Functions of Autobiographical Remembering and Its Relation to Affective Neuroscience Personality Traits in Healthy and Pathological Aging

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Abstract

Autobiographical memory (ABM) refers to our personal past experiences. *How* we remember these experiences has been widely studied for decades, whereas *why* we remember those memories (i.e., functions of ABM) has gained attention only recently. However, functions of autobiographical remembering in people with dementia has been completely unexplored. This study aims to investigate ABM functions in patients with episodic memory deficits (i.e., patients with amnestic Mild Cognitive Impairment and early-stage Alzheimer's Dementia) as well as cognitively healthy individuals, besides the relationship between affective neuroscience personality traits and ABM functions in these groups. Thirty-six patients and 26 cognitively healthy older adults were asked to fill in Brief Form of Affective Neuroscience Personality Scale (BANPS) and Autobiographical Memory Functions Scale (AMFS). We found that age of the participants was negatively correlated with their scores on SEEK (i.e., curiosity) and PLAY (i.e., playfulness) subscales of BANPS, as well as withtheir frequencyofremembering their memories to understand themselves better; while education was positively related to SEEK. Also, SEEK was positively related to participants' frequency of remembering their memories to take lessons from their pasts; while CARE (i.e., how affectionate the person is towards the others) was positively related to frequency of remembering the past on a hint basis. Even though not conclusive, our results suggest that there might be differences in personality characteristics and ABM functions between healthy individuals and patients with episodic memory decline.

Keywords: Affective neuroscience; alzheimer's disease; amnestic mild cognitive impairment; dementia; functions of autobiographical memory; personality

INTRODUCTION

Autobiographical memory (ABM) refers to how we remember our personal past experiences. ABMs have two components: Factual knowledge that are relevant to our identity, such as our name, age, number of our family members, where we went to school, and so on. This part of ABM is called personal semantics and is thought to rely on prefrontal functions (Bizzozero et al., 2012). The other component includes mentally traveling back in time and reliving specific incidences that we experienced, relying on hippocampal structures, which is called the episodic autobiographical memory(Bizzozero et al., 2012). Episodic autobiographical memory is the system affected by normal aging, which leads to a tendency to provide more general memories (Frankenberg et al., 2021). The decline in being able to recall specific previous experiences worsens if some forms of dementia accompany aging. The typical form of Alzheimer's Disease (AD), which is the most common type of dementia, starts with episodic memory failure and affects most of the cognitive and daily functioning in later stages (Alzheimer's Association, 2005). Patients with AD tend to provide more generic ABMs rather than memories of specific instances (El Haj et al., 2015; Martinelli et al., 2013), while personal semantics seem to remain intact in the early stages of the disease (Greene et al., 1995), and starts fading away as the disease progresses to the moderate stage (Kim et al., 2011; Seidl et al., 2011). Patients' ability to mentally travel back in time diminishes, besides other phenomenological qualities such as visual imagery (El Haj et al., 2016), leaving the patients only with a sense of familiarity regarding the experience, rather than being able to recall the specific details and relive the event (El Haj et al., 2014). AD first leads to an inability to learn new information (i.e., anterograde amnesia), and later patients have difficulty remembering old memories as well (i.e., retrograde amnesia, El Haj et al., 2015). Therefore, the destruction of autobiographical memoriescaused by the diseasestarts from the most recent memories, progressing to earlier memories, which is called the classical temporal gradient (i.e.,Ribot's law, Bizzozero et al., 2012). Memory problems arise due to the early atrophy observed in medial temporal lobe structures, especially the hippocampus, regions responsible for the formation and consolidation of new memories and retrieval of earlier episodic memories. Semantic memory is affected later than episodic memory, due to the storage of semantic memory in neocortical regions, which are affected later by the disease (Nadel et al., 2000; but see also Leyhe et al., 2009).

Mild Cognitive Impairment (MCI) is anintermediate conditionbetween cognitive health and dementia. Individuals diagnosed with MCI suffer from objective problems related to different cognitive domains including memory or executive functioning, which may evolve into AD with a probability of 10-15% (Petersen et al., 2009). Patients who have amnestic type MCI perform worse in episodic memory tasks than their healthy counterparts, while patients with dysexecutive type MCI have mild problems related to executive functions (Petersen, 2004). Previous research shows that episodic autobiographical memory is impaired in patients with amnestic MCI, compared to age-matched healthy participants (Berna et al., 2012; Seidl et al., 2011), especially in terms of reduced specificity in their ABMs compared to the healthy controls (Donix et al., 2010); while there is also evidence for impairment in semantic components of ABM in this group (Irish et al., 2010; Tramoni et al., 2012). On the other hand, Tomadesso et al. (2015) compared the performances of patients with aMCI and healthy controls for recent and remote memories and found that patients with aMCI perform worse than their healthy counterparts concerning the recent memories, but notremote ones.

Autobiographical Memory and Personality in Alzheimer's Disease

ABM is closely connected to the sense of self (Conway, 2005). Addis and Tippett (2004) showed that impairment of ABM in AD is connected to a weakened sense of identity. They showed that patients with early-to-mild stage AD use a higher number of abstract andvague terms,whileusing less definite terms to define themselves compared to age-matched healthy individuals. Also, patients with AD experience a more negative identity compared to their healthy counterparts, by integrating the limitations they experience in different domains of their daily life into their identities.Differences in how they perceive their identities were related to the number of ABMs they reported from their late childhood and autobiographical fluency regarding their late adulthood, providing support for the identity accounts for the phenomenon "reminiscence bump" (Fitzgerald, 1996), which is the tendency to remember a higher number of and more positive ABMs from teenage and early adulthood years. Martinelli et al. (2013) showed that individuals with early-stage AD experience more difficulty recalling specific memories that define themselves as who they are, compared to their healthy counterparts. Jetten et al. (2010) found that when patients with dementia become aware of their memory loss, it leads them to experience

a loss of identity (regarding personal as well as social levels of their identities), which has a negative impact on their well-being.

Considering that self and identity are concepts that are closely related to personality and discussed in a similar context (e.g.,Staudinger andFleeson, 1996), it seems important to investigate the personality structure of the patients in Alzheimer's continuum and the relationship between personality traits and ABM processes. Literature focusing on personality change in AD predominantly focuses on the five-factor model of personality (NEO-FFI; Costa and McCrae, 1992). Studies comparing personality traits of patients with AD and healthy controls revealed that patients with AD score higher on neuroticism, and lower on extraversion, openness, and conscientiousness (e.g.,Pocnet et al., 2011). In addition, the onset of AD negatively influences patients' personality, resulting in a decrease in extraversion, openness, and conscientiousness, compared to their premorbid personality traits (Pocnet et al., 2012). However, there is no previous study providing evidence for personality change in the MCI stage (TerraccianoandSutin, 2019).

