

Dia 5

Alguns detalhes sobre pré-processamento, como colocar fatores de distribuição dos eletrodos na sua análise, e como exportar medidas.

Alguns exemplos de seções metodológicas, detalhando parâmetros de coleta dos sinais, pré-processamento dos sinais, e análise estatística.

## 2.4. EEG acquisition and pre-processing

Continuous EEG was recorded from 64 surface active electrodes using the actiCHamp system (Brain Products, GmbH) placed using the international 10–20 system. Data were measured with respect to an online vertex reference, with the sampling rate of 500 Hz. Electrode impedances were kept below 10 k $\Omega$ . Data was analysed with Brain Vision Analyzer 2.0. Data was band pass filtered at 0.1 and 30 Hz with a notch filter at 60 Hz to filter out line noise. Blinks were detected and corrected semi-automatically using the Infomax Restricted independent component analysis (ICA) algorithm. Data were re-referenced to the average of the left and right mastoids and segmented from 200 ms before the stimulus onset to 800 ms after, with baseline correction applied from – 200 ms to 0 ms preceding the onset of the target adjective and noun, respectively. ERPs were time-locked to the onset of the adjective and noun, and data were segmented separately. Artefacts were detected semi-automatically and trials contaminated with artefacts exceeding  $\pm 100$   $\mu$ V due to body movements or peak deflection were rejected. Individual bad channels were replaced by interpolating surrounding channels on a participant-by-participant basis. A total of 5% of the channels were replaced across participants in the experiment. Average trial counts for each condition at the adjective were descriptive: 37.42; expressive: 36.46; pseudoword: 35.79.

Average trial counts for each condition at the noun were descriptive: 36.88; expressive: 36.50; pseudoword: 36.67. Finally, the ERP data were averaged across participants for each condition.

*Cursed Concepts: New insights on combinatorial processing from ERP*

*correlates of swearing in context* Stanley A. Donahoo *a,c*, Valeria Pfeifer *b,c,\**, Vicky Tzuyin Lai *b,c*

EEG data analysis. Initial data analysis was performed with the software package Brain Vision Analyzer (Brain Products GmbH, Germany). EEG was re-referenced off-line to an average of left and right mastoids and bandpass filtered (0.01–30 Hz, 48 dB/octave). The continuously recorded EEG signals were then segmented into time segments of 1350 ms around the onset of each picture, consisting of a 150 ms prestimulus interval and a 1200 ms poststimulus interval in which the response to each picture could be identified. Then all segments were visually inspected for eye movement, muscle, and other artifacts that may have contaminated the true EEG signal, and segments containing artifacts were discarded from further analysis (10.2% of all the segments on average, which is a typical rejection rate for EEG experiments). Next, a baseline correction was performed by subtracting, per segment, the average amplitude in the 150 prestimulus time window from all time points in that segment. This procedure corrects for offset differences between segments that would bias the subsequent averaging across segments. For each participant, the remaining EEG segments were then averaged separately in two categories: pictures presented prior to the TV commercial (Pre) or following the commercial (Post). This resulted in ERPs, at 32 electrode positions, for each picture category and each participant. These participant averages constitute the input for the statistical analyses (see below). Finally, the data were averaged across participants, separately for both the experimental and control groups. These grand averages were used for the graphical representation of the data only.

The statistical significance of the difference in the amplitude of these three ERP components between conditions was evaluated by a cluster-based random permutation approach (Maris and Oostenveld 2007), implemented in the MATLAB toolbox Fieldtrip (Oostenveld et al. 2010).

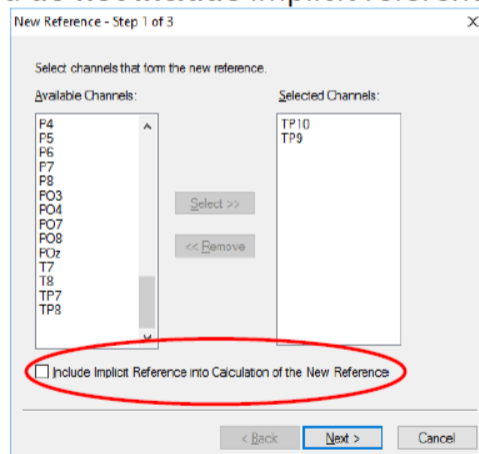
This nonparametric statistical analysis approach is designed for EEG and MEG research, and tests comparisons between 2 conditions, or groups. Crucially, it elegantly handles the multiple comparisons problem (which is substantial for the present data, given that we have 32 EEG channels to compare for each pairwise comparison). It naturally takes care of interactions between conditions and electrodes by identifying clusters of significant differences between conditions or groups in the spatial dimension, and effectively controls the type I error rate for multiple comparisons.

