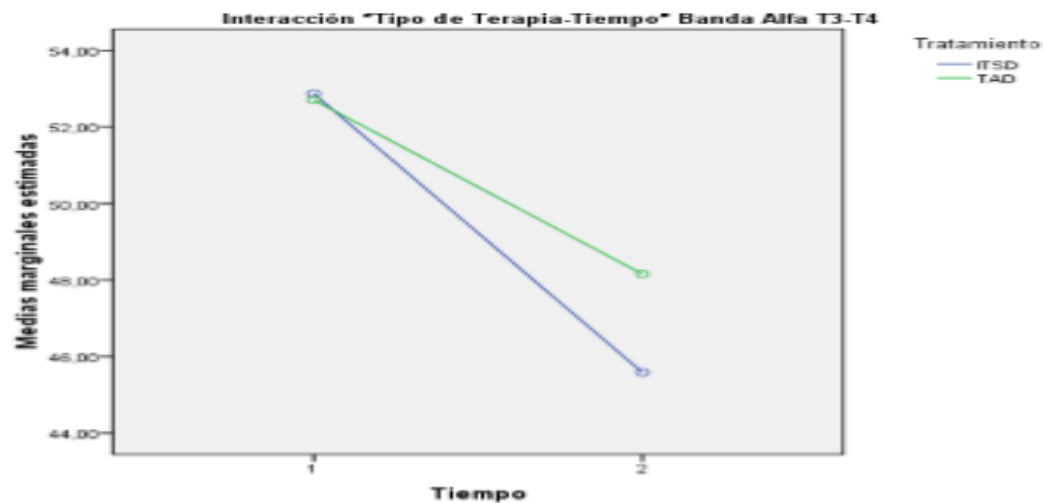
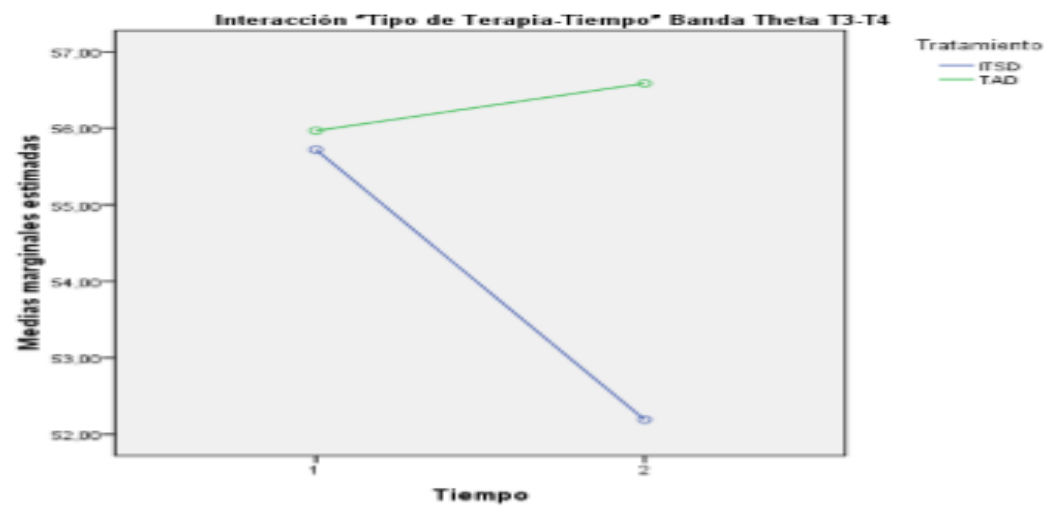
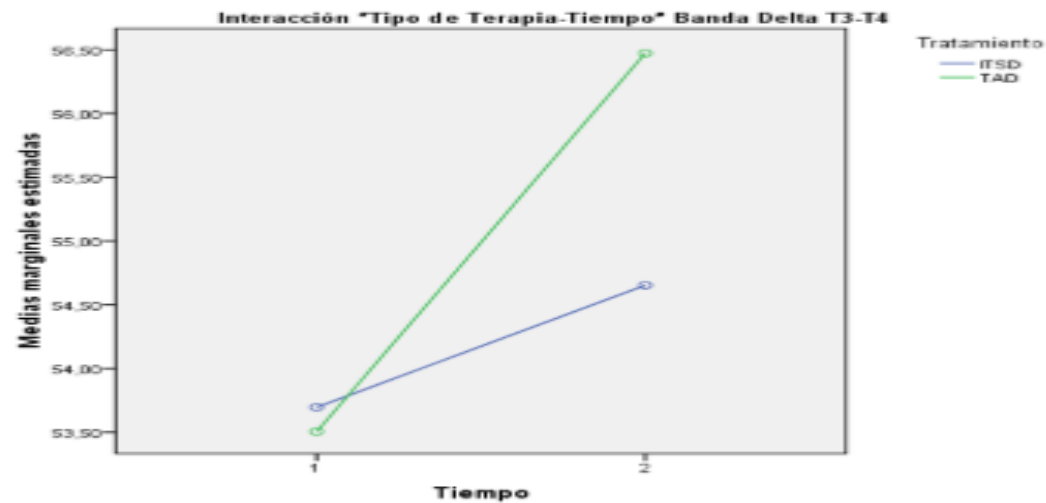
**Tabla**

