Phenomenology of Autobiographical Memory in Blind and Sighted Individuals

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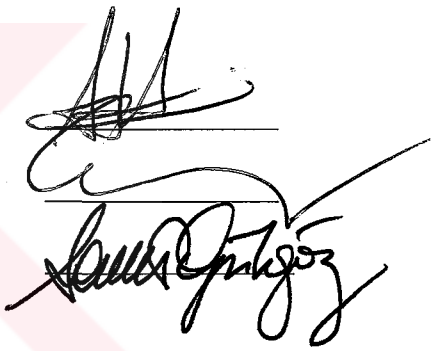

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Abstract

Phenomenology of Autobiographical Memory in Blind and Sighted Individuals

by Engin Yılmaz

This study compared the phenomenology of autobiographical and flashbulb memories in sighted and congenitally totally blind individuals. Participants recalled autobiographical memories in response to six cue words, and recalled how they heard about the September 11, 2001 attacks on the Twin Towers in New York City. They filled out the Autobiographical Memory Questionnaire (AMQ) for all these memories. Results showed that blind participants gave higher ratings to the belief variables. In addition, as expected, while blind participants were higher than sighted participants on auditory imagery, sighted participants gave higher ratings to the visual imagery variable than blind participants. The prediction of recollection and belief factors by component processes with multiple regression analysis indicated that story have become very significant contributer of recollection and belief factors for sighted individuals and emotion was significant predictor of those for blind individuals. For both group the significance of hear and language related factors were also seen as in the study of Gülgöz & Rubin (2001). The lack of vision could be compansated especially with the contribution of auditory imagery, setting and language related factors on blind participants. The results were discussed on the basis of Rubin's (2003, 2005) theoretical formulation of autobiographical memory.

özet

Gören ve Görmeyen Kişilerde Otobiyografik Hafıza Olgusu

Engin Yılmaz

Bu çalışma gören ve doğuştan hiç görmeyen kişilerde otobiyografik ve flaş bellek olgusunu karşılaştırmıştır. Katılımcılar 6 kelimenin kendilerine çağrıştırdığı anılarını ve 11 Eylül 2001'de New York City'deki ikiz kulelere yapılan saldırıyı nasıl duyduklarını hatırlamışlar ve tüm bu anılar için otobiyografik bellek anketini doldurmuşlardır. Sonuçlar, görmeyen katılımcıların inanç faktörüyle ilgili değişkenlere daha yüksek puanlar verdiklerini göstermiştir. Buna ek olarak beklendiği gibi, görmeyen katılımcılar işitsel imgede görenlerden daha yüksekken, görenler de görsel imge değişkenine görmeyenlerden daha yüksek puanlar vermişlerdir. Olayı hatırlama ve inanç faktörlerinin otobiyografik belleği oluşturan alt işlemlerce nasıl tahmin edildiğini ölçmek amacıyla yapılan aşamalı çoklu regresyon analizi, hikayenin gören katılımcılar için, duygunun da görmeyenler için olayı hatırlayabilme farkındalığı ve olayın olduğuna inanmayla ilgili değişkenlerin tahmin edilmesinde çok önemli alt işlemler olarak ortaya çıktıklarını göstermiştir. Ayrıca her iki grup için de, Gülgöz ve Rubin'in (2001) çalışmasında olduğu gibi, işitsel imge ve dil faktörlerinin önemi bir kez daha görülmüştür. Görmeyen katılımcılarda görsel imgenin eksikliği, özellikle işitsel imge, mekansal ve dil faktörlerinin katkılarıyla kapatılabilmiştir. Sonuçlar Rubin'in (2003, 2005) otobiyografik bellek teorik formülasyonu çerçevesinde tartışılmıştır.

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Introduction

Autobiographical memory, which has also been called personal memory (Pillemer, 1998) or recollective memory (Brewer, 1996), refers to one's recollections of his/her past experiences. The topic of autobiographical memory has gained momentum in the last 20 years, and a number of focal issues have been identified.

One major issue has been the temporal distribution of autobiographical memories. Research (e.g., Rubin, Wetzler, & Nebes, 1986) showed a very consistent pattern in terms of the temporal distribution of retrieved autobiographical memories. When people over 40 years of age retrieve autobiographical experiences in response to cue words, most of the memories come from the few most recent years of the individual's life, whereas a very few come from before the age of three. In addition, there is a third component; people remember more memories from their youth (10-30 years of age) than would be expected from a retention function (Rubin, Rahhal, & Poon, 1998). These three components are called recency, childhood amnesia, and (reminiscence) bump, respectively.

