

Familiar Olfactory Stimulation Enhances Self-consciousness in Alzheimer’s Disease

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Key Message

Familiar olfactory stimulation significantly enhanced autobiographical episodic memory and multiple dimensions of self-consciousness in individuals with mild-to-moderate Alzheimer's disease, supporting its potential as a person-centered non-pharmacological intervention.

Background

Alzheimer's disease progressively disrupts autobiographical memory and self-consciousness, compromising personal identity and the continuity of the self. Familiar odors are powerful autobiographical cues capable of eliciting emotionally meaningful memories; however, their potential to enhance self-consciousness remains largely unexplored. Investigating this relationship may contribute to the development of accessible non-pharmacological interventions for dementia care (Addis & Tippett, 2004; El Haj et al., 2015; Glachet et al., 2018).

Objective

To evaluate the effects of familiar olfactory stimulation on autobiographical episodic memory and self-consciousness in individuals with mild-to-moderate Alzheimer's disease.

Methods

Study Design

- Randomized
- Double-blind
- Placebo-controlled
- Mixed between- and within-subjects design

Participants

- 58 individuals with mild-to-moderate Alzheimer's disease
- Experimental group (n = 29): Familiar olfactory stimulation
- Control group (n = 29): Placebo stimulation

Phase	Measures
Pre	TEMPau AMQ Reaction Time Self-Consciousness Questionnaire (SCQ)
During	TEMPau AMQ Reaction Time
Post	Self-Consciousness Questionnaire (SCQ)

Results

Table 1. Autobiographical Memory (Pre vs During intervention)

Variable	Within Exp.	Within Control	Between-group p
TEMPau			
Global autobiographical score	↑	↓	<.001
Episodic specificity	↑	↔	<.001
Retrieval latency	↓	↔	.005
AMQ			
Emotional intensity	↑	↔	.036
Vividness	↑	↔	.012
Mental time travel	↑	↔	.004
Pleasantness	↔	↔	ns

Table 2. Effects of Familiar Olfactory Stimulation on Self-Consciousness (Pre vs Post-intervention)

Domain	Within Exp.	Within Control	Between-group p
Global SC	↑	↔	<.001
Anosognosia	↑	↔	<.001
Body representation	↑	↔	.002
Introspection	↑	↔	.001
Moral judgment	↑	↔	<.001
Prospective memory	~	↔	.033
Personal identity	↑	↔	ns
Affective state	↔	↔	ns

Discussion

Familiar olfactory stimulation facilitated access to emotionally meaningful autobiographical memories, reinforcing cognitive processes involved in maintaining self-consciousness. Five of seven SC domains improved significantly in the experimental group: anosognosia, body representation, introspection, moral judgment, and prospective memory, consistent with prior evidence on sensory stimulation and self-awareness (Arroyo-Anlló et al., 2013). Personal identity and affective state remained stable, likely sustained by semantic memory and emotion regulation systems more resistant to brief interventions (El Haj et al., 2019; Gil et al., 2001). These findings suggest that olfactory cues may contribute to preserving the sense of self in AD.

Conclusions

Familiar olfactory stimulation evoking specific, fluent, and emotionally rich autobiographical memories enhanced key dimensions of self-consciousness in mild-to-moderate AD, particularly anosognosia, moral judgment, introspection, and body representation. These findings support the development of low-cost, person-centered non-pharmacological interventions for dementia care.

References

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