



PRESTIMULUS ALPHA FREQUENCY PREDICTS THE LATENCY OF VISUAL EVOKED P1 COMPONENT

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1. INTRODUCTION

OSCILLATORY MODEL:
EVOKED RESPONSE IS GENERATED FROM A REORGANIZATION OF ONGOING OSCILLATIONS

EVIDENCE IN FAVOR:

- Functional similarities between P1 evoked component and alpha activity
- Alpha phase-locking is strongest during P1 time window
- P1 acts as a traveling alpha wave

(Barry et al., 2000; Klimesch et al., 2004; 2007a; Gruber et al., 2005)

EVIDENCE AGAINST:

- Methodological difficulties in dissociating evoked and oscillatory model
- Phase-reset of alpha activity does not generate visual ERPs
- Contrasting results regarding the relationship between alpha amplitude and the magnitude of P1

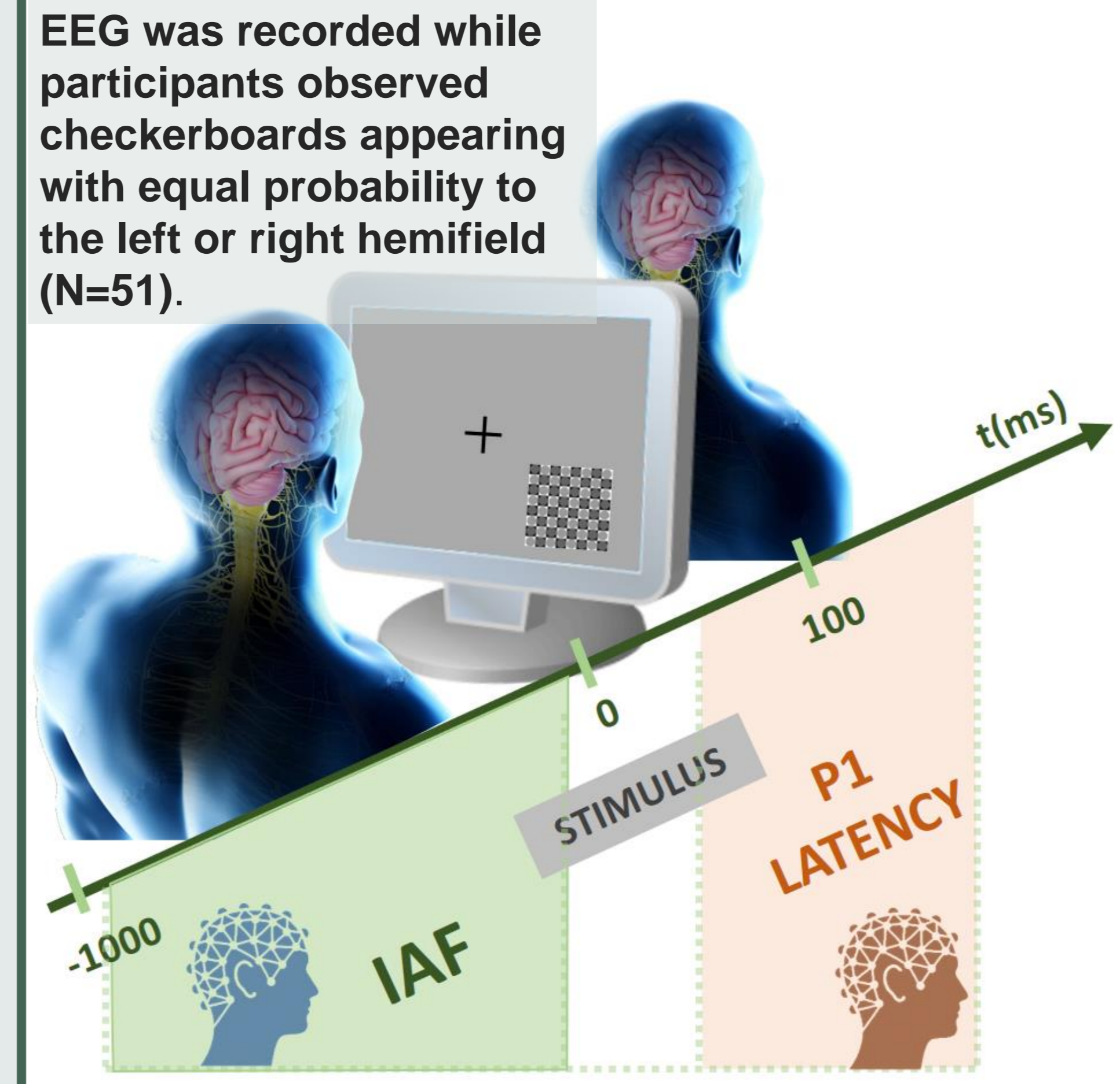
(Klimesch et al., 2007b; Mazaheri & Jensen, 2006)