Regarding childhood amnesia, most recent research addressed the age for offset of childhood amnesia; how this component might be influenced by personal demographic factors such whether one has a younger sibling or not (Mullen, 1994) as well as cultural factors (Wang, 2003). Regarding the bump, the focus has been determining the generality of this component and testing alternative explanations of why this bump occurs at the ages it does (e.g., Aydın & Tekcan, 2004; Berntsen & Rubin, 2004; Rubin et al., 1998; Tekcan, 2005).

A more frequently studied issue has been the accuracy of autobiographical memory, with an increasing number of studies addressing the factors that contribute to

false memories (Hyman and Billings, 1998; Loftus and Pickrell, 1995). Earlier studies generally measured accuracy indirectly by looking at the consistency of a person's recollection of an event with that of another person (generally a parent) who was present when the event happened (Barclay, 1986). These studies generally showed a relatively high level of consistency (around 80%), but also indicated that there was room for error. Fueled significanly by the debate on false memory/recovered memory of childhood abuse in real life, researchers started investigating whether it was possible to implant false memories. In other words, the issue was whether it was possible to make people believe that they had experienced an autobiographical event which they actually had not experienced (it has been well established that post-event misinformation could alter one's memory for an autubiographical event, e.g., Loftus & Palmer, 1974; the question here was whether a false memory could be created from scratch). Several studies in the last 10 years showed that this was possible; researcher have implanted false memories of having been lost in a shopping mall (Loftus & Pickrell, 1995), of having unintentionally push a table full of drinks over on people (Hyman & Billings, 1998). Research also concluded that imagery, especially repeated imagery has an important role to play in formation of false memories, an effect known as imagination inflation (Goff & Roediger, 1998).

Although autobiographical memory has been one of the most frequently studied issues in the last decade, theoretical formulations of how autobiographical memories are maintained and retrieved have been sparse. One such formulation has been proposed by Conway and Pleydell-Pearce (2000). They see autobiographical memories as temporary activations within the self-memory system and activated by using the underlying autobiographical knowledge base. This knowledge base contains autobiographical

experiences at three different levels of specificition: life-time periods ("working for company X"), general events ("my trip to Paris") and event specific knowledge ("details of the lunch I had at Restaurant Y in Paris"). Accordingly, one can access one's past at any one of these levels. It has to be noted that most studies on autobiographical memory uses memories that can be classified as event-specific knowledge by Conway and Pleydell-Pearce (2000). They also argue that there is a reciprocal relationship between the self and autobiographical memory systems. One's perception of one's self determines how the autobiographical experiences are going to be encoded and how encoded memories are going to be retrieved. Although it stands as a comprehensive model and fits in with findings from several domains, it still needs further empirical testing.

Another model of autobiographical memory, with an emphasis on retrieval of such memories was proposed by Rubin and colleagues (Rubin, 2005; Rubin, Schrauf, & Greenberg, 2003, Rubin, Schrauf, Gülgöz, & Naka, 2005). Rubin suggests that autobiographical memories are products of component processes. These components are: imagery in different modalities (but predominantly visual imagery), spatial imagery (regarding individuals and locations), language, narrative structure, and emotions. There is substantial empirical evidence showing that these components have neurological and behavioral separability and plausibility (Rubin, 2005). Moreover Rubin argued that such a multiple-systems approach to memory is needed to explain memory for more complex tasks such as memory for oral traditions (Rubin, 1995).

Rubin (2003) identified two metacognitive judgments that are considered to be essential components of retrieving and reporting autobiographical experiences: recollection and belief. The subjective sense of recollecting, or reliving, an experience

can be considered a definitive characteristic of autobiographical memory and functions to separate autobiographical memory from remembering autobiographical facts as well as real memory from dreaming etc. (Rubin, Schrauf, and Greenberg, 2003). Belief refers to one's belief in the accuracy of what is remembered (i.e., the degree to which the individual believes that what is remembered has actually happened, and is not a product of imagination). Rubin proposed that the degree to which one has a sense of recollection (or reliving) and belief is determined by the interaction of component processes mentioned above. The present study evaluates autobiographical memory in blind versus sighted participants within Rubin's basic systems approach. Therefore this theoretical approach is described in more detail.

