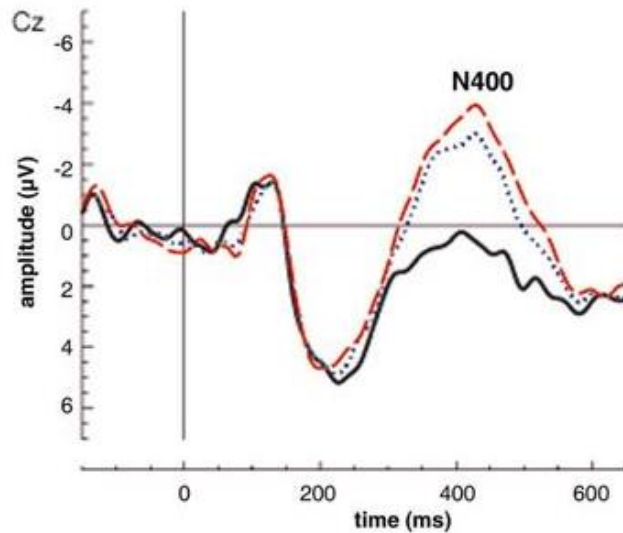


Kutas e Hillyard, 1980

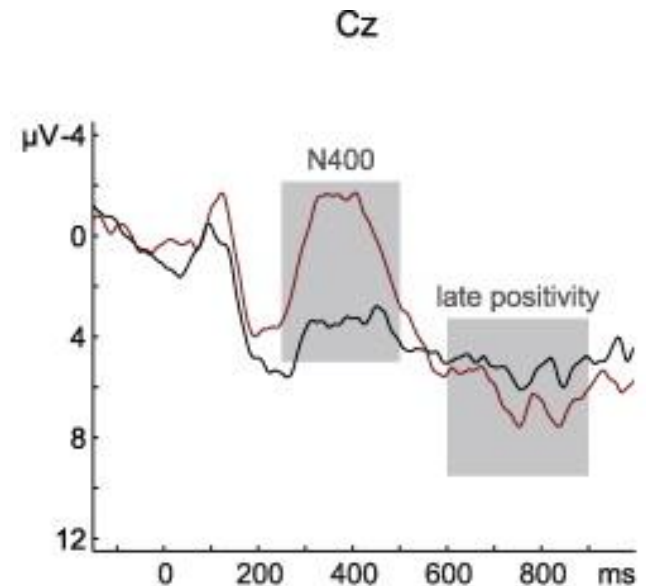
Amplitude mais negativa em relação à condição semanticamente incongruente/inesperada. Componente interpretado como esforço cognitivo de acesso lexical / integração semântica.

(pico maior = esforço cognitivo = dificuldade OU engajamento)

N400 (negativo aos N400)
Mas não precisa ser negativo em termos absolutos
(comparativamente)



-Amplitude MAIOR (em altura visível)
-ou amplitude MAIS NEGATIVO
(relativamente) à outra condição.
-traçado subindo (quando NEG
plotado para cima)



correct: The Dutch trains are yellow and very crowded.
world knowledge violation: The Dutch trains are white and very crowded.
semantic violation: The Dutch trains are sour and very crowded.

Design Experimental básico: violação semântica

(congruente)

Para o natal deste ano, Maria comprou os presentes e decorou **a árvore** com enfeites vermelhos.

alvo de medida

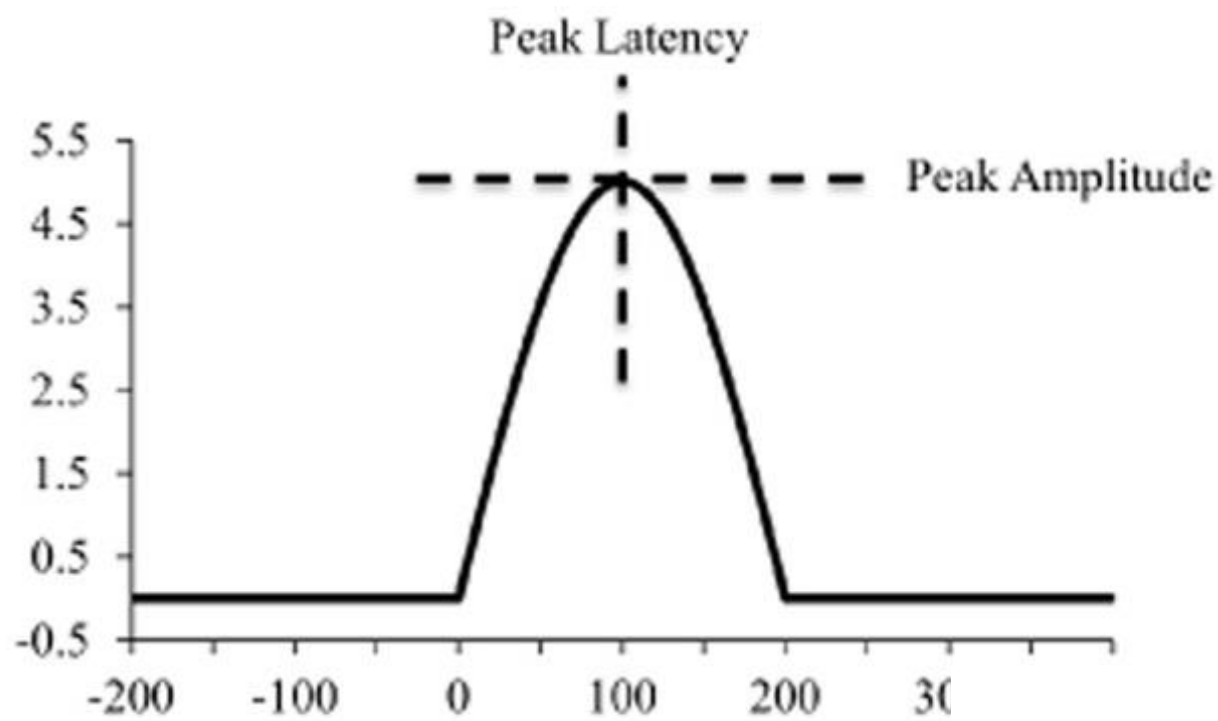
(incongruente)

Para o natal deste ano, Maria comprou os presentes e decorou **a banana** com enfeites vermelhos.

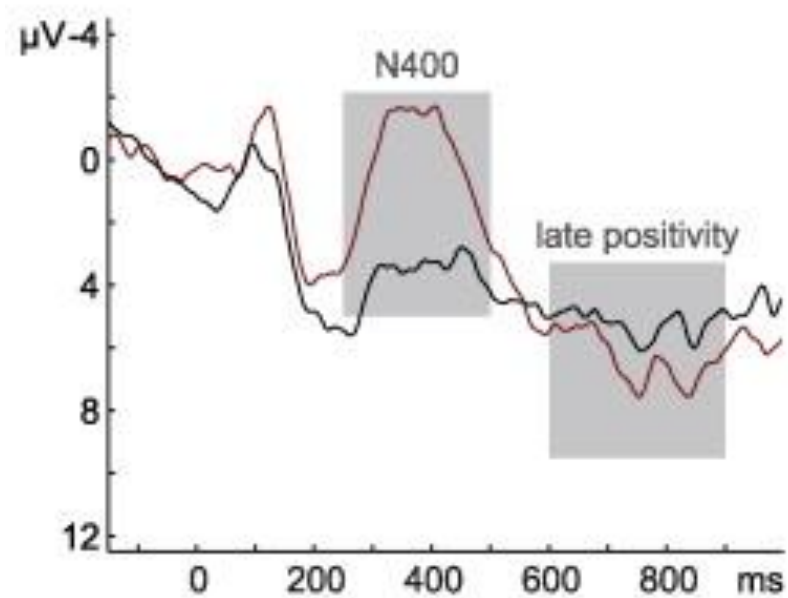
alvo de medida

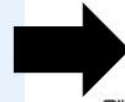
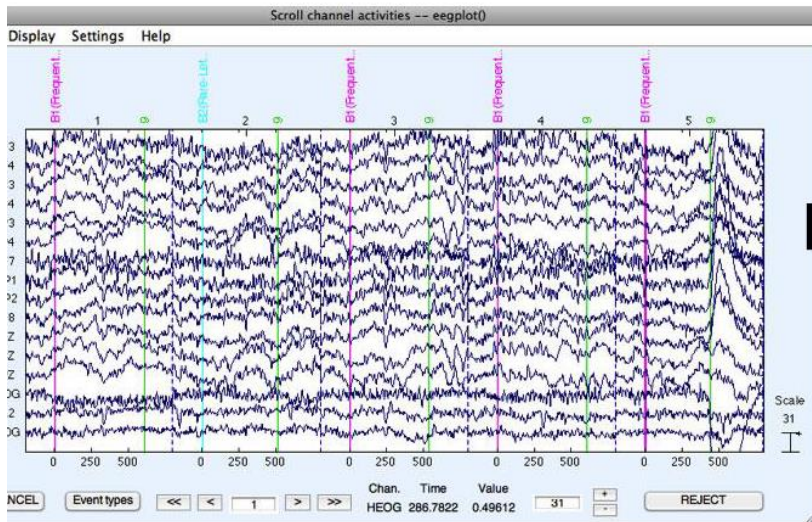
+ distratores, 20 itens cada condição