Emotion Measurement in Tourism Destination Marketing: A Comparative Electroencephalographic and Behavioral Study Marcel Bastiaansen<sup>1,2</sup>, Sebastiaan Straatman<sup>3</sup>, Ondrej Mitas<sup>3</sup>, Jeroen Stekelenburg<sup>2</sup>, and Saskia Jansen<sup>4</sup>

Sobre como rereferenciar no préprocessamento dos dados em Analyzer.  
É importante você só fazer isso, depois que terminar todas as operações de substituição e renomeação dos canais.

### 3. Re-Reference

- Click **Channel Preprocessing** and **New Reference**.
  - 1<sup>st</sup> Window - select TP9 and TP10 (left mastoid and right mastoid) and add them to the **Selected Channels** list. The mastoid channels form the new reference. Click **Next**.
  - Note: Ensure that you **do not include** implicit reference's into the new calculation.



- 2<sup>nd</sup> Window – Add all channels to the **Selected Channels** list **EXCEPT** for TP9 and TP10.

New Reference - Step 2 of 3

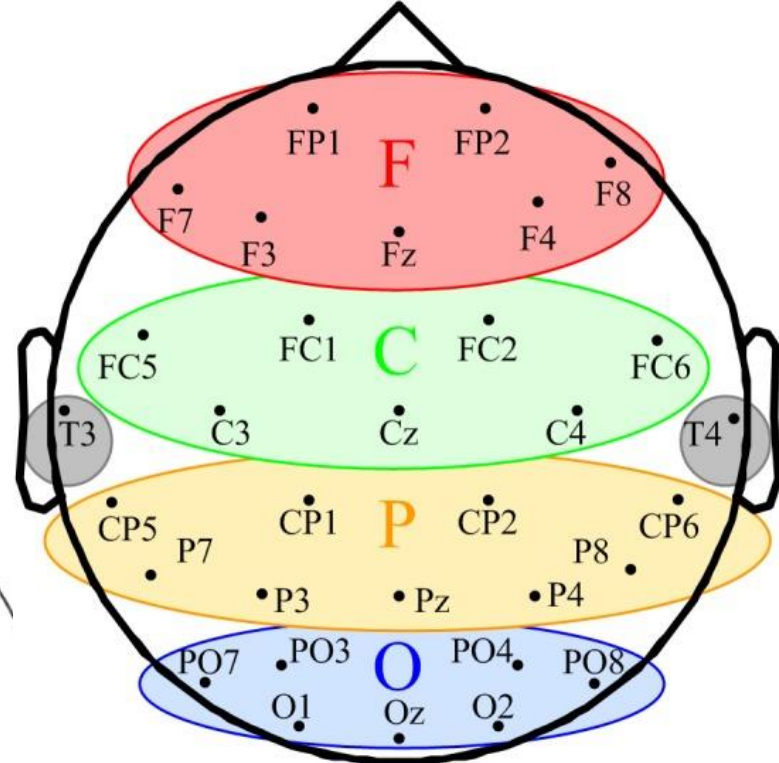
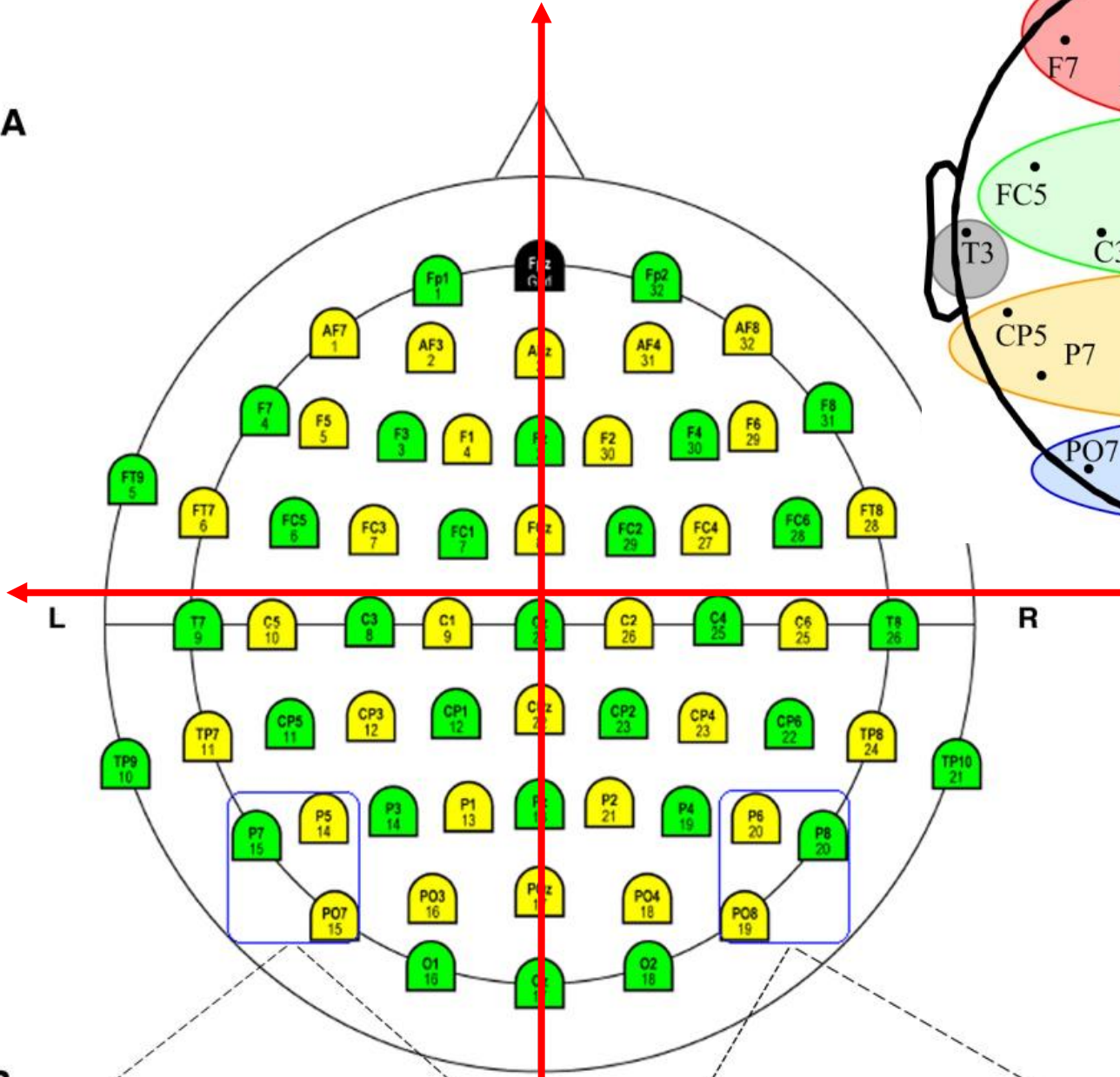
New Reference - Step 3 of 3

Sobre como fazer a rejeição de artefatos em Analyzer -> selecionar que opção?

