THE LIFESPAN RETRIEVAL OF THE MOST IMPORTANT, THE HAPPIEST, AND THE SADDEST AUTOBIOGRAPHICAL MEMORIES

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DECLARATION OF ORIGINALITY

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ABSTRACT

The Lifespan Retrieval of the Most Important, the Happiest,

and the Saddest Autobiographical Memories

In the present study, we examined the reminiscence bump and the phenomenological characteristics of outstanding life experiences, and tested the applicability of the bump accounts. Additionally, we investigated the content and narrative quality of their memories. Adults aged above 40 were asked to report in detail their most important, happiest, and saddest autobiographical memories. Results showed that most important and happiest memories formed a broad bump covering the 20-39 interval. Saddest memories generated a discernable bump in 30-49. Regarding the phenomenological characteristics, the bump memories were only higher in expectedness than memories from other life periods. The events mentioned in most important and happiest memories overlapped with Turkish cultural life-script to a great extent. Most important memories occurred within 20-29 matched the life-script more than the memories from other periods. While most important and happiest memories were mostly on relationships and achievements, saddest memories largely had life-threatening content. The memory narratives were quite specific, while they did not include much integrative statements. Participants aged between 40-49 reported more specific saddest memories than the other age groups. Age groups did not differ in terms of integration of memories.

ÖZET

En Önemli, En Mutlu ve En Üzücü Otobiyografik Anıların Yaşam Boyu Hatırlanması

Bu çalışmada önemli kişisel olaylara ait anı tümseklerini ve anıların fenomenolojik özelliklerini incelendi ve anı tümseğini açıklamaya yönelik yaklaşımlar test edildi. Bununla birlikte anıların içeriği ve anlatı özellikleri de incelendi. Bu amaçla 40 yaş üstü yetişkinlerden en önemli, en mutlu ve en üzücü otobiyografik anılarını ayrıntılı olarak anlatmaları istendi. Sonuçlar en önemli ve en mutlu anıların 20-39 yaş aralığını kapsayan geniş bir anı tümseği oluşturduğunu göstermiştir. En üzücü anılar ise 30-49 yaş aralığında göze çarpan bir tümsek yaratmıştır. Fenomenolojik özelliklere gelince ise anı tümseği içindeki anılar diğer dönemdeki anılardan yalnızca beklenirlik açısından daha yüksek değerlere sahiptir. En önemli ve en mutlu anılarda bahsedilen olaylar, kültürel yaşam seyri beklentisi ile büyük ölçüde örtüşmüştür. 20-29 yaş aralığında gerçekleşen en önemli olaylar diğer dönemlere nazaran yaşam seyri beklentisi şemasındaki olaylarla daha çok örtüşmüştür. Anıların içeriğine bakıldığında en önemli ve en mutlu anılar genellikle ilişkiler ve başarılar üzerineyken, en üzücü anılar çoğunlukla hayati tehlike arz eden olaylar üzerinedir. Anıların anlatımları oldukça spesifik iken bu anlatılarda anıları anlamlandırmaya dair ifadelerine pek rastlanmadı. 40-49 yaş arasındaki katılımcılar yalnız en üzücü anılarında diğer yaş gruplarına göre daha fazla spesifik anı bildirdiler. Anıların anlamlandırması açısından bu gruplar herhangi bir farklılık göstermedi.

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CHAPTER 1

INTRODUCTION

Autobiographical memories are recollections of events that individuals experience in their lives. When adults think back on their autobiographical memories across their life span, some prominent features in the temporal distribution of these memories are observed. The first component observed in the lifespan distribution of autobiographical memories is childhood amnesia, which refers to the absence of autobiographical memories from the first years of life (Wetzler & Sweeney, 1986). Another feature of the distribution of the memories is the recency effect, which refers to the tendency to recall more memories closer in time than older ones. In this sense, memories follow a monotonous forgetting curve in which fewer memories are reported as the time since the event increases. Lastly, adults, especially over 40 years of age, tend to remember considerably more memories from their adolescence and early adulthood years compared to other periods of life. This phenomenon, called reminiscence bump, is a well-founded pattern examined in numerous cultures (Conway, Wang, Hanyu, & Haque, 2005; Zaragoza Scherman, Salgado, Shao, & Berntsen, 2017) and age groups (Fromholt et al., 2003; Janssen, Chasse, & Murre, 2005; Rubin & Berntsen, 2003), with several elicitation techniques (Koppel & Berntsen, 2015). The different classes of memories generated through these techniques include memories of highly notable autobiographical experiences regarding their importance (Luchetti & Sutin, 2018), emotional value (Rubin & Berntsen, 2003), or vividness (Fitzgerald, 1988; Webster & Gould, 2007); memories cued by words (Rubin & Schulkind, 1997), or those freely recalled without specific prompts (Berntsen & Rubin, 2002; Demiray, Gülgöz, & Bluck, 2009; Wang &

Conway, 2004). The bump is observed not only in the lifespan distribution of autobiographical memories, but also in memories for public events (Koppel & Berntsen, 2014; Tekcan, Boduroğlu, Mutluturk, & Aktan-Erciyes, 2017), and for general and cultural knowledge (Janssen, Chessa, & Murre, 2007; Rubin, Rahhal, & Poon, 1998).

The most controversial among the three components of the lifespan distribution of autobiographical memories is the reminiscence bump. The reason that this phenomenon attracted much attention from researchers is that it disrupts the usual forgetting curve of memories in which memories decay with the passage of time, and that there could be several possible explanations of this pattern based on the characteristics of the events or individuals within the mentioned period.

Although the reminiscence bump is a robust phenomenon, the characteristics of the bump might differ according to the technique used to retrieve autobiographical memories. The lifespan retrieval of autobiographical memories was first examined through cue-word technique, introduced by Galton (1879), and developed by Crovitz and Schiffman (1974). In this method, individuals are given cue-words and asked to report the first memory that comes to their mind. The second way to retrieve autobiographical memories is asking participants about their particularly significant life events, such as the most important, vivid, positive, or traumatic memories. While memories recalled in response to cue words produce a bump in adolescence period (mean midpoint = 15.5, mean range = 8.7 – 22.5), memories prompted by importance of events show a bump in young adulthood (mean midpoint = 21.5, mean range = 15.1 – 27.9), slightly later than that of word-cued memories (Koppel & Berntsen, 2015). The reason of the difference in bump location is suggested to be the differential retrieval mechanisms required by each technique (Koppel & Berntsen, 2015; Munawar, Kuhn, &

Haque, 2018). When individuals are presented a word and instructed to generate an associated memory that comes to their mind, memory is directly retrieved by a bottom-up mechanism. Memories recalled by this method reflect presumably the natural distribution of memories over the lifespan (Munawar et al., 2018). On the other hand, important memories method is thought to divert one's attention to their identity and significant life events, which requires a more effortful, strategic top-down search process (Glück & Bluck, 2007). For this reason, reminiscence bump accounts might not be able to explain the bump differences in two methods to the same extent. The present study aims to investigate the lifespan distribution of autobiographical memories of the most important, happiest, and saddest events. For this reason, the following accounts will be discussed with regard to their applicability to memories of notable life experiences, rather than word-cued memories.

1.1 The reminiscence bump accounts

Four main accounts are suggested to explain the reminiscence bump in lifespan retrieval of autobiographical memories: The cognitive account underlines the novelty of events experienced during the bump period. According to Rubin and colleagues (1998), early adulthood years mark the transition from a period of rapid change to a more stable life course, in which people experience several first-time occurrences, such as their first job or first date with someone. The memory of events belong to these years benefit from both novelty of events and stability in the following years. These distinctive experiences require more cognitive effort and attention in order to be construed by the individual. Also, since they are different from other events, there are less events that would create proactive interference due to similarity. Regarding the benefit of stability, the first

experiences would serve as reference points in the future for individuals to compare recent life events (Robinson, 1992), which would keep these memories vivid through continuous retrieval with long intervals in life. In addition, with a rather stable life course, organization of memories and cues related to the events would stay unaltered as well (Schrauf & Rubin, 1998, 2001). In this sense, cues that remained relevant during remembering would provide congruity between encoding and retrieval circumstances, which would increase the memorability of these events (encoding specificity; Tulving & Thomson, 1973).

Based on this account, the novelty of events is of central focus rather than the age of individuals during the events. Supporting this point, Schrauf and Rubin (1998) found that for people who migrated after their thirties, the reminiscence bump emerged for the time they have migrated, instead of its usual location around the young adulthood. Schrauf and Rubin (1998) claimed that this result was due to the similarity of immigration process to the transition in young adulthood during which individuals go through a period of major changes followed by a rather stable time period. The study of Wolf and Zimprich (2016) bolstered the claims of the cognitive account by demonstrating that the reminiscence bump had a wider shape, covering a greater age-range for people who seek out novel experiences more, while a pointier bump in young adulthood was observed for people who scored low on openness to experience. The broader bump shape was interpreted to be due to these individuals' experience of distinctive and novel events not just during their youth, but throughout their life.

When we question whether the reminiscence bump period really includes memories of more novel and first-time events, the studies have mixed results. While there are studies showing that bump memories were more novel and distinctive than

memories happened during other life periods (Demiray et al., 2009), some studies found no difference between the bump and other years regarding novelty of events (Rubin & Schulkind, 1997; Tekcan et al., 2017). In a recent study, the bump years were found to contain more first-time experiences than following life periods, but years prior to the reminiscence bump include even more first-time events (Wolf & Zimprich. 2020). Also, Janssen and Murre (2008) found that one-third of memories recalled in response to cue words were about first-time experiences, but they were not necessarily from the bump period. In fact, bump memories mostly consisted of mundane events. These studies show that although events experienced during young adulthood can be distinctive, other life periods might also contain events that stand out regarding novelty.

According to the narrative/identity account, the reason of the overproduction of autobiographical memories belonging to adolescence and young adulthood is the development of a stable self and identity around these periods (Conway & Pleydell-Pearce, 2000; Fitzgerald, 1988), in line with Erikson's psychosocial stages of development (1950). Erikson (1950) stated that individuals begin to be preoccupied with their identity, roles, and place within their social environment during adolescence. Most of the events that are formative and identifying for one's character occur within these years (Conway & Pleydell-Pearce, 2000), and individuals begin to form their identity through a self-narrative consisting of these events (Fitzgerald, 1988). Fitzgerald (1996) argues that the relevance of these stories in corresponding the concerns related to identity influences the accessibility of these memories. For Conway (2005), enduring relation of these memories to the goals of current self increases the accessibility of these memories and helps individuals maintain a coherent identity.