Since personality characteristics of the patients with AD have been examined only by relying on the Five Factor strıcture, which is a theoretical model, it is important to examine this question by using other measures as well, such as affective neuroscience personality traits, which are neuroanatomically supported personality characteristics that were proposed by Panksepp (1998). To our knowledge, there is only one study investigating personality structure of patients in the AD continuum considering this model. SoncuBüyükişcan (2018) compared the affective neuroscience personality traits of three groups of participants that are at different stages on the continuum of Alzheimer's disease (i.e., in healthy controls, patients with amnestic type MCI, and patients with early-stage AD). She showed that motivation for problem solving and being open to new experiences (i.e., SEEK system) decreases in the AD continuum.

Another important finding regarding the relation between AD and identity supports the idea of "ignorance is bliss": Even thoughsubstantial differences in personalities of patients with AD occur with the progression of the disease, they seem to be unaware of these transformationsas some studies point out to the fact that impairment in memory functioning that is observed in AD affects patients' ability to update their self-knowledge, resulting in causing them to hold on an "older version" of themselves (Klein et al., 2003; Morris and Mograbi, 2013; Pocnet et al., 2011), a situation that helps them to preserve their psychological well-being (Naylor and Clare, 2008).

Functions of Autobiographical Memories

Remembering and sharing of ABMs are thought to serve different functions in one's life. The term *function* implies motivations or reasons for remembering and the uses of autobiographical memories in one's daily life (Harris et al., 2014). There had been two main approaches to explain the functions of ABMs. The first approach to the question of why we remember and share what we remember comes from the reminiscence literature, with a more specific focus on remembering the past in old age (Webster, 1993, 2003). By integrating top-down and bottom-up approaches (i.e., including open-ended questions addressing why people remember their personal memories) and including life-span samples, Webster (1993) developed Reminiscence Functions Scale (RFS). This scale revealed 8 factors:*Identity, Problem-Solving, Conversation, Boredom Reduction, Intimacy Maintenance, Death Preparation, Teach/Inform, and Bitterness Revival*. Later, he argued that these factors could be combined in a two-axis model: social-oriented vs. self-oriented and reactive/loss-oriented vs. proactive/growth-oriented functions of autobiographical reminiscence (i.e., reminiscence circumplex; Webster, 2003). The second approach is the three-function model, which focuses on three major areas in which remembering autobiographical memories is useful in one's life: *Self, Directive,* and*Social* functions (Bluck et al., 2005). *Self* function emphasizes the critical role of autobiographical memories to build and maintain a coherent sense of identity over one's life (Conway, 2005). Remembering our past and knowing ourselves are intertwined with each other. In line with this, Conway and Pleydell-Pearce (2000) proposed a self-memory system, proposing a reciprocal relationship between memory and self. Accordingly, we use our past experiences to build a sense of self, and our perception of who we are directs which memories we remember in order to maintain this identity. This system allows us to maintain a sense of self-continuity over time relying on our past experiences, as well as to keep a more positive version of ourselves (Wilson and Ross, 2003). On the other hand, *Directive*function focuses on the role of remembering past experiences to solve problems, to navigate through novel situations that we encounter in life, to plan our futures, and to make meaning out of our past experiences (Bluck et al., 2005; Pillemer, 2003). Lastly, *Social* function explains the use of autobiographical memories to connect with others and strengthen our social and romantic relationships (AleaandBluck, 2003; 2007).

More recently, Harris et al. (2014) attempted to integrate these two approaches. By combining the revised version of TALE and RFS, they suggested four classes of functions: *Reflective, Ruminative, Generative,* and *Social,* which mainly correspond to the quadrants of the "reminiscence circumplex model". *Reflective* function refers to the use of ABMs to understand oneself better, corresponding to *Self-Continuity* and *Directing Behavior* functions of the TALE and *Identity* and *Problem Solving* functions of the RFS. Meanwhile, *Ruminative* function refers to more anxious way of thinking about one's previous experiences, corresponding to *Boredom Reduction, Bitterness Revival,* and *Intimacy Maintenance* factors of the RFS. *Generative* function refers to leaving a legacy to younger generations, corresponding to *Teach/Inform* and *Death Preparation* functions of the RFS. Lastly, *Social* function refers to building relationships and making smooth conversations in daily life, covering for *Social-Bonding* factor of the TALE and *Conversation* factor of the RFS.

Even though some researchers suggest that emotion regulation can be considered as a by-product of *Directive* function when the tripartite structure of ABM functions is taken as the reference point (Vranic et al., 2018), some others suggest that the context of remembering and retelling the experience play a role in which memory function the reminiscence serves to (Pasupathi, 2003), hence proposing the possibility of relating emotion-regulation to other mainly articulated functions. Pasupathi (2003) reveals direct evidence for the emotion regulation function of autobiographical remembering and sharing. Accordingly, sharing previous personal experiences in social settings leads to a more positive appraisal of negative events. Öner and Gülgöz (2018) also tested the emotion regulation function of the autobiographical remembering by first asking participants sadness or anger-related memories versus neutral memories, then asking them random autobiographical memories. They found that participants in the negative emotion groups provided more positive memories after the emotion induction compared to the participants in the neutral group, providing support for the emotion-regulation function of autobiographical memory recall.

Individual Differences in the Use of ABM Functions Age

The motivations to remember and share autobiographical memories differ based on individual differences. One of these differences is age. Previous studies reveal that younger and older adults have different motivations for sharing autobiographical memories, consistently with the developmental challenges they face in life. Bluck and

Alea (2008, 2009) revealed that younger adults are more likely to remember and tell ABMs for *Self-Continuity* and *Directing-Behavior* functions compared to older adults, as they have a higher need for self-concept clarity and higher future orientation. Webster and McCall (1999) reported that younger adults report higher use of ABMs for *Identity*, *Problem-Solving*, *BitternessRevival*, and *Boredom Reduction* functions than older adults; whereas older adults are more likely to rely on *Teach/Inform* and *Death Preparation* functions compared to their younger counterparts. Regarding the *Social-Bonding* function, Bluck and Alea(2009) found no age effect, suggesting that this function of autobiographical reminiscence has equal importance in all stages of life. On the other hand, Vranic et al. (2018) and Alea et al. (2015) found that younger adults rely on *Social-Bonding* function of the autobiographical remembering more than older adults.

