



PART 2

Read the text below and answer questions 14–26.

THE SCENT OF MEMORY: OLFACTION, EMOTION, AND COGNITION

A

Smell has an unusual ability to evoke memories that feel immediate and emotionally charged, a phenomenon sometimes described as the Proustian effect. People often report that a brief scent can bring back a scene with striking clarity, sometimes from decades earlier, together with the bodily “tone” of the moment. Cognitive psychologists treat this as a clue about episodic memory: odours are learned in rich contexts (kitchens, hospitals, classrooms) and later act as compact cues that can unlock a whole pattern of associated information. The effect is powerful, but it is not magical; it reflects predictable properties of how olfactory signals reach memory and emotion systems.

B

Unlike vision and hearing, olfaction has comparatively few processing “stops” before reaching regions involved in affect and autobiographical recall. Volatile molecules bind to olfactory receptors in the nasal epithelium, signals converge in the olfactory bulb, and projections then reach primary olfactory cortex and limbic-adjacent areas with minimal thalamic relay. Pathways into piriform cortex and the entorhinal region provide efficient routes toward hippocampal circuits that support episodic retrieval. This limbic system connectivity helps explain reports that feeling arrives first: an odour can trigger an emotional response rapidly, with verbal description and conscious detail arriving moments later. Neuroimaging studies often interpret this as hippocampal engagement during retrieval, paired with amygdala activation that amplifies salience and subjective confidence.

C

Laboratory studies support the claim that odour cues can alter the subjective quality of remembering. Compared with word- or image-cued recall, odour-cued memories are frequently rated as older, more vivid, and more strongly “relived”. Yet researchers are careful to separate phenomenology from truth. Vividness is not the same as accuracy: participants can report high confidence while misplacing details, blending episodes, or importing plausible but incorrect elements. Some experiments suggest that affective intensity itself can strengthen the impression of certainty, even when objective measures of recall show distortions. In this sense, odours may strengthen access to a memory trace without guaranteeing faithful reconstruction.



D

Clinical work adds another perspective by showing how smell, mood, and cognition can move together. Persistent smell loss can reduce enjoyment of food and contribute to social withdrawal, but clinicians also track olfaction because it can appear as a prodromal symptom in some neurological conditions. The logic is not that smell “causes” decline; rather, reduced performance on odour identification or discrimination tasks may reflect broader neurological change affecting connected networks. At the same time, olfactory screening is probabilistic: scores vary with nasal health, attention, and cultural familiarity with test odours, so results are interpreted as signals rather than as diagnoses. This is why clinicians typically combine smell data with other markers and longitudinal follow-up.

E

Odours can also influence learning indirectly through context-dependent memory. In classic paradigms, participants study material while a distinctive scent is present and later retrieve it with the same scent. Under some conditions, performance improves, as if the cue helps reinstate the learning context and reduces interference from competing memories. However, the effect is not universal. It depends on attention, on whether the odour is sufficiently distinctive, and on whether it becomes distracting or irritating (some odours also stimulate trigeminal sensations such as cooling or burning). If the cue dominates awareness, it can compete with the task rather than supporting it.

F

Interest has expanded to sleep and consolidation. In targeted memory reactivation studies, an odour is paired with learning and then re-presented during slow-wave sleep (SWS) to strengthen consolidation. Some reports show improved later recall, consistent with the idea that sleeping brains can be nudged toward replaying specific traces and stabilising them. Yet replication is uneven and methodological challenges are substantial. Delivering an odour cue without waking participants is difficult, timing matters, and individual sensitivity varies; small changes in intensity can flip a benefit into disruption. Researchers also worry about practical confounds, such as residual scent lingering in equipment or rooms and blurring the intended on–off manipulation. As a result, the literature remains promising but cautious rather than settled.

G

Finally, olfaction influences judgement through emotional valence. Pleasant and unpleasant smells can bias evaluations of faces, rooms, or products, often outside conscious awareness, shifting what seems “welcoming” or “trustworthy”. However, what counts as pleasant is shaped by culture and personal history, so the direction and magnitude of these effects vary across individuals and societies. Because smell is tied to



identity and emotion, rehabilitation programs sometimes use structured odour exposure to rebuild discrimination after loss, and clinicians also explore scent-based routines to reduce stress, though effects may be modest. As odour-based biomarkers and sensing technologies develop, ethical questions about consent and privacy become harder to avoid. Overall, the science portrays a powerful but context-dependent pathway into cognition that requires careful experimental control.

Questions 14–18

The text has seven paragraphs, **A–G**. Which paragraph contains the following information? Choose the correct letter, **A–G**. **NB** You may use any letter more than once.

14 An experimental method that reintroduces a learning-linked odour during slow-wave sleep to influence later remembering.

15 An anatomical reason why an odour may trigger an emotional response before a person can report detailed content.

16 A finding that retrieval can improve when a distinctive scent present at learning is present again during recall.

17 A warning that memories can feel exceptionally vivid and confident while still containing inaccuracies.

18 The point that “pleasantness” judgments vary because odour meanings are shaped by culture and personal history.

Questions 19–24

Complete each sentence with the correct ending, **A–H**, below.

List of Endings

A reach limbic-adjacent memory circuits with relatively little relay.

B strong reliving can coexist with distorted or misplaced details.

C it may reflect broader neurological change in a prodromal phase.

D the same distinctive scent is present during learning and again at retrieval.

E results replicate unevenly and cue delivery risks disrupting sleep.

F the valence of “pleasant” odours is shaped by culture and experience.

G each odour activates a single dedicated receptor and is therefore easy to label.

H smells can be organised along one primary dimension similar to wavelength.

19 The Proustian effect is often linked to the fact that olfactory signals can

20 In laboratory reports, odour-cued episodes may feel unusually vivid, yet



21 Declining olfactory performance is sometimes used in screening because

22 Context-dependent memory benefits are most likely when

23 In sleep experiments, odour cues are reintroduced during slow-wave sleep to support consolidation, but the approach remains controversial because

24 Odours can shift evaluations without conscious awareness, although

Questions 25–26

Select the correct answer.

25 What is said about using odours to strengthen memory during sleep?

A It is already reliable enough to be applied widely in education.

B It can work in some cases, but findings are inconsistent and delivery is methodologically difficult.

C It consistently fails because odour cues always wake participants immediately.

D It is discouraged mainly because words and images are always more effective.

26 What is the writer's overall position on olfaction and cognition?

A The effects are largely uniform across individuals once attention is controlled.

B Odour-based influences are too weak to matter outside the laboratory.

C The findings are settled and can be generalised without careful controls.

D The effects can be substantial, but depend on context, individual differences, and experimental control.

Answer Key

14. F

15. B

16. E

17. C

18. G

19. A

20. B

21. C

22. D



23. E

24. F

25. B

26. D