Conway and Holmes (2004) asked their participants to freely recall as many memories as they could from each decade of life. Then, the content of autobiographical memories was classified according to the psychosocial stages they correspond to. For example, a memory related to getting recognition from friends and peers was categorized as an identity issue, while being concerned for one's partner was categorized as intimacy. Results showed that identity-related memories showed a bump between 10-19 years of age, while a bump was observed in 20s for intimacy-related memories. The same pattern was observed when classification categories were used as cues to remind memories (e.g. "Remember a memory of getting recognition from friends and peers").

Rathbone, Moulin and Conway (2008) investigated the formation of identities, and organization of memories related to them by using self-defining statements and memories. In this study, participants wrote down several statements that define their identity ("I am adventurous", "I am a mother"), then selected the most personally significant ones, and recalled autobiographical memories related to each of these self-defining statements. They indicated their age at the event, as well as the age that they feel the defining feature become a part of their identity. The memories formed a bump from young adulthood through middle age, later than expected; but more importantly, memories were clustered around the ages of identity formation. The results of this study strengthened the claims of narrative/identity account by showing that identity formation is important for the organization of autobiographical memories and the bump.

Demiray et al. (2009) found that memories corresponding the bump (between ages 10-30) were rated as more important for self-development compared to other years. Wolf and Zimprich (2016) further suggested that individuals with a clear and stable sense of who they are would show an earlier and more distinctive bump than those who

are still in the process of forming a stable self. They found that people with lower self-concept clarity revealed a wide reminiscence bump covering a broader age range, whereas people with high self-concept clarity had an earlier bump with less deviation. Together these results support the narrative/identity account of the bump by demonstrating the relation of memories from this period to identity development.

On the other hand, some studies show that bump memories were not perceived as more central to identity compared to memories from other life periods for happiest, most important (Tekcan et al., 2017), and most traumatic events (Berntsen, Rubin, & Siegler, 2011). These memories were not found to be more important overall (Koppel & Berntsen, 2014), especially compared to memories from later life periods (Wolf & Zimprich, 2020). For this reason, though identity-related issues are prevalent themes of memories of bump years, these memories might not always be regarded as the most important or integral to identity development. In addition, studies testing the narrative/identity account defined the self and formulated its relation to autobiographical memory in different ways. Conway and Holmes (2004) used prevalent concepts of bump period (e.g. concerns over acceptance and recognition by peers, friends, or partners) to classify and cue memories, while Rathbone et al. (2008) utilized self-defining statements to link the memories with identity formation. Other studies used self-ratings to measure the memories' overall importance (e.g. Koppel & Berntsen, 2014; Wolf & Zimprich, 2020) or the importance for their identity (e.g. Demiray et al., 2009; Tekcan et al., 2017; Berntsen et al., 2011). Differential conceptualizations of the self in the studies, their relation to autobiographical memories, and the way they were measured might preclude us from making clear inferences about the narrative/identity account.

The life-script account puts emphasis on the normative life events that people of a given culture are expected to experience in their lives within certain age ranges. These classes of events are formed by asking individuals about the most important life events that can be experienced by a hypothetical person from their culture. One does not have to experience the events to include them when forming a life-script. Indeed, cultural life-scripts can be formed during the childhood years (9-year-olds and older), long before the children experience the events in life-scripts (Bohn & Berntsen, 2008). For this reason, we can assert that life-scripts are not necessarily tied to personal experience (Bohn & Berntsen, 2008). These culturally shared representations of important life events are formed through personal narratives, observations (Berntsen & Rubin, 2004), alongside popular media content (Robinson, 1992) within one's environment. Life-scripts mainly reflect idealized lives, rather than average ones; thus, some common and important life events such as divorce might be excluded from them, even though the person experiences it (Berntsen & Rubin, 2004; Bohn & Berntsen, 2008). Although most of the events within life-scripts are the same, there might be some minor differences across cultures (Erdoğan, Baran, Avlar, Taş, & Tekcan, 2008; Zaragoza Scherman, Salgado, Shao, & Berntsen, 2017), and generations (Bohn, 2010; Tekcan, Kaya-Kızılöz, & Odaman, 2012).

Rubin and Berntsen (2003) argue that life scripts influence memory retrieval in a couple of ways. They claim that these typical life events might serve as a template when individuals are asked to think of their important personal experiences. It can provide a framework for narrowing down all the events of a lifetime to the events that people presumably experience a certain emotion, such as happiness (Berntsen & Rubin, 2004; Rubin & Berntsen, 2003). Furthermore, since these events are culturally valued

transitional events, people are more likely to rehearse these events in personal and social settings, and keep records of them such as photos and videos that might facilitate their recall.

Numerous studies found that when people remember the most important personal events from their lives, most of the memories reflect the events in the cultural life-script. When autobiographical memories are categorized for their match with the events in the life-script, more than half of them were found to reflect life-script events (Bohn, 2010; Koppel & Berntsen, 2014; Thomsen & Berntsen, 2008). Even though only the top 10 most frequently mentioned events were used for categorization, the match was 40% for most important, and 58% for happiest memories (Tekcan et al., 2017).

Majority of these prototypical events happen during the early adulthood, such as getting married, having children, and starting first job (Bohn, 2010; Erdoğan et al., 2008). For this reason, when people reminiscence about their life with the influence of cultural life-scripts, most of the autobiographical memories come from this period, creating a bump around 20s in the lifespan distribution. Koppel and Berntsen (2014) found that almost half of the personal events contained in life-script occurred in 20s, whereas less than 10% of out-of-script events fall within these years. Also, Bohn (2010) showed that 80% of life story events that fall within these years corresponded to life-script, while the rest of the events was out-of-script. When only personal events that does not fit life-script were examined, the bump in the third decade of life disappears (Ece & Gülgöz, 2017; Koppel & Berntsen, 2014). The similarity between life-script and life events is not confined to bump period; in fact, overall curves for life-scripts and personal memories were found quite similar by many researchers (Dickson, Pillemer, &

Bruehl, 2011; Zaragoza Scherman et al., 2017). These findings support the claims that people make use of life-scripts when they recall personal events from their life.

Strongest support for life-script account comes from differential distribution of positive and negative memories. While other bump accounts do not predict positive and negative memories to differ regarding the bump, life-script account underlines that negative events in life are mostly unexpected and infrequent (Dickson et al., 2011), and thus, do not have ascribed time period to occur, at least not as much as positive events (Berntsen & Rubin, 2002). For this reason, it is argued that the distribution of negative memories might not correspond to that of life-scripts, and they might not show a bump, at least not as pronounced as positive memories (Berntsen & Rubin, 2004). Several studies supported this claim by the lack of a discernable reminiscence bump for negative memories (Berntsen et al., 2011; Haque & Hasking, 2010; Rubin & Berntsen, 2003). When temporal distributions of life-script events and autobiographical memories are compared, Rubin and Berntsen (2003) found a great overlap for highly positive (most in love, happiest, most proud), as well as for saddest memories. While highly positive life events formed a bump in 20s, saddest events followed a normal forgetting function showing recency effect. The recency effect for saddest memories was also found by Berntsen and colleagues (2011). The content of these highly negative life events were mainly unexpected death of a close one and life-threatening illness, which are likely to take place later in life.

The life-story account (Glück & Bluck, 2007) aims to integrate key points of other bump accounts by restating the importance of individual and event characteristics in both encoding and retrieval. The account underlines that individuals begin to form a coherent life story while they start to perceive more control over their actions and events

during the bump years (Glück & Bluck, 2007). Furthermore, events belonging to these years are perceived to influence one's development as an individual (Bluck & Habermas, 2000), as also emphasized by narrative/identity account. Since these events stay relevant and rehearsed repeatedly due to their importance on who the individual has become, these events are argued to have an advantage on recall. Though life story account endorses the claims of life-script account on the emotional valence of bump events, Glück and Bluck (2007) stated that it is not sufficient to experience positive life events for the occurrence of the bump; having control over the event is important as well. Glück and Bluck (2007) tested their account by asking older adults about 15 most important events of their life. Participants were also requested to rate the events for their emotional valence, perceived control over the event, and influence on identity. As they expected, most of the positive events were perceived to be controlled by the individual (85.6%), while only around 20% of negative memories was perceived as such. Due to their large sample, they had enough autobiographical memories to observe the distribution of all valence/control combinations (such as negative events with low-perceived control). In line with their predictions, the reminiscence bump was found only in positive events with high perceived control. In addition, events' perceived influence on later development was lower for negative events (e.g. death of others, accidents, divorce), regardless of the degree of perceived control. In positive events, events with high perceived control (e.g. marriage, having children) were thought to influence personal development more than those with low control (e.g. beginning school). Demiray and colleagues (2009) supported life story account by demonstrating that memories within the reminiscence bump period were thought to be more important for identity development, alongside being more novel and distinctive (in line with other

bump accounts), when compared to events from other life periods. On the other hand, Ece and Gülgöz (2017) asked participants about the seven important events from their life and compared the self-rated characteristics of those classified as typical life events (e.g. marriage, first job, college; as in life-script) and those that did not fit into these categories. Interestingly, typical life events were found to receive significantly lower scores on perceived control and influence on individual's identity, compared to the events outside of these categories.

The description and measurement of life story should also be underlined here. As Habermas and Bluck (2000) stated earlier, life stories should be in the form of a narrative merging different life events with expressions about the event's influence on one's life or identity, rather than a mere collection of important events. Bluck and Habermas (2000) highlighted that these additional explanations that connect these events to each other and to self are what constitutes a life story. However, both Glück and Bluck (2007), and Demiray et al. (2009) investigated the applicability of life story account to reminiscence bump by asking a number of important events to individuals. They did not actually request a life story in which events are coherently connected by individuals (an example of such method can be seen in Habermas & de Silveira, 2008). For this reason, although the life story account seems explicatory of the reminiscence bump, it still needs further research.

1.2 The present study

The main objective of this study was to examine the lifespan distribution of important autobiographical memories of Turkish adults; namely, their most important, happiest, and saddest memories. The main aim was to see whether there is a

reminiscence bump for the most important, happiest, and saddest memories, and whether the pattern of the lifespan distribution is the same for individuals in different stages of adulthood. Another aim of the present study was to examine the phenomenological characteristics of these autobiographical memories, and compare the memories within and outside of bump periods regarding these characteristics. To delve deeper into the characteristics of lifespan autobiographical memories and the bump, we also analyzed the content and narrative qualities of these memories.