Gender

Previous researchrevealed inconsistent findings regarding the overall reminiscence frequency of women and men: Some studies suggest that women think and talk about their personal past more than men (Liao et al., 2016; Webster, 1994), while some report no difference in terms of how frequently men and women recall their autobiographical memories (e.g., Webster and McCall, 1999). But there are studies showing that women and mendiffer in terms of which ABM functions they rely more on. Webster and McCall (1999) reported that women use more *Identity* function, but report less frequency of *Bitterness Revival* use, compared to men. Maki et al. (2015) investigated gender differences in the use of ABMs using a Japanese sample and found that women rely more on *Self-Continuity* and *Social* functions than men. On the other hand, some other studies reported no gender difference in thereported use of autobiographical remembering to serve *Self*, *Social*, or *Directive* functions (BluckandAlea, 2009; Liao et al., 2016).

Personality Traits

Previous studiesreveal a relationship between personality traits and ABM functions. These studies predominantly relied on the Five-Factor Model of personality. Among these factors, Extraversion seems to be positively related to *Social* function of

reminiscing, which is a relatively consistent finding in the literature (Quackenbush and Barnett, 1995; Webster, 1993).

Opennessto experience is another trait that has been repeatedly associated with ABM functions. Webster (1994) proposed that Openness is positively related to the overall reminiscence frequency. His findings also reveal a positiverelationship between Openness and *Identity* and *Directive* functions of autobiographical remembering. Along the same lines, Rasmussen and Berntsen (2010) found that Openness is related to the use of memories for *Self* and *Directive* functions.Cappeliezand O'Rourke (2002) found that Openness was positively related to *Identity* and *DeathPreparation* function of reminiscence.Cully et al. (2001) found that Openness to Experience (along with Extraversion) was positively related to *Conversation* and *Teach/Inform* functions.

There are less consistent results regarding Conscientiousness and Agreeableness in terms of ABM functions. Alea et al. (2015) found that Conscientiousness was negatively related to *Social-Bonding*. Cully et al. (2001) found that*Agreeableness* was negatively related to *Bitterness Revival* and *Boredom Reduction* functions. On the other hand, Rasmussen and Berntsen (2010) found no relation of Agreeableness and Conscientiousness to the ABM functions.

Previous studies repeatedly showed that Neuroticism is related to different uses of autobiographical remembering. Cully et al.'s (2001) findings suggest that among the five factors of personality, Neuroticism (along with Extraversion) is the best predictor of how frequently participants remember their past.Cappeliezand O'Rourke (2002)'s findings also reveal that the higher scores participants have on Neuroticism, as well as Extraversion and Openness, the more frequently they remember their personal past. They found that Neuroticism was positively related to the *Identity* and *BitternessRevival* functions of RFS. Cully et al. (2001) found that Neuroticism was positively related to *Bitterness Revival, Boredom Reduction, and Death Preparation* functions of ABM in healthy older adults.

Previous studies also revealed interesting findings regarding the relationship between participants' self-concept and reliance on different ABM functions. Vranic et al. (2018) revealed a pragmatistic use of ABM functions. Accordingly, those with a less clear self-concept rely more on the *Self* function, while more anxiously attached individuals rely more on *Social* function, and past-oriented individuals rely more on *Directive* function, compared to the other functions. Liao et al. (2016) also suggested that people with low self-concept clarity rely more on *Self-Continuity* function of ABMs.

Affective Neuroscience Personality Traits.

In 1998, Jaap Panksepp argued that there are 7 main affective systems, which have the same neural structures and circuits in all mammalian brains. These are PLAY, SEEK, CARE, FEAR, ANGER, SADNESS, and LUST and accordingly they constitute the emotional baseline of human personality. PLAY refers to the tendency to be playful, joyful, and humorous. SEEK refers to being stimulation-oriented, curious, and being fueled by finding solutions to problems. CARE is the tendency to be affectionate and nurturing to others and seeking emotional and physical closeness. FEAR is the system that is related to being anxious about present and future. ANGER refers to being "hot-blooded", and tendency to be physically and verbally aggressive towards others. SADNESS refers to depressive tendencies and feeling of loneliness. To measure the variability among people on these emotional traits, Davis et al. (2003) developed Affective Neuroscience Personality Scale (ANPS). This self-report questionnaire had a seventh subscale called SPIRITUALITY to be able to measure the variability in this higher order emotion, which is unique to humans, even though it is not a primary emotion. Davis and Panksepp (2011) stated that LUST was not included in this scale for two reasons: The first was because it was not seen as important in defining human personality, as it was deemed less relevant. The other reason is the possibility that the ratings might be influenced by "social desirability bias". Later, Barrett et al. (2013) developed shorter version of this scale which measures only the 6 primary emotions (excluding SPIRITUALITY), has better psychometric properties, and is more time-efficient to use. This Brief Form of the Affective Neuroscience Personality Scales has been translated to Turkish by Uçar and SoncuBüyükişcan (2022) and shown to have sufficient psychometric properties.

Majority of the affective neuroscience personality traits correlate with FFM traits. Davis et al. (2003) revealed the following associations between ANPS and FFM traits: PLAY-Extraversion, SEEK-Openness to Experience, CARE-Agreeableness, FEAR and SADNESS-Neuroticism, ANGER-Neuroticism and Agreeableness (negative), whereas no subscale of ANPS correlates with Conscientiousness.

To the best of our knowledge, there is only one study that examined the relationship between ANPS and autobiographical remembering, even though not directly targeting ABM functions. Barrett et al. (2010) made young adults listen to music and assessed the feeling of nostalgia (which includes both positive and negative feelings)the music

evoked. They examined the effects of person-level factors (i.e., ANPS factors and nostalgia proneness) and the interaction between these and context-level factors (e.g., the autobiographical salience of the music for the participant) in terms of the evoked feeling of nostalgia. They found that SEEK and SADNESS were positively related to nostalgia proneness. They also found that PLAY was positively related to the evoked nostalgia, but this effect disappeared when they controlled for other person-level factors.