Component Processes of Autobiographical Memory

Recent work by Rubin and colleagues has been directed to delineate how these component processes interact and how they influence metacognitive judgments. Basic methodology of this research is quite straightforward. Participants are given a number of cue-words (e.g., tree), and asked to report the first autobiographical memory this word elicits, with the condition that the memory is a specific event experienced by the participant that lasted minutes or hours. This corresponds to Conway and Pleydell-Pearce's (2000) event specific knowledge. And then participants are asked to rate on a Likert-type scale each memory on a number of statements measuring the metacognitive judgments and component processes.

Recollection is measured by two constructs: reliving (*"As I remember the event, I feel as though I am reliving the original event"*) and back in time. (*"As I remember the event, I feel that I travel back to the time when it happened, that I am a subject in it again, rather than an outside observer tied to the present"*). Belief is also measured by

two constructs: remember/know (*" As I think about the event, I can actually remember it rather than just knowing that it happened"*) and real/imagine (*"I believe that event in my memory really occurred in the way I remember it and that I have not imagined or fabricated anything that did not occur"*).

The component processes and the corresponding statements to be rated by the participants were as follows: visual imagery (*"As I remember the event, I can see it in my mind"*); auditory imagery (*"As I remember the event, I can hear it in my mind"*); spatial imagery measured by setting (*"I can recall the setting where it occurred"*) and spatial layout (*"As I remember the event, I know its spatial layout"*); linguistic components as measured by talk (*"I or other people are talking in the memory"*), in words (*"The memory comes to me in words"*), and story (*"The memory comes to me as a coherent story"*); emotions (*"I can feel now the emotions I felt then"*). In addition, participants were asked to rate importance of the remembered events, frequency of rehearsal, whether the event was one that occured within a single day or a merging of several separate events, and age of memory.

The main questions addressed within this theoretical approach have been a) whether and how the component processes differ on the basis of some experimental or existing manipulation (e.g., normals vs those diagnosed with PTSD), and b) how the metacognitive judgments are accounted for by the component processes.

In the present study we address both of these questions as regards to blind versus sighted participants' autobiographical memories. The former questions are simply answered by comparing differences between average ratings of the groups. The latter, however, is answered by use of multiple regression analyses. Rubin and colleagues (Gülgöz and Rubin, 2001; Rubin et al, 2003; Rubin, et al., 2005) analyze data by three

different multiple regressions. The common element in both types of regression is that a regression analysis is carried out for each of the four variables thought to measure recollection and belief; reliving, back in time, remember/know, and real/imagine are used as dependent variables to be predicted by the component processes. Although the variables remain the same in both types of regression, the way the data points are calculated and the questions they address are different.

In between-subjects analyses, each participants' average scores on each variable (based on six memories) are calculated and used as data points. This is the more common approach in experimental cognitive psychology; each participant's sense of reliving, for instance, is calculated by averaging the six reliving scores (one for each memory elicited by a cue word). Same goes for all other variables such as visual imagery, auditory imagery etc. Then the multiple regression is carried out by using all the participants' average values on all those dimensions.

In the within-subjects regression, a regression analysis is carried out for each participant based on his/her data, and then the average of all the beta values for each variable are averaged. These analyses are considered to be complementary to each other. Results from such analyses in several studies revealed consistent results between the two methods, with some variation.

In analyses based on memories, memories are treated as independent units and each memory (and its related ratings) is taken as a single data point, regardless of who produced the memory. This is close to within-subjects analysis in the sense that it is trying to understand what predicts recollection of and belief of memories in general. An advantage of this analysis is that there are as many data points as memories, and therefore more power. However, the disadvantage is that it violates the assumption of

independence of observations in a multiple regression. This type of analysis has been used previously by Gülgöz and Rubin (2001).

What Predicts Recollection and Belief?

Rubin and colleagues (Rubin et al., 2003; Rubin et al., 2005) found that, in the between-subjects analyses, two measures of recollection (reliving and back in time) had the highest correlation with visual imagery. Other contributing factors to reliving were emotions (the degree to which one was able to experience the emotions felt at the time of the event) and to a lesser degree in words (to what degree the memory came in words). For back in time, story and importance contributed significantly (in addition to see) to the sense of reliving.

Remember/Know judgments presents a complicated picture. Although it has been treated in the literature as a measure of recollection, findings in autobiographical memory studies indicate that it behaves more like a measure of belief than recollection, in the sense that it is explained by a similar set of variables. Rubin et al. (2003) found that both remember/know and real/imagine variables are predicted most strongly by setting (remembering the setting where the event occurred) followed by story and emotions. It has to be noted that emotions variable is negatively correlated with both measures of belief. It also has to be noted that the see variable entered into regression equations for the Remember/Know judgments at either between or within-subjects analyses in all three experiments of Rubin et al. (2003).