In line with these aims, adults over 40 years of age were asked to report their most important, happiest, and saddest memories. They rated a number of characteristics of these memories, and indicated their age at the event. The memories generated by participants were categorized according to their specificity, integration, content, and correspondence to Turkish cultural life-script. In this way, we were able to examine the lifespan distributional pattern of the most significant memories in one's life, and examine the content and narrative qualities of memories, in addition to their phenomenological characteristics. The self-ratings on phenomenology, and our coding of life-script correspondence enabled us to test the applicability of different accounts of reminiscence bump to Turkish culture's sampling of autobiographical memories across the lifespan. Though the bump accounts are not mutually exclusive (Koppel & Berntsen, 2015; Wolf & Zimprich, 2020), and each of them possibly contributes to the bump in some way, providing additional data that can test multiple accounts within a sample is important. Additionally, through investigating the lifespan distribution and phenomenological characteristics of autobiographical memories of Turkish adults, the current study aimed to extend the work beyond predominantly Western samples.

Based on previous research, we expected a bump for the most important and happiest memories around young adulthood, and a less pronounced bump for the saddest memories, if at all. According to the premises of the cognitive account, we would expect the bump memories to be more novel and vivid than memories from other periods. Also, this period would contain more distinctive events (e.g. unique, happening for the first-time). Based on narrative/identity account, memories from the bump period would be more important for the individual's identity compared to memories of other life periods. In addition, if the lifespan recall of autobiographical memories is supported by cultural life-script, the overlap between the memories and cultural life-script would be the highest for memories from the bump period. Relatedly, we would also expect the events matched with the life-script to form a reminiscence bump. The events in the bump would more likely to be positive and expected experiences, since life-scripts consist of such events.

CHAPTER 2

METHOD

2.1 Participants

One hundred and sixteen adults (75 female, 41 male) aged above 40 participated in the study (M_{age} = 57.66, SD = 10.81, Range = 40-87). The cut-off for minimum age was set to 40; reminiscence bump studies typically focus on adults older than this age, since for younger individuals it is not possible to distinguish the effects of recency and the bump. since the reminiscence bump studies. Three groups were formed by the age of participants as those in their 40s (18 female, 8 male), 50s (31 female, 13 male), and aged above 60 (26 female, 20 male). The education level of the sample was quite high: 15.8% had a middle school degree or lower, 23.1% had a high school degree, and 61.1% obtained a college degree or higher. Majority of the participants were married (67.2%), while 12.9% of the sample was single. The rest of the participants were divorced, widowed, or did not indicate their marital status. Regarding financial standing, 15% indicated to have less than medium income, 50.5% to have middle income, and 34.6% to have above medium income. Almost all participants spent the most of their lives in metropolitan cities of Turkey. The participants were recruited from the subject pool of Boğaziçi University Cognitive Processes Laboratory.

2.2 Materials

2.2.1 Autobiographical memory task

All participants were asked to remember and write about one of their most important, happiest, and saddest memories that are from at least one year ago (see Appendix A).

Participants were informed that the event should be clearly recalled, and directly related to themselves. Also, it is indicated that the events must have a clear beginning and an ending, and must happened in a specific time and place. They were requested to write the memory of the event as much in detail as possible.

2.2.2 Autobiographical memory ratings

Participants rated each memory for its phenomenological qualities and relation to their identity. Each event memory was rated for its vividness (1 - very vague, 5 - vivid as if experiencing now), novelty (1 - very ordinary, 5 - very different/ extraordinary), and expectedness (1 - very unexpected, 5 - very expected) on a 5-point Likert type scale, and emotional valence (1 - very negative, 7 - very positive) on a 7-point scale (see Appendix B). Distinctiveness of the event was measured by asking whether individuals have experienced a similar event before or after the original event. In this way, we were able to differentiate whether the event was the first (or last) of similar events, and whether the event was an ordinary or a unique one.

In order to measure the centrality of the event, four items from Centrality of Events Scale (Berntsen & Rubin, 2006) were used. The selected items measure the extent to which the event is part of one's identity and life story, whether it is accepted as a turning point in life, and how it influences the perception and evaluation of other experiences in life (see Appendix C). The statements were rated on a 5-point Likert type scale ranging from 1 (definitely not) to 5 (definitely yes). Lastly, participants were asked to indicate their age at the time of the event.

2.2.3 Demographic information form

Participants were asked to provide demographical information such as their gender, date of birth, education level, occupation, marital status, and income (see Appendix D).

2.3 Coding of autobiographical memories

In order to compare the personal memories of life events occurred within and out of the reminiscence bump period, all memories were coded for their specificity, integration, content, and correspondence to life-script events. Each memory was coded by two coders. The agreement between coders were 78.8% for specificity, 95.6% for integration, 87.6% for event type, and 92.4% for life-script categories. Disagreements were resolved by discussion between the coders.

2.3.1 Specificity and integration

For specificity and integration of memories, the coding manual developed by Singer and Blagov (2000) was utilized. According to this classification system, specificity of memories is evaluated under three categories as specific, episodic, and generic. Briefly, a specific memory is defined as the memory of an individual event that happened within a particular day (or might continue to unfold in the following day). Episodic memory refers to the generalized expression of related incidents within a period of time, without giving much detail about them. A generic memory is the narration of a reoccurring experience of similar events over time, without referring a particular one of these events. Memory integration refers to the meaning or lessons derived from the personal experience. Based on Singer and Blagov (2000), autobiographical memories are evaluated under two integration categories as integrative and non-integrative. While

integrative memories contain evaluative expressions about the significance of the event for oneself, or their understanding of life, non-integrative memories lack this kind of additional statements pertaining to event.

2.3.2 Content

The memory narratives were examined for their content as well. For this purpose, classification scheme created for self-defining memories by Thorne and McLean (2001) was used. The memories were grouped into seven content categories according to the prevailing event in them. Life-threatening events contain issues related to well-being of the self or someone else (such as accident, illness, assault). Recreation/exploration memories are related to fun activities, hobbies, or unique experiences, while the focus of relationship narratives is intimacy or conflict in a personal relationship of the individual (or someone related). Memories included in achievement category emphasize individual's attainment of (or strivings for) a goal. Guilt/shame memories are related to concerns about doing right or wrong, and drug/alcohol/tobacco use memories center on the use of such substances.

2.3.3 Cultural life-script correspondence

The events in memories were also coded for their resemblance of life-script events in order to test life-script account of the reminiscence bump. The life-scripts produced by middle-aged and older Turkish adults in a prior study (Ece, 2010) were used due to their overlap with the age groups in the current study. Ece (2010) created two separate life-scripts from the answers of middle-aged (40-45) and older adults (60-70), but since our sample covers and extends above these age ranges, the common events of these lists

were used. The uniformity of these two life-scripts was reflected by the overlap of seven of the ten most frequently mentioned events in the lists. These events are as follows: marriage, having children, begin school, first job/payment, college, military service, and own illness. The autobiographical memories that our participants reported were coded according to their correspondence to these seven events. Memories that did not fall within these events were in the non-script category.

2.4 Procedure

Having taken the ethics approval from the institutional review board of Boğaziçi University (see Appendix E), data collection process started. All participants were asked to report the three memories in a fixed order beginning with the most important memory, followed by happiest, and then saddest memory. After writing each memory, participants rated the memory regarding its phenomenological characteristics and centrality to identity, and indicated their age at the event. All participants completed the demographic information form at the end of the study. The questionnaires were delivered to participants in paper-pencil form or electronically, and received back from them upon completion. Older participants who indicated that they would not be able to write their memories were requested to tell the memory to research assistants. Their memory narratives were recorded and transcribed.

CHAPTER 3

RESULTS

The results are organized under four headings: Lifespan distribution, phenomenology, content, and narrative qualities of the memories.

1. The lifespan temporal distribution of each memory type was examined. In order to decide whether the reminiscence bump phenomenon was evident in our sample, chi-square analyses comparing the number of memories within each decade of life that participants lived through were conducted. In this sense, for participants aged in their 40s, the analyses were based on 10-19, 20-29, and 30-39; for those aged in their 50s, 40-49 interval was added to the prior decades, and for participants aged above 60, life periods before 60 were on the analyses. Since there were very few memories in the first decade of life (0-9), they were not included in the analyses.
2. Phenomenological characteristics of memories, as rated by the participants, were analyzed. To investigate the possible differences between memory types, age groups, and age-at-event decades, several one-way ANOVAs were conducted.
3. Content of the memory narratives was evaluated for their correspondence to the event type categories based on Thorne and McLean (2001), and to Turkish cultural life-script categories for middle-to-older adults (Ece, 2010).
4. Most important, happiest, and saddest memories were investigated for their narrative qualities (i.e. specificity and integration). The comparisons were based on the memory types, age-at-event, and age groups.

One hundred and fifteen participants reported 112 most important, 102 happiest, and 104 saddest memories in total. The memories were grouped into 10-year bins according to participants' age at the event in the memory. Some participants did not indicate their age at the events; thus, their memories could not be used in the analyses. Since very few memories were reported from when participants were above 60 years of age, the memories after 60 were grouped together. In addition, it should be noted that each age group consists of participants that did not live through the whole decade (for example, participants aged 43 in 40s group). For this reason, the memories within the last decade of each age group (40-49 for 40s, 50-59 for 50s, and after 60 for 60+) were excluded from the analyses, though they can be seen in the lifespan distribution graphs. In consequence of the elimination of the memories from the first and last decades of life, the analyses were conducted with 94 most important, 83 happiest, and 73 saddest memories.

3.1 The lifespan distribution of memories

3.1.1 The most important memories

In order to examine the distribution of memories and to detect any possible reminiscence bump peaks in the distribution, multiple chi-square tests comparing the observed bump period with adjacent age periods were conducted. The lifespan distribution of most important, happiest, and saddest memories can be seen in Figure 1.

The distribution of most important memories demonstrated a bump-like pattern with a peak covering the 20-29 and 30-39 years of age in life when all participants were considered together. Chi-square analyses revealed that the number of memories in 20-29 and 30-39 intervals were not different from 10-19 period, $\chi^2(1)$ ps > .12. However, there

were significantly more memories between 20-29 ($\chi^2(1, N = 43) = 6.721, p = .01$) and 30-39 ($\chi^2(1, N = 42) = 6.095, p = .014$) than 40-49 period.

