



PART 3

Read the text below and answer questions 27–40.

THE ETHICS AND EFFICACY OF MEMORY ENHANCEMENT

A

Interest in strengthening memory has long been expressed through study habits, mnemonics, and self-discipline, but the contemporary debate has shifted toward biomedical enhancement and neurotechnology. This shift matters because it blurs an older boundary between therapy and enhancement. Therapy is typically framed as restoring function when a deficit exists—for example, treating cognitive impairment after injury—whereas enhancement aims to improve normal function beyond a medically defined baseline. In practice, the boundary is unstable: what counts as a “deficit” can depend on cultural expectations, occupational demands, and competitive environments. A pharmacological intervention prescribed for a disorder may be used by healthy students, and a device marketed as “wellness” may affect neural systems in ways similar to clinical treatment. Once enhancement is framed as a tool for optimising the self, the debate becomes not only scientific (do these tools work?) but also ethical (who bears risks, who gains advantages, and what kinds of persons we are encouraged to become).

B

Even when enhancement is limited to behavioural training, efficacy is more complicated than marketing implies. Cognitive scientists distinguish between near transfer and far transfer. Near transfer occurs when training improves performance on tasks that are structurally similar to the training activity; far transfer would mean improvements in broader capacities such as fluid intelligence or everyday reasoning. Working-memory training programmes often report gains on their own exercises and on closely related tests, but far transfer is harder to demonstrate and frequently fails under replication. The central difficulty is that cognitive skills are embedded in context: better performance may reflect learned strategies for a narrow task rather than a genuine increase in capacity. Moreover, improvements in laboratory measures do not automatically translate to the messy demands of daily life, where attention is divided and goals shift. This is why claims that strengthening working memory will reliably raise general intelligence remain controversial: the evidence suggests that transfer effects, when they occur, are limited and fragile rather than broad and durable.

C

Pharmaceutical enhancement makes the promise of far-reaching improvement seem more plausible, yet the evidence is again mixed. Stimulants such as methylphenidate are



widely discussed because they can increase alertness and sustained attention, but enhanced wakefulness is not the same as enhanced learning. Memory depends on encoding, retrieval, and synaptic consolidation, processes that interact with sleep, emotion, and prior knowledge. In healthy users, stimulants may produce modest benefits on some tasks while impairing others, and a placebo effect can inflate subjective impressions of being sharper. Performance also appears to follow an inverted-U relationship with arousal and stimulation: too little activation may reduce focus, but too much can increase anxiety, rigidity, or distractibility, thereby degrading accuracy. This implies that even if a drug “works” in principle, it may not work uniformly across individuals or situations. A small advantage under one set of conditions may be offset by costs in flexibility, creativity, or emotional regulation under another.

D

Alongside drugs, non-invasive stimulation has attracted attention because it seems to offer direct access to neural mechanisms. Transcranial direct current stimulation (tDCS), for example, applies weak electrical currents to the scalp with the aim of modulating cortical excitability. Some studies report short-term gains in learning or attention, but effects vary with electrode placement, task type, baseline ability, and timing relative to practice. This variability has ethical implications: where results are uncertain, risk-benefit assessment becomes difficult, and the temptation to experiment informally grows. The rise of consumer devices and online tutorials has created a culture of DIY brain hacking, where users assemble or purchase stimulators and apply them without clinical oversight. Even if the physical risks are usually low, the social and epistemic risks are significant: people may treat preliminary findings as settled science, combine stimulation with untested regimens, or normalise enhancement practices before long-term consequences are understood.

E

Fairness concerns become sharper when enhancement is viewed through the lens of distributive justice. Some goods are “positional”: their value depends on relative advantage rather than absolute improvement. In competitive settings—admissions, promotions, examinations—memory and learning capacity can function as positional goods, because gains for one individual may effectively raise the bar for others. Even a small enhancement can matter if selection is tight, creating a zero-sum dynamic in which advantages are redistributed rather than generated. Under these conditions, the ethical problem is not only unequal access to expensive tools, but the broader social pattern they may encourage: an arms race in which individuals feel compelled to invest in enhancement to avoid falling behind, while institutions quietly adjust expectations



upward. What appears as personal optimisation can, at scale, restructure norms of performance and deepen existing inequalities.