The screenshot displays the Analyzer software interface for EEG data processing. The main window shows a grid of EEG waveforms for various channels, including Fp1 - Mastoid, Fz - Mastoid, F3 - Mastoid, F7 - Mastoid, FT9 - Mastoid, T7 - Mastoid, Pz - Mastoid, Oz - Mastoid, TP10 - REF, C4 - Mastoid, FC2 - Mastoid, F4 - Mastoid, and Oz - Mastoid. Each waveform has a time axis from -200 to 600 ms. A dialog box titled 'Artifact Rejection' is open in the center, with the 'Channels' tab selected. The 'Method' section has three radio buttons: 'Manual Segment Selection', 'Semiautomatic Segment Selection' (which is selected), and 'Automatic Segment Selection'. The 'Mode' section has two checkboxes: 'Individual Channel Mode' and 'Mark bad segments instead of removing them'. At the bottom of the dialog are 'Test Criteria', 'OK', and 'Cancel' buttons. The software's menu bar includes File, Display, Transformations, Add Ins, Export, Macros, Solutions, History Template, and Help. The status bar at the bottom shows 'Standard Montage', '12:26:28.828', 'Seg: 1/22', 'Chan: Pz - Mastoid', and 'INTENSIVAO EEG'. The Windows taskbar at the very bottom shows the search bar with the text 'Digite aqui para pesquisar' and the system clock displaying '22:33 02/06/2022'.