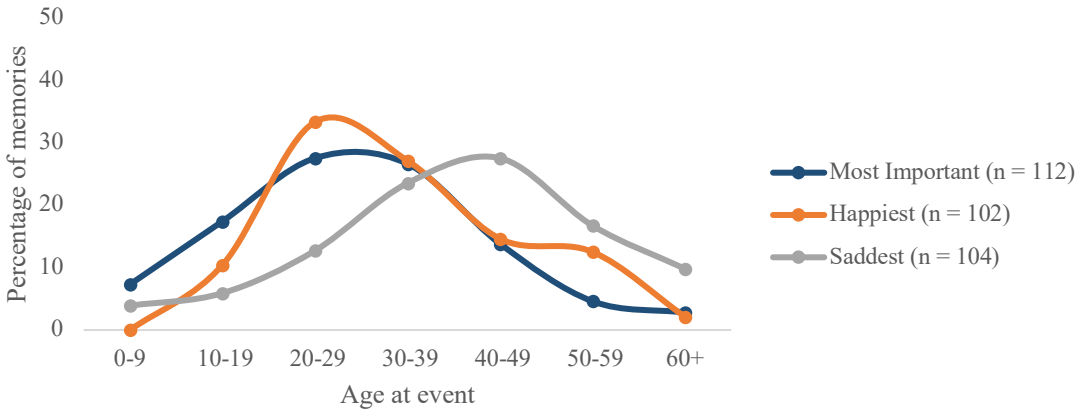

Fig. 1 Distribution of the most important, the happiest, and the saddest memories

As most important memories consist of both positive (such as being promoted in job, becoming a mother) and negative events (such as having a serious illness, family quarrels) we also looked at the distribution of the most important memories separated by their emotional valence. Memories rated above four in the 7-point Likert type scale of emotional valence were considered positive, while those rated below four were considered negative. Most important memories were mostly (64.1%) rated as positive, while 20.7% were rated negative. The distribution of the positive most important memories showed that more memories came from 20-29 and 30-39 compared to other life periods (see Figure 2), though the difference between 20-29 and 30-39 was not significantly different from 10-19 $\chi^2(1)$ *p*s > .114. However, 20-29 ($\chi^2(1, N = 29) = 15.207, p < .001$) and 30-39 interval ($\chi^2(1, N = 24) = 10.667, p = .001$) included more memories than 40-49. Negative memories seem to have formed a bump in 40-49. It should be noted the distribution of negative most important memories was based on very

few memories (n = 22, all memories included); thus, no analyses were conducted for the bump in these memories.

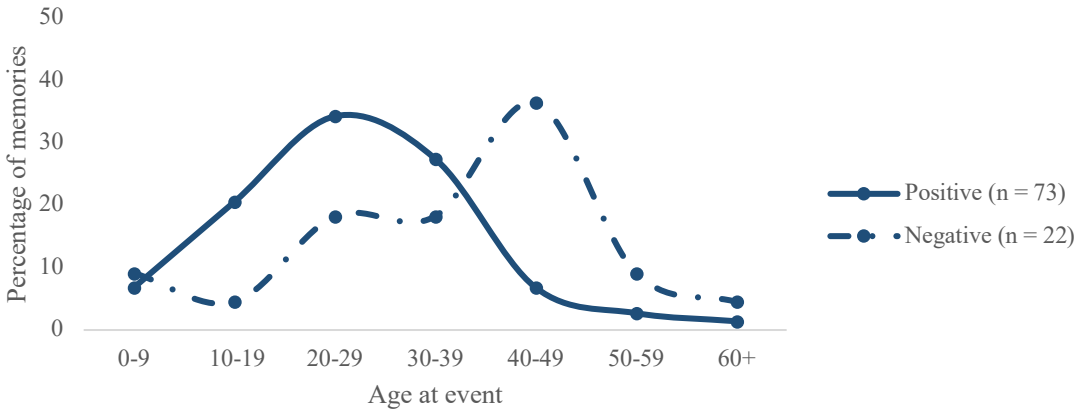

Fig. 2 Distribution of the most important memories by their emotional valence

The life span distribution of memories might show different patterns from middle to older age. Thus, the participants were examined separately by their age by decade. When participants were separated by their age groups, participants in their 50s reported more memories from the 30-39 interval than 10-19 ($\chi^2(1, N = 19) = 4.263, p = .039$). There was also a marginally significant difference between 10-19 and 20-29 intervals ($\chi^2(1, N = 17) = 2.882, p = .09$). The bump periods were not different from the following life period (40-49). For participants over 60, memories in 20-29 period was significantly different from those in 50-59 ($\chi^2(1, N = 15) = 5.40, p = .020$ (see Figure 3). The difference between the bump and neighboring periods was not significant (ps > .371). There was no difference between the life periods for those in their 40s.

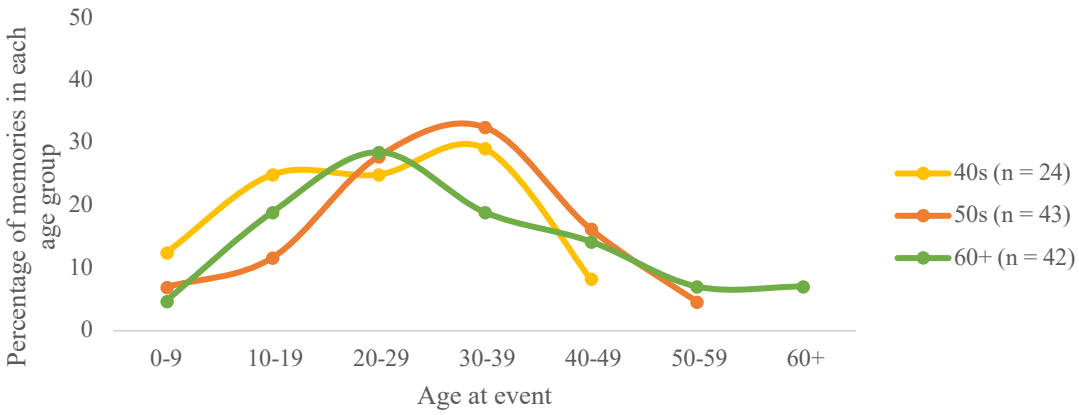

Fig. 3 Distribution of the most important memories by participant age groups

3.1.2 The happiest memories

Happiest memories formed a reminiscence bump both when participants were examined together, and in separate age groups. There were more memories between 20-29 years of age than between 10-19 ($\chi^2(1, N = 42) = 11.524, p = .001$), and 40-49 ($\chi^2(1, N = 41) = 12.902, p < .001$) in the overall sample (see Figure 1). Similarly, the difference between 30-39 and 10-19 ($\chi^2(1, N = 36) = 7.111, p = .008$), and 40-49 ($\chi^2(1, N = 35) = 8.257, p = .004$) was significant as well. The number of memories within 20-29 and 30-39 periods were very close to each other; thus, the difference was not significant.

For participants in their 50s, events occurred between 20-29 ($\chi^2(1, N = 13) = 6.231, p = .013$), and 30-39 ($\chi^2(1, N = 14) = 7.143, p = .008$) were significantly more than those in 10-19 (see Figure 4). The difference between 30-39 and 40-49 showed a trend towards significance ($\chi^2(1, N = 17) = 2.882, p = .09$). In participants aged above 60, the difference between 20-29 and 10-19 ($\chi^2(1, N = 16) = 6.25, p = .012$), as well as 40-49 ($\chi^2(1, N = 17) = 4.765, p = .029$) was significant. The youngest age group (40s) did not show any differences between the decades.

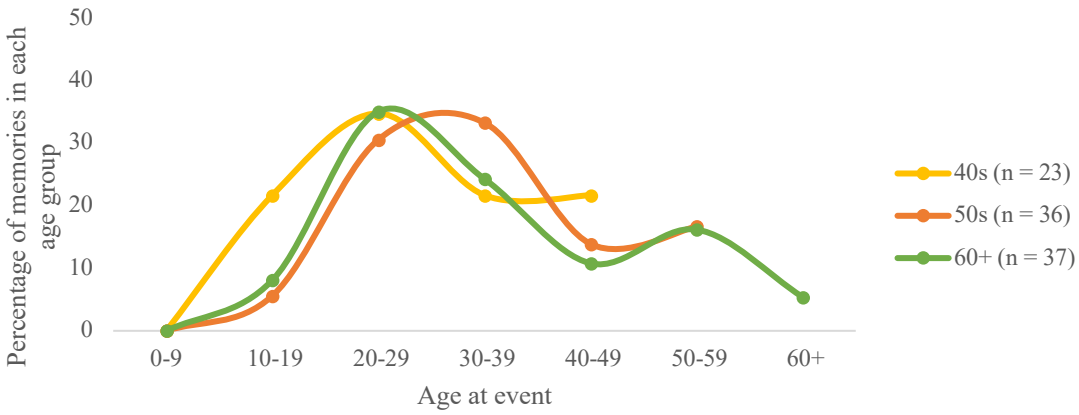

Fig. 4 Distribution of the happiest memories by participant age groups

3.1.3 The saddest memories

Unexpectedly, the distribution of the saddest memories formed a bump as well (see Figure 1). These memories seem to be grouped around 30-39 and 40-49 years of age, even though the memories of those aged in their 40s were not included for the 40-49 period. The difference between these two peak periods and 10-19 was significant (for 30-39, $\chi^2(1, N = 30) = 10.80$, $p = .001$; for 40-49, $\chi^2(1, N = 29) = 9.966$, $p = .002$), and marginally significant for 20-29 (for 30-39, $\chi^2(1, N = 37) = 3.270$, $p = .071$; for 40-49, 20s vs 40s $\chi^2(1, N = 36) = 2.778$, $p = .096$). The number of memories within the 40-49 period was significantly more than 50-59 period as well ($\chi^2(1, N = 30) = 8.533$, $p = .003$).

When age groups were separately analyzed, the shape of the distribution showed some alterations (see Figure 5). However, the difference between the age-at-event periods was not significant for those aged between 40-49 and 60+. Chi-square analyses revealed that participants in their 50s reported more memories from their 30-39 and 40-49 years of age. The number of memories coming from these years was significantly

higher than those from 10-19 (for 30-39, $\chi^2(1, N = 12) = 8.333$, $p = .004$; for 40-49, $\chi^2(1, N = 13) = 9.308$, $p = .002$), and 20-29 (for 30-39, $\chi^2(1, N = 14) = 4.571$, $p = .033$; for 40-49, $\chi^2(1, N = 15) = 5.400$, $p = .020$).

