



Effect of Emotional Content on Memory Characteristics: Emotional Valence, Emotional Intensity, and Individual Emotions

Bellek Özelliklerinde Duygu İçeriğinin Etkisi: Duygusal Değer, Duygusal Yoğunluk ve Tekil Duygular

İnci Boyacıoğlu¹, Kıvanç Konukoğlu², Tolga Ergiyen³

¹Dokuz Eylül University, İzmir, Turkey

²Acıbadem Mehmet Ali Aydınlar University, İstanbul, Turkey

³İzmir Ekonomi University, İzmir, Turkey

ABSTRACT

The aim of the present study is to examine the relationships between the emotional valence and emotional intensity of autobiographical memories and the phenomenological characteristics of memories in the context of individual emotions and memory types. Seven hundred and sixty-four students (514 female, 250 male) from Dokuz Eylül University participated in the study. Participants were asked to recall a childhood memory, a self-defining memory, or a romantic relationship memory. After thinking about the memory they remember, they were requested to fill out the Autobiographical Memory Characteristics Questionnaire and a scale for intensity of individual emotions. Regression analyses showed that emotional intensity of the memories predicted the sensory details, rehearsal, and preoccupation with emotions. In moderated-mediation analyses, mediating effects for emotional intensity were detected between individual emotions and memory characteristics, except for the negative self-esteem emotions. Among these analyses, a moderating effect of memory types was detected only for the relationships between hostile emotions and anxiety-related emotions and the memory characteristics through the mediation of emotional intensity. While the intensity of singular emotions showed stronger relationship with emotional valence, the main variable that predicted memory characteristics overall was the emotional intensity.

Keywords: Autobiographical memory, emotions, emotional intensity, emotional valence

ÖZ

Bu çalışmanın amacı anıların duygusal değeri ve duygusal yoğunluğu ile otobiyografik anıların fenomenolojik özellikleri arasındaki ilişkileri tekil duygular ve anı türleri bağlamında incelemektir. Bu çalışmaya Dokuz Eylül Üniversitesi'nden 764 öğrenci (514 kadın, 250 erkek) katılmıştır. Katılımcılardan bir erken çocukluk anısı, bir öz tanımlayıcı anı veya bir romantik ilişki anısı hatırlamaları istenmiştir. Ardından hatırladıkları anıyı düşünerek Otobiyografik Bellek Özellikleri Ölçeği'ni ve tekil duyguların yoğunluğuna ilişkin ölçeği doldurmaları istenmiştir. Yapılan regresyon analizlerinde anıların duygusal yoğunluğunun anılardaki algısal detayları, anıların tekrar tekrar hatırlanmasını ve duygusal aşırılaştırmayı yordadığı bulunmuştur. Düzenleyici-aracı analizlerde, olumsuz benlik-saygısı duyguları haricinde tekil duygularla anı özellikleri arasında duygusal yoğunluk için anlamlı bir aracılık etkisi gözlemlenmiştir. Bu analizlerden sadece düşmanca duygular ve kaygı ilintili duygular ile anı özellikleri arasında duygusal yoğunluğun aracılığındaki ilişkide anı türlerinin düzenleyici etkisi tespit edilmiştir. Tekil duyguların yoğunluğu duygusal değerle daha güçlü ilişkiler gösterirken, anı özelliklerini asıl yordayan değişken anıların genel duygusal yoğunluğu olmuştur. Ancak olumsuz benlik-saygısı duygularının kendilerine özgü bir örüntüye sahip olduğu görülmüştür.

Anahtar sözcükler: Otobiyografik bellek, duygular, duygusal yoğunluk, duygusal değer

Address for Correspondence: İnci Boyacıoğlu, Dokuz Eylül University Faculty of Letters Department of Psychology, İzmir, Turkey

E-mail: inci.boyacioglu@deu.edu.tr **Received:** 04.2.2022 **Accepted:** 19.07.2022

ORCID ID: 0000-0002-1863-3792

Introduction

The relationships between emotions and autobiographical memories, particularly the concepts of emotional valence and emotional intensity have been extensively studied in the literature. While various important differences have been found in the encoding, storage, and retrieval processes of positive and negative emotional memories (Conway and Pleydell-Pearce 2000, Levine and Bluck 2004, Kensinger 2009a, Kensinger 2009b, Holland and Kensinger 2010), numerous studies also show that affective processes associated with memories have strong relationships with individual differences and psychological symptoms (Boals et al. 2008, Rasmussen and Berntsen 2010, Sarp and Tosun 2011, Boyacioglu et al. 2017).

While the emotional valence of memories refers to the positive or negative affect that the memory triggers in general, emotional intensity refers to the arousal strength of the affect. Emotional valence and intensity of memories predict several phenomenological qualities such as rehearsal of memories, remembering memories as if reliving them, vividness of memories, richness of sensory details of memories, physical reactions during the recollection of memories (visceral reactions), retrieval of memories from the first person/field or third person/observer perspective (Talarico et al. 2004, Mickley and Kensinger 2009, Boyacioglu and Akfirat 2015). However, there are some conflicting results among studies examining the relationships between the emotional valence, intensity, and phenomenological characteristics of memories (Öner 2021). The present study aims to examine the relationships between the emotional valence and intensity of memories and the phenomenological characteristics of autobiographical memories while considering the individual emotions and memory types. In the autobiographical memory literature, individual emotions have been neglected except for specific emotions such as shame and guilt (D'Argembeau and Van der Linden 2008, Robinaugh and McNally 2010, Pivetti et al. 2016), and the relationship between memories and emotions has rarely been compared for different types of memories. We believe that the results of the present study will provide explanatory information about inconsistent findings in the literature and contribute to related research in the field of psychological health.

Positive emotional bias in memory processes is a phenomenon frequently detected in research examining the emotional valence of autobiographical memories ((Berntsen 1996, Walker ve ark. 2003, Schaefer ve Philippot 2005, Marsh ve ark. 2019). Positive memories strongly influence people's feelings about themselves, protect their self-esteem via self-enhancing functions, and play a significant role in the construction of the self (Wilson and Ross 2003, Collins et al. 2007, Demiray and Janssen 2015). Positive autobiographical memories are more easily stored (Dolcos and Cabeza 2002), more easily and quickly recalled (Lishman 1974, Levine and Bluck 2004, Bohanek et al. 2005), and remembered more vividly and in detail than negative memories (D'Argembeau and Van der Linden 2008, Lindeman et al. 2017). In addition, it has been found that the weakening of the emotions accompanying the memory (fading effect), is stronger in negative memories,

while positive emotions are relatively preserved (Walker and Skowronski 2009). The endurance of positive memories is associated with the effort to create a meaningful and adaptive life story (Collins et al. 2007, Tekcan et al. 2017).

However, it is found that the positivity bias in memory is not valid in all cases. Various types of memories, especially traumatic memories and flashbulb memories, have some differences compared to other autobiographical memories. Studies are showing that the emotions felt during the recall of traumatic and flashbulb memories are felt more intensely than the emotions accompanying positive memories (Christianson 1986, Er et al. 2008), and that the event is remembered in more detail and easily (Christianson 1992, Tromp et al. 1995, Tekcan 2001, Berntsen and Rubin 2007, Crespo and Fernández-Lansac 2016). Briefly, two viewpoints, one posits that positive memories and the other posits negative memories have advantages in terms of autobiographical memory characteristics, are both supported by empirical studies. Accordingly, it has become important to develop a new perspective that takes into account the variables that may affect these associations between emotional valence and memory characteristics, which may vary between studies.

The functions of memories in the autobiographical memory literature have brought a functional perspective to the debate on the emotional valence of memories as a new field of research. In this framework, positive and negative memories are compared within the scope of their functions in daily life. Rasmussen and Bernsten (2009) claimed that memories associated with negative emotions often have a directive function for the person, while memories with positive emotions are served for self and social functions. Apparently, even if memories carry negative emotions, they may be suitable for functional use in different contexts (Burnell et al. 2020). A recent study indicates that the functions of memories may vary not only according to the emotional valence of the memory used but also according to its intensity (Wolf et al. 2021). In line with the functional perspective, the comparison of different types of autobiographical memories defined within the framework of different functions in the context of the emotion-memory relationship may enrich our perspective on autobiographical memory.

Although research in the field has mostly focused on the comparison between positive and negative autobiographical memories, it has been consistently found that emotional intensity of memories is a strong predictor of more autobiographical memory characteristics (e.g., vividness, sensory details, rehearsal) and has a higher effect size than emotional valence. Talarico and colleagues (2004) argued that the predictive effect of emotions on memory is mediated by intensity. According to their vector model, emotional intensity is divided into two directions along with emotional valence, but whether it is positively or negatively charged, strong emotional intensity has an enhancing effect on memory characteristics.