Controle: posição alvo, repetição de item (quadrado latino), características lexicais (tb cloze), tarefa (% de cada)

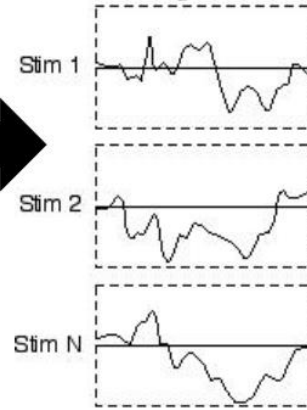


Cz

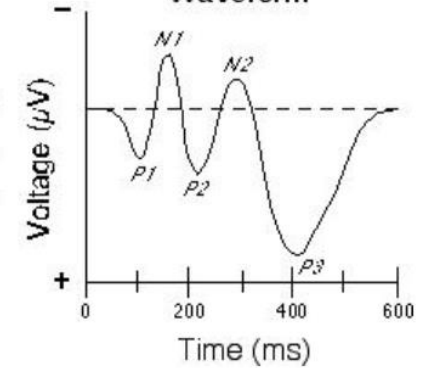




EEG Segments



Averaged ERP Waveform



ERP (Potencial Rel. a Evento)

- Evento (ex. ler uma palavra em uma sentença congruente x incongruente)
- Ruído / Sinal (noise to signal ratio)
- EEG contínuo
 - > segmentos por condição (bin)
 - > média por sujeito por condição
 - > média geral do grupo de participantes (grand average)



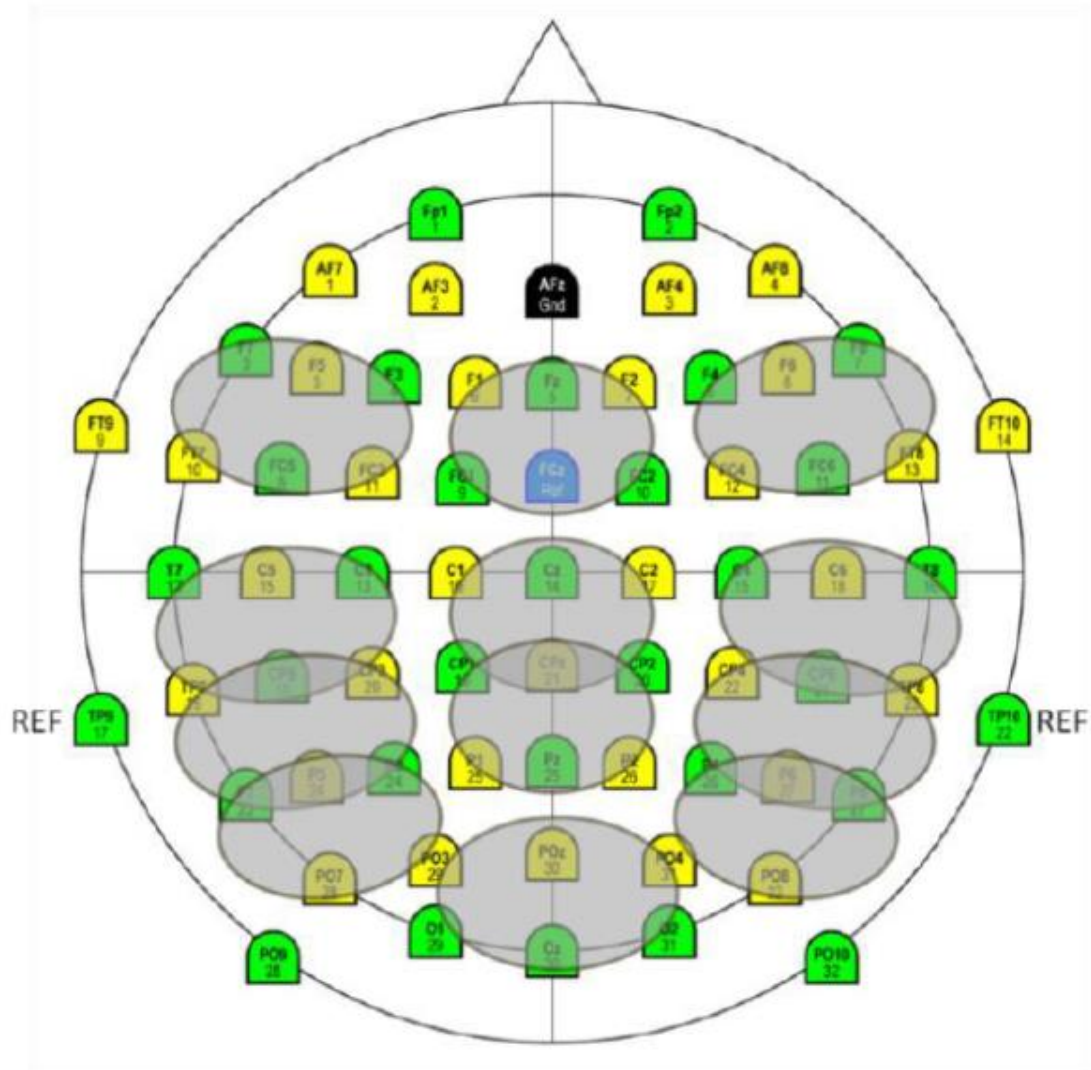


Figure 21: ROI definition as based on anatomical proximity

Ex. da tese, Marije (2014)

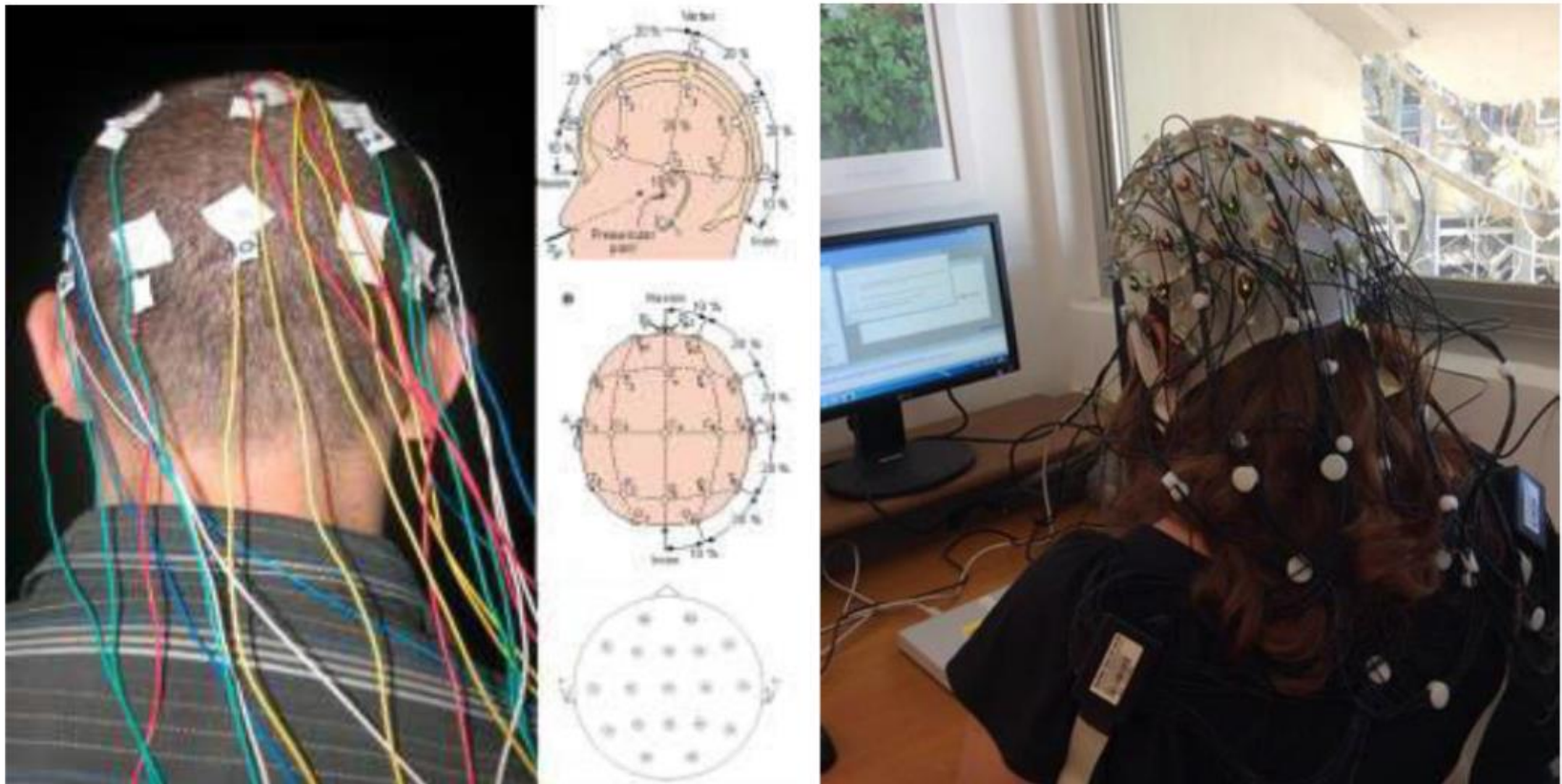
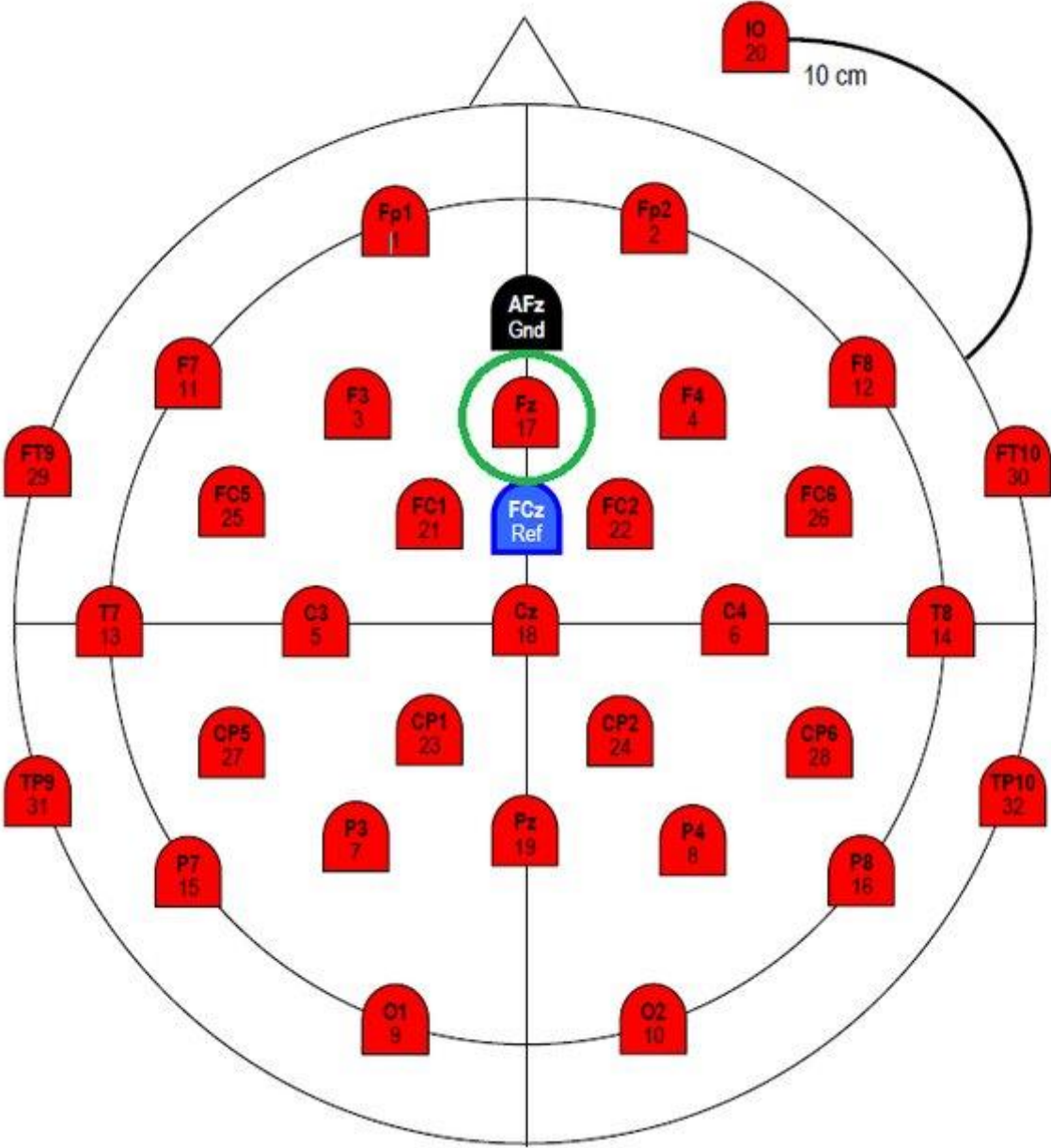