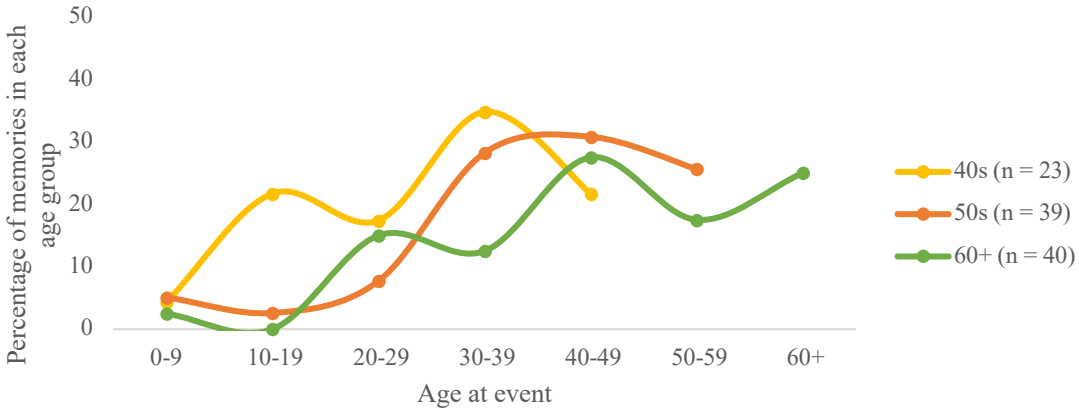

Fig. 5 Distribution of the saddest memories by participant age groups

3.2 Phenomenology of the memories

Multiple one-way ANOVAs were conducted to examine whether most important, happiest, and saddest memories differ regarding their ratings of memory phenomenology. For all multiple comparisons, Bonferroni-adjustment was applied. As expected, emotional valence values of three types of memories were different from each other $F(2, 224) = 132.252$, $p < .001$, $MSE = 2.72$, $\eta_p^2 = .541$. Happiest memories ($M = 6.61$, $SD = .83$) were rated significantly more positive than most important ($M = 5.37$, $SD = 2.23$) and saddest ($M = 1.96$, $SD = 1.36$) memories ($ps < .001$), as demonstrated through Tukey post hoc tests. There was a significant effect of memory type on novelty of events as well $F(2, 245) = 3.429$, $p = .034$, $MSE = .68$, $\eta_p^2 = .027$. Tukey post hoc comparison showed that most important memories ($M = 4.69$, $SD = .64$) were rated to be

more extraordinary than happiest memories (M = 4.37, SD = .85, p = .033). Saddest memories (M = 4.46, SD = .99) did not differ from the other memory types. Relatedly, an effect was observed in the expectedness ratings (F(2, 247) = 24.385, p < .001, MSE = 2.00, η_p^2 = .165): most important memories (M = 2.36, SD = 1.52) were less expected than happiest ones (M = 3.34, SD = 1.51, p < . 001). Saddest memories (M = 1.78, SD = 1.13) were less expected than both most important (p = .024) and happiest memories (p < .001). The memory types differed in the centrality of events in the memories, F(2, 208) = 3.288, p = .039, MSE = 1.45, η_p^2 = .031). Tukey post hoc comparisons revealed that saddest memories (M = 3.34, SD = 1.22) were regarded as less central to one's life compared to most important (M = 3.81, SD = 1.19, p = .053) memories, though the difference was marginally significant. There was a trend for happiest memories (M = 3.78, SD = 1.21) to be more central than saddest ones as well (p = .089).

Three memory types might be different in the ratings of phenomenological characteristics, but the pattern might differ across age groups. Each phenomenological characteristic was analyzed with a two-way ANOVA examining the effects of participant age and memory type. There was a significant interaction between the effects of memory type and participants age on emotional valence ratings, F(4, 218) = 4.060, p = .003, MSE = 2.50, η_p^2 = .069. Simple effect analysis showed that in most important memories, participants aged 40-49 and above 60 rated their memories more positively than those in their 50s, p = .001 and p < .001, respectively (see Table 1). No such difference was observed in other memory types. Saddest memories were rated as more negative than happiest and most important memories in all age groups (ps < .001), as expected. While most important and happiest memories did not differ in emotional valence for participants aged 40-49 and above 60 (ps > .10); those aged 50-59 rated their

happiest memories significantly more positive than most important ones ($p < .001$). Other phenomenological memory characteristics did not reveal such effects in analyses of variance (for two-way ANOVAs for each memory type separately, see Appendix F).

Table 1. Means and standard deviations of phenomenological ratings by age groups and memory types

		Most Important		Happiest		Saddest	
	Participant age	M	*SD*	M	*SD*	M	*SD*
Emotional valence	40s	6.05	*1.39*	6.67	*.49*	2.43	*1.60*
	50s	4.42	*2.64*	6.63	*1.03*	2.00	*1.45*
	60+	6.00	*1.74*	6.56	*.80*	1.50	*.82*
Vividness	40s	4.68	*.67*	4.39	*.78*	4.59	*.62*
	50s	4.50	*.86*	4.53	*.82*	4.37	*1.18*
	60+	4.76	*.55*	4.69	*.68*	4.79	*.49*
Expectedness	40s	3.11	*1.70*	3.44	*1.54*	1.65	*1.12*
	50s	2.11	*1.41*	3.50	*1.28*	2.00	*1.14*
	60+	2.24	*1.46*	3.14	*1.61*	1.66	*1.14*
Novelty	40s	4.68	*.48*	4.44	*.71*	4.76	*.56*
	50s	4.86	*.35*	4.43	*.94*	4.50	*.76*
	60+	4.51	*.87*	4.29	*.86*	4.24	*1.30*
CES	40s	3.60	*1.30*	3.47	*1.34*	3.13	*1.20*
	50s	3.74	*1.25*	3.83	*1.26*	3.17	*1.26*
	60+	4.02	*1.04*	3.96	*1.05*	3.63	*1.17*

In order to examine whether the bump memories were different than memories happened in other life periods, two-way ANOVAs examining the influence of age-at-event and memory type on memory phenomenology were conducted. A significant

interaction of age-at-event and memory type was found for emotional valence $F(8, 212) = 2.572$, $p = .011$, $MSE = 2.43$, $\eta_p^2 = .088$. Simple effect analysis revealed that in most important memories, events happened in 10-19 ($M = 5.94$, $SD = 1.59$), 20-29 ($M = 6.00$, $SD = 1.76$), and 30-39 ($M = 5.45$, $SD = 2.11$) were rated as more positive than those happened in 40-49 ($M = 3.15$, $SD = 2.79$, ps $< .001$). There was no difference between life decades in happiest and saddest memories. For expectedness, there was also a main effect of memory type ($F(2, 235) = 14.249$, $p < .001$, $MSE = 1.88$, $\eta_p^2 = .108$), and age-at-event ($F(4, 235) = 2.672$, $p = .033$, $MSE = 1.88$, $\eta_p^2 = .043$). Their interaction showed a trend towards significance ($F(8, 235) = 1.745$, $MSE = 1.88$, $p = .089$, $\eta_p^2 = .056$). Simple effects analyses showed that only most important events happened between 20-29 were more expected than those happened within 30-39 ($p = .002$), 40-49 ($p < .001$), and 50-59 ($p = .031$). There was no difference between the decades in happiest and saddest memories.

3.3 Content of the memories

The most common contents for each memory type, age group, and age-at-event decade were examined. Prevalent contents in most important memories were achievement (31.1%), life threatening events (27.7%), and relationship (20.5%). Happiest memories predominantly consisted of relationship (50.5%) and achievement events (33.3%). Most of the saddest memories were about life-threatening events (79.4%). For most common event type categories across age and age-at-event groups, see Table 2.

Table 2. Percentage of the most common event type categories

	Most Important			Happiest		
Age-at-event	40s	50s	60+	40s	50s	60+
0-9	LTE (33.3%) REL. (33.3%) ACH. (33.3%)	LTE (33.3%) ACH. (33.3%)	LTE (50%) ACH. (50%)	REL. (66.7%)	ACH. (66.7%)	REL. (50%)
10-19	ACH. (50%)	ACH. (40%)	ACH. (50%)	ACH. (66.7%)	ACH. (60%)	REL. (33.3%) ACH. (33.3%)
20-29	ACH. (50%)	ACH. (50%)	ACH. (50%) REL. (41.7%)	ACH. (80%)	ACH. (40%) REL. (40%)	REL. (75%)
30-39	LTE (42.9%)	LTE (42.9%)	ACH. (37.5%) REL. (25%)	REL. (57.1%)	REL. (66.7%)	REL. (57.1%)
40-49	LTE (50%) ACH. (50%)	LTE (71.4%)	LTE (50%)	REL. (100%)	REL. (42.9%)	REL. (50%)
50-59	-	REC. (50%) REL. (50%)	LTE (100%)	-	ACH. (100%)	REL. (66.7%)
60+	-	-	UNCL. (66.7%)	-	-	REL. (33.3%) ACH. (33.3%)

Note: LTE: Life-threatening event, REL.: Relationship, ACH.: Achievement, REC.: Recreation/Exploration, UNCL.: Unclassified

Chi-square analysis contrasting age groups and event types revealed that there was a trend towards differential distribution of event types across age groups, ($\chi^2(6, N = 82) = 10.829$, $p = .094$). There was no difference in the most important memories between age groups. When the happiest memories of participants aged between 40-49 and above 60 were compared, relationship theme was observed more in 60+ adults, $\chi^2(1, N = 29) = 5.828$, $p = .016$. There was not any other significant difference in other

memory types or distribution of event types. There was also a trend in saddest memories of participants aged 40-49 and 60+ ($\chi^2(1, N = 37) = 3.27, p = .071$). Adults aged above 60 reported more memories with life threatening content compared to those aged in their 40s. There was no difference between 50s group and the other two age groups.

The content of the memories in the bump period (20-29) and neighboring decades were compared for each memory type. In most important memories, memories occurred in 20-29 years of age contained significantly more achievement memories than 30-39, $\chi^2(1, N = 20) = 5.000, p = .025$). For the happiest memories, events within 20-29 period consisted of relationship events significantly more than those in the prior age decade, $\chi^2(1, N = 23) = 15.696, p = .0001$.

3.4 Cultural life-script correspondence

The memories were separated into two groups as scripted and non-scripted events. Memories that correspond to one of the seven events from Turkish cultural life script (marriage, having children, begin school, first job/payment, college, military service, own illness; Ece, 2010) were categorized as scripted, while others were categorized as non-scripted. More than half of happiest memories (60.2%) matched with the events from the life script, while the overlap with the life script was 41.5% for most important memories. The most frequent life-script event was having children for both most important and happiest memories (see Table 3). Only one of the saddest memories corresponded to the life-script events (1.4%). When memory types were compared, happiest memories corresponded to life script more than most important memories ($\chi^2(1, N = 176) = 9.894, p = .002$). As expected, saddest memories overlapped with life-script

events less than most important ($\chi^2(1, N = 167) = 40.316, p < .001$), and happiest memories ($\chi^2(1, N = 155) = 74.390, p < .001$) did.

