Chapter 4 - Brain Timing Associated with Long-Term Memory

BCSC

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Theme 1

Brain Timing Associated with Long-Term Memory

temporal dynamics of activity → understand the brain mechanisms underlying memory

1.1 Timing of Activity

ERP
naming: parietal (P) or frontal (F), odd: left hemisphere, even: right hemisphere
high voltage → cortical activity

ERP studies of memory have focused on two brain activity: to re ect familiarity and recollection

ERP component 1) mid-frontal old–new effect
occurs within 300 to 500 milliseconds after trial onset
maximum amplitude over frontal electrodes
than correct rejection of new items 보다 familiarity-based retrieval서 큰 진폭

ERP component 2) left-parietal old–new effect
occurs within 500 to 800 milliseconds after trial onset
a maximum amplitude over left parietal electrodes
correct rejection of new items 보다 recollection-based retrieval서 큰 진폭

FN400: frontal negative 400ms, 자극 후 전두엽서 400ms 후 나오는 음 값

"remember" 등급: R1(덜 상세), R2(상세)
activity at electrode P5 within 500 to 800 milliseconds: R2 ¿ R1 ¿ new
→ magnitude of the left-parietal old–new effect reflects the amount of information retrieved during recollection.

오랜 논쟁: familiarity and recollection가 과정이 다른가?
mid-frontal old–new effect and the left-parietal old–new effect:
topographically separable, temporally separable, and functionally separable
$\Longrightarrow$ 다른 듯!

third ERP component) right-frontal old–new effect
occurs within 1000 to 1600 milliseconds
maximum amplitude over right frontal electrodes
correct rejection of new items 보다 recollection-based or familiarity-based retrieval of old items서 큰 진동
일반적으로 주목하지 아니해.
혹시? 추측! : post-retrieval monitoring (i.e., evaluating what was just remembered) or memory elaboration (i.e., filling in details of the previous experience)

1.2 The FN400 Debate

mid-frontal old–new effect의 FN400
가설: repetition priming 반영: change in the magnitude of brain activity that occurs when an item is repeated
Amnesic patients(with medial temporal lobe damage: impaired conscious long-term memory) → normal repetition priming effects → is a nonconscious process?????

Paller왈, FN400는 priming referred의 한 유형: conceptual repetition priming: 틀린 주장
Figure 4.2: conceptual priming effects: 400ms부터 high meaning old가 덜 떨어짐, 이는 FN400가 다름.
위치도 달라
mid-frontal old–new effect → familiarity
Phase and Frequency of Activity Synchronized brain activity: 실험, 이전 새로운 도형, 오른족시야 기억 - 왼쪽 시야 기억, 그리고 old-left-hits were subtracted from old-right-hits
같은 반구서 동일한 시간에 활성화? 맞음!
Such synchronous activity is referred to as in phase or phase-locked
심지어, 전두, 측두, 후두도 동기화

Figure 1.1

Figure 1.1: 82쪽 중간 부분: @claude

1.2.1 cross-frequency coupling

brain regions with different frequencies of modulation can be in phase with each other → two brain regions interact

파 활동들 important role during long-term memory encoding and retrieval
Theta activity → frontal regions
Gamma activity → parietal-occipital regions