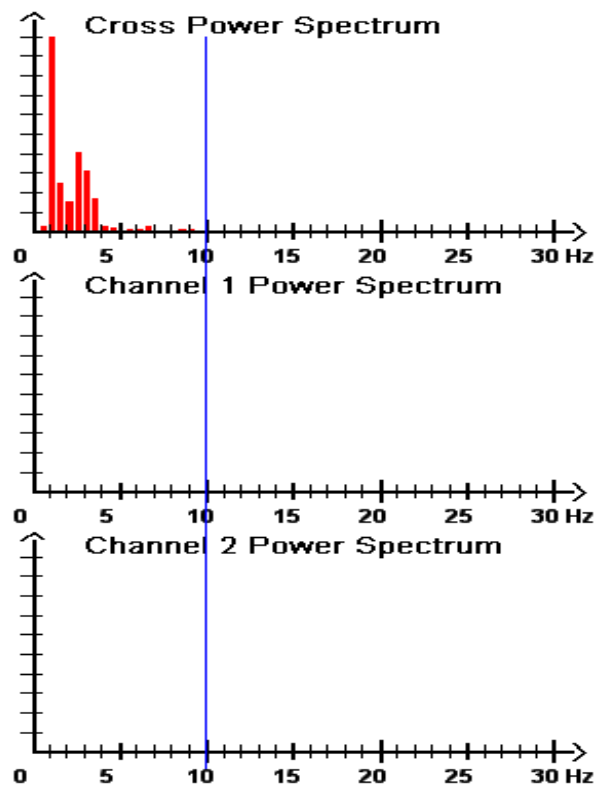
**Tratamiento \* Prepost**

| Medida | Tratamiento | Tiempo | Media  | Error típ. | Intervalo de confianza 95% |                 |
|--------|-------------|--------|--------|------------|----------------------------|-----------------|
|        |             |        |        |            | Límite inferior            | Límite superior |
| Delta  | ITSD        | Pre    | 53,696 | 2,590      | 48,469                     | 58,923          |
|        |             | Post   | 54,653 | 3,166      | 48,263                     | 61,043          |
|        | TAD         | Pre    | 53,506 | 2,590      | 48,279                     | 58,732          |
|        |             | Post   | 56,472 | 3,166      | 50,082                     | 62,862          |
| Theta  | ITSD        | Pre    | 55,719 | 2,775      | 50,120                     | 61,319          |
|        |             | Post   | 52,191 | 3,448      | 45,234                     | 59,149          |
|        | TAD         | Pre    | 55,967 | 2,775      | 50,367                     | 61,567          |
|        |             | Post   | 56,585 | 3,448      | 49,628                     | 63,543          |
| Alfa   | ITSD        | Pre    | 52,870 | 2,983      | 46,849                     | 58,890          |
|        |             | Post   | 45,585 | 3,095      | 39,340                     | 51,830          |
|        | TAD         | Pre    | 52,705 | 2,983      | 46,684                     | 58,725          |
|        |             | Post   | 48,155 | 3,095      | 41,909                     | 54,400          |
| Beta   | ITSD        | Pre    | 39,912 | 1,744      | 36,393                     | 43,431          |
|        |             | Post   | 34,120 | 2,205      | 29,670                     | 38,569          |
|        | TAD         | Pre    | 42,653 | 1,744      | 39,134                     | 46,172          |
|        |             | Post   | 36,826 | 2,205      | 32,376                     | 41,276          |