In the autobiographical memory literature, few studies have examined the relationship between individual emotions and memory characteristics. Since an emotional memory is not

bound with a single emotion, it is difficult to create a specific emotional state using autobiographical recall in research (Levine and Pizarro 2004, Barrett 2006, Lerner et al. 2015). Nevertheless, some studies show that certain emotions might be more determinant of memory characteristics. For instance, Montebanacci and her colleagues (2016) indicated that fear and anger predicted the emotional intensity of memories more strongly than sadness, shame, and guilt. Öner and Gülgöz (2018) reported that anger memories were remembered more vividly and were remembered with higher levels of imagery compared to emotionally neutral memories. The individual emotion-memory relationship is a subject of study that has the potential to generate valuable information for the field of psychological health. In a study exemplifying this contribution, Newby and Moulds (2012) showed that the emotions associated with rumination were helplessness, sadness, worry, shame, guilt, and disgust, respectively. It can be hypothesized that the emotional content of memories may also be related to the type of memory due to the strong associations of certain emotions with certain event themes. For instance, it is quite expected that emotions such as love, anxiety, and trust are more central in memories with the theme of romantic relationships. However, for each theme and each emotion, the possible connections are not so clear and therefore these relationships need to be examined in empirical studies.

The relationship of autobiographical memories with psychopathology is examined concerning both the phenomenological characteristics of memories and the emotions associated with the memories. For instance, people with emotional disorders may recall in a non-detailed, overly general level when recalling a particular memory (Williams 1996). Various studies showed that overgeneral memory, which manifests itself in many psychological disorders such as depression and trauma, is also used as a kind of emotion regulation strategy to avoid intense affect (Capture and Rumination-Functional Avoidance-Impaired Executive Functions, CaRFAX, Williams et al. 2007).

In research examining the relationship between depression and memory, which is one of the most frequently studied subjects in the field of psychopathology, it is found that individuals who have experienced depression show more negative emotion bias in memory processes and experience negative emotions more intensely than those who do not experience depression (Watson et al. 2012). In addition, they perceive positive memories more psychologically distant than negative memories (Janssen et al. 2015) and experience the facing effect less in negative emotions (Walker et al. 2003). In parallel with these findings, it has been revealed that individuals with depression feel the emotions of fear, sadness, and anger more intensely, but they cannot regulate their emotions through their autobiographical memories (del Palacio-Gonzalez et al. 2017).

Another relationship that has been consistently detected in the field is that extremely stressful memories are more likely to be rehearsed with high emotional intensity. These memory characteristics also have been detected in autobiographical

memories of individuals with severe posttraumatic stress disorder (PTSD) (Rubin et al. 2008, Rubin et al. 2011). Memories of traumatic events are remembered more vividly, in detail, and with intense emotions with increasing PTSD symptoms, while depressive symptoms can reduce the vividness of these memories (Ashbaugh et al. 2018). These studies aim to provide an explanatory conceptual framework for memory biases that accompany certain psychopathologies (Kaya-Kızıllöz and Altan-Atalay 2018). In addition to expanding our general understanding of memory processes, these studies on the relationship between emotion and memory can enrich clinical practice through concepts such as memory biases, rumination, and overgeneralization that are associated with depression and anxiety disorders. The current study will examine the emotional valence of memories, emotional intensity, and the relationship between individual emotions and memory characteristics that have strong links with clinical studies. Based on Talarico et al.'s (2004) study, emotional intensity is expected to be a stronger predictor than emotional valence in the relationship between individual emotions and memory characteristics, and emotional intensity is expected to mediate the relationship between individual emotion factors and memory characteristics. Additionally, individual emotions are expected to differ between memory types in terms of the intensity with which they are felt. Specifically, based on self-enhancement motivations, positive emotions are thought to be most intensely observed for self-defining memories. In addition, it is thought that memory type will have a moderating effect on the relationship between individual emotions, emotional intensity, and memory characteristics. More specifically, for romantic relationship memories, it is expected to observe the highest predictive effect of the hostile emotions factor, which consists of negative relational emotions, on memory characteristics. For self-defining memories, which are closely related to processes such as self and self-esteem, it is assumed that the predictor effect of the negative self-esteem emotions factor on memory characteristics will be stronger.

Method

Participants

In total, 764 (514 female, 250 male) students from Dokuz Eylül University participated in the present study. Ages of the participants varied between 17-29 ($M = 21.44$, $SD = 1.95$). The majority of the participants are single (95.7%) and have spent most of their lives in cities or big cities (83.6%). Research ethical approval was obtained from Dokuz Eylül University Ethics Committee (decision dated 16.08.2012 and numbered 2/2). All participants gave informed consent before participating in the study.

Measures

The Autobiographical Memory Characteristics Questionnaire.

The scale developed by Boyacıoğlu and Akfırat (2015) consists of 63 items and these items measure 14 different phenomenological

features related to autobiographical memory. All items are answered on a 7-point Likert scale (1 = Strongly Disagree, 7 = Strongly Agree). Cronbach's alpha values of the subscales were reported to vary between .74 and .96. In the present study, only rehearsal (e.g., "When I remember this event, I seem to rethink what I thought during the event or feel like I felt again."), sensory details (e.g., "The smell of this event [for example, the smell of dampness or perfume] I feel it again when remembering the event."), preoccupation with emotions (e.g., "My feelings while remembering this event are so intense that I cannot focus on what I do afterward.") and emotional distancing (e.g., "I suppress what I feel while remembering this event.") subscales used. In addition, emotional valence and emotional intensity have been measured. In the calculations based on the average of the answers given by the participants to the scale items of each memory characteristics, high scores in emotional valence mean that the moment generally makes people feel high positive emotions, and high scores in emotional intensity mean that the emotions felt by the memory are generally intense.

Intensity of Individual Emotions

In order to measure the intensity of the emotions felt by the participants when recollecting their autobiographical memories, a scale containing 22 individual emotions was administered. These emotions were selected based on Talarico et al.'s (2004) study. Participants were asked to rate the intensity with which they felt each of the related emotions (e.g., happiness, fear, etc.) while recalling the event on a 7-point Likert-type scale (1 = Not at all, 7 = Very intensely). Participants rated each emotion separately. In the exploratory factor analysis conducted for individual emotions, Kaiser-Meyer Olkin's (KMO) value was .93, and Bartlett's test result was found to be significant, $\chi^2(231) = 13.816,192, p < .001$. According to the results, 4 factors with eigenvalues higher than 1 were identified and these factors explained 71.74% of the total variance. After Varimax rotation, it was determined that the first factor consisted of 9 emotions (happiness, satisfaction, joyful, pleasure, satisfied, proud, excited, comfort, and love), and the second factor consisted of 6 emotions (hate, irritable, hostile, anger, frustration, bored), the third factor consisted of 5 emotions (anxiety, fear, confusion, sadness, nervous) and the fourth factor consisted of 2 emotions (shame, guilt). Factor loadings varied between .56 and .89. The factors were named by the researchers as "Positive Emotions" (e.g., love, pleasure), "Hostile Emotions" (e.g., anger, hate), "Anxiety-Related Emotions" (e.g., anxiety, tension), and "Negative Self-Esteem Emotions" (guilt and shame), respectively. In addition, this factor structure was examined separately for each memory type by exploratory factor analysis and it was seen that the four-factor structure proposed for individual emotions was valid for all memory types. When the memory types were analyzed separately, it was detected that in the childhood memories, the feeling of boredom gave a strong factor loading to the third factor, Anxiety-Related Emotions. In the romantic relationship memories, feelings of tension and confusion also loaded on the second factor, Hostile Emotions. Similarly, in self-defining memories, tension is loaded on the Hostile Emotions factor. It was concluded that these detected

differences did not constitute an obstacle to using the four-factor structure. The factors obtained are consistent with the categories of emotions used in many psychological studies in the past. Indeed, self-esteem-related emotions (e.g., Kernis et al. 1996), anxiety-related emotions (e.g., Major et al. 2003, Schlicht 1994), and hostile emotions (e.g., Ihlebaek and Holter 2021, Maneta et al. 2015) correspond to categories frequently used in the literature for individual emotions. In the present study, positive individual emotions were not differentiated and were attributed to a single factor. For the aim of the study, this factor structure was also found to be appropriate for the theoretical framework of the study, and the analyses were conducted based on the average scores obtained in these factors.

Procedure

Convenience Sampling was used as the sampling methodology. The questionnaires were administered in the classroom at the end of the course to those who voluntarily wanted to participate in the study, using the paper-and-pencil method. No incentive was given to the participants. An informed consent form was presented to the participants at the beginning of the study. Demographic information including age, gender, marital status, and place of residence for most of their lives was obtained from the participants who agreed to participate. In the data collection sets, three different instructions were used in the memory task, and participants were given one of these instructions. In other words, each participant was asked to recall only one memory. Accordingly, participants were asked to recall a memory of their childhood, self-defining or romantic relationship experiences. The memory task instructions for childhood and romantic relationship memories were adapted from Talarico et al. (2004). The instruction for self-defining memories was adapted from Singer and Moffitt (1992) and participants were asked to recall a very important memory that is central to their self and life story. To avoid the possibility of that the participants might not read or understand the instructions, the researcher verbally explained the type of memory they were asked to recall in the memory task before distributing the questionnaire. The participants completed the Autobiographical Memory Characteristics Questionnaire and the individual emotions form by thinking about the memory they recalled during the memory task.