Figure 18: Left: 22 electrodes passive electrodes (EMSA), right: 64 active electrodes (BrainProducts: actiCap)

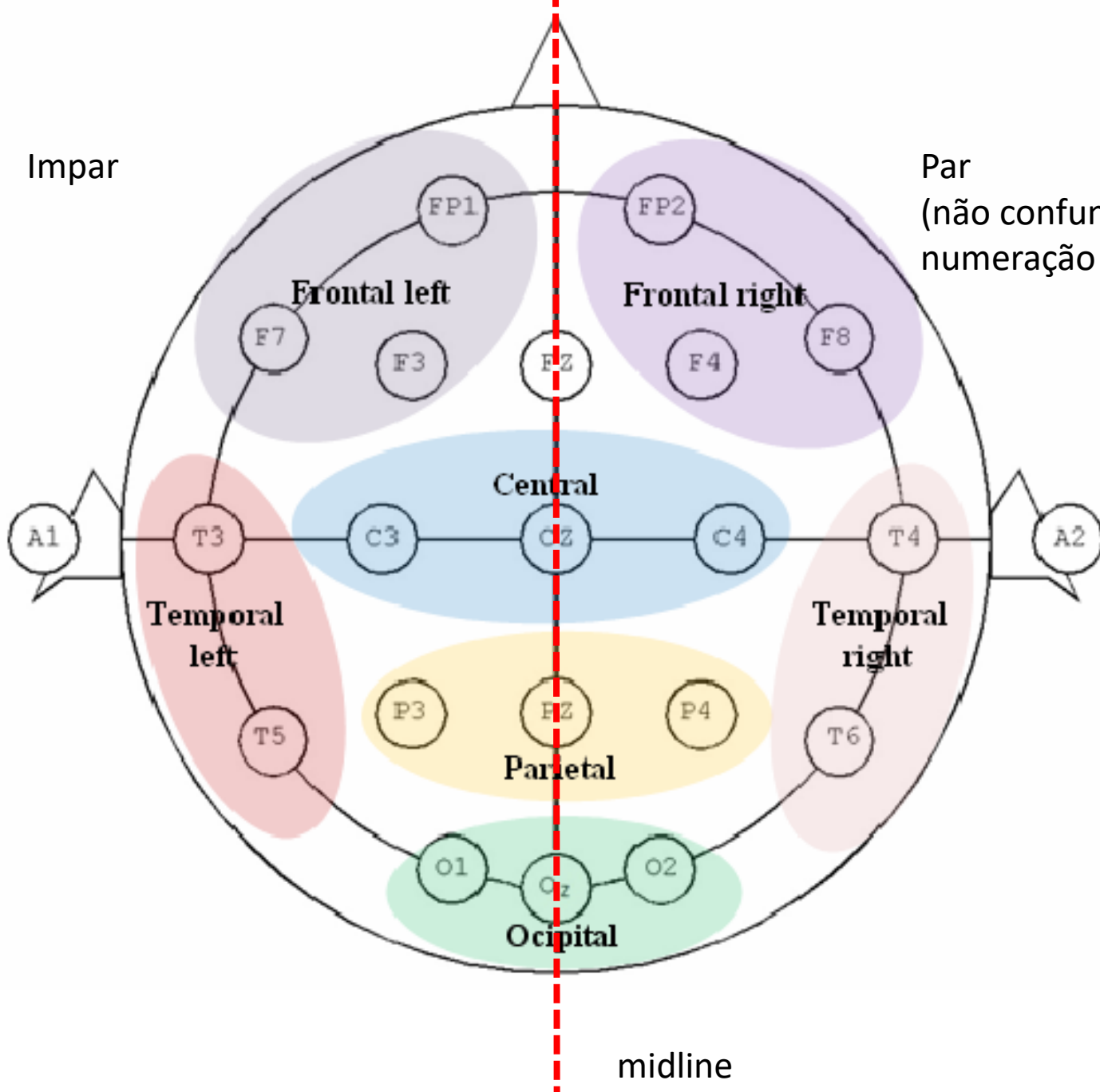
32 eletrôdos



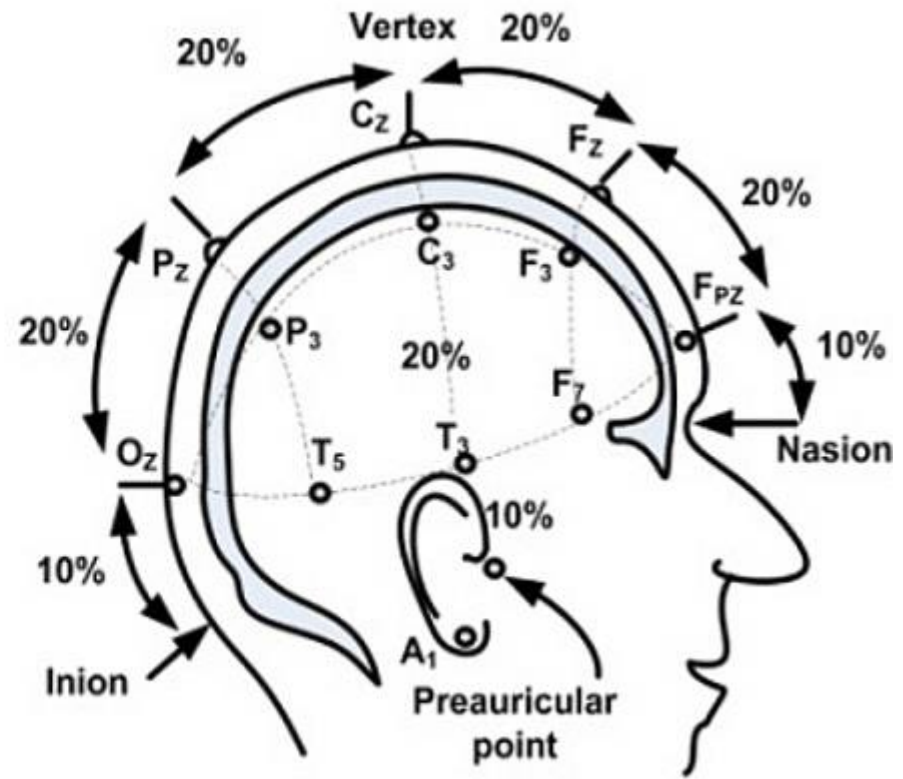
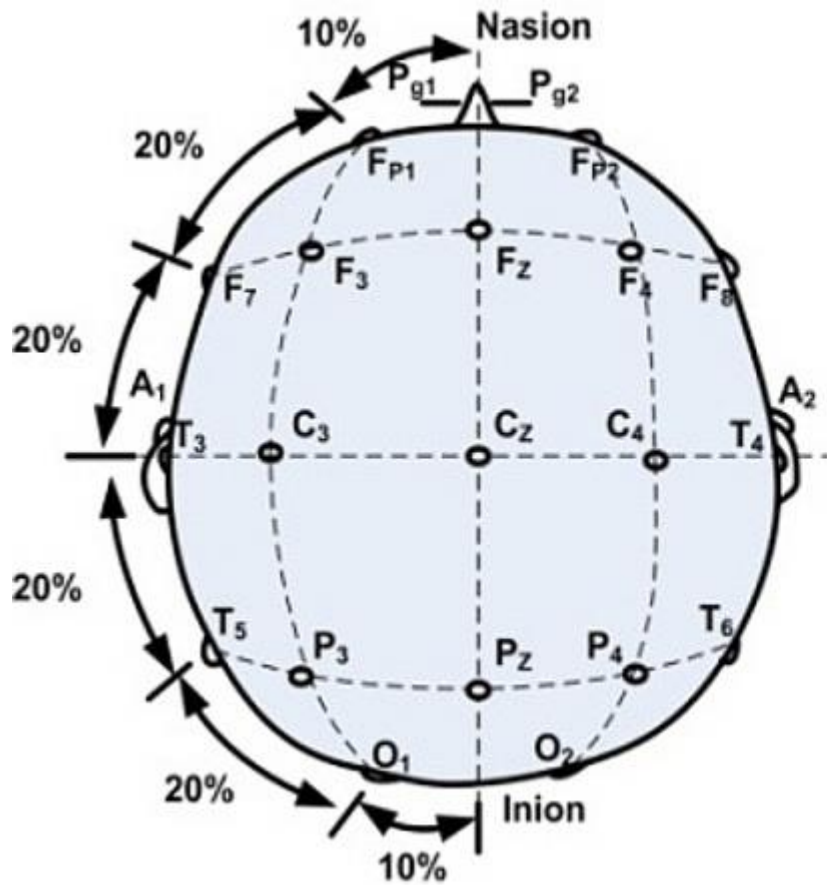
Impar

Par

(não confundir com a numeração do Actichamp)

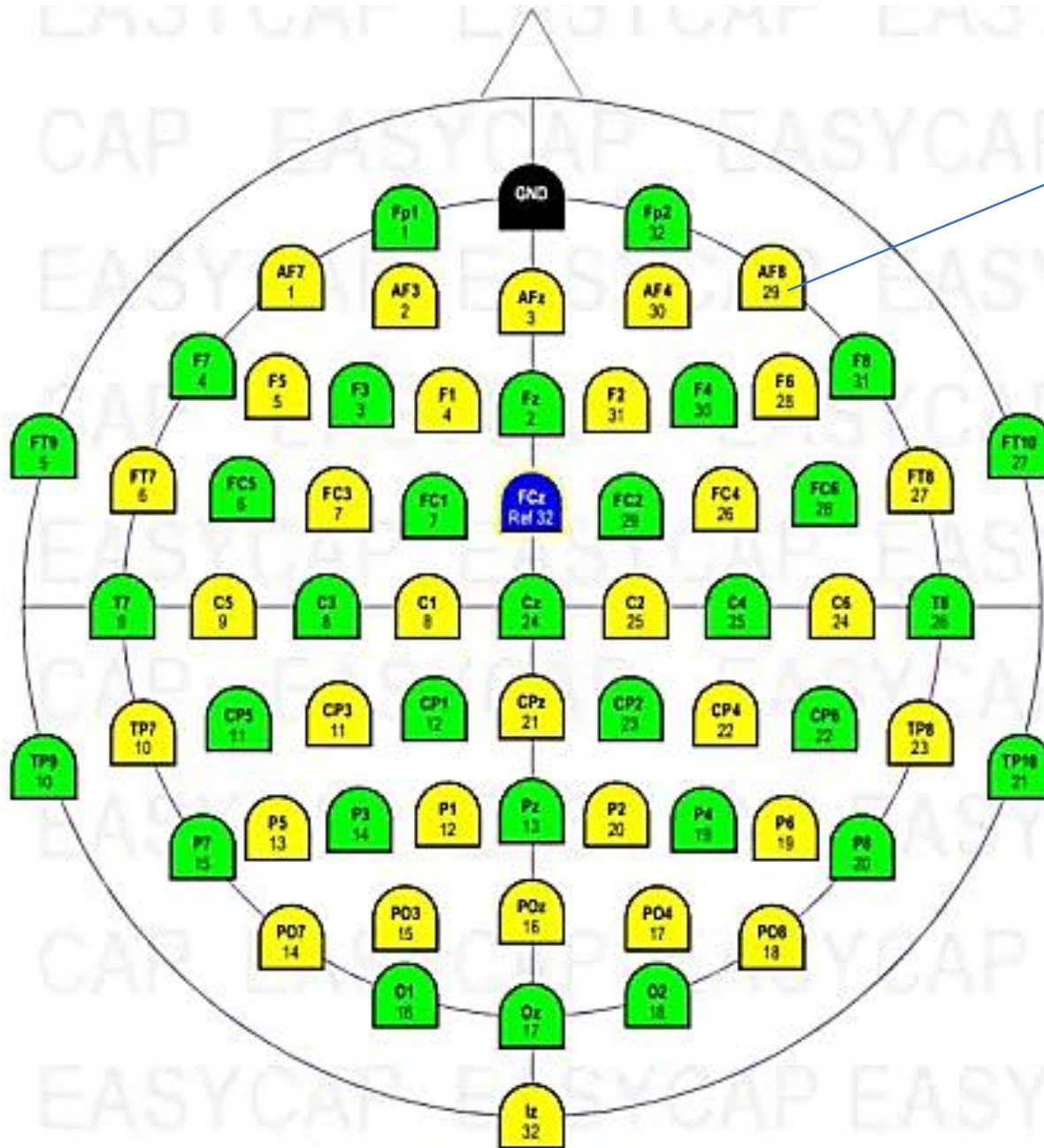


midline



Montagem 10-20:

“For a 64 electrode set up, a 10-10 system can be used that is based on the 10-20 system. The latter was initially developed by Jasper (JASPER, 1958), and it describes the positioning and naming of electrodes in a system where electrodes are placed at 10 or 20% intervals along latitude and longitude lines running over the skull (in this case, all electrodes are placed at 10% intervals). The ‘equators’ (the middle longitudinal and latitudinal lines) go from the nasion (between eyes, top of the nose) to the inion (bone felt at the back of the head), and from the left pre-auricular point to the right pre-auricular point. Along parallel running longitudinal and latitudinal lines, the distances between one extreme point to another are divided into 10 and 20% intervals along which electrodes are placed.” (SOTO, 2014)



Esses números não são referências 'anatômicas'.