Culture

Alea and Wang (2015) claim that use of autobiographical memories might change based on one's cultural background. The findings they review suggest a complicated understanding of memory functions beyond the distinction between individualistic and collectivistic cultures, suggesting differences in *Self, Social,* and *Generative* functions of ABMs in different cultures such as China, Japan, Trinidad, and different populations of Australia. Considering this cultural variance regarding the use of ABMs, it seems important to investigate the ABM functions in a Turkish sample. To the best of our knowledge, there is only one study exploring the ABM functions using a Turkish sample, conducted by Er and Yaşın (2016). The aim of this study was to develop a valid and reliable questionnaire that measures ABM functions using a Turkish sample. They combined top-down and bottom-up approaches, creating theory-driven new items and using items of the Functions of Autobiographical Memory Scale (FAM, Leist et al., 2010), which was a combination of TALE, RFS, and additional items. By using a Turkish sample, 80% of which was consisted of undergraduate students, they created Autobiographical Memory Functions Scale (AMFS). This scale has 5 factors: *Self, Taking Lessons from the Past, Remembering the Past on a Hint Basis, Mood Regulation,* and *Facing with the Past.Self* seems to be consistent with the existent literature on *Self* function of the ABMs, while *Taking Lessons from the Past* correspond to the *Directive* function. *Remembering the Past on a Hint Basis* refers to participants' reported tendency to travel back in time and voluntarily remember their memories when they encounter a trigger, such as a photo. *Mood Regulation* function refers to the use of positive ABMs to get out of a bad mood or maintain a good mood. Lastly, *Facing with the Past* factor seems to be a mixture of *Reflective, Ruminative,* and *Directive* functions. Considering the fact that Turkish culture is a relatively collectivistic and relational

content (Hofstede, 1980), it is surprising that this questionnaire did not have a factor referring to *Social* function of ABMs. The scale itself includes items related to the *Social* function, however they load onto different factors and do not construct a separate factor.

Present Study

Even though ABM in dementia is widely studied, *functions* of autobiographical remembering in clinical samples, more specifically in patients with cognitive impairment and dementia, remain completely unexplored. This might be due to the difficulty experienced by clinical samples (i.e., patients with MCI and AD) in remembering ABMs and their tendency to provide overgeneral memories (Donix et al., 2010). However, previous studies show that ABM performance can be improved with therapeutic interventions (El Haj et al.; 2015).Therefore, it seems important to detect individual variations during the reminiscence of personal past in these clinical populations, so that more personalized interventions to improve autobiographical remembering and psychological well-being can be developed.

This study is the first to examine the ABM functions in patients with episodic memory deficits. It is also the first study that aims to investigate the relationship between ABM functions and affective personality traits in these clinical populations, besides healthy older adults. Due to the different conceptualizations of autobiographical memory functions in the literature, existence of only one study focusing on this topic in a Turkish sample (which was conducted only with young adults), and no previous study examining ABM functions in people with AD, the hypotheses of the present study remain exploratory.

Method

Participants

Thirty-six participants diagnosed with episodic memory deficits (17 patients with mild cognitive impairment of the amnestic type and 19 patients with early-stage Alzheimer's Dementia) and 26 cognitively healthy participants were recruited for this study. The clinical samplewas recruited from the Behavioral Neurology and Movement Disorders

Unit of the Department of Neurology of Istanbul University Istanbul Faculty of Medicine. All participants were pre-screened for the existence of any other neurological diagnoses than aMCI or AD. It is known that depression influences ABM processes,leading to rememberingmore generic memories than specific episodes (e.g.,Kuykenand Dalgleish, 1995), more rumination (Zetche et al., 2011), and differential use of autobiographical memoires considering the motivation of self-continuity (Grace et al., 2016). Since it is quite common for individuals with dementia to have depression (e.g.,Lyketsosand Olin, 2002), it is important to discriminate the effects of dementia from depression on ABM processes. Therefore, all the participants were pre-screened for depression and only individuals scoring 13 or lower on Geriatric Depression Scale were included in the study. The healthy group were asked if they had any neurological or psychological diagnoses and only those who scored 26 or higher on Mini-Mental State Examination(MMSE) were recruited for the study.

Fifty-three percent of the total sample was female and 47% was male. The age range of the sample was 50-85 years, and all participants were at least elementary school graduates. The average age of the sample was 67.9 (*SD* = 8.84) and average years of education was 12 (*SD* = 4.92). The demographics of the groups are shown in Table 1.

Materials

Demographic Form. This form includes questions about participants' age, gender, education, marital status, occupation, previous or current neurological or psychological diagnoses, medication use, and handedness.

Mini-Mental State Examination (MMSE). MMSE is a 30-item assessment tool focusing on cognitive skills such as orientation, attention, memory, language, and visuospatial abilities, developed by Folstein et al. (1975). MMSE was adapted to Turkish by Güngen et al. (2002) andis widely used for neurological assessment in clinics.

Geriatric Depression Scale (GDS).GDS is a 30-item scale developed to assess depression in older adults (Yesavage et al., 1982). The items are answered on a Yes/No basis considering the previous week. GDS was adapted to Turkish by Ertan et al. (1997). The cutoff score for depression was established as 14.

Brief Form of Affective Neuroscience Personality Scale (BANPS).

In this study, short version of ANPS was used, developed by Barrett et al. (2013). This scale includes 33 items, rated on a 5-point Likert scale ranging from "1- strongly disagree" to "5- strongly agree". This short version of ANPS was adapted to Turkish by Uçar and SoncuBüyükişcan (2022). BANPS includes 6 subscales:PLAY, SEEK, CARE, FEAR, ANGER, and SADNESS. In the whole sample, the Cronbach alpha scores of these subscales were .82, .78, .58, .77, .53, and .61 respectively. In the clinical group, the scores were .77, .75, .50, .76, .54, and .57 for each subscale; while in the healthy group the scores were .87, .76, .68, .81, .52, and .73.

Autobiographical Memory Functions Scale (AMFS).

AMFS is a 41-item scale including questions on the motivation to remember personal past experiences. Each item is rated on a 5-point Likert scale ranging from "1- strongly disagree" to "5-strongly agree". The questionnaire was developed by Er and Yaşın (2016). AMFS has 5 subscales: Facing the Past, Remembering the Past on a Hint Basis, Mood Regulation, Self, and Taking Lessons from the Past. In the whole sample, the Cronbach alpha scores of these subscales were .86, .85, .84, .75, and .85 respectively. In the clinical group, the scores were .87, .85, .80, .77, and .85 for each subscale; while in the healthy group, the scores were .84, .86, .87, .73, and .85.