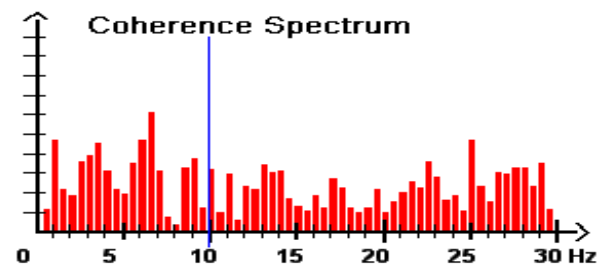






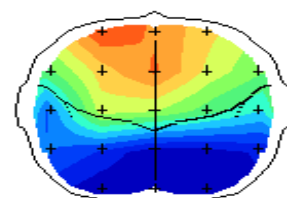


INTER-ELECTRODE COHERENCE  
Selected Epoch: AVG1.AVG (Sys Ref)

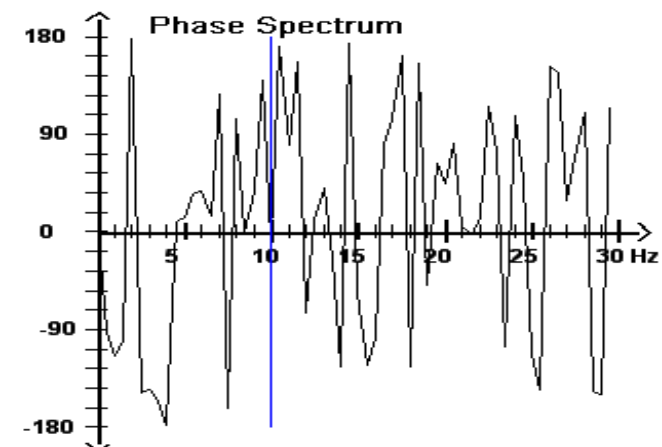
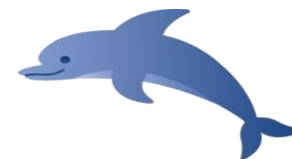


Channel 1: O1

Channel 2: O2



FFT Mapping



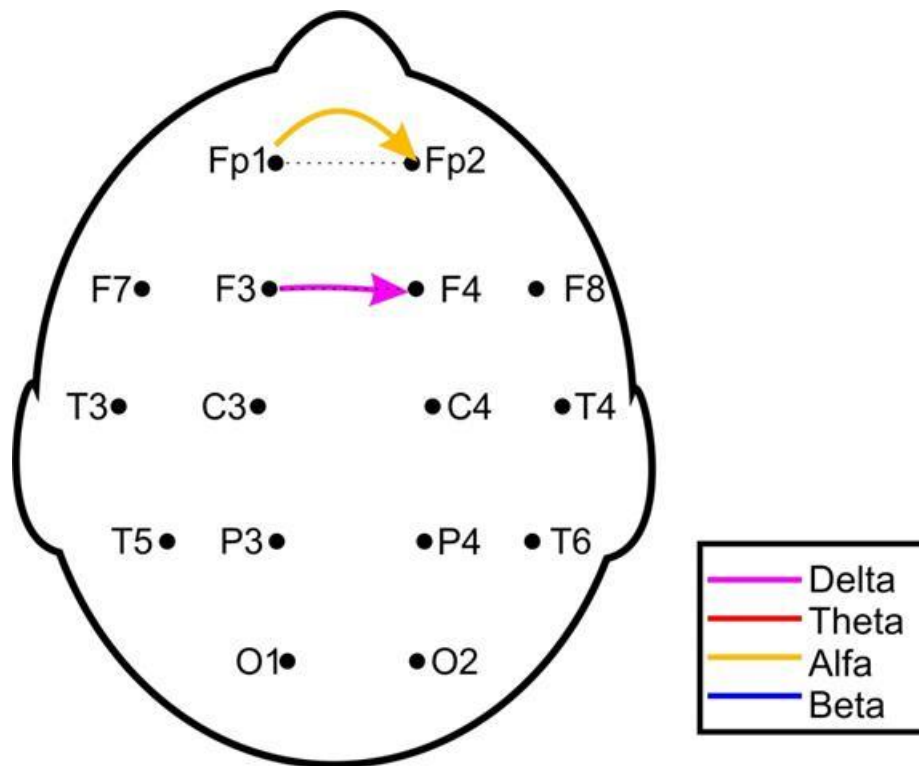
Frequency: 10.0 Hz.