Electricity is like a water hose

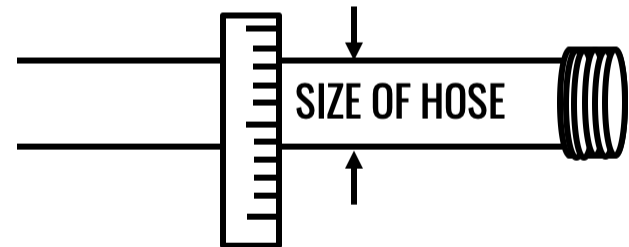
Voltage

Volts (V)



Current

Amps (A or I)



Resistance

Ohms (R or Ω)



(impedância)

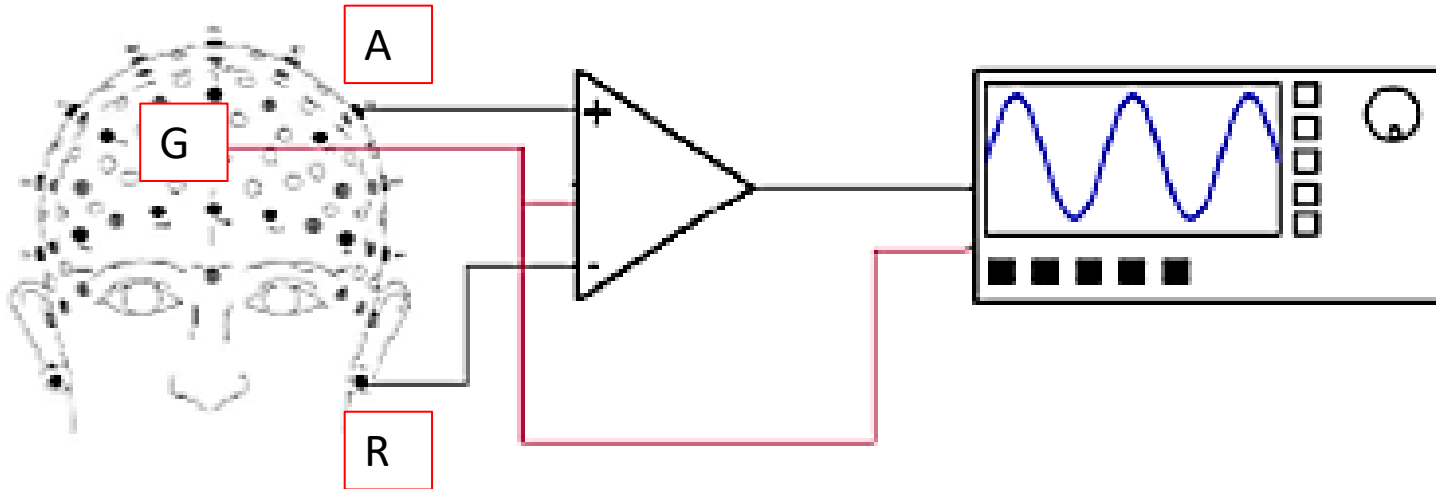
Voltage can be thought of as the potential for current to move from one place to another, and as a result there is really no such thing as a voltage at a single point.

(Ex.) The voltage measurement of twelve volts represents the potential for current to move from the positive terminal to the negative terminal, and it doesn't make sense to talk about the voltage at one terminal in isolation. For example, you could touch one terminal without being shocked (assuming you weren't touching any other conductors), but if you touch both terminals you will definitely receive a shock. Similarly, you can never record the voltage at a single scalp electrode. Rather, the EEG is always recorded as a potential for current to pass between two electrodes. (LUCK, 2002)

In household electrical systems, a metal stake driven deep into the ground beneath the house serves as an important reference point for electrical devices. The ground literally provides the reference point, and the term ground is now used metaphorically in electrical engineering to refer to a common reference point for all voltages in a system.



To solve the problem of the ground circuit picking up noise, EEG amplification systems use differential amplifiers. A differential amplifier uses three electrodes to record activity: an active electrode (A) placed at the desired site, a reference electrode (R) placed elsewhere on the scalp, and a ground electrode (G) placed at some convenient location on the subject's head or body. The differential amplifier then amplifies the difference between the AG voltage and the RG voltage (AG minus RG). Ambient electrical activity picked up by the amplifier's ground circuit will be the same for the AG and RG voltages and will therefore be eliminated by the subtraction.



AG - voltagem de ativação de interesse + ativação 'base' + ruído de ambiente

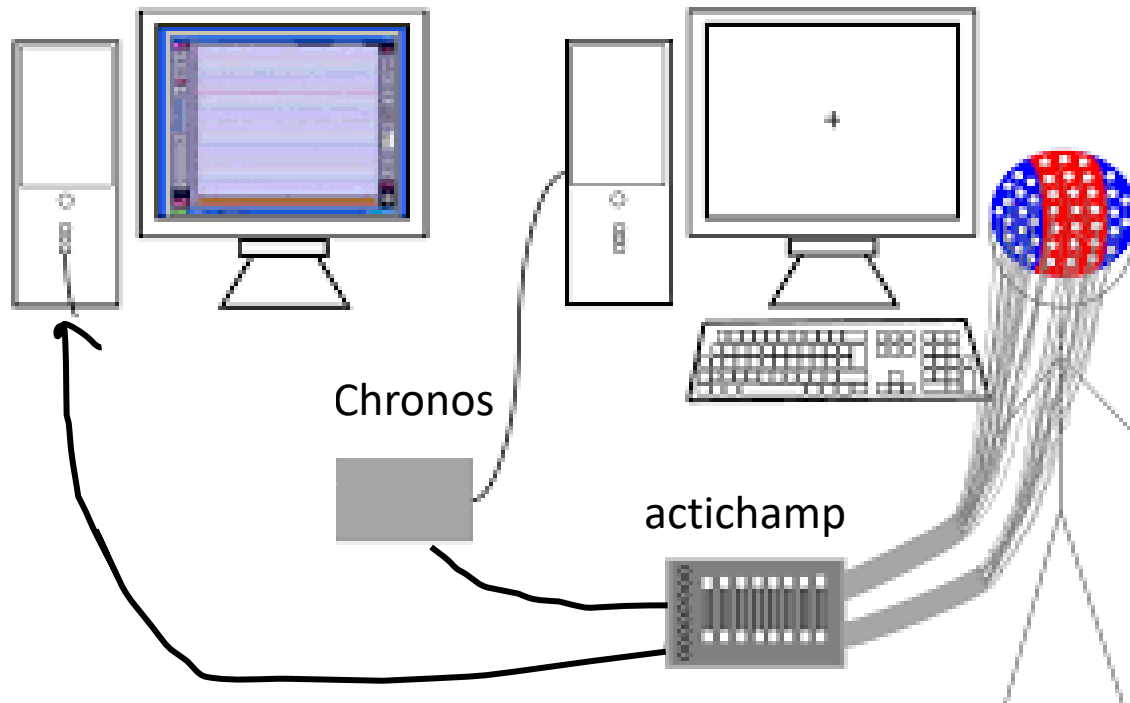
RG - ativação 'base' + ruído de ambiente

Diferença: voltagem de ativação de interesse -> é ampliado!

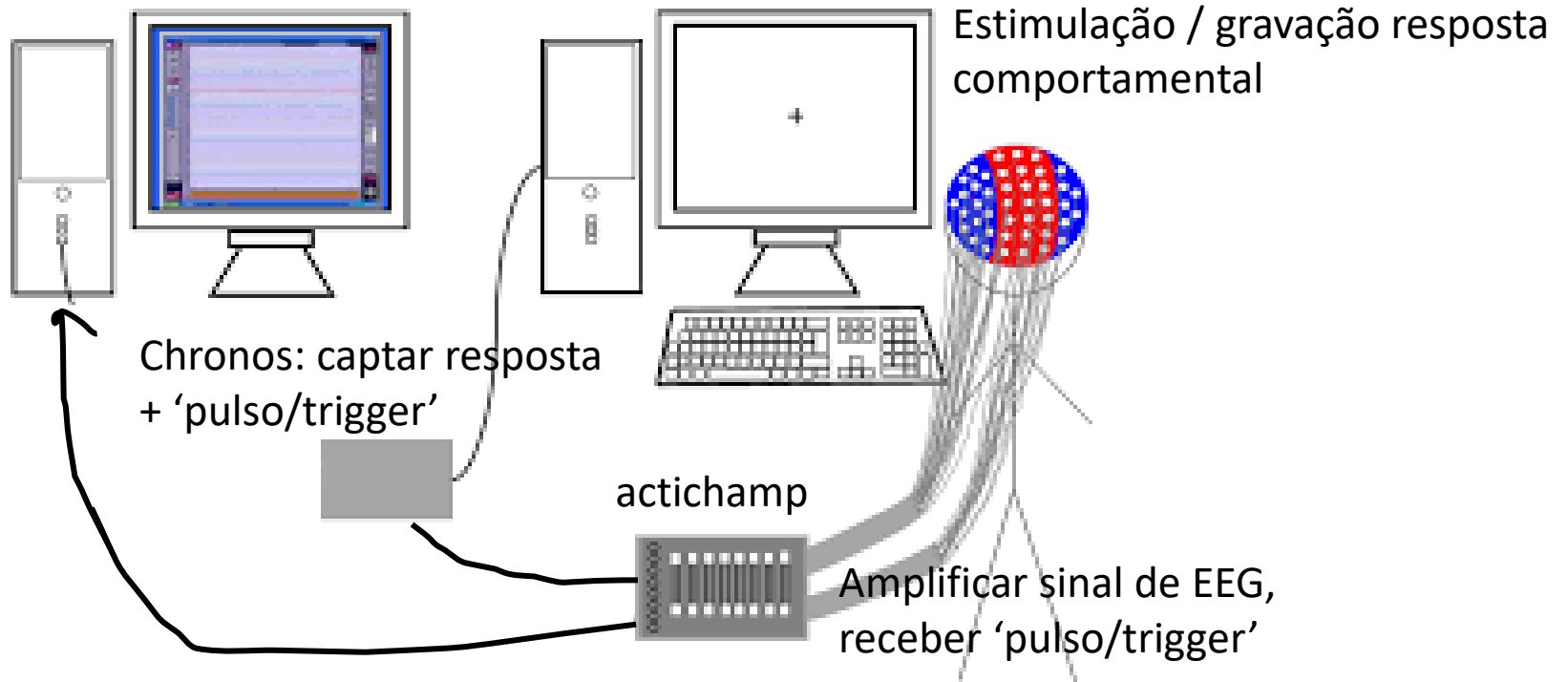


Set up/configuração:

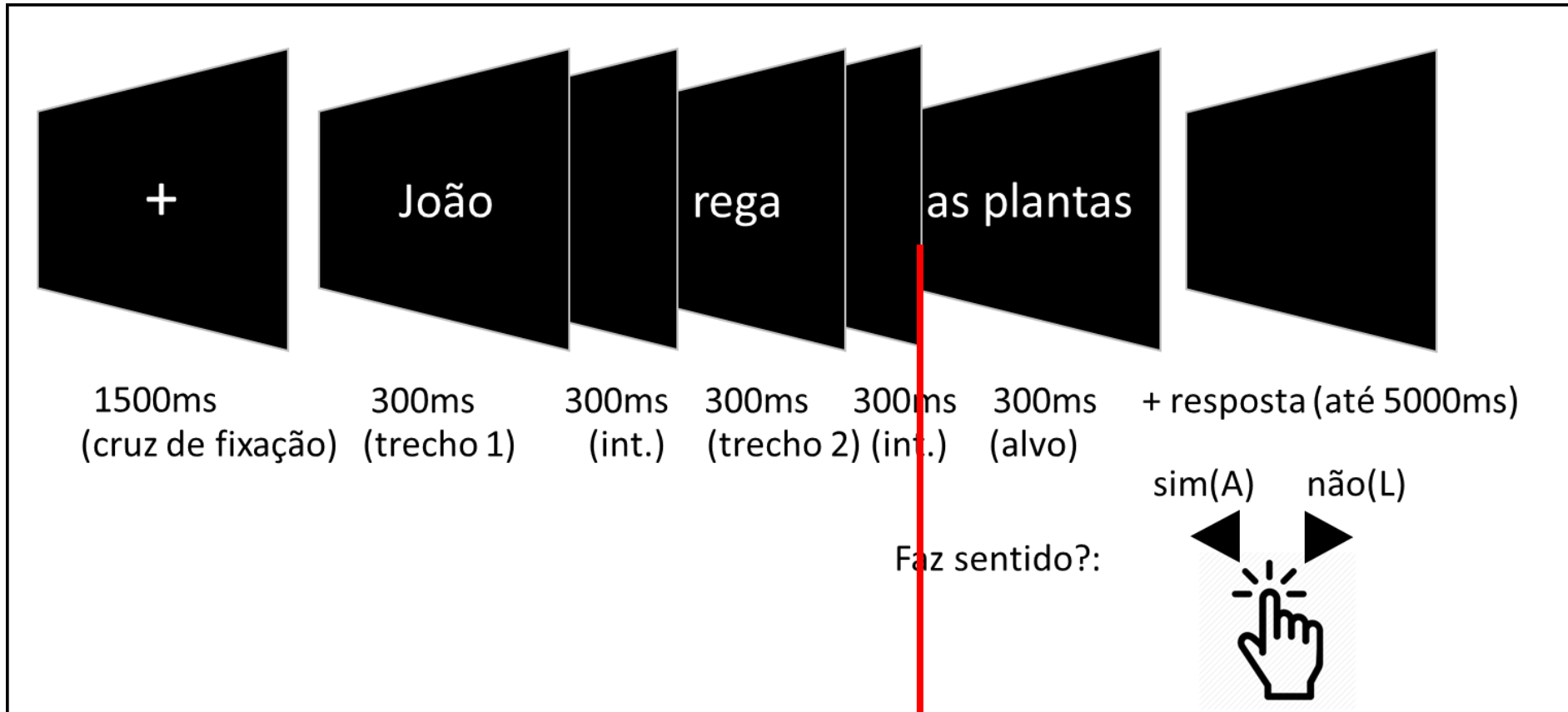
- Apresentação de estímulos e tarefa
- Coleta de resposta da tarefa
- Coleta de sinais neurofisiológicos
- Amplificação e digitalização dos sinais
- Gravação dos sinais
- Sincronização entre estímulos / sinal



Gravação sinal de EEG 'pulso/trigger'



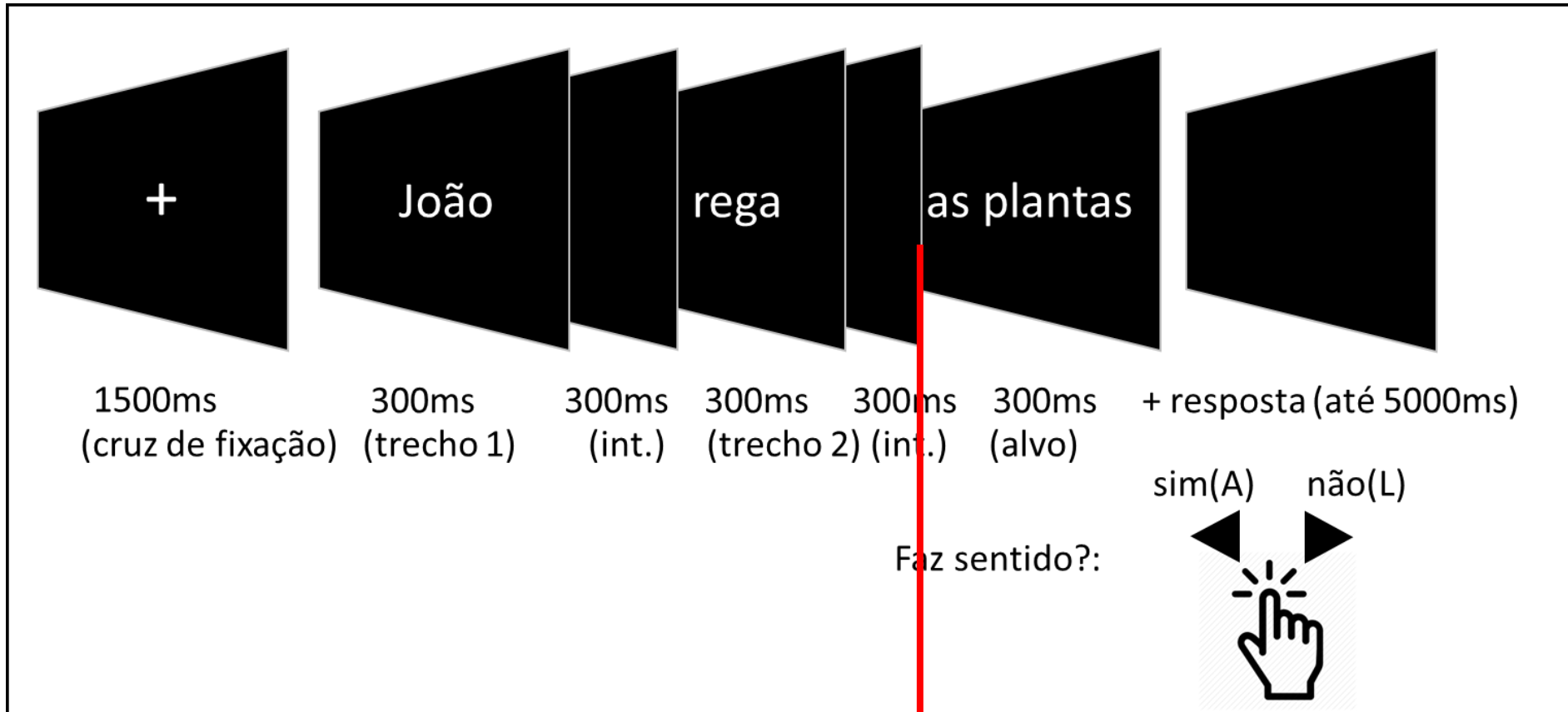
O que é um 'pulso/trigger'?