Statistical Analysis

All analyzes and estimations were performed with the SPSS 25 package program. Pearson Correlation Coefficient was used to reveal the relationship between the variables. Hierarchical regression method was used to determine the variables that predicted the main dependent variables. While gender and memory type variables were used in the first step of this analysis, emotional value and emotional intensity were used in the second step. Finally, mediation analyzes were performed with the PROCESS (version 3.5.3) plugin (Hayes, 2017), and the bootstrapping method was used 5000 times in all analyzes. Model 14 in PROCESS was used in the analysis. In addition, gender was included as a control variable in all analyzes

Results

There were 305 participants in the childhood memories condition, 197 participants in the romantic memories condition and 262 participants in the self-identifying memories condition. We first examined the relationships between variables using data from participants in all conditions. The correlations between individual emotion factors and memory characteristics are shown in Table 1. Positive Emotions were significantly correlated with all memory characteristics ($|- .10| < |r| < |-.23|$), Hostile Emotions were significantly correlated with all memory characteristics except rehearsal ($|.11| < |r| < |.36|$), Anxiety-Related Emotions were significantly correlated with all memory characteristics ($|.12| < |r| < |.34|$), and finally, Negative Self-Esteem Emotions were significantly correlated with emotional distancing and preoccupation with emotions ($r = .17, r = .25$, respectively). In particular, the negative relationship between positive emotions and negative self-esteem emotions ($r = -.19$) and hostile emotions ($r = -.39$) and the positive relationship of negative self-esteem emotions with hostile emotions ($r = .36$) and anxiety-related emotions ($r = .42$) in the expected direction support the validity of the factor analysis on single emotions.

Emotional intensity and emotional valence were found to be correlated with all memory characteristics, and the coefficients of the correlations were compared in one-way analyses for the strength of the relationship (see Lenhard and Lenhard 2014). The correlations of emotional intensity with preoccupation with emotions ($z = 3.25, p = .001$), rehearsal ($z = 8.14, p < .001$), and sensory details ($z = 9.14, p < .001$) were significantly stronger than correlations of emotional valence. The effect size of emotional valence was found to be higher only in emotional distancing, $z = 3.15, p = .001$. For the individual emotion factors, emotional valence was more strongly associated with positive emotions ($z = 14.09, p < .001$), hostile emotions ($z = 8.31, p < .001$) and anxiety-related emotions ($z = 5.52, p < .001$) than emotional intensity.

According to the results of one-way analysis of variance (ANOVA) followed by Tukey's post hoc test, there were significant differences in the emotional valences of memories according to memory types [$F(2, 763) = 47.897, p < .001$]. Accordingly, while there was no difference between romantic relationship memories ($M = 3.74, SD = 2.17$) and childhood memories ($M = 3.85, SD = 1.91$), the emotional valence of self-defining memories ($M = 5.29, SD = 1.95$) was higher than other types of memories. In terms of emotional intensity [$F(2, 763) = 48.065, p < .001$], the mean of childhood memories ($M = 3.99, SD = 2.55$) was significantly lower than both romantic relationship memories ($M = 5.17, SD = 1.60$) and self-defining memories ($M = 5.16, SD = 1.70$). In terms of individual emotion factors, positive emotions showed significant differences according to memory types [$F(2, 763) = 57.124, p < .001$]. Positive emotions were more intense in self-defining memories ($M = 6.67, SD = 2.01$) than in romantic relationship memories ($M = 3.35, SD = 2.00$) and childhood memories ($M = 3.35, SD = 2.00$). Hostile emotions [$F(2, 763) = 37.175, p < .001$] and anxiety-related emotions [$F(2, 763) = 22.601, p < .001$] were more intense in romantic relationship memories ($M = 3.20, SD = 1.86, M = 3.83, SD = 1.77$) than childhood memories ($M = 2.29, SD = 1.49, M = 3.14, SD = 1.64$) and self-defining memories ($M = 2.33, SD = 1.70, M = 2.82, SD = 1.44$). Finally, memory characteristics showed significant differences in terms of negative self-esteem emotions [$F(2, 763) = 11.562, p < .001$]. Accordingly, negative self-esteem emotions were significantly more intense in romantic relationship memories ($M = 2.63, SD = 1.79$) than in childhood memories ($M = 2.27, SD = 1.55$), and there was a significant difference between childhood memories and self-defining memories ($M = 1.93, SD = 1.39$) in favor of childhood memories. All analyses are shown in graphs (Figure 1-6).

The Predictive Role of Emotional Intensity and Emotional Valence on Memory Traits

Hierarchical regression analyzes were applied to determine the predictive role of emotional intensity and emotional valence

Table 1. Mean, standard deviation, and correlations of variables

	Mean	SD	1	2	3	4	5	6	7	8	9	10
1. Positive Emotions	3.80	2.10	-									
2. Hostile Emotions	2.54	1.70	-.39***	-								
3. Anxiety-Related Emotions	3.21	1.65	-.39***	.66***	-							
4. Negative Emotions	2.25	1.59	-.19***	.36***	.42***	-						
5. Emotional Valence	4.32	2.11	.76***	-.53***	-.46***	-.28***	-					
6. Emotional Intensity	4.70	1.71	.27***	.18***	.23***	.04	.16***	-				
7. Emotional Distance	3.11	1.55	-.23***	.30***	.24***	.17***	-.22***	-.07*	-			
8. Preoccupation with Emotions	2.65	1.39	-.10**	.36***	.34***	.25***	-.18***	.32***	.29***	-		
9. Rehearsal/Reliving	5.09	1.63	.18***	.07	.12***	.02	.13***	.48***	-.08*	.07	-	
10. Sensory Detail	4.85	1.50	.20***	.11**	.15***	.06	.12***	.51***	.01	.18***	.34***	-

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

on the memory characteristics (predicted variables = emotional distancing, sensory details, rehearsal, preoccupation with emotions). In total, four hierarchical regression analyzes were performed. In all analyses, gender and memory type variables were included in the first step, and emotional valence and emotional intensity were included in the analysis as predictive variables in the second step. According to the results, females

recall their memories more repeatedly than males ($\beta = -.07, p = .055$), and males put more emotional distanc from their memories than females ($\beta = .10, p = .007$). Analyzes also showed