The degree to which events in the young adulthood period (20-29) and adjacent age-at-event groups (10-19 and 30-39) match the life-script events were compared by a series of chi-square analyses. Results showed that in most important memories events in the 20-29 life period corresponded to life-script more than those in 10-19 ($\chi^2(1, N = 49) = 6.412, p = .011$), and 30-39 ($\chi^2(1, N = 59) = 6.166, p = .013$). There was no difference in happiest, and saddest memories.

Table 3. Life-script events within memory types

	Most Important		Happiest	
Life-script events	Frequency	%	Frequency	%
Having children	19	20.2	30	36.1
Marriage	6	6.4	10	12
College	8	8.5	5	6.0
Own illness	2	2.1	3	3.6
First job	4	4.3	-	-
Military service	-	-	2	2.4
Out-of-script	55	58.5	33	39.8
Total	94		83	

3.5 Narrative qualities of the memories

3.5.1 Specificity

Most of the events reported by participants were specific: 72.3% of most important memories, 59.6% of happiest memories, and 55.7% of saddest memories were coded as referring to a specific episode of event. As can be inferred from the percentages, most important memories were coded as specific more than happiest ($\chi^2(1, N = 216) = 3.891, p = .049$), and saddest memories ($\chi^2(1, N = 218) = 6.579, p = .01$).

The adults aged in their 40s, 50s, and above 60 were compared for the specificity of their memory narratives (see Figure 6). No effect of age was observed in most important and happiest memories. In saddest memories, participants in their 40s were more likely to report specific memories, compared to those in their 50s ($\chi^2(1, N = 64) = 5.564$, $p = .018$), and above 60 ($\chi^2(1, N = 67) = 3.682$, $p = .055$).

When three age-at-event groups were compared on the number of specific memories they include, the only difference was found in most important memories. Memory narratives from 20-29 years were more specific than those from 10-19, $\chi^2(1, N = 49) = 8.784$, $p = .003$.

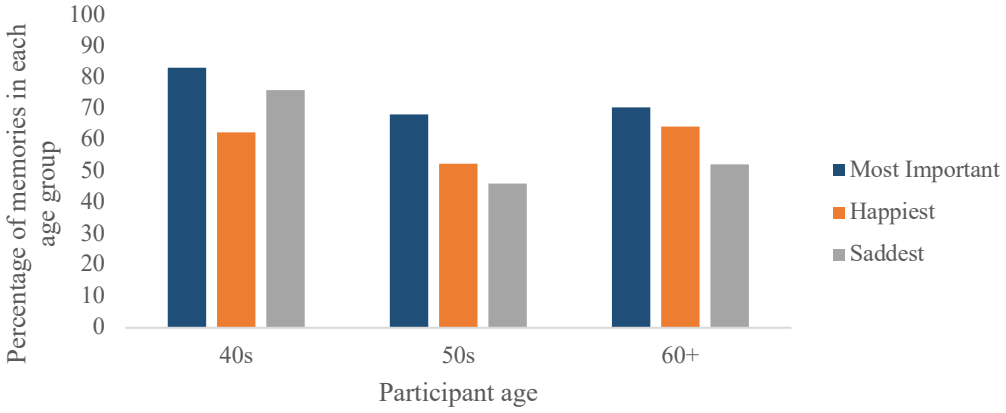

Fig. 6 Specificity of memory narratives in each age group and memory type

3.5.2 Integration

The integration of the memory narratives was also examined. Most of the memories did not contain any integrative statements: Only 16.1% of most important, 3.8% of happiest memories, and 4.7% of saddest memories were integrative narratives. Most important memories were more integrative than happiest (χ^2 (1, $N = 216$) = 8.810, $p = .003$), and

saddest (χ^2 (1, N = 218) = 7.440, p = .006) memories. The number of integrative memories was not different for the three age groups. None of the happiest and saddest memories reported by 40s age group was integrative.

CHAPTER 4

DISCUSSION

The present study mainly investigated the lifespan distribution of most important, happiest, and saddest memories of adults aged over 40. In addition, phenomenological characteristics, content, and narrative qualities of these memories were examined. Through comparing three memory types, age groups, and life decades, we were able to explore the possible effects of these factors on recall of notable life experiences.

4.1 The reminiscence bump

The temporal distribution of most important memories revealed that participants recalled more memories from 20-39 period. This age interval is broader than our expectations, since the reminiscence bump in previous studies was mainly located only in 20-29 period (Berntsen & Rubin, 2002; Haque & Hasking, 2010; Rubin & Schulkind, 1997), though the broad range was also observed earlier by Koppel and Berntsen (2014).

Participants in their 40s showed a relatively flat pattern in the distribution of most important memories. For those aged between 50-59, the bump remained in its broad shape; while participants aged above 60 showed a more discernable bump in 20-29 interval.

In line with previous studies, most important memories were predominantly positive (Glück & Bluck, 2007; Rubin & Berntsen, 2003; Rubin & Schulkind, 1997). However, they might also be related to negative life experiences. When the distribution of most important memories was examined separately by their emotional valence, positive memories reflected the same broad bump pattern between 20-39. The small

number of negative memories formed a bump in 40-49 (similar to saddest memories, which will be discussed later). Studies that separately examined most important memories by their emotional valence generally found a recency effect in negative memories, but no bump was observed (Berntsen & Rubin, 2002; Glück & Bluck, 2007; Rubin & Berntsen, 2003).

The reminiscence bump for happiest memories had a discernable peak in 20-29 interval that extended over the next decade, like the most important memories. Similar to previous studies that included these two types of memories, the bump in happiest memories seem to be more pronounced than that of most important memories (Berntsen & Rubin, 2002; Rubin & Berntsen, 2003). For those aged in their 40s and over 60, the peak was in 20-29, though it was not significantly a bump for the former group. Participants in their 50s showed a wide bump covering third and fourth decade of life. Previous studies focusing on happiest/most positive memories located the bump only in third decade of life (Berntsen & Rubin, 2002; Haque & Hasking, 2010; Tekcan et al., 2017; Thomsen et al., 2011). However, the bump covering the 30-39 interval is not common.

The broad bump extending over to fourth decade of life in most important and happiest memories might be related to certain events happened in this life decade. To figure out the possible reason of the high number of memories in 30-39 age period, the content of memories within this interval was examined. Out of 29 most important memories, there were 10 memories related to life-threatening events (i.e. death of close others, serious illness etc.). Even though negative events seem to be rather common in this age interval, only four of these memories were rated as negative by participants.

Alternatively, oversampling of memories from 30-39 age period could be due to timing of some important life events within this specific sample of participants. In the present study, more than half of the happiest, and one-fourth of the most important memories in 30-39 interval was about having children. There might be some relation between the educational level and the age at which people experience some life events (such as having children), though the reasons and details are outside the scope of this study. More than half of our participants (61.1%) had a college degree or higher, which is much above the general population of Turkey (20.8% had tertiary education), and even above the most educated countries (e.g. Canada: 57.9% and Russia: 56.7%; OECD, 2019). While 41% of women with a Bachelor's, and 54% of women with a graduate degree become parents for the first time after their 20s, the ratio is much lower among women with a high school degree or lower (17%; Livingston, 2015). In Turkey, the statistical reports on births in 2019 revealed that 32.3% of women who gave birth in their 30s had a college degree or higher, while this ratio was 23.9% for those who gave birth in their 20s (TUIK, 2020). Based on these points, we can suggest that the high number of memories in the fourth decade of life might be related to educational level and life experiences of our participants, regarding that our sample mostly consists of female participants. Although studies with similar sample characteristics (highly educated Turkish adults; Demiray et al., 2009; Ece & Gülgöz, 2017) did not found a bump in 30s, it should be noted that the cueing method used in both of these studies were different from the present study; thus, the life span distribution of memories consisted of both important and trivial events from life, which might have leveled down the number of memories related to parenthood.

We found a reminiscence bump for the saddest memories as well. The increase was observed in 40-49 period in the overall sample, even though the memories of the youngest group (40s) was not included for that interval. Indeed, rather than a slight increase in the number of memories, the bump was distinctive, as opposed to previously suggested (Berntsen & Rubin, 2002). When the age groups were separately examined, the temporal distributions showed quite disparate patterns, yet all groups reported more memories from the middle adulthood (beginning from 30 years of age). Based on the high number of memories in the most recent decade for all age groups, we would assume that the distribution of saddest memories showed the recency effect found in previous studies (Berntsen & Rubin, 2002; Berntsen, Rubin, & Siegler, 2011; Rubin & Berntsen, 2003).

However, the content analyses revealed that almost all saddest memories in our study were about life-threatening events, specifically death or serious illness of close others (58.8% about parents, 37.6% about others e.g. spouse, child, close friend). When the correspondence of these memories to Turkish life-script is evaluated, there seems to be a small overlap. However, we used only seven most frequent events common in the life-scripts of middle-to-older adults. For this reason, although they were not among the most frequently mentioned events (thus, coded as "out of script"), negative life events such as parental or familial loss, serious illnesses, family quarrels and fights (Bohn, 2010; Ece, 2010; Erdoğan et al., 2008; Tekcan et al., 2012) are also included when people are asked about the life-script within their culture. Even though individuals might experience these events at any point in their lifetime, there is still a roughly expected time period when they are likely to occur, which is when one (and their close others) approaches to old age. When both young and older adults were asked to estimate time

for each event in life-scripts, most of the events were estimated to happen from 40s on (Berntsen & Rubin, 2004; Erdoğan et al., 2008; Haque & Hasking, 2010; Rubin & Berntsen, 2003). The mean estimated age for negative life-script events were all within the middle and late adulthood years (e.g. parents' death in 40s, serious illness in 50s, spouse's death in 70s; Berntsen & Rubin, 2004; Erdoğan et al., 2008). In addition, the distributions of negative life-script events and negative autobiographical memories collected from elderly adults matched to a great extent (Haque & Hasking, 2010; Rubin & Berntsen, 2003). Although there are less agreement across participants regarding the existence and time for negative events in the life-script compared to positive ones (Berntsen & Rubin, 2004), they are still a part of the life-scripts.