Procedure

Participants taking part in this project were recruited as a part of a larger, ongoing study ("VideokonferansAracılığıileNöropsikolojik Test UygulanmasınınGüvenilirliğininİncelenmesi", project #121K261), funded by TÜBİTAK. Their participation in the present study was on voluntary basis. The diagnoses of the participants with MCI and AD were given by the neurologists of the department based on neurological, neuropsychological, and radiological assessments at the Behavioral Neurology and Movement Disorders Unit of the Department of Neurology of Istanbul University Istanbul Faculty of Medicine. All participants went through a screening in which they were given the Demographic Form, MMSE, and GDS by an interviewer. If the participant met the including criteria, they weregiven ANPS and AMFS by the same interviewer. The interviews took place in a silent and

well-lit room in one of the following institutions: Yeditepe University, Işık University, or Istanbul University Faculty of Medicine.This study was approved by the Ethical Committees of Yeditepe University and Istanbul University.

RESULTS

Sociodemographic and Clinical Characteristics of the Sample

Table 1 shows the sociodemographic and clinical characteristics of the sample. There was no difference between groups regarding gender distribution, $\chi 2(1) = .36$, $p > .05$. Participants in the clinical group ($M = 70.8$, $SD = 7.4$) were significantly older than the participants in the heathy group ($M = 64$, $SD = 9.29$), $t(60) = -3.20$,$p = .002$. Average years of education was higher in the healthy group ($M = 14$, $SD = 4.14$), compared to the clinical group ($M = 10.6$, $SD = 4.98$),$t(60) = 2.86$, $p = .006$.

Participants in the clinical group scored lower ($M = 25.3$, $SD = 2.86$) on the Mini Mental State Examination Test, compared to their healthy counterparts ($M = 29$, $SD = 0.89$), $t(44) = 7.32$, $p < .001$. There was no difference between groups in terms of their scores on the Geriatric Depression Scale, $U = 409$, $p > .05$.

Group Comparisons in terms ofBANPS and AMFS

Table 2 shows the subscale scores of the groups. The subscale scores of BANPS and AMFS were compared between clinical and healthy groups using two-tailed independent samples t-tests. We found that groups differ on the SEEK subscale of BANPS and Mood Regulation subscale of AMFS. Specifically, healthy participants scored higher on the SEEK subscale ($M = 23.6$, $SD = 4.63$), compared to the clinical group ($M = 20.1$, $SD = 5.13$), $t(60) = 2.78$, $p = .007$. On the other hand, participants in the clinical group scored higher on the Mood Regulation subscale of AMFS ($M = 29$, $SD = 7.22$), compared to the healthy participants ($M = 24.6$, $SD = 7.83$), $t(60) = -2.28$, $p = .026$.

Since the two groups differ in terms of age and years of education, we also conducted Analysis of Covariance Tests to compare participants' BANPS and AMFS scores, this time controlling for age and education. The ANCOVA analyses revealed

that participants in the clinical and healthy groups did not differ in terms of their SEEK ($F(1,58) = 1.74$), PLAY ($F(1,58) = .97$), CARE ($F(1,58) = .08$), ANGER ($F(1,58) = .30$), FEAR ($F(1,58) = .07$), and SADNESS ($F(1,58) = .39$) scores. Likewise, there were no group differences in terms of Facing the Past ($F(1,58) = 1.15$), Remembering on Hint Basis ($F(1,58) = .21$), Mood Regulation ($F(1,58) = 3.83$), Self ($F(1,58) = 1.73$), Taking Lessons ($F(1,58) = .55$) subscales of AMFS, as well as the total scores of AMFS ($F(1,58) = 1.73$), $p > .05$.

To see whether there is an effect of gender on the participants' scores on the subscales of the BANPS and AMFS, we conducted two-tailed independent samples tests. In the whole sample, female and male participants did not differ in terms of their scores on SEEK ($t(60) = 1.11$), PLAY ($t(60) = -.68$), CARE ($t(60) = .99$), ANGER ($t(60) = 1.55$), FEAR ($t(60) = -1.54$), and SADNESS ($t(60) = -.96$) subscales of the BANPS. Likewise, there were no gender differences in terms of Facing the Past ($t(60) = -.82$), Remembering on Hint Basis ($t(60) = -.60$), Mood Regulation ($t(60) = .01$), Self ($t(60) = -.13$), Taking Lessons ($t(60) = .39$) scores, as well as total scores of AMFS ($t(60) = -.33$), $p > .05$.

In the clinical group, female and male participants did not differ in terms of SEEK ($t(34) = .26$), PLAY ($t(34) = -1.11$), CARE ($t(34) = .40$), ANGER ($t(34) = 1.53$), FEAR ($t(34) = -1.61$), and SADNESS ($t(34) = -.57$) subscales of the BANPS. Likewise, there were no gender differences in terms of Facing the Past ($t(34) = -.81$), Remembering on Hint Basis ($t(34) = -1.67$), Mood Regulation ($t(34) = -.95$), Self ($t(34) = -.35$), Taking Lessons ($t(34) = -.12$) subscales of AMFS, as well as the total scores of AMFS ($t(34) = -.93$) in the clinical group, $p > .05$.

In the healthy group, male participants scored higher on the SEEK subscale of BANPS ($M = 25.6$, $SD = 3.56$), compared to their female counterparts ($M = 22.1$, $SD = 4.85$), $t(24) = 2.06$, $p = .05$. There were no other gender differences in the healthy group in of terms of PLAY ($t(24) = .39$), CARE ($t(24) = 1.06$), ANGER ($t(24) = .53$), FEAR ($t(24) = -.44$), and SADNESS ($t(24) = -.79$) subscales of the BANPS. There were no gender differences in terms of Facing the Past ($t(24) = -.47$), Remembering on Hint Basis ($t(24) = 1.09$), Mood Regulation ($t(24) = .79$), Self ($t(24) = .20$), Taking Lessons ($t(24) = .73$) subscales of AMFS, as well as the total scores of AMFS ($t(24) = .47$) in the healthy group, $p > .05$.

Correlations among the subscales of BANPS and AMFS

Toexamine the relationship among BANPS and AMFS subscales, we conducted Pearson correlation analyses for the whole sample, clinical group, and healthy group (See Table 3, Table 4, and Table 5, respectively), also including the sociodemographic characteristics which are different between groups (i.e.,age and years of education).