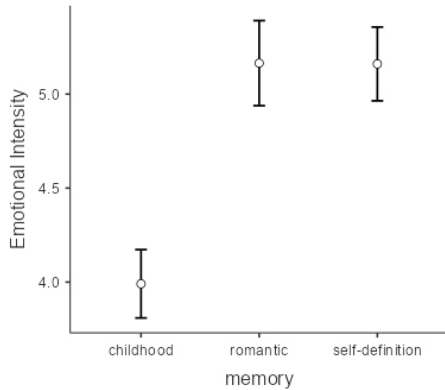


Figure 1. Means of Emotional Intensity by Memory Type

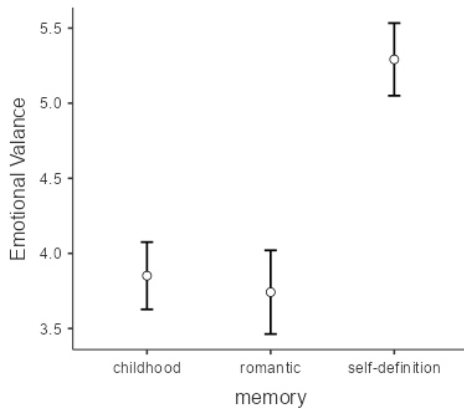


Figure 2. Means of Emotional Valance by Memory Type

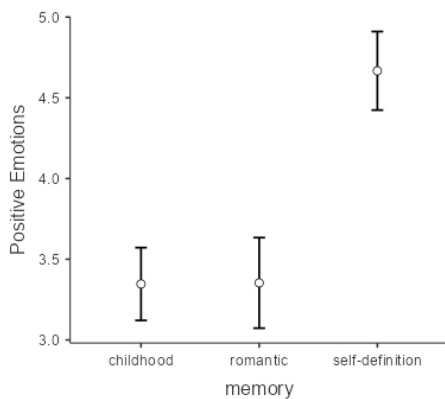


Figure 3. Means of Positive Emotions by Memory Type

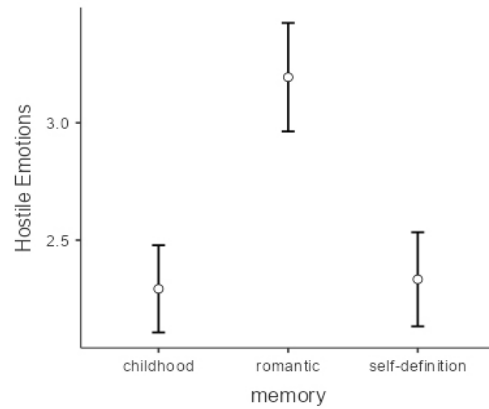


Figure 4. Means of Hostile Emotions by Memory Type

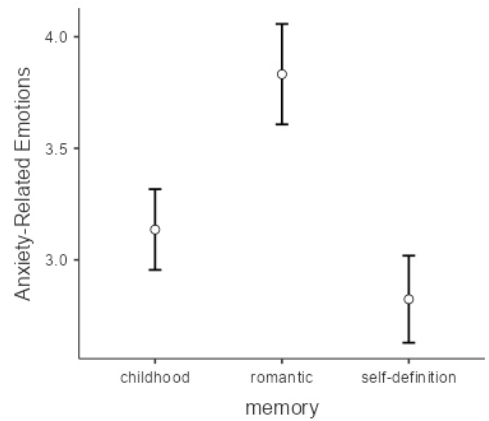


Figure 5. Means of Anxiety-Related Emotions by Memory Type

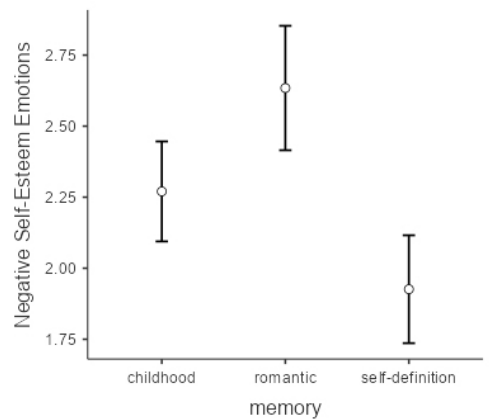


Figure 6. Means of Negative Self-Esteem Emotions by Memory Type

that memory types were significantly predictive of memories in sensory details, rehearsal, and preoccupation with emotions (self-defining memories: $\beta = .34, p < .001, \beta = .27, p < .001, \beta = .09$, respectively). , $p = .03$, romantic relationship memories: $\beta = .29, p < .001, \beta = .23, p < .001, \beta = .20, p < .001$). On the other hand, only romantic relationship memories had a significant predictive effect on emotional distancing ($\beta = .07, p = .03$).

In the second step of the regression analyses, emotional intensity significantly predicted sensory details ($\beta = .46, p < .001$), rehearsal ($\beta = .44, p < .001$), and preoccupation with emotions ($\beta = .35, p < .001$), except for emotional distancing ($\beta = -.07, p = .065$). Emotional valence, on the other hand, significantly predicted preoccupation with emotions ($\beta = -.25, p < .001$) and emotional distancing ($\beta = -.26, p < .001$). However, it did not significantly predict sensory details ($\beta = -.01, p = .978$) and rehearsal ($\beta = .03, p = .420$). In sum, an increase in emotional intensity in memories is associated with recalling more sensory details in memories and recalling memories repeatedly, whereas an increase in the negativity of emotional valence is associated with emotional distancing from memories. In preoccupation with emotions, both high emotional intensity and negative emotional valence show predictive effects.

A model of emotional intensity, memory type, and characteristics was tested for each individual emotion factor separately (Positive Emotions, Hostile Emotions, Anxiety-Related Emotions, and Negative Self-Esteem Emotions). However, to our best knowledge, it has not been examined the conditions or mechanisms which lead positive emotions to increase preoccupation with emotions and/or emotional distancing efforts in previous studies. Due to the absence of a well-founded theoretical framework in the literature and the absence of measurements of important variables (individual differences, depression, etc.) related to

positive emotions in the current study, we will test our moderated-mediation model only for negative emotion factors.

The Mediator Role of Emotional Intensity in the Relationship between Hostile Emotions and Memory Characteristics and the Moderating Role of Memory Type in the Mediator Relationship

The SPSS 25 and PROCESS (version 3.5.3) were used to test the 12 different moderated-mediation models (model 14) (Hayes, 2017). The overall model tested is shown in Figure 7. In all analyses, the bootstrapping method (5000) was used. In addition, gender was included as a control variable in all analyses. The values of all analyses are shown in Table 2.

Sensory Details: There is a significant relationship between hostile emotions and sensory details ($\beta = .10, SE = .03, p = .002$). When emotional intensity was included in the analysis as a mediator variable, the relationship between hostile emotions and

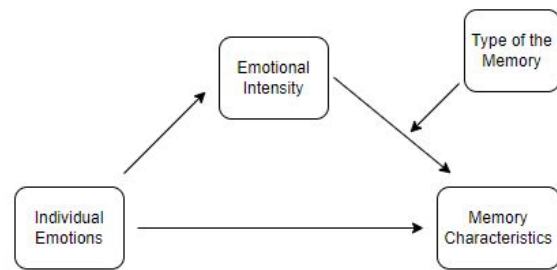


Figure 7. The overall model

Independent Variable	Mediator	Dependent Variable (Direct Effect)				Indirect Effect	Conditional Indirect Effect		
		Sensory Detail	Rehearsal/Reliving	Preoccupation with Emotions	Emotional Distance		Childhood	Romantic	Self-defining
Hostile Emotions	.19***	.02				.08*	.06*	.07*	.09*
			-.02			.08*	.08*	.06*	.08*
				.25***		.04*	.05*	.03*	.04*
					.28***	-.02*	-.01	-.02	-.05*
Anxiety-Related Emotions	.23***	.05				.10*	.07*	.08*	.11*
			.03			.10*	.09*	.08*	.10*
				.23***		.06*	.07*	.05*	.06*
					-.14***	-.03*	-.01	-.02	-.07*
Negative Self-esteem Emotions	.04	.05				.02	.02	.02	.02
			.01			.02	.02	.02	.02
				.20***		.01	.02	.01	.01
					.16***	-.01	.01	-.01	-.01

Note: * Indirect effects didn't have a zero point (no effect) in the 95% confidence interval, **= p < .05, ***= p < .001

sensory details was not significant ($\beta = .02$, $SE = .03$, $p = .476$). The change in significance indicates full mediation. However, the strength of the indirect effect does not vary across memory types. Accordingly, childhood memories [$\beta = .06$, 95% CI = (.03, .09)], romantic relationship memories [$\beta = .07$, 95% CI = (.04, .10)], and self-defining memories [$\beta = .09$, 95% CI = (.05, .12)] showed a similar pattern. In sum, although emotional intensity mediates the relationship between hostile emotions and sensory details, this mediation does not vary according to memory type.

Rehearsal: The direct effect of hostile emotions on rehearsal was not significant when emotional intensity was included in the analysis ($\beta = -.02$, $SH = .03$, $p = .611$). Moreover, there was a positive and significant relationship between hostile emotions and emotional intensity ($\beta = .19$, $SE = .04$, $p < .001$), and between emotional intensity and rehearsal ($\beta = .41$, $SE = .03$, $p < .001$). Indirect effects indicate full mediation, although they do not differ across memory types. All associations were significant for childhood memories [$\beta = .08$, 95% CI = (.04, .12)], romantic relationship memories [$\beta = .06$, 95% CI = (.03, .10)], and self-defining memories [$\beta = .08$, 95% CI = (.05, .12)]. To summarize, the relationship between hostile emotions and rehearsal is mediated by intensity and this mediation does not vary according to memory type.

Preoccupation with Emotions: Hostile emotions showed a positive and significant relationship with emotional intensity ($\beta = .19$, $SE = .03$, $p < .001$). Similarly, emotional intensity showed a significant positive relationship with preoccupation with emotions ($\beta = .21$, $SE = .03$, $p < .001$). The direct effect of hostile emotions and preoccupation with emotions was similarly significant ($\beta = .25$, $SE = .03$, $p < .001$). When the indirect effect was examined according to memory types, childhood memories [$\beta = .05$, 95% CI = (.03, .07)], romantic relationship memories [$\beta = .03$, 95% CI = (.01, .06)] and self-defining memories [$\beta = .03$, 95% CI = (.02, .06)] revealed a significant indirect effect. The fact that the significance level of the relationship between hostile emotions and preoccupation with emotions did not change due to the inclusion of the mediator variable (emotional intensity) in the analysis and the absence of a zero point in the confidence intervals of the indirect effects indicate that emotional intensity indicates partial mediation in this relationship. Memory type did not show a moderating effect.

Emotional Distancing: Although hostile emotions showed a positive relationship with emotional intensity ($\beta = .19$, $SE = .04$, $p < .001$), emotional intensity showed a negative relationship with emotional distancing ($\beta = -.13$, $SE = .03$, $p < .001$), indicating a negative indirect effect. When the mediator variable was included in the analysis, the relationship between hostile emotions and emotional distancing was significant ($\beta = .28$, $SE = .03$, $p < .001$). The mediation differed according to the type of memory. Accordingly, while the indirect effect was not significant for childhood memories [$\beta = -.01$, 95% CI = (-.03, .01)] and romantic relationship memories [$\beta = -.02$, 95% CI = (-.05, .01)], the indirect effect was negative and significant for self-defining memories ($\beta = -.05$, 95% CI = [-.08, -.03]).

