Cortex

Research report

Describe yourself to improve your autobiographical memory: A study in Alzheimer's disease

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ABSTRACT

This study investigated whether retrieval of information related to conceptual self (i.e., self-images that encompass general factual and evaluative knowledge of one's identity) would improve autobiographical memory in Alzheimer's disease (AD). Participants with AD and controls were asked to retrieve autobiographical memories after providing statements to the question "Who am I? and after a control condition consisting of reading a general text. Autobiographical recall was analyzed with respect to specificity (general *vs* specific event), context recall (information describing the "when, where, and who" as well as affective states), and reliving (the subjective experience of recall). AD participants showed higher specificity, context recall and reliving after the "Who am I?" statements than after the text reading, and controls showed higher context recall after the former than after the latter condition. These findings highlight the relationship between self and autobiographical memory in AD and demonstrate how retrieval of information related to conceptual self may influence autobiographical memory in the disease.

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1. Introduction

Alzheimer's disease (AD) is a progressive age-related neurodegenerative disease that involves insidiously progressive memory impairment [e.g., (McKhann et al., 2011)]. AD has been related with a decreased ability to retrieve specific memories and a diminished sense of self (Mograbi, Brown, & Morris, 2009; Morris & Mograbi, 2013). According to the AMAD model (Autobiographical Memory in Alzheimer's Disease) (El Haj, Antoine, Nandrino, & Kapogiannis, 2015), owing to anterograde amnesia (i.e., inability to form new memories), retrograde amnesia (i.e., inability to retrieve old memories),

and semantization of autobiographical memories, AD patients may have limited access to memories that shape their self-knowledge, self-consciousness and self-image, resulting in a compromised sense of identity.

The compromised sense of identity in AD can be highlighted by empirical research demonstrating the compromise of self-defining memories, or memories that are highly relevant for self-images, in the disease (El Haj, Antoine, Nandrino, Gely-Nargeot, & Raffard, 2015; Martinelli, Anssens, Sperduti, & Piolino, 2013). In a related vein, Caddell and Clare (2010) suggested that AD patients often show difficulties with self-recognition, especially in the advanced stage of the disease.

The latter assumption has been supported by studies demonstrating that patients with advanced AD are less likely to recognize themselves in the mirror compared to patients with mild AD (Biringer & Anderson, 1992; Biringer, Anderson, & Strubel, 1988; Grewal, 1994). Another characteristic of identity compromise is the difficulty that AD patients face in updating their self-knowledge [(Eustache et al., 2013; Klein, Cosmides, & Costabile, 2003), for a similar view, see (Morris & Mograbi, 2013)]. This issue was addressed by Klein et al. (2003) who investigated the discrepancy between a patient's ratings of current personality and the relative's ratings of that person's personality now and before the onset of dementia. Results showed that the patient's ratings were accurate but reflected her personality before the onset of disease. Hence, general self-knowledge in AD may be intact, thanks to semantic knowledge (Klein & Lax, 2010), but outdated. Together, compromise of self-defining memories, decline in self-recognition and difficulties in updating self-knowledge may explain the compromised sense of identity that occurs in AD.

The relationship between the compromised sense of identity and autobiographical decline in AD can be illustrated by a study by Addis and Tippett (2004). Participants with mild AD were asked to retrieve autobiographical events and to perform two identity tests, i.e., the Twenty Statements Test (Kuhn & McPartland, 1954) and the Tennessee Self Concept Scale (Fitts & Roid, 1964). On the Twenty Statements Test, they had to provide 20 statements to the question "Who am I?". On the Tennessee Self Concept Scale, they had to rate physical-Self statements (e.g., "I have a healthy body"), personal-Self statements (e.g., I'm a cheerful person), family-Self statements (e.g., "I am a member of a happy family"), social-Self statements (e.g., "I'm a friendly person"), and moral-Self statements (e.g., "I am a decent person"). The study by Addis and Tippett (2004) demonstrated a decreased sense of identity in AD participants, a decline that was significantly correlated with autobiographical compromise. These findings are of interest because responses to the question "Who am I?", as assessed in the study by Addis and Tippett (2004), are thought to reflect conceptual self (Charlesworth, Allen, Havelka, & Moulin, 2015). Conceptual self refers to self-images that encompass general factual and evaluative knowledge of one's identity (Conway, 2005). Charlesworth et al. (2015) investigated the relationship between autobiographical memory and the conceptual self by asking young participants to retrieve autobiographical information or to write a description of the solar system in a control condition. Both autobiographical and control conditions were followed by "Who am I?" statements. Participants engaging in autobiographical recall generated more "Who am I?" statements than those in the control condition. Hence, the procedures of Charlesworth et al. (2015) suggest that autobiographical generation may enhance access to self-images in younger adults. However, because our paper assesses whether retrieval of self-related information may influence autobiographical construction, we applied the opposite procedures to those applied by Charlesworth et al. (2015). In our view, assessing whether retrieval of self-related information may influence autobiographical construction is of interest as this may provide empirical support for the theoretical assumption that the self modulates access to autobiographical knowledge (Conway, 2005). On a clinical level, assessing whether self-related information may influence autobiographical retrieval is of interest because retrieval of this information may serve as a useful tool to cue autobiographical recall in AD.

To summarize, the study by Addis and Tippett (2004) highlights the association between conceptual self and capacity to retrieve autobiographical memories in AD. However, it did not examine whether or how the conceptual self may influence autobiographical retrieval in the disease. To investigate this issue, we asked participants with mild AD to retrieve autobiographical memories after a control test and after providing statements related to the conceptual self (i.e., statements to the question "Who am I?"). Autobiographical retrieval was analyzed with respect to specificity, context recall and reliving. Because it has been assumed that the self modulates access to autobiographical knowledge (Conway, 2005), we expected that retrieval of self-related information would enhance autobiographical construction in mild AD, especially since patients with mild AD seem to have relatively preserved access to basic self-knowledge (El Haj, Antoine, Nandrino, & Kapogiannis, 2015).

2. Method

2.1. Participants

This study included 24 people with probable AD (17 women and 7 men; *Mean* age = 71.20 years, *SD* = 5.29; M years of formal education = 8.79, *SD* = 2.34) and 27 healthy older adults (18 women and 9 men; *M* age = 68.41 years, *SD* = 8.17; M years of formal education = 9.35, *SD* = 2.59). AD participants, meeting NINCDS-ADRDA (National Institute of Neurological and Communicative Disorders and Stroke–Alzheimer's Disease and Related Disorders Association) criteria for probable AD (McKhann et al., 2011), were recruited from local retirement homes. Control participants were often the spouses, relatives or friends of the participants with AD. No differences were found between AD and control participants in terms of gender [X^2 (1, N = 51) = .10, p > .10], age [t(49) = 1.58, p > .10] or years of formal education [t(49) = .83, p > .10].

All participants provided written informed consent. All were French native speakers and reported corrected-to-normal visual and auditory acuity. Exclusion criteria were: history of traumatic brain injury, cerebrovascular disease, or significant neurological or psychiatric illness. From the original sample of 30 AD participants, two participants were excluded from the study owing to major visual impairment, one owing to major auditory impairment and three since they were unable to follow the instructions provided. The neuropsychological and clinical performance of all participants is described below and scores are shown in Table 1.

2.2. Materials

To assess their neuropsychological and clinical characteristics, participants were administrated tests of general cognitive functioning, verbal episodic memory, working memory, inhibition, verbal fluency, anxiety and depression. Besides this evaluation, they were tested on the "Who am I?" task and