In the whole sample, age was negatively correlated with SEEK ($r(62) = -.27$, $p = .03$) andPLAY subscales of BANPS, ($r(62) = -.39$, $p = .002$), and with the Self subscale of AMFS ($r(62) = -.25$, $p = .05$). Education was positively correlated with the SEEK subscale of BANPS, $r(62) = .33$, $p = .01$. SEEK subscale of BANPS was positively correlated with Taking Lessons from the Past subscale of AMFS, $r(62) = .27$, $p = .03$. CARE subscale of BANPS was positively correlated with Remembering the Past on a Hint Basis subscale of AMFS, $r(62) = .27$, $p = .03$.

In the clinical group, the only significant (positive) correlation was between SEEK subscale of BANPS and Taking Lessons from the Past subscale of AMFS, $r(36) = .38$, $p = .02$.

In the healthy group, age was negatively correlated with SEEK subscale ($r(26) = -.48$, $p = .01$), PLAY subscale ($r(26) = -.41$, $p = .04$), and CARE subscale of BANPS ($r(26) = -.53$, $p = .005$). CARE subscale of BANPS was positively correlated with Remembering the Past on a Hint Basis subscale of AMFS, $r(26) = .49$, $p = .01$; whereas ANGER subscale was negatively correlated with Remembering the Past on a Hint Basis, $r(26) = -.47$, $p = .02$.

Regressions for the AMFS subscales

To follow up the correlation analyses examining the relationship between autobiographical memory functions and affective neuroscience personality characteristics, we conducted multiple regression analyses using the enter method in SPSS. Two regression models were built to further examine the significant correlations regarding “Remembering the Past on a Hint Basis” and “Taking Lessons” subscales of AMFS.

To examine the effect of diagnosis and personality traits on Remembering the Past on a Hint Basis, we built a model including diagnosis, CARE, and ANGER as predictors. Table 6 shows the results of the multiple regression analysis. The predictors accounted for 10% of the variance, $F(3,58) = 2.12$, $p = .11$. CARE was the only significant predictor in this model, $\beta = .28$, $t = 2.21$, $p < .05$.

To examine the effect of diagnosis and SEEK on Taking Lessons from the Past, we built another model including diagnosis and SEEK as predictors. Table 7 shows the results of the multiple regression analysis. The predictors accounted for 10% of the variance, $F(2,59) = 3.20$, $p < .05$. Only SEEK was a significant predictor in this model, $\beta = .33$, $t = 2.49$, $p < .05$.

DISCUSSION

In this study, we examined why cognitively healthy older adults and patients with episodic memory deficits remember their autobiographical memories and whether there is a relationship between functions of autobiographical remembering and affective neuroscience personality traits. For this purpose, we recruited patients with amnestic type MCI and early-stage AD besides healthy controls who have no known neurological or psychological disorder. They were given BANPS to determine their affective neuroscience personality traits and AMFS to measure how much they rely on each autobiographical memory function when remembering their personal past.

Our analyses revealed that participants in the clinical group scored lower on the SEEK subscale of BANPS and higher on the *MoodRegulation* subscale of AMFS, but these differences were no longer significant when controlling for age and education, which were significantly different across groups. The group difference in terms of the SEEK subscale would be consistent with SoncuBüyükişcan's (2018) results, as well as previous literature proposing that patients with AD have lower Openness to Experience scores. Since the SEEK subsystem constitutes the basis for any motivation-driven activity and curiosity for what is going on in the world, this group difference would not be surprising considering the apathy of patients in the AD continuum. On the other hand, the group difference regarding *MoodRegulation* subscale of AMFS could be interpreted as a pragmatistic reliance on this ABM function to compensate for the deficit in mood regulation that patients in the AD continuum experience (Todd, 2020), in line with previous studies revealing the tendency to rely on the *Self* function more when one has a less clear self-concept (Vranic et al., 2018). However, to be able to draw more clear conclusions regarding these group differences, it is crucial to replicate these findings with age- and education-matched groups.

In the healthy group, we found that male participants scored higher on the SEEK subscale of BANPS. Barrett et al. (2013) reported gender differences regarding ANGER, CARE, FEAR, and SADNESS subscales of BANPS, but not for SEEK;

whereas Davis et al. (2003) reported a “marginal” difference for the SEEK subscale of the long form of ANPS showing that men have higher SEEK scores. Our finding is consistent with previous studies showing that men score higher on Openness to Experience subscale of the Five Factor Model (Costa et al., 2001)since the SEEK subscale and Openness to Experience are similar in content. However, another study conducted with Turkish and American participants found no gender effect in terms of SEEK in Turkish culture (Özkarar-Gradwohl et al., 2014). The latter finding seems counterintuitive regarding the gender inequality evident in traditional Turkish culture, which reinforces men to get more involved in the economic system and to have wider social connections, compared to women (KaracaandKocabaş, 2011). However, it should be noted that the majority of the sample of Özkarar-Gradwohl et al.’s (2014) study consisted of university students (who might not endorse traditional values strongly), and only a small portion included older adults.

Correlations for the whole sample revealed that age was negatively correlated with the SEEK and PLAY subscales of BANPS and the Self subscale of AMFS. Negative relation of age to SEEK and PLAY was consistent with the previous studies (Özkarar-Gradwohl et al., 2014), suggesting that as people age, they have lower energy levels and playfulness levels, and lower curiosity towards external stimuli. On the other hand, education was positively correlated with the SEEK subscale of BANPS. The SEEK subscale has items regarding problem solving and curiosity towards different domains in life, so it is very likely that people with a more active SEEK system would be more motivated to attainfurther progress ineducation.Also, previous research shows that as domain-specific knowledge increases, people are more likely to show interest to information on the given domain and to remember that information (Alexander et al., 1994). Considering the correlational nature of the relationship between SEEK and education, it is also possible to think that higher education might be increasing individuals’ curiosity levels, leading them to give higher ratings to SEEK subscale.

In terms of AMFS, age was also negatively correlated with the Self subscale in the whole sample. This is consistent with the previous finding suggesting that issues relating to identity become less self-relevant in later stages of life, leading to less reliance on the Self function when remembering personal past (BluckandAlea, 2008; 2009).This negative correlation between the Self subscale and age did not emerge when we conducted separate analyses for clinical and healthy groups, probably due to the decrease inpower since the r values were similar.