In support of the late occurrence of negative events in life, Thomsen and colleagues (2011) showed that the beginnings of the most negative life chapters and specific events formed a bump in 35-50 interval. Holmes and Conway (1999) indicated that memories of events related to health issues had a peak after 30. Similarly, Tekcan and colleagues (2017) found a shallow bump in 30-49 interval in Turkish adults' saddest personal memories. Looking at the content of the memories, they concluded that the overpopulation of saddest memories was due to the content and timing of these specific events. Together these findings suggest that the high proportion of the saddest memories towards the late adulthood might be "simply a reflection of the way life is" (Rubin & Berntsen, 2003, p. 11), rather than a recency effect.

4.2 Characteristics of the memories

The comparison of the phenomenological characteristics of the bump memories and neighbor periods yielded variant results. The results showed that memories of most

important events happened between 20-29 years of age were more expected than following life periods. Oversampling of expected events around the young adulthood was previously found in other studies as well (Dickson et al., 2011; Tekcan et al., 2017). Relatedly, as cultural life-scripts consist of events expected to occur in one's life, the most important events occurred within 20-29 years of age matched the cultural life-script more than previous and following life decades. In support of this, earlier studies found that important memories that fit within cultural life-script are mostly located in the reminiscence bump period (Bohn, 2010; Koppel & Berntsen, 2014). Likewise, the temporal distribution of important memories and life-script events largely overlapped in previous studies (Haque & Hasking, 2010; Zaragoza-Scherman et al., 2017). However, it should be noted that the differences in our sample were peculiar to most important memories; happiest and saddest memories did not reveal any difference in the characteristics of events within the reminiscence bump.

In addition, memories within the bump periods did not differ from those occurred in other life decades in their vividness, novelty, distinctiveness and centrality of events to one's identity, consistent with prior studies (Luchetti & Sutin, 2018; Rubin & Schulkind, 1997; Tekcan et al., 2017; but see Demiray et al., 2009). The lack of differences regarding vividness, novelty, and distinctiveness conflict with the fundamental claims of the cognitive account. In addition, narrative/identity account would predict memories occurred within early adulthood years to be considered as more important for one's identity, though our findings were not as such.

The content analyses showed that most important and happiest memories mainly consist of events related to one's relationships and achievements. Saddest memories (and some of the most important memories) are predominantly of life-threatening events

that individuals or their close others lived through. For most important memories, although the bump covers both third and fourth decade of life, the former decade includes more memories of achievements than the latter. Also, in happiest memories, relationship memories were more prevalent in 20-29 interval than the earlier decade, but not different than the following decade. According the Erikson's psychosocial stages of development (1950), these years correspond to a period when intimacy and relationships gain importance in one's life. Based on this point, oversampling of relationship memories in the 20-29 was consistent with narrative/identity account.

As expected, the events within the most important and happiest memories overlapped with Turkish cultural life-script to a large extent. The high correspondence between these memories and the life-script supports the view that individuals utilize cultural life-scripts when asked to remember remarkable events from their lives. In addition, saddest memories did not match with the events within life-script at all. Although negative experiences are not uncommon in a typical human life, these events are usually unexpected and lack a commonly ascribed time period to occur; thus, greatly absent in cultural life-scripts, except for few examples.

Most of the autobiographical memories reported by the participants did not involve meaning making within narratives. Though still very few, most important memories were more integrative than happiest and saddest memories. Negative experiences are thought to be scrutinized more thoroughly and they might urge individuals to reflect on the events and themselves, as well as to make changes in order to ease the effects of the event (Baumeister, Bratlavsky, Finkenauer, & Vohs, 2001; Taylor, 1991) and guide identity and future actions (Singer et al., 2007), although they are more difficult to integrate to one's self (Weeks & Pasupathi, 2011). In line with

these points, Thorne, McLean and Lawrence (2004) found that individuals were more likely to integrate events that involved tension and discomfort (e.g. mortality, conflict). They suggested that positive events may not require much integrative effort by the rememberer, since they could be easier to relate to one's self. Yet, our sample did not write integrative narratives for their negative memories. Most important memories that contained meaning-making statements were highly positive, while only four memories (out of 18) were rated as negative by their rememberer. The saddest memories which predominantly consisted of life-threatening events were stated in very few words, even without disclosing any details (e.g. "My saddest memory is the loss of my mother. There is nothing else to say about it."). The tendency of the participants to keep brief especially their saddest memories might have precluded us from observing the integration of memories.

4.3 Age differences in memory characteristics

Although individuals might show some differences in autobiographical memory characteristics as they age (Habermas, Diehl, & Welzer, 2013; Piolino, Desgranges, Benali, & Eustache, 2002; Polsinelli, Rentscher, Glisky, Moseley, & Mehl 2020; Rubin & Berntsen, 2009); however, the differences might be more clear when comparing older adults with younger adults, rather than middle-aged individuals.

Our study did not reveal much consistent differences between age groups in phenomenological characteristics of memories. Socioemotional Selectivity Theory (Carlstensen, Isaacowitz, & Charles, 1999) states that older adults undergo changes in motivations through which emotional goals take precedence in life. Based on this, it is suggested that older adults become more emotionally positive in their autobiographical

memories and focus on their relationships (Elnick, Margrett, Fitzgerald, & Labouvie-Vief, 1999; Özbek, Bohn, & Berntsen, 2020; Polsinelli et al., 2020; Singer et al., 2007). In our study, though oldest age group evaluated their most important memories as more positive than those in their 50s, positive emotional valence was also high in the memories of participants in their 40s. Schryer and colleagues (2012) underlined that though older adults can be more emotionally expressive in their narratives, they might not differ from young adults in valence ratings of remote memories from their life. Besides, in support of older individuals' increased relational focus, oldest age group reported more events related to relationships than the youngest age group in their happiest autobiographical memories.

Earlier studies showed inconclusive results on the effects of age on vividness ratings of autobiographical memories. Despite some studies show that elderly participants gave higher vividness ratings on their autobiographical memories (Janssen, Rubin, St. Jacques, 2011; Luchetti & Sutin, 2018; Singer, Rexhaj, & Baddeley, 2007), there are studies showing that vividness of memories might decrease with age as well (Habermas et al., 2013).

Regarding narrative qualities, we would expect specificity to decrease while meaning making takes precedence in memory narratives of older adults, based on previous studies (Pasupathi & Mansour, 2006; Singer et al., 2007). We observed no age effect in specificity of most important and happiest memories. In saddest memories, youngest age group reported more specific events than those aged above 50. Very few memory narratives included integrative statements, and participants of different age groups did not show any difference on this matter.

Despite the deterioration of recall in older age (Piolino et al., 2002), Habermas and colleagues (2013) suggested that some memories might be preserved from such influences due to their relation and importance to the individual. Repeated rehearsal through sharing the events might strengthen the stability of these memories (Campbell, Nadel, Duke, & Ryan, 2011). In addition, Fitzgerald and Broadbridge (2012) suggested that older adults might employ a different logic when rating their memories, especially regarding vividness as "If I remember something from my past, it must be at least somewhat vivid" (pg. 256). Though speculative, this situation might be true, and might disrupt the reliability of such ratings, and preclude us from observing the effect of age on vividness, if there is.

4.4 Limitations

Some limitations should be considered for the present study. First, the number of participants in the youngest age group was quite small, especially for examining lifespan distribution of autobiographical memories. The lack of significant results in the reminiscence bump analyses for this age group might have caused by the small sample size (n = 24). Additionally, a possible reminiscence bump might have been obscured by the recency effect for this age group. Regarding that the participants within this group were mostly in earlier years of 40s, memories from their 30s might have been recalled more due to their relative recency. Although the distribution did not reveal a discernable bump, the pattern was not flat at all. Secondly, although the study aimed to investigate life span retrieval of autobiographical memories within Turkish culture, the sample was highly educated and from metropolitan areas in Turkey, which did not truly reflect the characteristics of Turkish society. Lastly, the order of the autobiographical memories

was not counterbalanced. All participants were initially asked their most important memory, followed by the happiest, and lastly the saddest. In this way, it was ensured that the saddest memories would not influence the following memory through influencing participants' mood.

4.5 Conclusion

The present study aimed to contribute to the reminiscence bump literature by investigating the phenomenon in Turkish culture with detailed analyses on content and narrative qualities of memories.

The lack of significant differences in the phenomenology of bump versus other memories disagrees with cognitive and narrative/identity accounts. Since life-story account combines the predictions of earlier bump accounts, and claims the bump memories to be more novel, distinctive, and influential on identity than non-bump memories (Demiray et al., 2009), our data did not support this account either.

The bump memories being more expected than the other ones and the overall congruity between memories and cultural life-script demonstrate that individuals might be using cultural life-scripts as templates when asked to remember their most significant experiences. However, the presence of the reminiscence bump for saddest memories as pronounced as other memory types conflicts with the fundamental arguments of life-script account. Future studies focusing on life-script account of the reminiscence bump should examine saddest autobiographical memories more carefully, and integrate the memories of these negative life experiences into the account.

Having these in mind, our findings emphasized that the shape and characteristics of reminiscence bump might show alterations due to sample characteristics. It should

also be noted that the life span retrieval of autobiographical memories still needs further research with different populations and retrieval methods, and that the existing bump accounts need to be revised.

APPENDIX A

AUTOBIOGRAPHICAL MEMORY TASK

In this study, we request you to try to remember your memories that contain certain emotions. These memories should be clearly recalled, and directly related to yourself. The event in the memory must have a clear beginning and an ending, and must happened in a specific time and place. What we want from you is to tell about your memories as much in detail as possible. These memories should be related to an event from at least one year ago. *(Bu çalışmada sizden belirli duygular içeren farklı anılarınızı hatırlamaya çalışmanızı rica ediyoruz. Sizden istediğimiz, başı-sonu belli, doğrudan sizinle ilgili, net bir biçimde hatırladığınız, belirli bir yerde ve zamanda olmuş anılarınızı mümkün olduğu kadar ayrıntılı bir biçimde anlatmanızdır. Bu anılar son bir yıldan daha önceki bir olaya ilişkin olmalıdır.)*

Now, write down your most important (happiest/saddest) memory as much in detail as possible. Please write down only one memory. *(Şimdi, kendi hayatınızı düşündüğünüzde en önemli (en mutlu/en üzücü) bulduğunuz anınızı mümkün olduğunca detaylı bir şekilde yazınız. Lütfen tek bir anınızı anlatın.)*

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APPENDIX B

MEMORY PHENOMENOLOGY QUESTIONS

Please answer the questions below for the most important (happiest/saddest) memory you have written. *(Lütfen yukarıda belirttiğiniz "en önemli" (en mutlu/en üzücü) anıyı düşünerek aşağıdaki soruları yanıtlayın.)*