Coherence: 32.2 %.

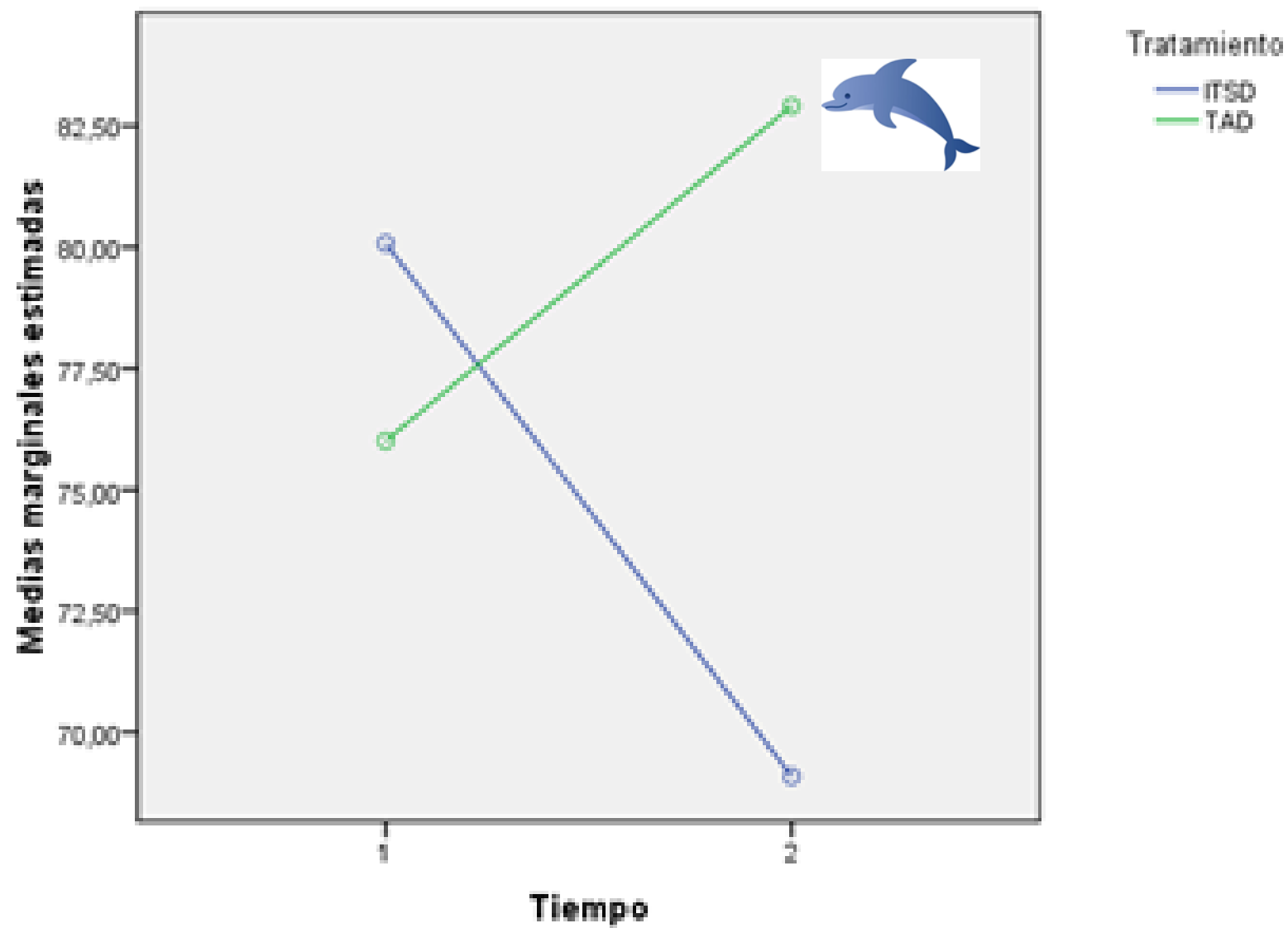
Angle: -11.8 grad.

Time: -3.28 ms.