SEEK was positively correlated with Taking Lessons from the Past subscale of AMFS in the whole sample. This correlation was also significant when the analysis was conducted only for the clinical group, but not for the healthy group. To understand the relation among this function, SEEK subscale, and diagnosis, we conducted a multiple regression analysis. The regression showed that SEEK was a significant predictor of Taking Lessons from the Past, but diagnosis was not. This function is similar to the *Directive* function of the tripartite model of ABM functions (Er andYaşın, 2016). Previous studies consistently showed that there is a relationship between Openness to Experience and relying on ABMs for their *Directive* function (Cappeliezand O'Rourke, 2002; Rasmussen and Berntsen, 2010; Webster, 1994). People who have a more active SEEK system have curiosity and motivation to find new solutions for problems and to encounter new challenges. It makes sense that these people rely more on their past experiences to direct their future behavior and to solve new problems they encounter in life.

CARE subscale was positively correlated with Remembering the Past on a Hint Basis subscale of AMFS in the whole sample, as well as in the healthy group, but not in the clinical group. On the other hand, ANGER was negatively correlated with this function only in the healthy group. Again, to understand the nature of this relation better, we conducted a multiple regression analysis with Remembering Past on a Hint Basis as the outcome and CARE, ANGER, and diagnosis as predictors. Even though the overall model was not significant, CARE was the only variable significantly predicting this function. This result can be better understood by looking closely at the subscales. CARE subscale measures the level of emotional closeness and affection that the person feels towards others. Remembering on Hint Basis involves items that correspond to *IntimacyMaintenance* (with the lost loved ones) or *Conversation* subscales of RFS, and items that might be triggering a feeling of nostalgia ("When I listen to music, I remember the meaning of that song for me", "When I find an object which is personally important to me, I remember special moments involving that object", "When I look at the photographs, I remember that moment"). Considering that people who care about others would remember their personal past to re-connect with others and their memories involving them, this positive correlation is sensible.

Even though correlations regarding personality structures and the ABM functions that participants rely onwere different in the clinical versus healthy groups, regression analyses did not reveal an effect of diagnosis regarding Taking Lessons from the Past

and Remembering the Past on a Hint Basis functions. Also, the diagnosis effect we found regarding SEEK system and Mood Regulation function disappeared after age and education were controlled. There might be a few reasons for the lack of reliable group differences in our results. First of all, previous studies showed that due to the difficulty they experience remembering recent information, patients with AD seem to have difficulty incorporating the latest experiences into their identity, resulting in a weakened abilityto update their self-knowledge (Klein et al., 2003; Morris andMograbi, 2013). Since we used only self-reports in this study, when we compare personality traits of the healthy and clinical groups, what we actually compare might be personalities of cognitively healthy participants and "healthy older versions" of the patients, at least considering the patients with AD. This might be also true regarding their AMFS ratings. To overcome this possible problem, future studies could support self-reports of patients with informant ratings that could be collected from the patients' significant others.

Also, previous studies suggest no difference between personality structures of patients with MCI and cognitively healthy individuals (TerraccianoandSutin, 2019). The fact that our clinical group involved both patients with MCI and early-stage AD due to the sample size issues, it is important to further examine personality traits of these groups with more patients.

Relying only on self-report measures in the functions of ABM research has its own drawbacks, even when the research is conducted only with healthy participants. Considering the impaired metacognitive abilities of people with dementia (Bertrand et al., 2016), this might be even a bigger problem for the studies involving these groups. As Pillemer (2003) suggested, due to the nature of the research question itself, looking back to the past and trying to remember why one recalls the past at the time of the recall might lead to biased results. We use many ABM functions automatically when remembering our memories, not necessarily being aware of why we remember them. Future studies might overcome this issue by adding other measures as well, such as diaries to record the ABM at the time it is remembered besides the functions of remembering it. Another option might be coding the ABM narratives in terms of which function that the narrative seems to include (e.g., Hyman andFaries, 1992).

Another interesting direction for future studiesmight be to replicate our findings involving other clinical groups, as well.Limbic parts play a crucial role in the formation and consolidation of episodic memory, whereas prefrontal cortex is more important for retrieval of memories (Bizzozero et al., 2012). Therefore, with a holistic approach, it

might be interesting to examine the relation of episodic memory and executive functioning processesto the functions of autobiographical remembering, also including patients with frontal type of dysfunction.

Our findings have important practical value considering the lack of attentionto personal factors such as personality characteristics and personal motivations for remembering the past inreminiscence therapies conducted with patients with dementia. Considering the personal characteristics and motivations to remember the personal past, the cues used in these interventions can be more individualized, and the positive effects that patient experiences on their memory performance and psychological well-being can be further alleviated and extended to a longer period. In addition, since patients with AD have a less clear self-concept (Addis andTippett, 2004) and experience problems remembering self-relevant memories (Martinelli et al., 2013), considering the personality structures of patients during the intervention of reminiscence therapies seemeven more important.

Another practical implication of the present study is relevant to the role of psychotherapy in cognitive and psychological well-being. Our results show that SEEK and PLAY are the two subsystems that become less activated with age. SoncuBüyükişcan's (2018) findings also show that patients in AD continuum are extra sensitive to the decreased SEEK levels which is experienced during normal aging. Since psychotherapy is an insight-oriented process that encourages curiosity about the self and resembles a playground as it reinforces spontaneity and creativity (Winnicott, 1971/2005), our findings emphasize the importance of the endeavor to increase curiosity and playfulness in the context of psychotherapy, both in healthy and clinical populations.

CONCLUSION

The present study is important in terms of being the first one to examine ABM functions in patients with episodic memory impairment, in addition to investigating the relationship between neurologically supported personality traits and ABM functions. Even though not conclusive, our results suggest the possibility that there are differences between cognitively healthy and clinical group in terms of their personality structures and why they remember their personal experiences. We also found that SEEK and CARE systems of affective personality are positively related to Taking Lessons from

the Past and Remembering the Past on a Hint Basis functions, respectively. Our findings point out to the importance of considering personal characteristics in interventions that aim to improve ABM performance and psychological well-being.