Trigger (desencadear) um evento

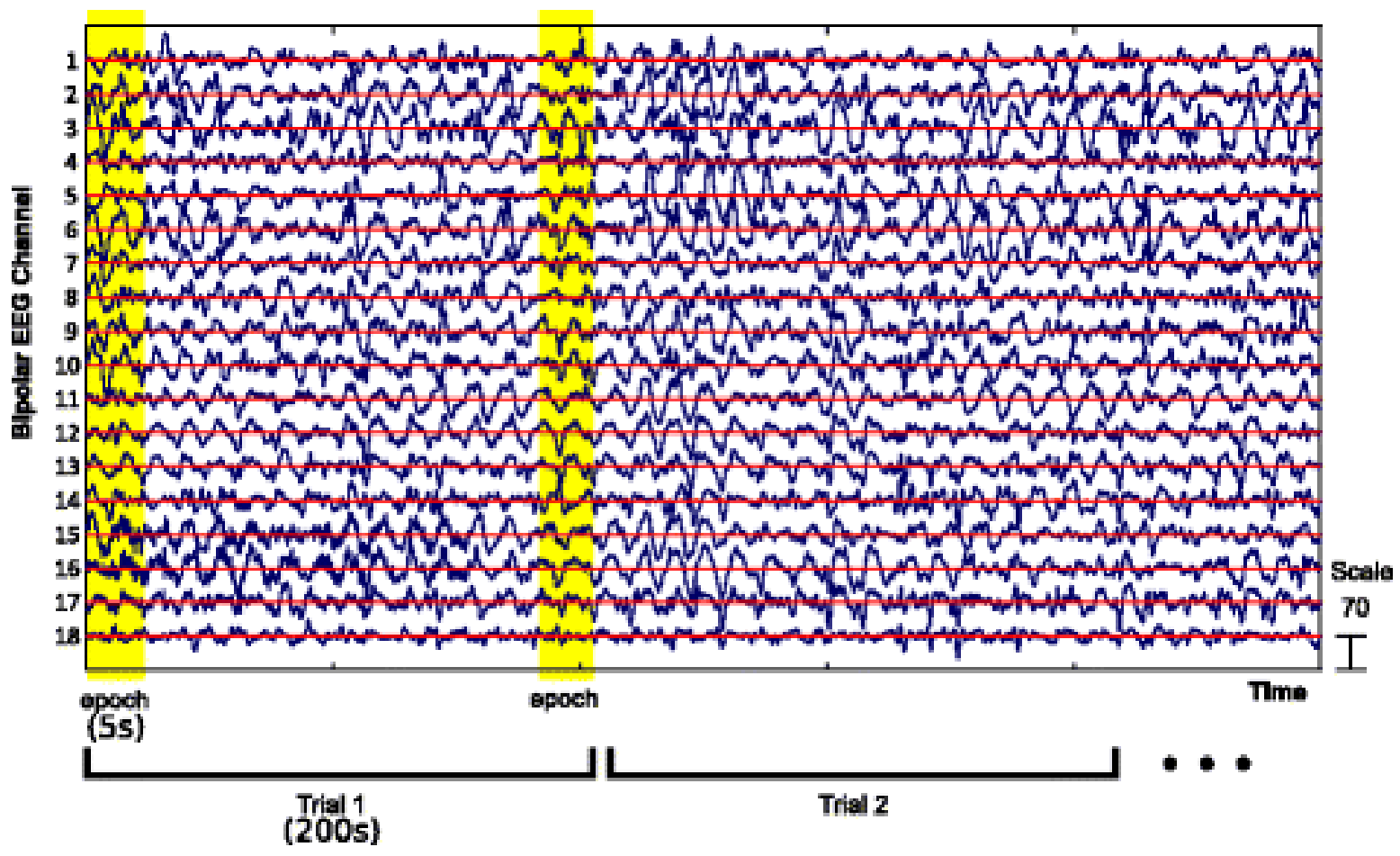
No início (onset) da palavra alvo, desencadeie um evento: mandar um pulso elétrico para o amplificador de EEG (fica gravado como marcador (marker) de estímulo no sinal de EEG)

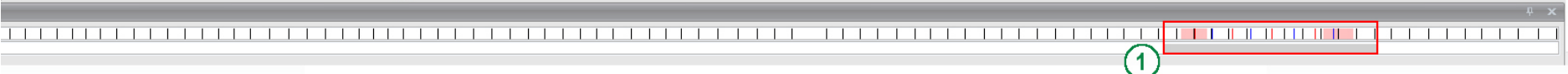
O que é um 'pulso/trigger'?



Trigger (desencadear) um evento

Importante: o momento deste trigger, e que informação ele veicula (ex. S= apresentação de estímulo ou R=resposta, que condição? Etc.)





Programação de apresentação de estímulos + triggers + gravação da resposta comportamental (RT, acurácia, etc).



The screenshot shows the E-Studio software interface. The main window displays a summary of the experiment setup, including a table of trial parameters. A dialog box titled "List E-Object" is open, asking "Are you sure you want to remove the selected Levels?". The dialog has two buttons: "是(Y)" (Yes) and "否(N)" (No).

Summary

4 Samples (1 cycle x 4 samples/cycle)
1 Cycle equals 4 samples
Random Selection (No Repeat After Reset)

ID	Weight	Procedure	Nested	Stimulus	CorrectAnswer
1		2 TrialProc		X	1
2		2 TrialProc		Y	2
3					
4					

List E-Object

Are you sure you want to remove the selected Levels?

是(Y) 否(N)

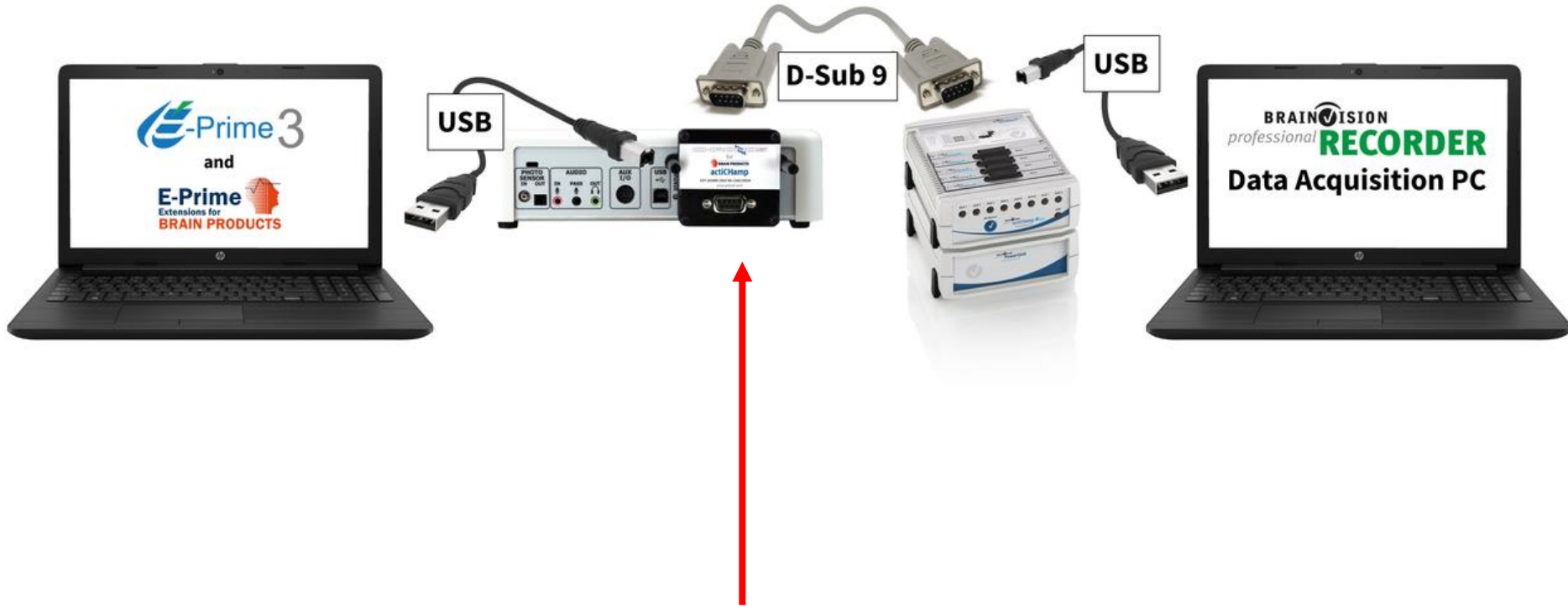
Chavinha!

Chronos: buttonbox

Coleta de resposta (aperto de botão)



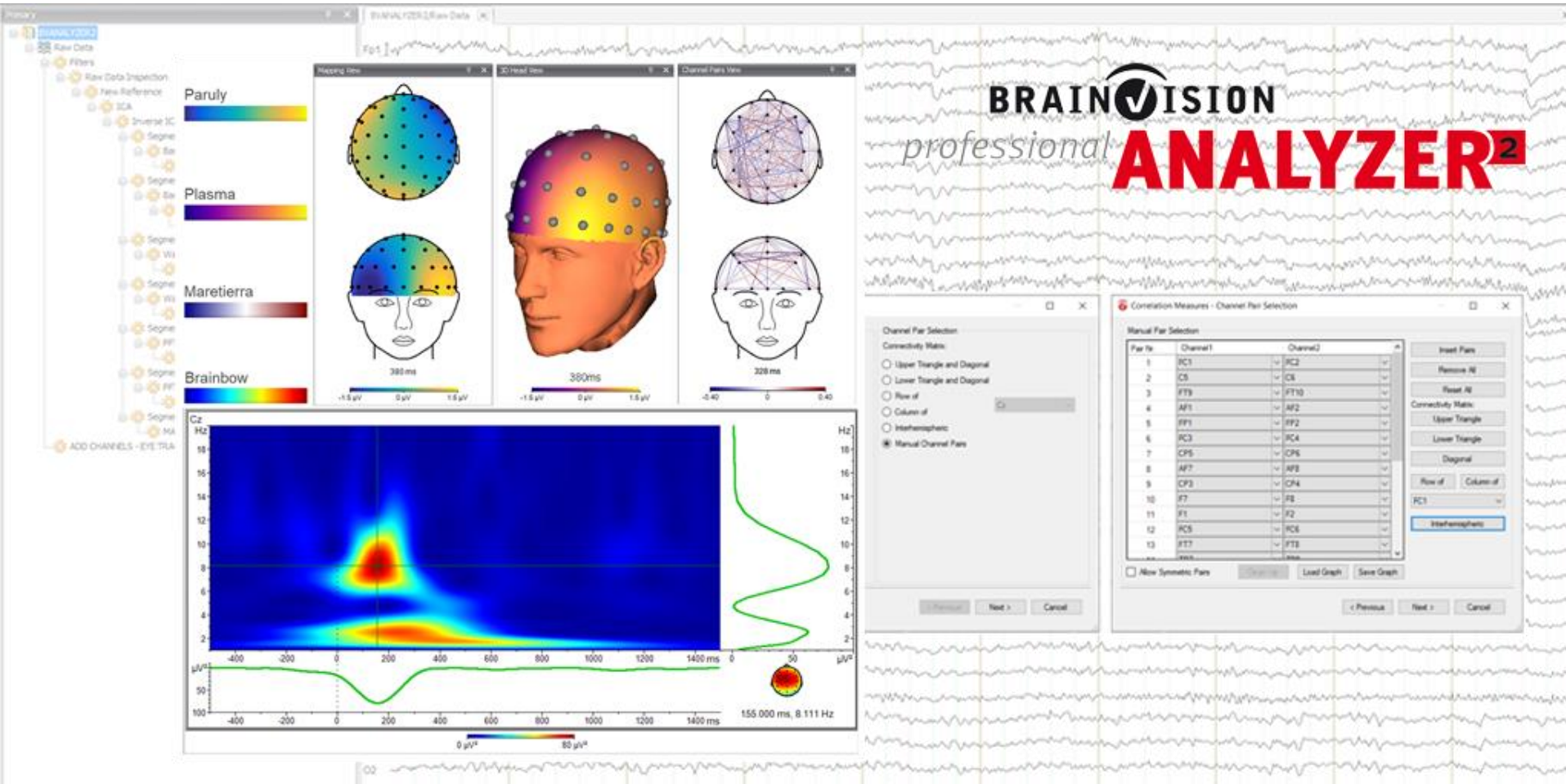
Chronos: buttonbox
Coleta de resposta (aperto de botão)



