

一、 認知心理學

請閱讀以下論文，並依序回答四個問題：

1. (填充題 10 分)：這篇論文想要知道_____是否真的是_____的神經關聯
2. (簡答題 10 分)：回報意識內容時，可能會有哪些混淆變因？(寫出兩項)
3. (簡答題 15 分)：若採用 no-report paradigm，仍可能會有什麼混淆變因？
4. (簡答題 15 分)：該如何重新設計實驗移除或控制第 3 題中的混淆變因？

TITLE: Distinguishing the Neural Correlates of Perceptual Awareness and Postperceptual Processing

ABSTRACT To identify the neural correlates of perceptual awareness, researchers often compare the differences in neural activation between conditions in which an observer is or is not aware of a stimulus. While intuitive, this approach often contains a critical limitation: to link brain activity with perceptual awareness, observers traditionally report the contents of their perceptual experience. However, relying on observers' reports is problematic because it is difficult to know whether the neural responses being measured are associated with conscious perception or with postperceptual processes involved in the reporting task (e.g., working memory, decision-making). To address this issue, we combined a standard visual masking paradigm with a recently developed "no-report" paradigm in male/female human participants. In the visual masking paradigm, observers saw images of animals and objects that were visible or invisible, depending on their proximity to masks. Meanwhile, on half of the trials, observers reported the contents of their perceptual experience (i.e., report condition), while on the other half of trials they refrained from reporting about their experiences (i.e., no-report condition). We used electroencephalography to examine how visibility interacts with reporting by measuring the P3b event-related potential, one of the proposed canonical "signatures" of conscious processing. Overall, we found a robust P3b in the report condition, but no P3b whatsoever in the no-report condition. This finding suggests that the P3b itself is not a neural signature of conscious processing and highlights the importance of carefully distinguishing the neural correlates of perceptual awareness from postperceptual processing.

SIGNIFICANCE STATEMENT What are the neural signatures that differentiate conscious and unconscious processing in the brain? Perhaps the most well established candidate signature is the P3b event-related potential, a late slow wave that appears when observers are aware of a stimulus, but disappears when a stimulus fails to reach awareness. Here, however, we found that the P3b does not track what observers are perceiving, but instead tracks what observers are reporting. When observers are aware of simple visual stimuli, the P3b is nowhere to be found unless observers are reporting the contents of their experience. These results challenge the well established notion of the P3b as a neural marker of awareness and highlight the need for new approaches to the neuroscience of consciousness.

見背面

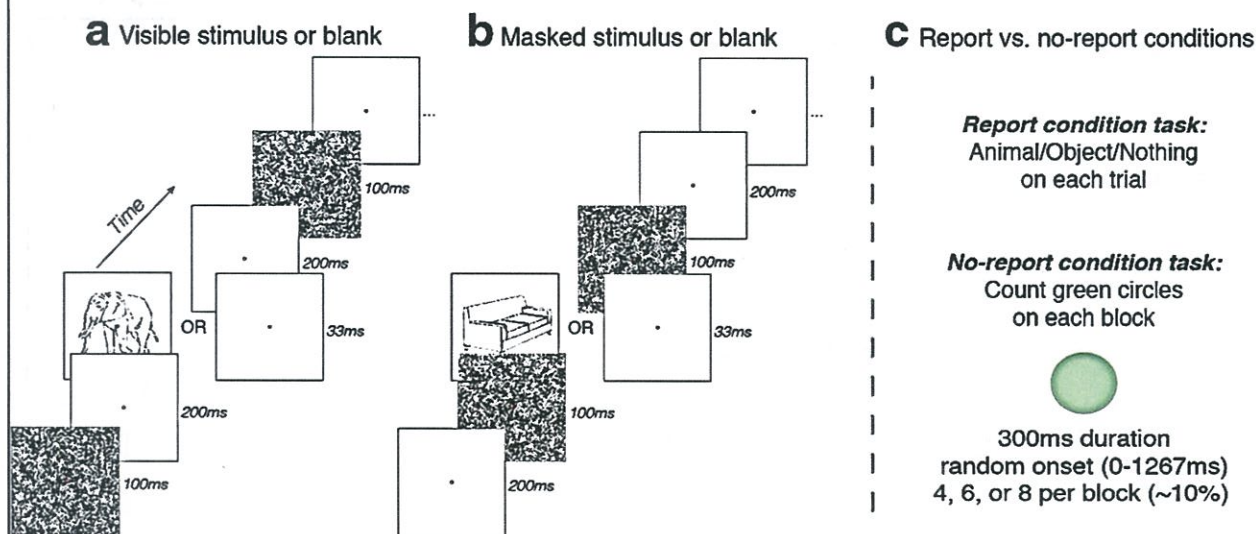
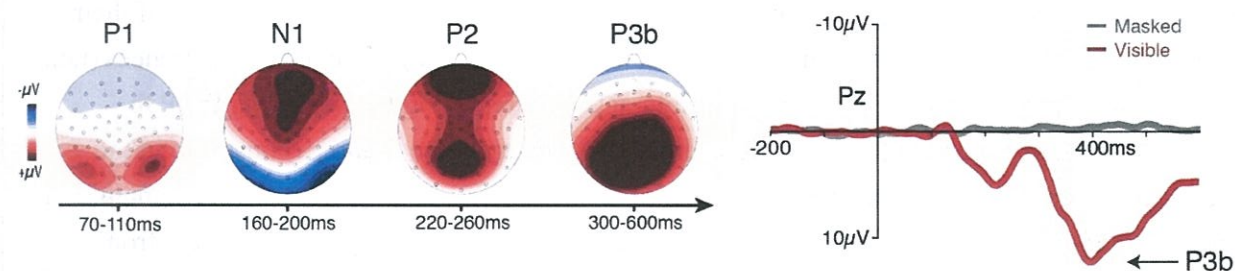