In sum, partial mediation is detected for the relationship between hostile emotions and emotional distancing. However, this partial mediation emerges only for the self-defining memory type. For other types of memories, the mediator role of emotional intensity variable was not supported.

The Mediator Role of Emotional Intensity in the Relationship between Anxiety-Related Emotions and Memory Characteristics and the Regulatory Role of Memory Type in the Mediator Relationship

Sensory Details: The relationship between anxiety-related emotions and sensory details did not show a significant relationship when emotional intensity was included in the analysis ($\beta = .05$, $SE = .03$, $p = .103$). The relationship between anxiety-related emotions and emotional intensity ($\beta = .23$, $SE = .04$, $p < .001$) and the relationship between emotional intensity and sensory details ($\beta = .37$, $SE = .03$, $p < .001$) are positive. When the indirect effect was analyzed, although there was no difference according to the type of memory, full mediation was found. There was a positive indirect effect for childhood memories [$\beta = .07$, 95% CI = (.05, .11)], romantic relationship memories [$\beta = .08$, 95% CI = (.05, .12)] and self-defining memories [$\beta = .11$, 95% CI = (.07, .15)]. In sum, while emotional intensity mediates between anxiety-related emotions and sensory details, this mediation does not vary according to memory type.

Rehearsal: Anxiety-related emotions were positively associated with emotional intensity ($\beta = .23$, $SE = .04$, $p < .001$). Similarly, emotional intensity was significantly correlated with rehearsal ($\beta = .40$, $SE = .03$, $p < .001$). When the direct effect of anxiety-related emotions on rehearsal was examined, a non-significant relationship was detected ($\beta = .03$, $SE = .03$, $p = .446$). When the indirect effect was evaluated according to memory types, childhood memories [$\beta = .09$, 95% CI = (.06, .14)], romantic relationship memories [$\beta = .08$, 95% CI = (.04, .12)] and self-defining memories [$\beta = .10$, 95% CI = (.07, .15)] showed a full mediator role, but this mediation did not vary according to memory type. Emotional intensity mediated the relationship between anxiety-related emotions and rehearsal, but this did not vary according to memory type.

Preoccupation with Emotions: When emotional intensity was included in the analysis as a mediator, the relationship between anxiety-related emotions and preoccupation with emotions was significant ($\beta = .23$, $SE = .03$, $p < .001$). Despite the lack of change in the significance level, the absence of a zero point in the indirect effect values when the confidence intervals of the indirect effects are examined indicates partial mediation. However, it does not vary according to the type of memory. Accordingly, childhood memories [$\beta = .07$, 95% CI = (.04, .10)], romantic relationship memories [$\beta = .05$, 95% CI = (.00, .07)] and self-defining memories [$\beta = .06$, 95% CI = (.04, .09)] were significant. The positive directional indirect effect was due to the relationship between anxiety-related emotions and emotional intensity ($\beta = .23$, $SE = .04$, $p < .001$) and between emotional intensity and preoccupation with emotions ($\beta = .23$, $SE = .03$, $p < .001$). In sum,

we can conclude that there is a partial mediation of preoccupation with emotions.

Emotional Distancing: Anxiety-related emotions were positively correlated with emotional intensity ($\beta = .23$, $SE = .04$, $p < .001$). Emotional intensity and emotional distancing showed a significant and negative relationship ($\beta = -.14$, $SE = .03$, $p < .001$). The direct effect of anxiety-related emotions on emotional distancing was significant ($\beta = .26$, $SE = .03$, $p < .001$). When the indirect effect was evaluated according to memory types, the significant moderating effect of memory type was revealed. Accordingly, while the indirect effect was not significant for childhood memories ($\beta = -.01$, 95% CI = [-.03, .02]) and romantic relationship memories ($\beta = -.02$, 95% CI = [-.06, .01]), the indirect effect was significant for self-defining memories ($\beta = -.07$, 95% CI = [-.11, -.04]). The indirect effect in the context of self-defining memories shows partial mediation. In the relationship between anxiety-related emotions and emotional distancing, partial mediation of emotional intensity is valid only in the context of self-defining memories.

The Mediator Role of Emotional Intensity in the Relationship between Negative Self-Esteem Emotions and Memory Traits and the Regulatory Role of Memory Type in the Mediator Relationship

In the mediation analyses of emotional intensity between negative self-esteem emotions and memory characteristics, the relationship between negative self-esteem emotions and emotional intensity of memories ($\beta = .05$, $SE = .04$, $p = .219$) was not significant. Emotional intensity did not mediate any of the relationships, although negative self-esteem emotions were significantly related to preoccupation with emotions ($\beta = .20$, $SE = .03$, $p < .001$) and emotional distancing ($\beta = .15$, $SE = .04$, $p < .001$), but not to rehearsal ($\beta = -.01$, $SE = .04$, $p = .843$) and sensory details ($\beta = .05$, $SE = .03$, $p = .092$). Indirect effects were not significant for rehearsal [$\beta = .02$, 95% CI = (-.01, .05)], sensory details [$\beta = .02$, 95% CI = (-.01, .06)], preoccupation with emotions [$\beta = .01$, 95% CI = (-.01, .03)], and emotional distancing [$\beta = -.01$, 95% CI = (-.01, .01)]. In summary, the mediator role of the emotional intensity variable in the relationship between negative self-esteem emotions and memory characteristics and the moderation role of memory types in this model were not supported.

Discussion

As a central research topic in the autobiographical memory literature, emotions are important in terms of understanding the mechanisms behind memory processes, identifying individual differences, and revealing the relationship between biases in autobiographical recollection and psychopathological symptoms. However, theoretical discussions on the subject have gained importance in the literature upon the findings showing the memory advantages of both positive and negative emotional memories. In the current study, we aim to contribute to the relevant theoretical discussions with an examination of individual emotions and autobiographical memory types. In the first stage,

the conducted analyses of variance conducted showed that memory types differed in terms of emotional valence, emotional intensity, and individual emotion factors. For emotional valence, self-defining memories were found to have the highest positive emotional valence, while there was no difference between romantic relationship and childhood memories. When individual emotion factors were examined, it was found that the most intensely felt emotions in self-defining memories were positive emotions. These findings may indicate that people tend to show more positivity bias in self-defining memories, which stand at the center of the self and have central functions in defining oneself (Wood and Conway 2006). In terms of emotional intensity, childhood memories seem to be recalled with a weaker emotional intensity compared to other types of memories. The emotional intensity of memories of childhood experiences that occurred at more distant times compared to the life experiences covered by other types of memories seems to weaken over time (Sutin and Robins 2007). Hostile emotions, anxiety-related emotions, and negative self-esteem emotions are felt most intensely in romantic relationship memories. Considering that the present study has a young sample, it can be hypothesized that romantic relationship memories come to the fore due to developmental needs and motivations. These findings will be discussed in the following sections in more detail with the light of other findings.

One of the main findings of the current study is that emotional intensity emerged as a stronger and more consistent predictor of the phenomenological features of memories than emotional valence, consistent with previous studies (Talarico et al. 2004, Ford et al. 2012). In the regression analyses, emotional intensity strongly predicted all memory characteristics except the effort of emotional distancing. Similar to previous studies, as the emotional intensity of memories increases, individuals tend to recall their memories strongly and repeatedly (Bradley et al. 1992, D'Argembeau and Van der Linden 2004, Mather and Sutherland 2009). In the present study, emotional valence showed a predictive effect, especially on the preoccupation with emotions and emotional distancing. As the positive valence of the memory increased, people remembered their memories more vividly, while as the negative valence of the memory increased, preoccupation with emotions and the effort for emotional distancing to the memory tended to be stronger.