Adaptador para Actichamp:
Envio de 'trigger/pulso'

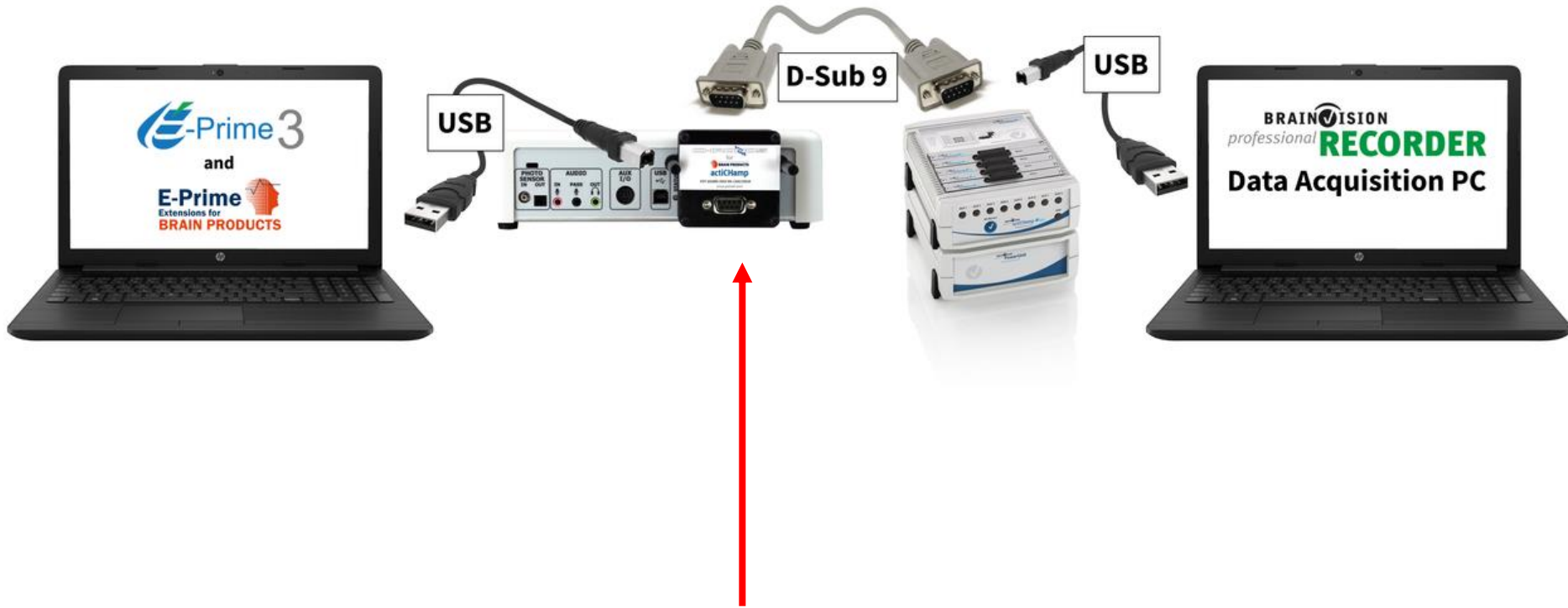


Pycorder, open source
Interface amplificador e computador
Gravação sinal



Programa de análise de sinal (chavinha!)

Vamos conectar!



Adaptador para Actichamp:
Envío de 'trigger/pulso'

E-prime:

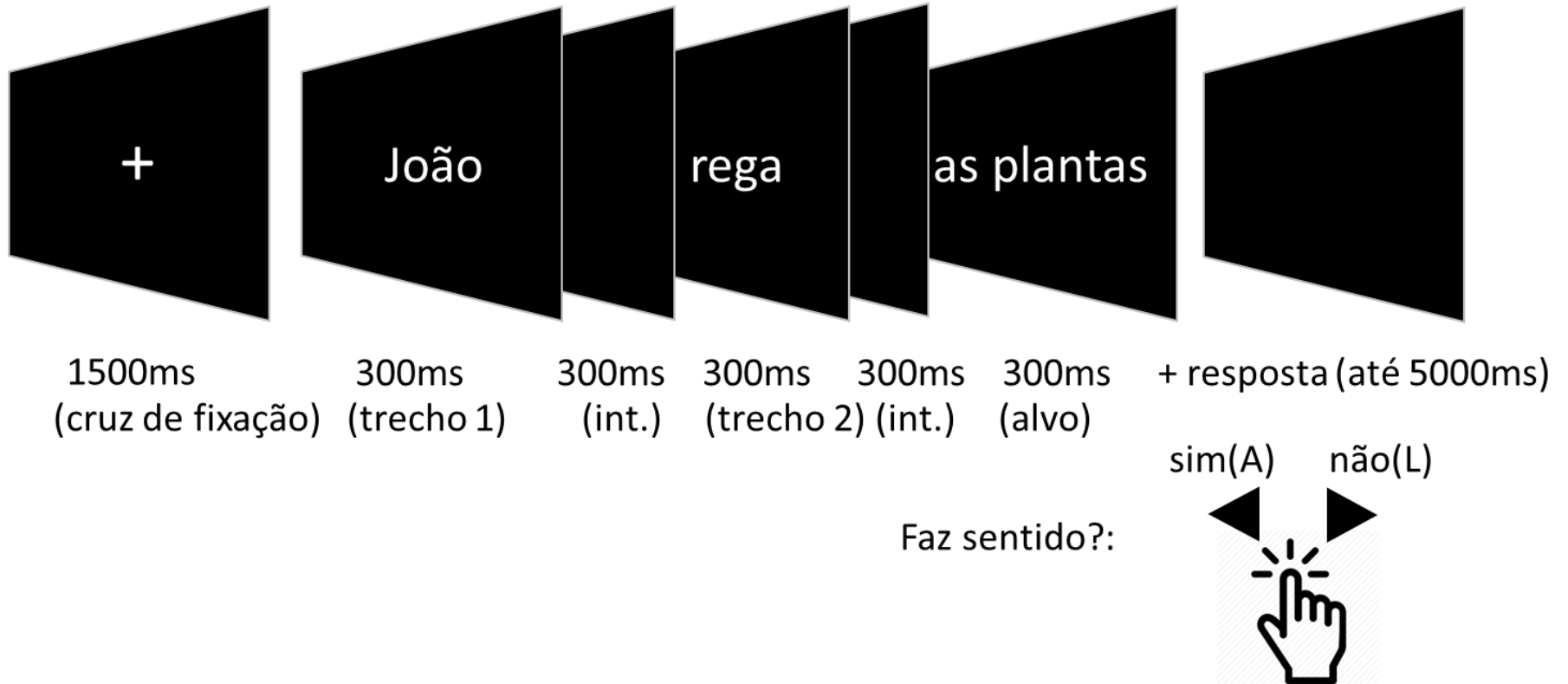
Vamos desenhar nosso plano de apresentação de estímulo (quadro branco)

- Que elementos/procedimentos (explicação, treino, etc.)?
- Quantos blocos?
- Como é o trial? Que componentes são constantes e quais são variáveis ([var])?
- Que tipo de resposta é requerido do participante?
- Tempos de apresentação (próximo slide)

E-prime:

Protocolo de apresentação de estímulo (do trial):

- Como fazer a segmentação? (por palavra, por sintagma, outra lógica)
- Tempo de segmento, de intervalo, do início (cruz), do time-out (resposta)
- Geralmente formato é rapid serial visual presentation (RSVP)
- Mostrar excel



E-prime:

Lista de estímulos

Explicar estrutura do programa

Tarefa:

- Usando o exemplo, construir um programa do zero.
- Escrever telas
- Descrever protocolo de apresentação