2. OBJECTIVES

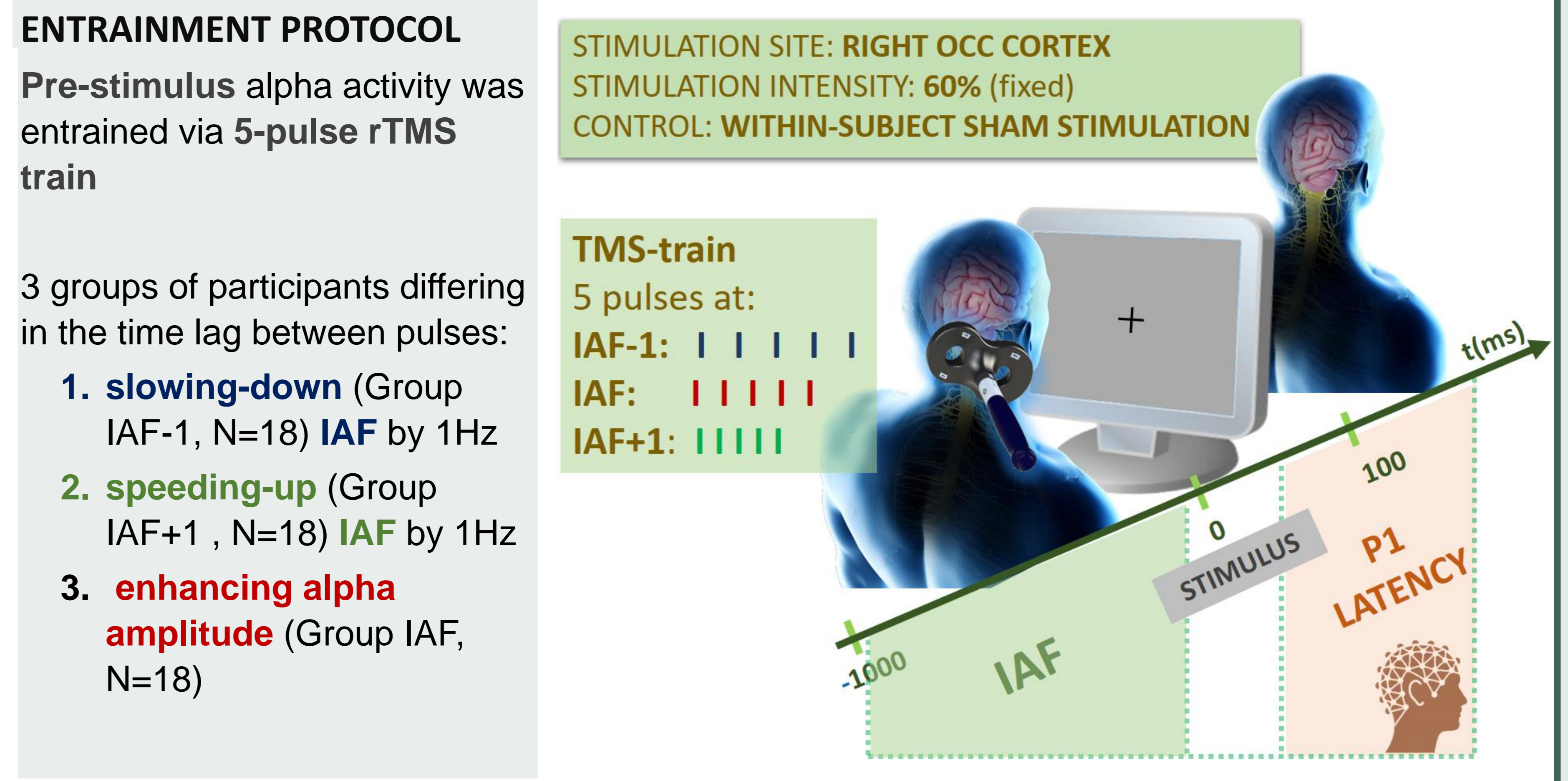
1. CONFIRM OSCILLATORY MODEL BY EXAMINING THE RELATIONSHIP BETWEEN :
 - INDIVIDUAL ALPHA FREQUENCY (IAF) INDEX OF SENSORY SAMPLING ABILITIES *(Cecere et al., 2015; Samaha & Postle, 2015)*
 - P1 LATENCY RELEVANT ROLE IN TIMING OF NEURAL ACTIVITY
2. DEMONSTRATE THAT THE CREATION OF P1 DIRECTLY DEPENDS ON IAF MANIPULATE PRE-STIMULUS IAF OF THE PARTICIPANT VIA rTMS AND OBSERVE ELECTROPHYSIOLOGICAL CONSEQUENCES ON P1