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Table 1

Sociodemographic and clinical characteristics of the sample

	Total (N=62)	Clinical (N=36)	Healthy (N=26)	p
Gender (%)				
Female	53.23	50	57.69	
Male	46.77	50	42.31	.55 $^{\chi 2}$
Average Age (SD)	67.9 (8.84)	70.8 (7.4)	64 (9.29)	**.002** ^{t}
Average Years of Education (SD)	12 (4.92)	10.6 (4.98)	14 (4.14)	**.006** ^{t}
Average MMSE Score (SD)	26.8 (2.91)	25.3 (2.86)	29 (0.89)	**<.001** ^{t}
Average GDS Score (SD)	5.08 (3.48)	5.36 (3.47)	4.69 (3.54)	.40 ^{U}

Table 2

Group comparisons in terms of the BANPS and AMFS

	Total (N=62)	Clinical (N=36)	Healthy (N=26)	p
BANPS_SEEK	21.5 (5.19)	20.1 (5.13)	23.6 (4.63)	**.007**
BANPS_PLAY	22.5 (5.04)	21.6 (4.81)	23.8 (5.14)	.082
BANPS_CARE	16.8 (2.58)	16.7 (2.5)	16.9 (2.73)	.745
BANPS_ANGER	13.7 (3.39)	13.7 (3.56)	13.7 (3.22)	.973
BANPS_FEAR	11.9 (4.23)	11.9 (4.44)	11.8 (3.99)	.874
BANPS_SADNESS	12.3 (3.4)	12.2 (3.5)	12.4 (3.34)	.821
AMFS_Facing the Past	33.1 (10.9)	34.8 (11.4)	30.8 (9.98)	.160
AMFS_Remembering on Hint	32.6 (6.24)	32.8 (6.46)	32.5 (6.03)	.878
AMFS_Mood Regulation	27.1 (7.73)	29 (7.22)	24.6 (7.83)	**.026**
AMFS_Self	16.8 (4.66)	16.9 (4.74)	16.7 (4.64)	.871
AMFS_Taking Lessons	27.2 (7.72)	27.6 (7.99)	26.7 (7.45)	.654
AMFS_Total	137 (31.2)	141 (31.6)	131 (30.03)	.229

BANPS: Brief Form of Affective Neuroscience Personality Scales, AMFS: Autobiographical Memory Functions Scale

Table 3

Correlations for the whole sample

	Age	Education	SEEK	PLAY	CARE	ANGER	FEAR	SADNESS	Facing the Past	Remembering on Hint	Mood Regulation	Self	Taking Lessons
Education	-.07												
SEEK	-.27*	.33**											
PLAY	-.39**	-.06	.54***										
CARE	-.24	-.04	.37**	.43***									
ANGER	.04	.22	.11	-.14	.001								
FEAR	.03	-.13	-.08	-.25*	-.26*	.38**							
SADNESS	.02	-.11	-.03	-.28*	-.21	.24	.69***						
Facing the Past	.11	-.07	.05	-.07	.03	-.004	-.03	.18					
Remembering on Hint	-.21	-.14	.20	.18	.27*	-.15	-.08	.20	.57***				
Mood Regulation	.11	-.10	-.06	.001	.15	-.08	-.04	.17	.57***	.58***			
Self	-.25*	.09	.17	.10	.16	.02	-.01	.21	.64***	.41**	.50***		
Taking Lessons	-.01	.07	.27*	.07	.16	-.08	-.02	.20	.73***	.64***	.71***	.66***	
AMFS_Total	-.02	-.04	.13	.05	.17	-.07	-.04	.23	.88***	.76***	.81***	.74***	.91***

Note. * p < .05, ** p < .01, *** p < .001

Table 4

Correlations for the clinical group

	Age	Education	SEEK	PLAY	CARE	ANGER	FEAR	SADNESS	Facing the Past	Remembering on Hint	Mood Regulation	Self	Taking Lessons
Education	.07												
SEEK	.08	.29											
PLAY	-.27	-.02	.50**										
CARE	.05	.02	.30	.34*									
ANGER	.01	.21	.07	-.08	.10								
FEAR	.005	-.29	-.01	-.10	-.29	.35*							
SADNESS	.11	-.08	.03	-.22	-.20	.26	.64***						
Facing the Past	.01	.08	.23	.01	-.01	.003	-.12	.24					
Remembering on Hint	-.16	-.03	.24	.18	.12	.04	-.08	.23	.65***				
Mood Regulation	.07	.19	.12	.26	.08	-.03	-.19	.17	.48**	.58***			
Self	-.19	.22	.15	.14	.06	.01	-.13	.28	.64***	.47**	.49**		
Taking Lessons	.05	.27	.38*	.11	.03	-.05	-.07	.26	.70***	.63***	.73***	.66***	
AMFS_Total	-.03	.17	.28	.16	.06	-.01	-.14	.28	.88***	.80***	.78***	.76***	.90***

Note. * p < .05, ** p < .01, *** p < .001

Table 5

Correlations for the healthy group

	Age	Education	SEEK	PLAY	CARE	ANGER	FEAR	SADNESS	Facing the Past	Remembering on Hint	Mood Regulation	Self	Taking Lessons
Education	.09												
SEEK	-.48*	.13											
PLAY	-.41*	-.37	.51**										
CARE	-.53**	-.18	.49*	.55**									
ANGER	.07	.27	.20	-.23	-.13								
FEAR	.04	.18	-.19	-.48*	-.22	.43*							
SADNESS	-.07	-.22	-.16	-.39	-.24	.21	.78***						
Facing the Past	.08	-.19	-.09	-.11	.12	-.02	.13	.11					
Remembering on Hint	-.32	-.33	.17	.20	.49*	-.47*	-.07	.15	.44*				
Mood Regulation	-.08	-.29	-.07	-.16	.27	-.16	.15	.21	.66***	.64***			
Self	-.39	-.08	.25	.07	.30	.03	.17	.09	.65***	.31	.54**		
Taking Lessons	-.13	-.20	.18	.05	.35	-.13	.06	.12	.80***	.67***	.72***	.66***	
AMFS_Total	-.15	-.27	.07	-.02	.34	-.17	.11	.16	.89***	.72***	.86***	.73***	.93***

Note. * p < .05, ** p < .01, *** p < .001

Table 6

Regression for predicting "Remembering the Past on a Hint Basis"

Variable	t	p	β	95% Confidence Interval
Intercept	4.11	< .001		
Diagnosis (0= Healthy, 1=Clinical)	.26	.80	.06	[-0.44, 0.57]
CARE	2.21	**.03**	.28	[0.03, 0.53]
ANGER	-1.22	.23	-.15	[-0.40, 0.10]

Table 7

Regression for predicting "Taking Lessons from the Past"

Variable	t	p	β	95% Confidence Interval
Intercept	3.15	.003		
Diagnosis (0= Healthy, 1=Clinical)	1.28	.21	.34	[-0.19, 0.87]
SEEK	2.49	**.02**	.33	[0.06, 0.59]