Overview of Common ERP Components Part 2

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The P3 Family

Varieties of P3 Components

- P3a: Frontally maximal
- P3b: Parietally maximal

] Unpredictable, infrequent changes in the stimuli

- Frontal P3-like response

→ Unexpected, unusual, or surprising task-irrelevant stimulus within an attended stimulus train

- P3a = Frontal P3?

Theories of Functional Significance

- What neural or cognitive processes are reflected by P3?
- Context updating (Donchin, 1981)
- Working memory updating(Luck, 1998; Vogel, Luck, Shapiro, 1998; Vogel & Luck, 2002)
- *Strategic* rather than tactical (Donchin, 1981)

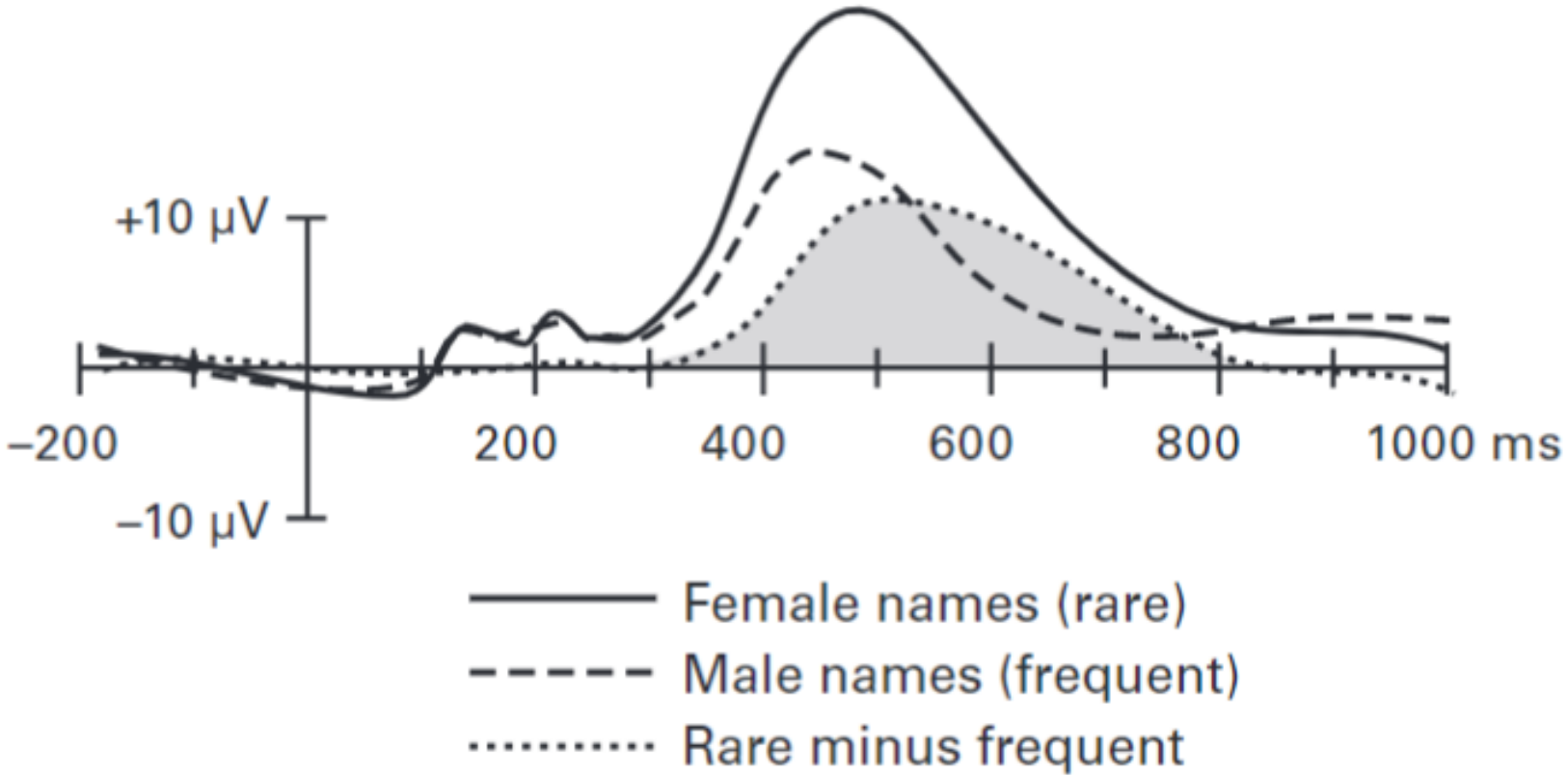
Effects of Probability

- Sensitive to target probability
  - P3 amplitude↑ as target probability ↓
  - Along with overall probability, local probability matters as well
  - Probability of the task-defined stimulus category
    - A-E-A-A-A-A-A-A
    - A-B-E-F-G-T-Y-C
  - Sequential probability Temporal probability

P3, Resource Allocation, and Task Difficulty

- More effort → Larger P3 amplitude → measure of resource allocation
- Uncertainty → Smaller P3 amplitude
- P3 amplitude = U x (P + R)

P3 Latency and Stimulus Categorization



Kutas et al. (1977)

P3 Latency and Stimulus Categorization

- Response selection
- Categorization must occur before P3

P3 and Postcategorization Processes

- P3 latency is sensitive *only* to the time required to perceive and categorize the stimulus
- P3 latency (measured by onset) reflects the time required to categorize a stimulus and insensitive to response-related processes

P3 and Schizophrenia

- Auditory oddball paradigm where participants silently count the rare stimuli
- Cannot draw a precise and broadly meaning conclusion
- Does P3 reflect auditory-specific processes?