3. METHODS

1. EXAMINING THE RELATIONSHIP BETWEEN IAF AND P1



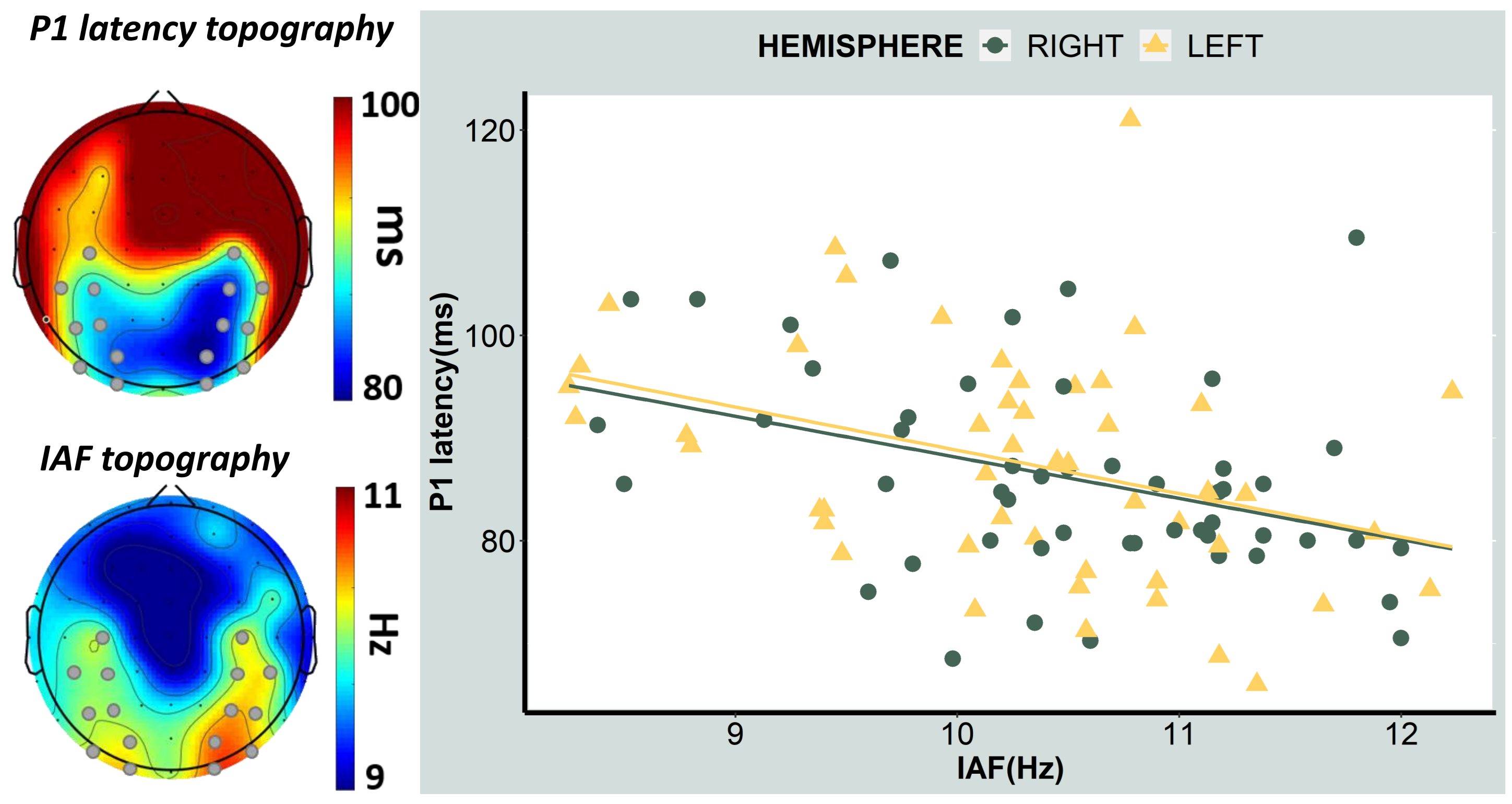
2. DEMONSTRATE THAT THE CREATION OF P1 DEPENDS ON THE IAF



4. RESULTS