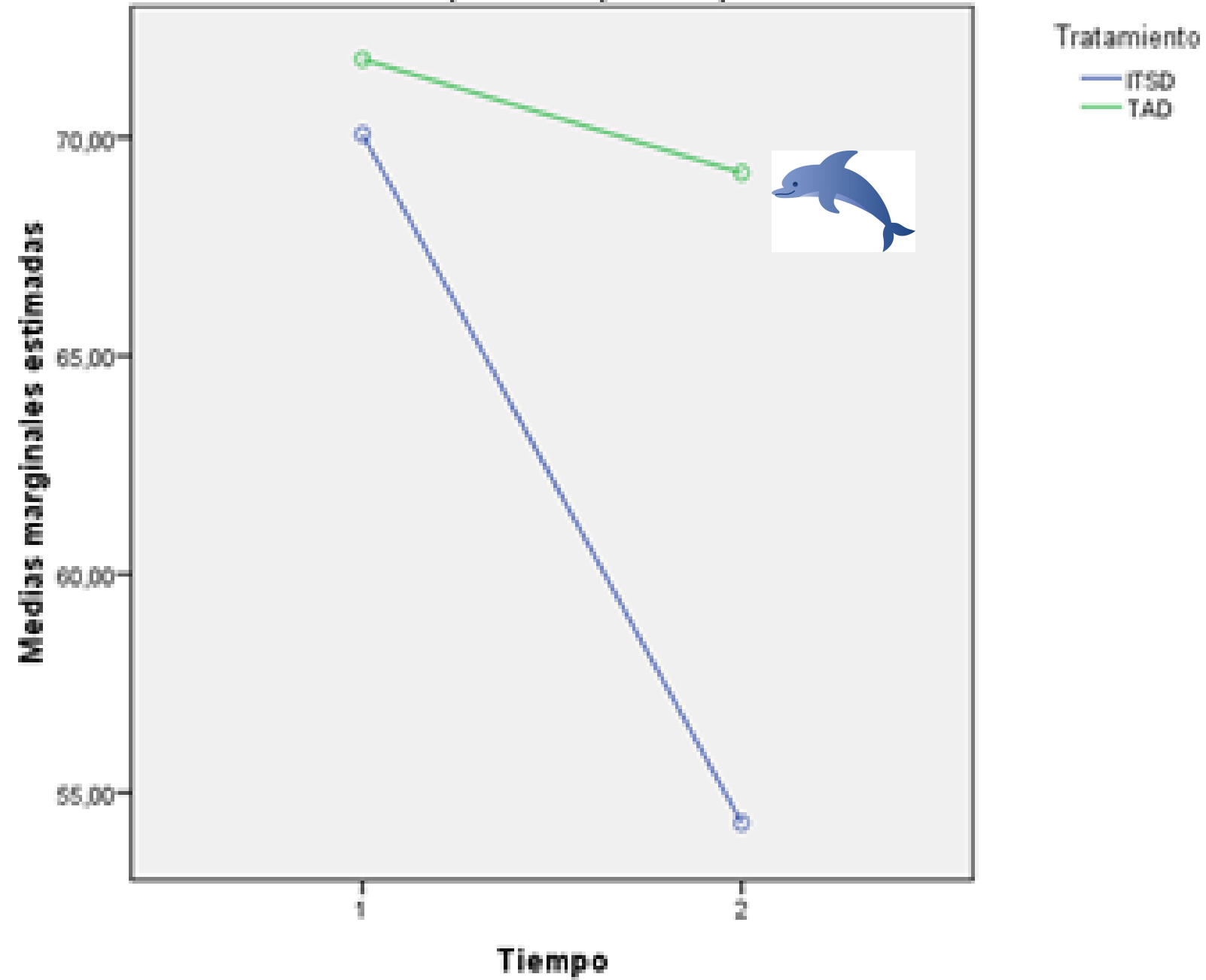


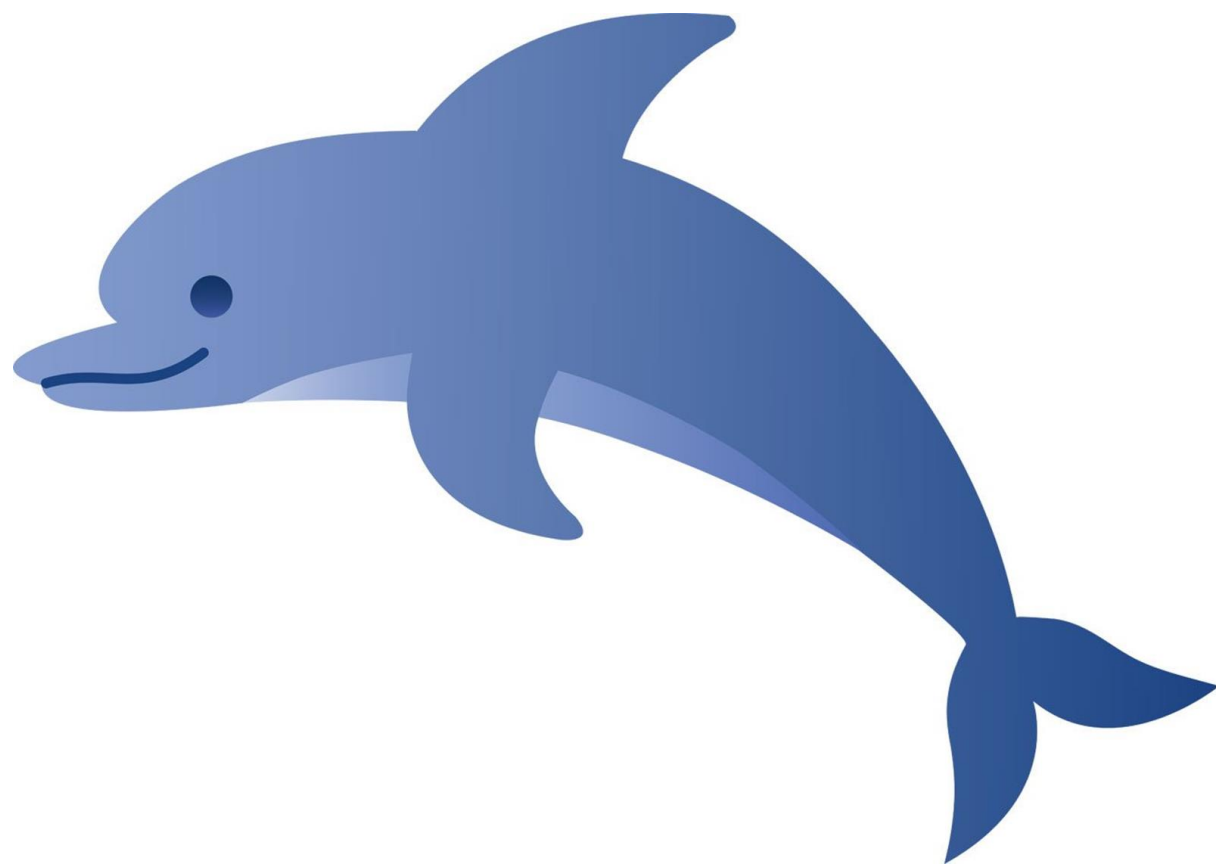


### Interacción "Tipo de Terapia-Tiempo" Banda Alfa Fp1-Fp2



Interacción "Tipo de Terapia-Tiempo" Banda Delta F3-F4





- **Introducción :** El trastorno del espectro autista (TEA) es un trastorno del neurodesarrollo asociado con trastornos de la función ejecutiva , el lenguaje, la función emocional y la función social cuyo sustrato anatomofuncional está relacionado con una desorganización de las conexiones funcionales cerebrales. En el presente estudio se investigan las conexiones cerebrales en sujetos con TEA mediante el análisis de la coherencia interhemisférica (CIH) del electroencefalograma cuantificado (QEEG).
- **Material y Métodos:** Se determino la CIH en áreas temporales (T3-T4) en 44 niños de edades comprendidas entre 4 y 5 años, con TEA, antes de asignarse aleatoriamente a dos grupos de intervención terapéutica asistida con delfines (TAD) y sin delfines (ITSD). Los resultados se analizaron estadísticamente mediante el test de la ANOVA multimedida para los factores intrasujeto (tiempo) e intersujeto (intervención terapéutica TAD frente a ITSD).
- **Resultados:** La CIH mostró una reducción significativas ( $p > 0.05$ ) para ambos grupos (TAD mas ITSD) en las frecuencias alfa y beta. No se observaron diferencias significativas en el factor intersujeto TAD frente a ITSD.
- **Conclusiones:** El estudio de la función neurofisiológica está indicado en niños con TEA El análisis de la CIH posibilita un seguimiento evolutivo en los sujetos a los que se ha realizado una intervención, aunque en el estudio actual en áreas temporales no se aprecian diferencias significativas se precisa un estudio global de todas las áreas del cerebro y un estudio con grupo control de niños normales.





# El autismo