Figure 1.

Design of experiment 1. Stimuli (i.e., animals or objects) or blank displays were presented in between masks. *a*, On visible trials, there were 200 ms gaps separating the stimuli from the masks. *b*, On masked trials, the masks came immediately before and after the stimulus, rendering them completely invisible. *c*, In the report condition, participants reported on a trial-by-trial basis whether they saw an animal, an object, or nothing. In the no-report condition, the stimulus presentation sequence was the same, but instead of reporting on these stimuli, participants counted the number of times they saw a green circle and reported their count at the end of each block.

a Report condition



b No-report condition

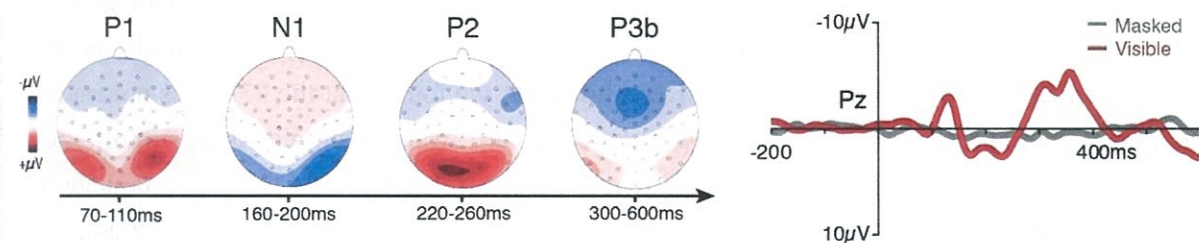


Figure 2.

a, b, ERP results for both the report (top row; *a*) and the no-report (bottom row; *b*) conditions. For both condition, topographical voltage distributions over a series of time windows (difference between visible and masked) and the waveforms (for both visible and masked stimuli) from a pool of central-parietal electrodes are plotted. A clear P3b was present in the report condition when observers were aware of the task-relevant stimulus, but the P3b completely vanished in the no-report condition when these same stimuli were task irrelevant. Amplitude scales for the topography maps are as follows: $\pm 4 \mu V$ (P1); $\pm 5 \mu V$ (N1/P2); $\pm 6 \mu V$ (P3b in report condition); $\pm 4 \mu V$ (P3b in no-report condition).

二、 發展心理學

A. 解釋下列名詞 (30%，每題 3%，共 10 題)

1. Zone of proximal development and preoperational stage (hint: cognitive development)
2. Experience-expectant processes, experience-dependent processes and synaptic pruning (hint: brain development)
3. Cognitive flexibility and dual representation (hint: Cognitive development)
4. Fuzzy trace theory (hint: memory development)
5. Micorsystem, exosystem, and chronosystem (hint: ecological systems theory)
6. Authoritative, authoritarian and permissive parenting
7. Gender typing and gender schema
8. internal working model and secure attachment (hint: attachment development)
9. Entity view of ability and incremental view of ability (hint: self development)
10. Popular, rejected, and neglected children (hint: peer acceptance)

B. 問答題 (20%，每題 10%，共兩題)

1. 為了控制新興傳染病 Covid19 的傳播，教育單位採取「室內外活動需要配戴口罩」及「全面線上教學」等防疫措施。而這防疫措施對兒童心智成長的影響，成為近年發展心理學的熱門研究議題。請描述語言發展理論之一的「social interaction theory」，而且利用支持這項理論研究發現，推論「配戴口罩」和「線上教學」，是否會影響兒童學習語言？而防疫措施是否對學前幼兒和小學兒童，有不同的影響？請以某一特定的語言成份，例如「詞彙」、「語法」或「語用」，來討論這項議題。(10 分)
2. 「social domain theory」是道德發展的主要理論，請說明這項理論的 moral imperatives、social conventions 和 personal choice 等道德範疇(domain)。依據這項道德發展理論，家長教養方式和文化因素，如何影響兒童的道德發展？(10 分)

試題隨卷繳回