1. How vivid can you imagine the event in this memory? Can you please rate by giving a score from 1 to 5, as 1 indicating "very vague" and 5 "vivid as experiencing now"? *(Bu anıdaki olayı şu anda zihninizde ne kadar canlandırabiliyorsunuz? Lütfen "1" Son derece silik, "5" Sanki şu anda yaşıyormuş gibi canlı olmak üzere 1 ile 5 arasında bir puan vererek değerlendirir misiniz?)*

1	2	3	4	5
Very vague *(Son derece silik)*				Vivid as if experiencing now *(Sanki şu anda yaşıyormuş gibi canlı)*

2. How different/extraordinary was this event for you when it occurred? Can you please rate by giving a score from 1 to 5, as 1 indicating "very ordinary" and 5 "very different/extraordinary"? *(Bu olay olduğu zaman sizin açınızdan ne kadar farklı/sıra dışı bir olaydı? Lütfen "1" Çok sıradan, "5" Çok farklı/sıra dışı bir olaydı olmak üzere 1 ile 5 arasında bir puan vererek değerlendirir misiniz?)*

1	2	3	4	5
Very ordinary *(Çok sıradan)*				Very different/ extraordinary *(Çok farklı/sıra dışı bir olaydı)*

3. Have you experienced a similar event before/after this event? Mark the appropriate option. *(Bu olay öncesinde/sonrasında buna benzer bir olay yaşadınız mı? Uygun seçeneği işaretleyiniz.)*

Yes, I had before *(Evet, öncesinde)*		
Yes, I had after *(Evet, sonrasında)*		
Both before and after *(Hem öncesinde hem sonrasında)*		
No, I have not *(Hayır yaşamadım)*		

4. Looking back now, thinking its consequences, is your most important/happiest/saddest memory positive or negative for you? *(Yukarıda belirttiğiniz en önemli/en mutlu/en üzücü anınız, sonuçları itibariyle, bugün geriye dönüp baktığınızda, size göre olumlu mudur, olumsuz mudur?)*

1	2	3	4	5	6	7
Very negative *(Çok olumsuz)*	Negative *(Olumsuz)*	Somewhat negative *(Biraz olumsuz)*	Neither positive nor negative *(Ne olumlu ne olumsuz)*	Somewhat positive *(Biraz olumlu)*	Positive *(Olumlu)*	Very positive *(Çok olumlu)*

5. Do you think this was an expected or unexpected event? Can you please rate by giving a score from 1 to 5, as 1 indicating "very unexpected" and 5 "very unexpected"? *(Sizce bu olay beklenen bir olay mıydı, beklenmeyen bir olay mıydı? Lütfen "1" Hiç beklenmedik bir olaydı, "5" Son derece beklenen bir olaydı olmak üzere 1 ile 5 arasında bir puan vererek değerlendirir misiniz?)*

1	2	3	4	5
Very unexpected *(Hiç beklenmedik bir olaydı)*				Very expected *(Son derece beklenen bir olaydı)*

6. How old were you during the event you described above? Please do not write a period such as “my childhood, youth”. Indicate a specific age. If you are not sure, guess the age that you believe the closest. *(Yukarıda anlattığınız anınız kaç yaşınıza ait? Lütfen çocukluğuma, gençliğime ait gibi dönem vermeyiniz, kesin bir yaş belirtiniz. Eğer emin olamıyorsanız yakın olduğuna inandığınız bir tahminde bulununuz.)*

   I was …… years old. *(…… yaşıma ait.)*

APPENDIX C

CENTRALITY OF EVENT QUESTIONS

	Definitely Not *(Kesinlikle Hayır)*				Definitely Yes *(Kesinlikle Evet)*
I feel that this event has become part of my identity. *(Bu olayın kimliğimin bir parçası haline geldiğini hissediyorum.)*	1	2	3	4	5
I feel that this event has become a central part of my life story. *(Bu olayın hayat hikayemin merkezi bir parçası haline geldiğini hissediyorum.)*	1	2	3	4	5
This event has influenced the way I think and feel about other experiences. *(Bu olay, diğer olaylarla ilgili duygu ve düşüncelerimi etkiledi.)*	1	2	3	4	5
This event was a turning point in my life. *(Bu olay, hayatımda bir dönüm noktası oldu.)*	1	2	3	4	5

APPENDIX D

DEMOGRAPHIC INFORMATION QUESTIONNAIRE

1. Gender *(Cinsiyetiniz)*: Female *(Kadın)*____ Male *(Erkek)*_____

2. Highest level of education you have completed *(En son bitirdiğiniz okul)*:

Elementary *(İlkokul)*__ Middleschool *(Ortaokul)*__ Highschool *(Lise)*__

Undergraduate *(Üniversite)*__ Graduate *(Lisansüstü)*__

3. Year of birth *(Doğum yılınız)*: _____

4. Occupation *(Mesleğiniz)*:_____

5. Marital status *(Medeni durumunuz)*: _____

6. If you are married, highest level of education your spouse has completed *(Evli iseniz, eşinizin en son bitirdiği okul)*:

Elementary *(İlkokul)*__ Middleschool *(Ortaokul)*__ Highschool *(Lise)*__

Undergraduate *(Üniversite)*__ Graduate *(Lisansüstü)*__

7. Do you have children? *(Çocuğunuz var mı?)*: Yes *(Evet)*___ No *(Hayır)*___

If yes, how many? *(Varsa kaç tane?)*: _____

8. Where do you place your economic status when you evaluate the overall economic situation in Turkey? *(Türkiye genelinde değerlendirdiğinizde kendi ekonomik durumunuzu nasıl görüyorsunuz?)*

Low income *(Düşük gelir düzeyi)*___

Lower-middle income *(Düşük-orta gelir düzeyi)* ___

Middle income *(Orta gelir düzeyi)* ___

Upper-middle income *(Orta-üst gelir düzeyi)* ___

High income *(Üst gelir düzeyi)* ___

9. What is your family's total monthly income approximately? *(Ailenizin toplam aylık geliri yaklaşık ne kadardır?)* _____

10. How many people are dependent on this income? *(Bu gelir toplam kaç kişinin geçimini sağlamaktadır?)* _____

11. In which city did you spend most of your life? *(Hayatınızın en büyük bölümünü hangi şehirde geçirdiniz?)* _____

12. Where did you live in the city you just wrote? *(Bu şehirde aşağıdakilerden hangisinde yaşadınız?)*

City center *(Şehir merkezi)* ___ Sub-province *(İlçe)* ___

Town *(Kasaba)* ___ Village *(Köy)* ___

APPENDIX E

ETHICS COMMITTEE APPROVAL

T.C.
BOĞAZİÇİ ÜNİVERSİTESİ
İnsan Araştırmaları Kurumsal Değerlendirme Kurulu
2011/1

02 Mart 2011

İlgili Makama,

Boğaziçi Üniversitesi Psikoloji Bölümü öğretim üyesi Prof. Dr. Ali İzzet Tekcan'ın "Bireysel ve Sosyokültürel Faktörlerin Otobiyografik ve Toplumsal Bellek Süreçleri Üzerindeki Etkileri" başlıklı projesi ile ilgili olarak Boğaziçi Üniversitesi İnsan Araştırmaları Kurumsal Değerlendirme Kurulu'na yapmış olduğun başvuru kurulumuzun 2 Mart 2011 tarihli toplantısında değerlendirilerek uygun bulunmuştur.

Bilgilerinize arzederiz.

Prof. Dr. Yekta Ülgen,
Biyomedikal Mühendisliği Enstitüsü, B.Ü.

Prof. Dr. Hande Çağlayan,
Fen-Edebiyat Fakültesi, B.Ü.

Prof. Dr. Şemsa Özar,
İktisadi ve İdari Bilimler Fakültesi, B.Ü.

Prof. Dr. Önder Ergönül
Marmara Üniversitesi Tıp Fakültesi
(katılmadı)

Doç. Dr. Hale Bolak
Fen-Edebiyat Fakültesi,
İstanbul Bilgi Üniversitesi

Doç. Dr. Yeşim Atamer
Hukuk Fakültesi,
İstanbul Bilgi Üniversitesi
(katılmadı)

APPENDIX F

TWO-WAY ANOVAS FOR EACH MEMORY TYPE

In order to examine the differences in memory phenomenology between the age groups and age-at-event decades, two-way ANOVAs for each memory type were conducted. For the most important memories, analysis on emotional valence showed that there was a main effect of age ($F(2, 81) = 6.638$, $p = .002$, $MSE = 24.721$, $\eta_p^2 = .141$) and age-at-event ($F(4, 81) = 5.082$, $p = .001$, $MSE = 18.925$, $\eta_p^2 = .201$). The interaction of these two factors was not significant. Tukey's post-hoc analyses revealed that participants aged in their 40s ($p = .01$) and above 60 ($p = .002$) reported more positive memories than those in their 50s. Also, events occurred between 40-49 years of age were rated as more negative than antecedent decades (for 10-19, $p = .001$; for 20-29, $p < .001$; for 30-39, $p = .005$). For novelty ratings, there was a main effect of participant age ($F(2, 81) = 3.367$, $p = .039$, $MSE = 1.255$, $\eta_p^2 = .077$). Tukey's post-hoc comparisons demonstrated that participants aged in their 50s found their most important memories as more novel than those aged above 60 ($p = .04$). The main effect of age-at-event and the interaction of the two was non-significant. There was a main effect of age-at-event for expectedness ratings of memories ($F(4, 82) = 3.497$, $p = .011$, $MSE = 7.112$, $\eta_p^2 = .146$), though the main effect of participant age and their interaction was not significant. Post-hoc analyses showed that most important events occurred in 20s were more expected than those occurred in 30s ($p = .032$) and 40s ($p = .004$). Neither participant age nor age-at-event showed an effect on vividness and CES ratings on most important memories.

Most of the phenomenology analyses on happiest memories yielded non-significant results. Interestingly, only the analysis on novelty produced a significant

interaction effect of participant age and age-at-event ($F(5, 71) = 3.168$, $p = .012$, $MSE = 3.168$, $\eta_p^2 = .182$), though both main effects were not significant. Simple effect analysis revealed no significant results for the interaction in pairwise comparisons, when Bonferroni correction was applied.

For saddest memories, there was a main effect of age-at-event on emotional valence ratings ($F(4, 54) = 3.013$, $p = .026$, $MSE = 12.726$, $\eta_p^2 = .182$). Saddest memories that occurred between 10-19 were more positive than those occurred between 20-29 ($p = .039$), 30-39 ($p = .008$), and 40-49 ($p = .017$). The main effect of age and the interaction was not significant. The analyses on vividness, novelty, expectedness, and CES ratings were not significant.

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