Possibilidades de parâmetros de distribuição na sua análise estatística.

A



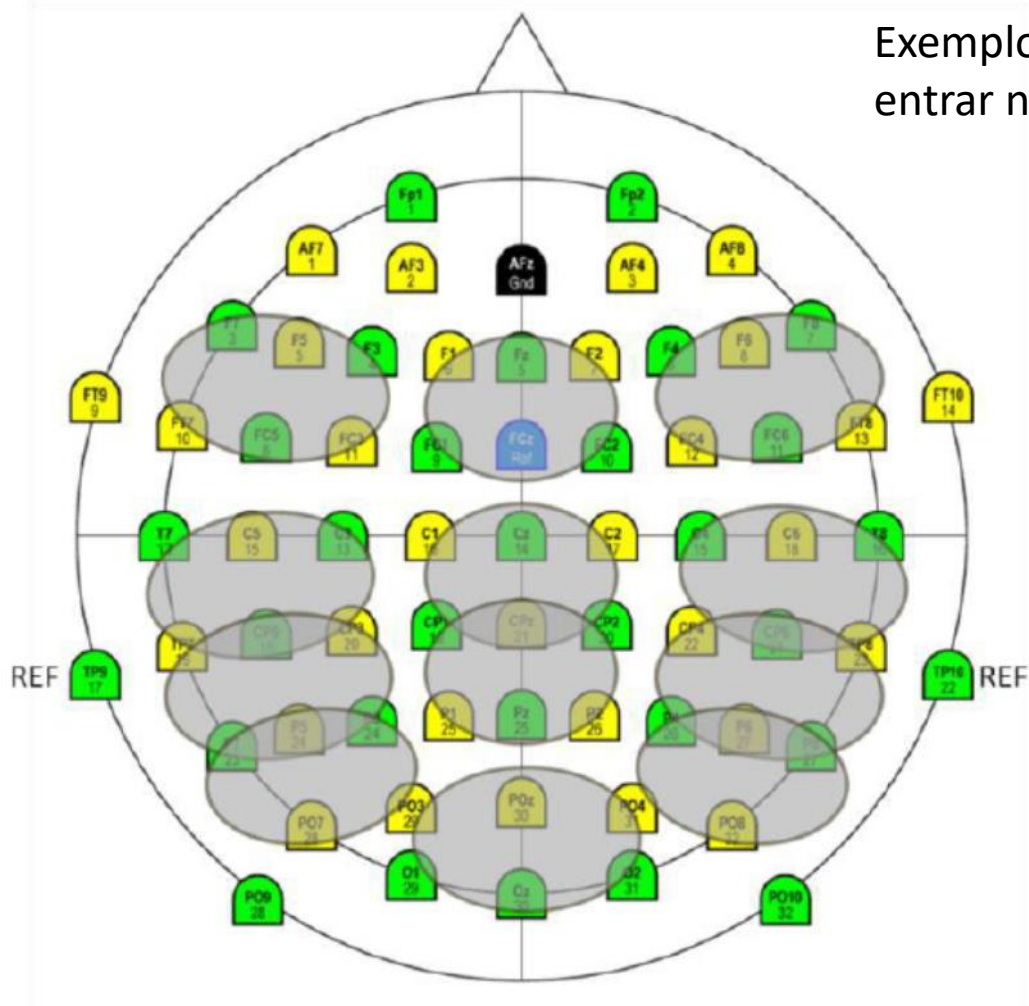
N400 data were analyzed for a centro-parietal region of interest (ROI: CPz, Cz, CP1, CPz, CP2, P1, Pz, P2) within a 300 to 500 ms time window. (HODAPP, BRADOVSKY, 2022)