One of the most valuable findings is the difference detected in the nature of the relationships of individual emotions to emotional valence and emotional intensity. Depending on their conceptual framework, it can be expected that the intensity levels of individual emotions also determine the overall emotional intensity of the memory, and thus, individual emotion intensities and emotional intensity might be expected to show strong relationships. However, when the correlations between the variables were compared, the individual emotion factors showed stronger relationships with emotional valence than with emotional intensity. Another important finding indicated that the main emotional element that determines how memories are remembered is the degree to which the memory as a whole evokes intense emotions, rather than the emotional valence of

the memories or the emotional intensity of individual emotions. This view is supported by the fact that emotional intensity fully mediated the relationships between individual emotion factors and the memory characteristics of sensory details and rehearsal in the moderated-mediation analyses, except for negative self-esteem emotions. Moreover, memory types did not show a moderating effect in these full mediation effects. In other words, it was detected that in all types of memories, hostile and anxiety-related emotions enhanced sensory details and strengthened the tendency to rehearsal through the emotional intensity of the memories as a whole. This pattern is also consistent with Rubin and Talarico's (2004) vector model. Rubin and Talarico (2009) show that emotional intensity, which forms the basis of emotions, is divided into two directions by emotional valence. Thus, the emotional valence of memories in which emotions are felt with high intensity is not neutral but tends to carry a positive or negative valence (Comblain et al. 2005, Rasmussen and Berntsen 2013, Schwager and Rothermund 2014). As a result, our memories with intense emotions are recalled more frequently, in detail, and vividly than memories with neutral valences (Kensinger and Corkin 2003, Comblain et al. 2005). The concrete contributions of findings from autobiographical memory studies to clinical applications have been increasing recently. For example, Memory Specificity Training, in which individuals gain healthy recall skills in the treatment of depression, can yield very successful results (Eigenhuis et al. 2017). In the current study, based on the relationship between the intensity of negative individual emotions and the emotional intensity of the memory in general, providing emotion regulation-oriented training that can raise awareness of the distinction between individual emotions and the general emotional intensity has the potential to reduce unhealthy recall tendencies.

When the relationship between individual emotions and memory characteristics was examined, it was found that all individual emotion factors showed a significant relationship with preoccupation with emotions and emotional distancing, which are closely related to emotion regulation strategies. However, the moderated-mediation analyses for preoccupation with emotions and emotional distancing, which are associated with emotion regulation strategies, point to the complicated nature of the emotion-memory relationship. Among the negative emotions, hostile emotions and anxiety-related emotions show a partial mediation effect in the relationship between preoccupation with emotions and emotional intensity. Accordingly, hostile emotions and anxiety-related emotions contribute to the tendency to preoccupation with emotions as individual variables, apart from the mediator effect of emotional intensity. Conway et al. (2004) explained the close relationship between autobiographical memories and motivational processes within the framework of their Self-Memory System Model. In this model, the emotions felt during the recollection of autobiographical memories are largely considered as an output of motivational processes. For example, following Conway et al. (2004), empirical studies based on this model (Boyacıoğlu and Sümer 2011, Boyacıoğlu 2012) reported that preoccupied attachment, which is characterized by an obsessive

interest in the attachment figure and intense abandonment anxiety, recalled attachment-related autobiographical memories more negatively, accompanied by intense emotions and lacking narrative coherence, depending on the hyperactivating strategies they used in emotion regulation. They found that individuals with an avoidant attachment style, on the other hand, have an excessive general tendency to recall memories due to deactivating affect regulation strategies and trying to isolate the emotional content from the autobiographical recollection. When these patterns found in previous studies are considered together with the current study's investigations within the framework of preoccupation with emotions and emotional distancing, they may also differ depending on the nature of individual emotions or the type of memory. In particular, it can be hypothesized that hostile and anxiety-related emotions strengthen some retrieval tendencies/models independently of affect regulation strategies related to individual differences. At this point, it is conceivable that manipulations to change the perspective of memory applied in the clinical field may also be effective against preoccupation with emotions. Studies indicate that the strategic or deliberate adoption of a third-person perspective instead of a first-person perspective during the recollection of a negative emotional memory reduces the intensity of negative emotions (Wallace-Hadrill and Kamboj 2016). Although the long-term effects are still unknown, there is empirical support for the view that third-person perspective recall instructions and training help emotion regulation in clinical practice. When considered together with the findings of the current study, it can be hypothesized that if people intentionally adopt a third-person perspective, the intensity of hostile and anxiety-related emotions and general emotional intensity will decrease, and accordingly, unhealthy emotion regulation tendencies such as preoccupation with emotions during recall will be weakened.

In the analyses specific to emotional distancing, it was found that emotional distancing decreased as the emotional intensity increased for hostile and anxiety-related emotions, but only for self-defining memories. To better understand this finding, the differences between the three types of memories were examined in terms of emotion-related variables. These comparison analyses indicated a significant positive recall bias for self-defining memories. Compared to the other types of memories, the analyses showed that self-defining memories were recalled with more positive emotional valence, scoring significantly higher on the positive individual emotions factor, but lower on the hostile emotions and anxiety-related emotions factors. Self-defining memories also differ significantly from other types of memories in terms of their functions. Conway et al. (2004) stated that self-defining memories have strong relationships with the motivational system as a type of memory that contains information about developmental goals and unresolved conflicts. Therefore, these memories have the function of providing self-consistency as well as guiding the representation of certain information in the form of autobiographical memories that are critical in achieving goals that are of central importance for individuals. For example, a memory associated with

negative emotions in an important romantic relationship and interpreted by the person as one of the turning points in his/her life contains important information about the goal of establishing a long-term romantic relationship defined by the culture for adulthood. As long as the person does not fully reach this developmental goal, this memory serves the primary goals in the current goal hierarchy of the self-memory system and is recalled more frequently, vividly, and in detail due to its directive function. It has been reported in many previous studies that self-defining memories have stronger qualities in terms of memory characteristics compared to other types of memories (Singer and Blagov 2004, Boyacioglu et al. 2017). Since self-defining memories both contain a significant positivity bias and these memories have important roles in achieving current goals in terms of the functioning of motivational processes, the effort to maintain emotional distancing may be reduced in the process of recalling these particular memories. In addition, emotional intensity did not show a predictive effect only on emotional distancing in regression analyses. This finding indicates that emotional distancing occurs under certain conditions. However, in order to better understand this issue, experimental research focusing on the nature of emotions associated with memories (e.g., to whom negative emotions are focused, such as hostile emotions targeting others, the role they play in the motivational system, etc.), memory biases and the functions of memories, and longitudinal studies using methods such as diary studies are needed.

It was found that the direct effect of negative self-esteem emotions on preoccupation with emotions and emotional distancing was significant, but emotional intensity did not show a mediator effect. This finding shows that self-esteem-damaging emotions may trigger preoccupation with emotions during memory recall and an effort for distancing from them as a defensive tendency without being associated with the overall emotional intensity of the memory. Shame and guilt are emotions that are matched with events and clues that indicate whether the child's existence is valued by others in their relationship with their parents from early childhood. These emotions are effective in determining what kind of self-regulation strategies will be put into action after the failure(s) experienced in the physical, social, developmental, etc. goals of the motivational system (Higgins 1987, Blaine and Crocker 1993,). Due to their strong and deep-rooted connections with the basic structures and mechanisms of the self-system, these emotions are likely to have their unique dynamics in autobiographical memory processes. However, it is inconsistent with the expectations of the study that self-defining memories, which have privileged importance in terms of self-esteem, do not show a moderating effect in a way that strengthens the effect of negative self-esteem emotions compared to romantic relationship memories and childhood memories. A difference in terms of the type of self-defining memories was found only in the analysis of variance and the lowest negative self-esteem emotions were detected in self-defining memories. Even if individuals use defensive strategies against negative self-esteem emotions in order to protect the self during the recollection of self-defining

memories, if these memories, which stand at the center of the self, evoke shame and guilt, a similar recollection pattern detected in other memory types may also emerge during the recollection of self-defining memories. This possibility raises many research questions for future experimental studies.

Despite the unique contribution of the present study, information on three memory types could not be collected from each of the same participants, as an important limitation, thus the role of memory types could only be examined in a limited way by comparing between participants. We had thought that three separate sessions would have been needed to collect data on each memory type from each participant, which would have resulted in a significant reduction in the sample size. In addition, it was not possible to randomly assign memory types to the participants due to the collective implementation of the practices in the classrooms. However, the data were collected from the classes of students with similar demographic characteristics (age group, marital status, residential unit) in the undergraduate programs within the social sciences of the same university, and the memory types were randomly applied in the classes. The applications were initiated in all classes at the end of the course when the lecturer invited the researcher, and a uniform procedure was followed in terms of application except for the memory type. In addition to the limitations related to sampling, measurements of variables that could provide clearer information about psychopathologies such as rumination were not used and clinical sampling was not included in the study, although we examined biases in autobiographical memory. In particular, the lack of measures of depression and anxiety symptoms prevented us from discussing the possible outcomes of the negative recall biases we identified. In addition, the lack of such variables also prevented us from examining positive emotions. In the literature, there are findings that some variables such as depression, low self-esteem, and prevention focus in self-regulation are characterized by protective social, cognitive, and emotional strategies against positive emotions. The absence of such variables in the current study is an important shortcoming, and it would be a unique contribution to the field to focus on positive individual emotions in future research. Finally, although gender was controlled in the analyses, the differences between the number of male and female participants in the sample should be noted as a limitation.