F

This leads to a subtler concern: coercive incentives without explicit force. If enhancement becomes common, declining it may carry costs—lower rankings, weaker evaluations, fewer opportunities—even when a person is uncomfortable with risks or values authenticity over optimisation. Consent is formally present, yet practically compromised when the “choice” is made under competitive pressure. The ethical issue is intensified by workplace and educational cultures that reward constant productivity: enhancement can be framed as responsible self-management rather than optional experimentation. In that climate, people may internalise pressure, treating pharmacological or technological upgrades as the price of remaining employable. The result is a shift from individual choice to social compulsion, in which the burden of keeping up is placed on individuals while institutions benefit from raised output.

G

Finally, the debate cannot be reduced to effectiveness and fairness alone, because memory is entwined with identity. Philosophers have argued that personal continuity depends not merely on having information, but on how experiences are integrated into a narrative self. Enhancement may therefore raise questions of authenticity: if my achievements depend on interventions that alter what I can remember or how I learn, are they fully “mine”? There is also the neglected value of forgetting. Forgetting can be adaptive: it prevents overload, enables abstraction, and supports emotional recovery by allowing harmful memories to lose their grip. Attempts to reshape memory—whether by amplifying retention or dampening traumatic recollections—may relieve suffering, yet they also risk altering the meaning of experiences and the responsibilities attached to them. From this perspective, neuroethics is not simply a regulatory add-on to innovation; it is a debate about what kinds of remembering a society should cultivate, and what kinds of selves it is willing to produce.

Questions 27–33

Choose the correct heading for each paragraph.

List of Headings

- i Authenticity, narrative identity, and the overlooked function of forgetting
- ii Why long-term evidence is unnecessary when users report subjective improvement
- iii When optimisation becomes medicine: the unstable boundary between repair and upgrade



- iv** Synaptic consolidation as the decisive solution to educational underperformance
- v** A technology that looks simple but behaves unpredictably: stimulation and the rise of unsupervised use
- vi** The hidden compulsion of competitive norms: consent under coercive incentives
- vii** The promise and limits of transfer: why training gains often remain task-bound
- viii** Enhancement as a positional good: how relative advantage can create a zero-sum contest
- ix** Why stimulants disappoint as “smart pills”: modest effects, trade-offs, and misperceived benefits
- x** A purely individual-rights approach: why social policy should remain neutral

27 Paragraph A

28 Paragraph B

29 Paragraph C

30 Paragraph D

31 Paragraph E

32 Paragraph F

33 Paragraph G

Questions 34–37

Choose **YES** if the statement agrees with the claims of the writer, choose **NO** if the statement contradicts the claims of the writer, or choose **NOT GIVEN** if it is impossible to say what the writer thinks about this.

34 The writer implies that commercial brain-training programmes often overstate the likelihood of far transfer.

35 The writer suggests that increased alertness from stimulants guarantees improved synaptic consolidation in healthy users.

36 The writer argues that tDCS should be restricted to hospital settings until all long-term effects are known.

37 The writer claims that enhancement can create pressure to participate even when no one is explicitly forced to do so.

Questions 38–40

Select the correct answer.



38 What is the writer's overall position on drug-based memory enhancement?

A It is most useful for sustaining attention, because greater alertness normally produces stronger learning and memory.

B It may bring modest gains in some contexts, but its effects vary and can be offset by cognitive or emotional costs.

C Its apparent benefits are produced mainly by users' expectations, while objective performance generally remains unchanged.

D It should become consistently effective once dosage is adjusted to place each user at the optimal level of arousal.

39 What social implication does the writer emphasise about enhancement in competitive environments?

A Unequal access is the principal problem, so wider availability would largely remove the pressure associated with enhancement.

B Institutions may resist enhancement because higher average performance would make selection processes less meaningful.

C Small individual gains can produce collective escalation, raising expectations while intensifying inequality and pressure.

D Competitive pressure becomes ethically significant only when schools or employers formally require enhancement.

40 Which conclusion best captures the philosophical concern in Paragraph G?

A Questions of authenticity are confined to whether enhanced achievements still feel personally earned.

B The value of forgetting lies chiefly in reducing traumatic recollections rather than shaping thought more broadly.

C Ethical assessment must consider how changing memory may affect identity, meaning, responsibility, and the kinds of selves society promotes.

D Neuroethics should concentrate on separating treatment from enhancement because memory interventions do not affect personal continuity.

Answer Key

27. iii

28. vii

29. ix

30. v



31. viii

32. vi

33. i

34. YES

35. NO

36. NOT GIVEN

37. YES

38. B

39. C

40. C