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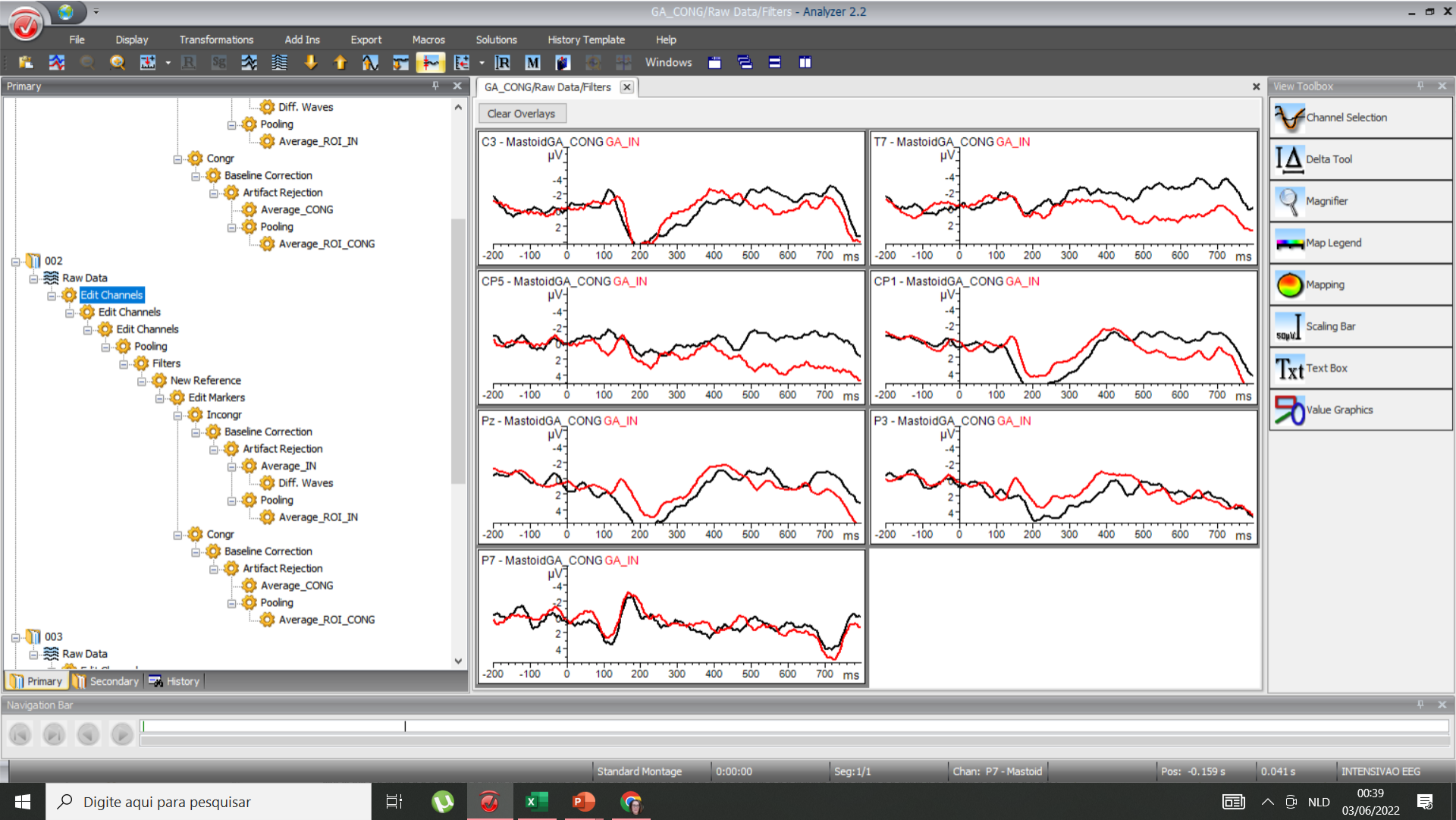


# Área (F,C,P,O) x hemisfério (ESQ, MED, DIR) x condições

Exemplo de como aspectos de distribuição podem entrar na sua análise multivariada



# Exemplo de como usar a função overlay para comparar traçados entre duas condições



Quando você tem discrepâncias nos nomes dos canais, por exemplo, na hora de substituir canais ruins em um sujeito e não em outro, pode haver problema na hora de exportar as suas medidas que você vai usar na análise.