Conclusion

Despite all these limitations, the findings of the present study provided information about the nature of the relationship between individual emotions, emotional valence, and emotional intensity, pointing out that the relationship between individual emotions and emotional intensity may show different patterns depending on the nature of the individual emotions, that the relationship between negative self-esteem emotions and memory characteristics has some specificities due to the functioning of the self-system, that memory types may be important in terms of the relationships between the emotional components of the memory and raised many interesting new research questions. For example, the relationships examined in the current study can

be examined within the framework of a wide range of different psychopathological disorders such as PTSD, depression, and social anxiety; various individual differences such as self-esteem, personality traits, and locus of self-regulation; and environmental factors of very different qualities such as intimate relationship violence, pandemic, perceived parenting styles. Moreover, considering the emotion models that cannot be included in this study, examining the relationships between memory types and individual emotions in the light of theoretical approaches such as the emotion cube (Lövheim 2012) and the vector model (Bradley et al. 1992) has the potential to make important contributions to the literature. What kind of memories individuals recall and how they recall them in the presence of which factors is not only a discussion about the past but also holds important information about how they perceive today and tomorrow.

Financial Support: *This work was conducted at and supported by Dokuz Eylül University under Grant [2012.KB.SOS.010]*

References

- Ashbaugh AR, Marinos J, Bujaki B (2018) The impact of depression and PTSD symptom severity on trauma memory. *Memory*, 26:106-116.
- Barrett LF (2006) Solving the emotion paradox: Categorization and the experience of emotion. *Pers Soc Psychol Rev*, 10:20-46.
- Berntsen D (1996) Involuntary autobiographical memories. *Appl Cogn Psychol*, 10:435-454.
- Berntsen D, Rubin DC (2007) When a trauma becomes a key to identity: enhanced integration of trauma memories predicts posttraumatic stress disorder symptoms. *Appl Cogn Psychol*, 21:417-431.
- Blaine B, Crocker J (1993) Self-esteem and self-serving biases in reactions to positive and negative events: an integrative review. In *Self-Esteem: The Puzzle of Low Self-Regard*, (Ed. RF Baumeister):55-85. Boston, MA, Springer US.
- Boals A, Rubin DC, Klein K (2008) Memory and coping with stress: the relationship between cognitive-emotional distinctiveness, memory valence, and distress. *Memory*, 16:637-657.
- Bohanek JG, Fivush R, Walker E (2005) Memories of positive and negative emotional events. *Appl Cogn Psychol*, 19:51-66.
- Boyacıoğlu I, Akfırat S (2015) Development and psychometric properties of a new measure for memory phenomenology: The Autobiographical Memory Characteristics Questionnaire. *Memory*, 23:1070-1092.
- Boyacıoğlu I, Akfırat S, Yılmaz AE (2017) Gender differences in emotional experiences across childhood, romantic relationship, and self-defining memories. *J Cogn Psychol*, 29:137-150.
- Bradley MM, Greenwald MK, Petry MC, Lang PJ (1992) Remembering pictures: pleasure and arousal in memory. *J Exp Psychol Learn Mem Cogn*, 18:379-390.
- Burnell R, Rasmussen AS, Garry M (2020) Negative memories serve functions in both adaptive and maladaptive ways. *Memory*, 28:494-505.
- Christianson SÅ (1986). Effects of positive emotional events on memory. *Scand J Psychol*, 27:287-299.
- Christianson S-Å (1992) Do flashbulb memories differ from other types of emotional memories? In *Affect and Accuracy in Recall: Studies of Flashbulb Memories*, 4th ed. (Eds EWINograd, U Neisser): 191-211. New York, NY, Cambridge University Press.
- Collins KA, Pillemer DB, Ivcevic Z, Gooze RA (2007) Cultural scripts guide recall of intensely positive life events. *Mem Cognit*, 35:651-659.
- Comblain C, D'Argembeau A, Van der Linden M (2005) Phenomenal characteristics of autobiographical memories for emotional and neutral events in older and younger adults. *Exp Aging Res*, 31:173-189.
- Conway MA, Pleydell-Pearce CW (2000) The construction of autobiographical memories in the self-memory system. *Psychol Rev*, 107:261-288.
- Crespo M, Fernández-Lansac V (2016) Memory and narrative of traumatic events: A literature review. *Psychol Trauma*, 8:149-156.
- D'Argembeau A, Van der Linden M (2004) Influence of affective meaning on memory for contextual information. *Emotion*, 4:173-188.
- D'Argembeau A, Van der Linden M (2008) Remembering pride and shame: self-enhancement and the phenomenology of autobiographical memory. *Memory*, 16:538-547.
- Demiray B, Janssen SMJ (2015) The Self-enhancement function of autobiographical memory. *Appl Cogn Psychol*, 29:49-60.
- Dolcos F, Cabeza R (2002) Event-related potentials of emotional memory: Encoding pleasant, unpleasant, and neutral pictures. *Cogn Affect Behav Neurosci*, 2:252-263.
- Eigenhuis E, Seldenrijk A, van Schaik A, Raes F, van Oppen P (2017) Feasibility and effectiveness of memory specificity training in depressed outpatients: A pilot study. *Clin Psychol Psychother*, 24:269-277.
- Er N, Hoşrik E, Ergün H, Şerif M (2008) Duygu durum değişimlerinin otobiyografik bellek üzerindeki etkileri. *Türk Psikoloji Dergisi*, 23:1-16.
- Ford JH, Addis DR, Giovanello KS (2012) Differential effects of arousal in positive and negative autobiographical memories. *Memory*, 20:771-778.
- Gryzman A, Hudson JA (2013) Gender differences in autobiographical memory: Developmental and methodological considerations. *Dev Rev*, 33:239-272.
- Hayes, AF (2017) *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach*, 2nd ed. New York, Guilford Press.
- Higgins ET (1987) Self-discrepancy: A theory relating self and affect. *Psychol Rev*, 94:319-340.
- Holland AC, Kensinger EA (2010) Emotion and autobiographical memory. *Phys Life Rev*, 7:88-131.
- Ihlebaek KA, Holter CR (2021) Hostile emotions: An exploratory study of far-right online commenters and their emotional connection to traditional and alternative news media. *Journalism*, 22:1207-1222.
- Janssen SMJ, Hearne TL, Takarangi MKT (2015) The relation between self-reported PTSD and depression symptoms and the psychological distance of positive and negative events. *J Behav Ther Exp Psychiatry*, 48:177-184.
- Kaya-Kızılöz B, Altan-Atalay A (2018) Otobiyografik bellek ve psikopatoloji. In *Hayatı Hatırlamak: Otobiyografik Belleğe Bilimsel Yaklaşımlar*, (Eds S Gülğöz, B Ece, S Öner):165-184. İstanbul, Koç University Press.
- Kensinger EA (2009a) What factors need to be considered to understand emotional memories? *Emot Rev*, 1:120-121.
- Kensinger EA (2009b) Remembering the details: effects of emotion. *Emot Rev*, 1:99-113.
- Kensinger EA, Corkin S (2003) Memory enhancement for emotional words: are emotional words more vividly remembered than neutral words? *Mem Cognit*, 31:1169-1180.
- Kernis MH, Jadrach J, Gibert P, Sun CR (1994) Stable and unstable components of self-evaluations: Individual differences in self-appraisal responsiveness to feedback. *J Soc Clin Psychol*, 15:430-48.
- Lenhard W, Lenhard A (2014) *Hypothesis Tests for Comparing Correlations*, Biberigau (Germany), Psychometrica.
- Lerner JS, Li Y, Valdesolo P, Kassam KS (2015) Emotion and decision making. *Annu Rev Psychol*, 66:799-823.