1. EXAMINING THE RELATIONSHIP BETWEEN IAF AND P1

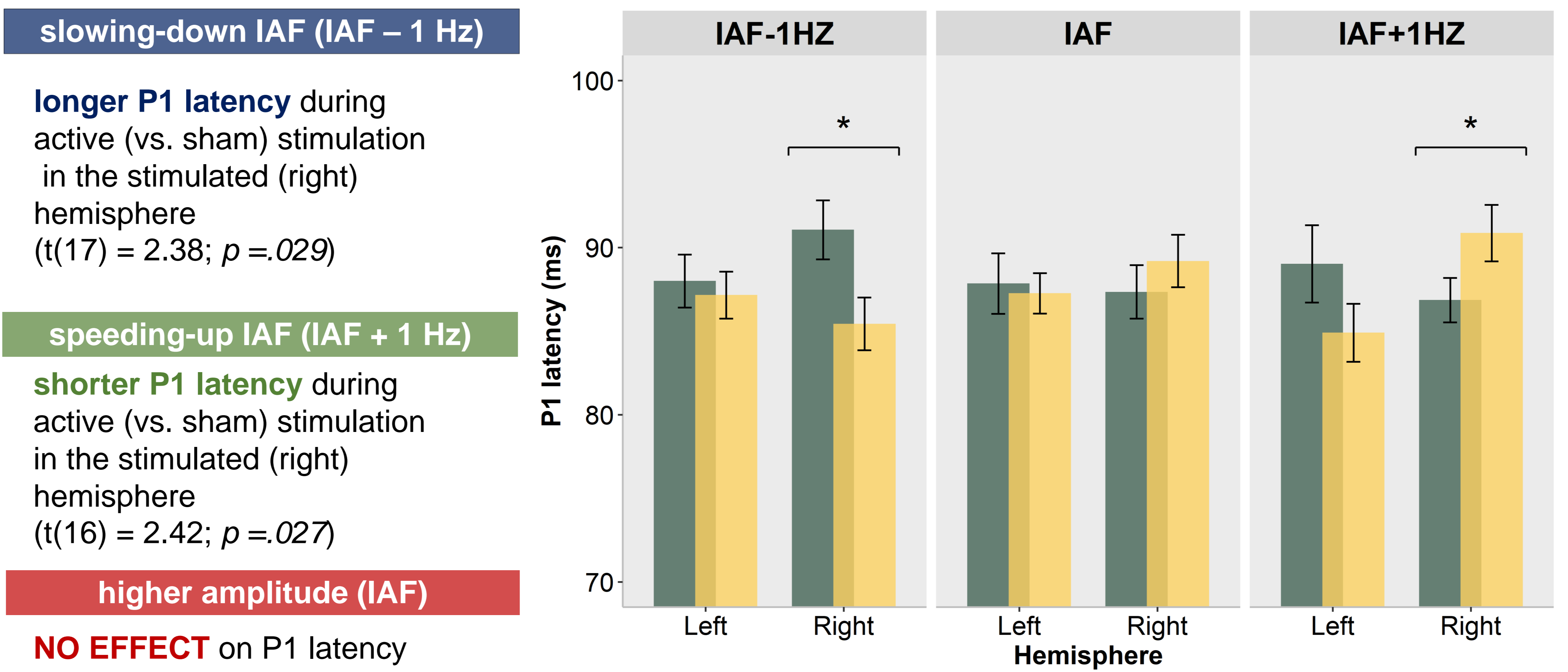
ROBUST SKIPPED CORRELATIONS:
LEFT HEMISPHERE: $r = -0.494$, $p < .01$
RIGHT HEMISPHERE: $r = -0.448$, $p < .01$