The screenshot displays the EEG Analyzer 2.2 interface. On the left, a 'Primary' panel lists various subject folders, including 'sujeito12\_palavras', 'sujeito12\_sentences', 'sujeito13\_palavras', 'sujeito13\_sentences', 'sujeito14\_palavras', 'sujeito14\_sentences', 'sujeito15\_palavras', 'sujeito15\_sentences', 'sujeito16\_palavras', 'sujeito16\_sentences', 'sujeito17\_palavras', 'sujeito17\_sentences', 'sujeito18\_palavras', 'sujeito18\_sentences', 'sujeito19\_palavras', 'sujeito19\_sentences', 'sujeito20\_palavras', 'sujeito20\_sentences', 'sujeito21\_palavras', 'sujeito21\_sentences', 'sujeito3\_palavras', 'sujeito3\_sentences', 'sujeito4\_palavras', 'sujeito5\_palavras', 'sujeito5\_sentences', 'sujeito6\_palavras', 'sujeito6\_sentences', 'sujeito7\_palavras', 'sujeito7\_sentences', 'sujeito8\_palavras', 'sujeito8\_sentences', 'sujeito9\_palavras', and 'sujeito9\_sentences'. A central dialog box titled 'Area Information Export - Operation Log' is open, displaying the following text:

```
*** Area Export ***  
Output file: D:\Marije trabalho\backup_HD_parte3\N400_tese_aug_2014_PROCESSAMENTO\Marije EEG\Exp  
Decimal symbol: .  
Area relative to time 0: 300ms - 500ms  
Reference file for channels, length, sampling rate etc.: suj2_sentences  
E R R O R in 'suj11_sentences': data set 'Average FC' not found.  
E R R O R in 'suj19_sentences': data set 'Average FC' not found.  
E R R O R in 'suj8_sentences': data set 'Average FC' not found.  
E R R O R in 'suj8_sentences': data set 'Average FIC' not found.  
Data has not been rectified.  
Exporting Mean Values  
Fields: <Channel>-<Dataset> (mean value in  $\mu$ V)
```

The dialog box has 'Save Log...' and 'Close' buttons. The software's menu bar includes 'File', 'Display', 'Transformations', 'Add Ins', 'Export', 'Macros', 'Solutions', 'History Template', and 'Help'. The 'View Toolbox' on the right contains icons for 'Channel Selection', 'Delta Tool', 'Magnifier', 'Map Legend', 'Mapping', 'Scaling Bar', 'Text Box', and 'Value Graphics'. The Windows taskbar at the bottom shows the date as 03/06/2022 and the time as 00:50.

# Você pode exportar medidas de amplitude média via a função exportar informações de área

The screenshot displays the 'Area Information Export' dialog box in the BrainVision Analyzer 2.2 software. The dialog is configured as follows:

- Input:**
  - Time Domain (selected), Frequency Domain
  - Area Interval Relative to Time 0: Start [ms]: 300, End [ms]: 500
  - Name(s) of the Involved Data Sets (History Nodes) Separated by Commas: Average ROI FC, Average ROI FIC
  - Primary History Files Only (checked)
  - Use Whole Workspace (unchecked)
  - Select Individual History Files (selected)
  - Selection Filter: \*
  - Refresh button
  - Available Files list: sub1, subj1\_pal, subj2\_palavras, subj2\_sentences, subj4\_sentences, suj\_palavras, suj1\_pal, suj10\_palavras, suj10\_sentences, suj11\_palavras, suj11\_sentences, suj12\_palavras, suj12\_sentences, suj13\_palavras, suj13\_sentences, suj14\_palavras, suj14\_sentences, suj15\_palavras, suj15\_sentences, suj16\_palavras
  - Selected Files list: (empty)
  - Buttons: Add >>, << Remove, Add All >>, << Remove All
- Options:**
  - Overwrite Default Decimal Symbol (.): (checked)
  - Decimal Symbol: .
  - Rectification: Use Voltage (Signed Values) (selected), Use Activity (Unsigned Values, Rectified)
  - Export Type: Mean Activity [ $\mu$ V] (selected), Area [ $\mu$ V \* ms], Area as Raw Sum of Activity Values [ $\mu$ V]
- Output:**
  - Folder: D:\Marije
  - Output File: Area.txt

The background workspace shows a list of subject folders under 'Primary'. A background window displays a red banner with the text '...in, but no live event is coming up?' and '...inar channel and ...binars anytime & for free!'. The Windows taskbar at the bottom shows the system tray with the date 03/06/2022 and time 11:51.