- Levine L, Bluck S (2004) Painting with broad strokes: Happiness and the malleability of event memory. *Cogn Emot*, 18:559-574.
- Levine L, Pizarro DA (2004). Emotion and memory research: A grumpy overview. *Sos Cogn*, 22:530-554.
- Lindeman MIH, Zengel B, Skowronski JJ (2017) An exploration of the relationship among valence, fading affect, rehearsal frequency, and memory vividness for past personal events. *Memory*, 25:724-735.
- Lishman WA (1974) The speed of recall of pleasant and unpleasant experiences. *Psychol Med*, 4:212-218.
- Lövheim H (2012) A new three-dimensional model for emotions and monoamine neurotransmitters. *Med Hypotheses*, 78:341-348.
- Major B, Kaiser CR, McCoy SK (2003) It's not my fault: When and why attributions to prejudice protect self-esteem. *Pers Soc Psychol Bull*, 29:772-781.
- Maneta EK, Cohen S, Schulz MS, Waldinger RJ (2015) Linkages between childhood emotional abuse and marital satisfaction: The mediating role of empathic accuracy for hostile emotions. *Child Abuse Neglect*, 44:8-17.
- Marsh L, Edgington T, Conway MA, Loveday C (2019) Positivity bias in past and future episodic thinking: Relationship with anxiety, depression, and retrieval-induced forgetting. *Q J Exp Psychol*, 72:508-522.
- Mather M, Sutherland M (2009) Disentangling the effects of arousal and valence on memory for intrinsic details. *Emot Rev*, 1:118-119.
- Mickley KR, Kensinger EA (2009) Phenomenological characteristics of emotional memories in younger and older adults. *Memory*, 17:528-543.
- Montebarocci O, Surcinelli P, Rossi NCF (2016) Self-defining and early childhood memories: Subjective intensity rating of memory-related emotions. *Am J Appl Psychol*, 5:32-37.
- Newby JM, Moulds ML (2012) A comparison of the content, themes, and features of intrusive memories and rumination in major depressive disorder. *Br J Clin Psychol*, 51:197-205.
- Öner S (2021) Duygu yoğunluğu ve duygu değerliğinin otobiyografik hatırlamadaki rolü. *Psikiyatride Güncel Yaklaşımlar*, 13:605-618.
- Öner S, Gülgöz S (2018) Autobiographical remembering regulates emotions: a functional perspective. *Memory*, 26:15-28.
- del Palacio-Gonzalez A, Berntsen D, Watson LA (2017) Emotional intensity and emotion regulation in response to autobiographical memories during dysphoria. *Cognit Ther Res*, 41:530-542.
- Pivetti M, Camodeca M, Rapino M (2016) Shame, guilt, and anger: Their cognitive, physiological, and behavioral correlates. *Curr Psychol*, 35:690-699.
- Rasmussen AS, Berntsen D (2009) Emotional valence and the functions of autobiographical memories: positive and negative memories serve different functions. *Mem Cognit*, 37:477-492.
- Rasmussen AS, Berntsen D (2010) Personality traits and autobiographical memory: Openness is positively related to the experience and usage of recollections. *Memory*, 18:774-786.
- Rasmussen AS, Berntsen D (2013) The reality of the past versus the ideality of the future: emotional valence and functional differences between past and future mental time travel. *Mem Cognit*, 41:187-200.
- Robinaugh DJ, McNally RJ (2010) Autobiographical memory for shame or guilt provoking events: association with psychological symptoms. *Behav Res Ther*, 48:646-652.
- Rubin DC, Boals A, Berntsen D (2008) Memory in Posttraumatic Stress Disorder: Properties of voluntary and involuntary, traumatic and nontraumatic autobiographical memories in people with and without PTSD symptoms. *J Exp Psychol*, 137:591-614.
- Rubin DC, Dennis MF, Beckham JC (2011) Autobiographical memory for stressful events: the role of autobiographical memory in posttraumatic stress disorder. *Conscious Cogn*, 20:840-856.
- Rubin DC, Talarico JM (2009) A comparison of dimensional models of emotion: evidence from emotions, prototypical events, autobiographical memories, and words. *Memory*, 17:802-808.
- Sarp N, Tosun A (2011) Duygu ve otobiyografik bellek. *Psikiyatride Güncel Yaklaşımlar*, 3:446-465.
- Schaefer A, Philippot P (2005) Selective effects of emotion on the phenomenal characteristics of autobiographical memories. *Memory*, 13:148-160.
- Schlicht W (1994) Does physical exercise reduce anxious emotions? A meta-analysis. *Anxiety Stress Coping*, 6:275-288.
- Schwager S, Rothermund K (2014) On the dynamics of implicit emotion regulation: counter-regulation after remembering events of high but not of low emotional intensity. *Cogn Emot*, 28:971-992.
- Singer JA, Blagov P (2004) The integrative function of narrative processing: Autobiographical memory, self-defining memories, and the life story of identity. In *The Self and Memory*, (Eds DR Beike, JM Lampinen, DA Behrend):117-138. New York, Psychology Press.
- Singer J A, Moffitt KH (1992) An experimental investigation of specificity and generality in memory narratives. *Imagin Cogn Pers*, 11:233-257.
- Sutin AR, Robins RW (2007) Phenomenology of autobiographical memories: The memory experiences questionnaire. *Memory*, 15:390-411.
- Talarico JM, LaBar KS, Rubin DC (2004) Emotional intensity predicts autobiographical memory experience. *Mem Cognit*, 32:1118-1132.
- Tekcan AI (2001) Flashbulb memories for a negative and a positive event: News of Desert Storm and acceptance to college. *Psychol Rep*, 88:323-331.
- Tekcan AI, Boduroglu A, Mutlutürk A, Aktan Erciyes A (2017) Life-span retrieval of public events: Reminiscence bump for high-impact events, recency for others. *Mem Cognit*, 45:1095-1112.
- Tromp S, Koss MP, Figueredo AJ, Tharan M (1995) Are rape memories different? A comparison of rape, other unpleasant, and pleasant memories among employed women. *J Trauma Stress*, 8:607-627.
- Walker WR, Skowronski JJ (2009) The Fading affect bias: But what the hell is it for? *Appl Cogn Psychol*, 23:1122-1136.
- Walker WR, Skowronski JJ, Gibbons J, Vogl R, Thompson C (2003) On the emotions that accompany autobiographical memories: Dysphoria disrupts the fading affect bias. *Cogn Emot*, 17:703-723.
- Walker WR, Skowronski JJ, Thompson CP (2003) Life is pleasant—and memory helps to keep it that way! *Rev Gen Psychol*, 7:203-210.
- Wallace-Hadrill S, Kamboj SK (2016) The impact of perspective change as a cognitive reappraisal strategy on affect: A systematic review. *Front Psychol*, 7:1715.
- Watson LA, Berntsen D, Kuyken W, Watkins ER (2012) The characteristics of involuntary and voluntary autobiographical memories in depressed and never depressed individuals. *Conscious Cogn*, 21:1382-1392.
- Williams, JMG. (1996). Depression and the specificity of autobiographical memory. In *Remembering our past: Studies in autobiographical memory* (Ed DC Rubin):244-267. New York, Cambridge University Press.
- Williams JMG, Barnhofer T, Cran, C, Herman D, Raes F, Watkins E et al. (2007) Autobiographical memory specificity and emotional disorder. *Psychol Bull*, 133:122-148
- Wilson AE, Ross M (2003) The identity function of autobiographical memory: time is on our side. *Memory*, 11:137-149.
- Wolf T, Pociunaite J, Hoehne S, Zimprich D (2021) The valence and the functions of autobiographical memories: Does intensity matter? *Conscious Cogn*, 91:103-119.
- Wood WJ, Conway M (2006) Subjective impact, meaning making, and current and recalled emotions for self-defining memories. *J Pers*, 74:811-846.

Addendum. Memoir Type Guidelines

Childhood Memories Guidelines

AUTOBIOGRAPHICAL MEMORIES

The topic of our survey is autobiographical memories (personal memories). Autobiographical memories are memories of events that you have personally experienced and that are important to you. Autobiographical memories can be about many different topics. For example, they can be about your school and work experiences, or about events with your family and loved ones, such as your lover/spouse.

These memories are often emotionally charged. Autobiographical memories can be positive or negative. Positive ones are those that make you feel positive emotions such as happiness and trust. Negative autobiographical memories are those that cause you negative emotions such as sadness and anxiety.

Often, you know the time of events that are engraved in your Autobiographical Memory, or you can recognize them when you think about them. Autobiographical memories can be from any period of your life. The event you recall may have happened when you were a child, or it may have happened yesterday.

Romantic Memories Guidelines:

AUTOBIOGRAPHICAL MEMORIES

The topic of our survey is autobiographical memories (personal memories). Autobiographical memories are memories of events that you have personally experienced and that are important to you. Autobiographical memories can be about many different topics. For example, they can be about your school and work experiences, or about events with your family and loved ones, such as your lover/spouse.

These memories are often emotionally charged. Autobiographical memories can be positive or negative. Positive ones are those that make you feel positive emotions such as happiness and trust. Negative autobiographical memories are those that cause you negative emotions such as sadness and anxiety.

Often, you know the time of events that are engraved in your Autobiographical Memory, or you can recognize them when you think about them. Autobiographical memories can be from any period of your life. The event you recall may have happened when you were a child, or it may have happened yesterday.

Self-defining Memories Guidelines:

SELF-DEFINING MEMORIES

This section is about your “Self-defining Memories”. Self-defining Memories are memories of some personal events in your past.

These are events that have helped you to recognize yourself, to realize your own characteristics or have shown who you are and what kind of person you are to people you care about.

For example, think of the sentence “I am a person” or the statement “He knows me as a person”. Think about the events that led you to realize that you have this characteristic or that led that person to think that way. Your important memories of such events are Self-Defining Memories.

Self-defining Memories usually relate to specific events that you know the time of or can recognize when you think about them. These memories can be from any period of your life. The event you recall may have happened in the early days of your childhood, or it may have happened yesterday.

Self-Defining Memories often cause you to feel very intense and strong emotions.

You will think about and recall these memories many times throughout your life.

© 2022. This work is published under

<https://creativecommons.org/licenses/by-nc-nd/4.0/>(the “License”).

Notwithstanding the ProQuest Terms and Conditions, you may use this content
in accordance with the terms of the License.