Faster pre-stimulus IAF is related to shorter P1 latencies in the hemisphere contralateral to the stimulus presentation.

2. DEMONSTRATE THAT THE CREATION OF P1 DEPENDS ON IAF

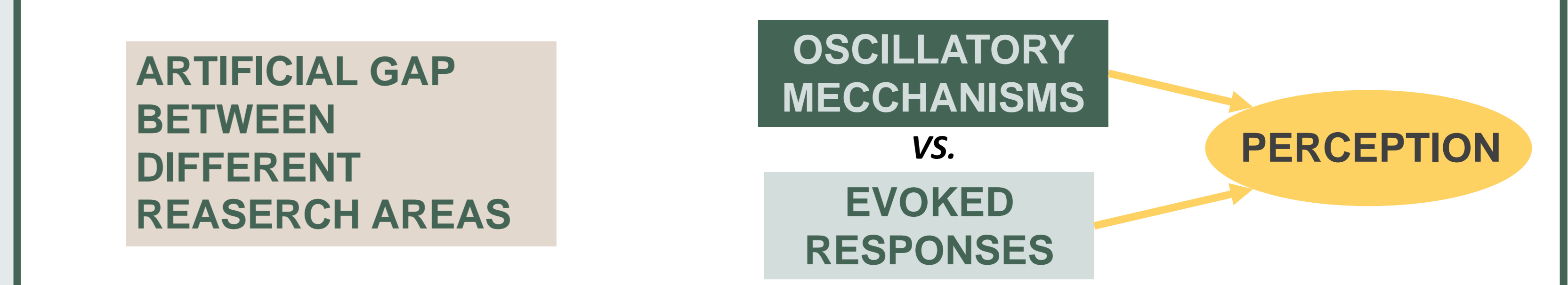
ANOVA 2x2x3: STIMULATION (TMS,SHAM) X HEMISPHERE (Right,Left) X GROUP (IAF-1, IAF, IAF+1)
STIMULATIONxHEMISPHERExGROUP (F(2,51) = 4.41; $p = .017$)



5. CONCLUSIONS

FIRST CAUSAL EVIDENCE OF A CRUCIAL ROLE OF IAF IN SHAPING P1 EVOKED RESPONSE LATENCY

FUNDAMENTAL EVIDENCE IN FAVOR OF THE OSCILLATORY MODEL



IAF: A FLEXIBLE MECHANISM THAT UNDERGOES ADAPTIVE CHANGES UNDER SPECIFIC TASK DEMANDS, AND DIRECTLY SHAPES THE SUBSEQUENT VISUAL EVOKED RESPONSES