Rubin et al. (2003) showed that recollection (as measured by the sense of reliving and the degree to which subjects feel they travel back in time) and belief (as measured by remember/know and real/imagine variables) were prediected by different variables lending support to the idea that these metacognitive judgments are different.

Visual imagery is a significant predictor of recollection but not of belief. Setting, on the other hand, is a significant predictor of belief, but not of recollection. Story is an equally important element for both. Moreover, emotions are negatively related to belief, but positively to recollection.

Cross Cultural Findings In Autobiographical Memory

Although memory processes have long been assumed to be pretty much similar across cultures, there has been a surge of interest and a set of interesting findings that, especially autobiographical memory can be influenced by one's culture in several ways (e.g., Mullen, 1994; Wand, 2003; Rubin et al., 2005). In a very interesting study, Rubin et al. (2005) compared North American, Turkish and Japanese participants to see if the same set of variables predict measures of recollection and belief. Comparing the data from the US sample with that from the Turkish sample, one can conclude that there is substantial agreement between the groups along with few interesting differences. It should be pointed out that the US data in this study is the same as Rubin et al.'s (2003) Experiment 1. First of all, between-subjects regressions found that reliving and back in time have strongest correlations with visual imagery for both samples, and belief measures (especially real/imagine) are strongly correlated with setting for both samples. Also story variable was correlated significantly with back in time, and remember/know variables for both cultures. The major differences emerged in regard to the role played by what can be called language related variables. Hear (auditory imagery) entered into the equation to contribute to reliving, back in time, and real/imagine for the Turkish sample but not for the US sample. In addition, talk variable contributed to back in time for Turkish sample but not the US sample. Overall, it seemed that auditory imagery, as measured by both the hear and talk variable contribute to the Turkish sample but not the

US. Within-subjects analyses produced similar results, with the exception that see now entered the equation for Remember/Know ratings of the Turkish sample.

Another set of findings reported by Gülgöz and Rubin (2001), who addressed the same question with a Turkish sample, are also relevant. In that study, Gülgöz and Rubin looked at, among other questions, what predicts sense of reliving. As mentioned above they used the between-subjects and "all memories" regression analyses. In their "all memories" analysis, they found that three factors (see, hear, and emotions) contributed to the reliving ratings significantly. In the between-subjects analyses only hear and emotions contributed significantly to reliving.

Visual Imagery and Autobiographical Memory

Visual imagery system is argued to be the most important component of all memory systems including autobiographical memory (Rubin & Greenberg, 1998; Rubin, 1998; Williams, Healy and Ellis, 1999). One way of addressing the role of visual system in autobiographical memory has been to look at how deficits in the visual system related to memory performance. This question has been dominantly investigated in two separate lines of research. One is by looking at the effects of cortical damage to the visual cortex on memory, and especially autobiographical memory performance. A number of studies reported substantial memory deficits (both retrograde and anterograde amnesia) in individuals with damage to certain areas in the brain (Rubin & Greenberg, 1998; Greenberg & Rubin, 2003; Greenberg, Eacott' Brechin & Rubin, 2005).

For instance, Rubin and Greenberg (1998) found 11 cases with damage to the visual parts of the posterior neocortex. They reported that all these individuals had both anterograde and retrograde amnesia. In addition, Greenberg and Rubin (2003) stated that damage in visual cortex have more dramatic impacts on autobiographical memory than

damage on the cortex of other (auditory or olfactory) modalities. That is, while the people whose visual cortex is damaged showed the symptoms of retrograde and anterograde amnesia to a degree, people whose auditory, tactual or olfactory systems were damaged did not have significant memory problems Rubin, 2005).

Greenberg, Eacott, Brechin, and Rubin's (2005) case study M.S. also showed that when the visual parts of the brain are damaged, this can lead to severe retrograde amnesia. M.S., whose visual imagery system in brain was severely damaged, manifested severe retrograde amnesia and mild antrograde amnesia. In the light of neurological theories Greenberg et al. (2005) hypothesized that damage in visual cortex would preclude the activation between visual and nonvisual cortexes and this would lead to amnesia.

The other line of research looks at episodic memory performance in non-cortical blind individuals. Interestingly almost all published studies in this line of research have been on working memory or list-learning type episodic memory studies (e.g., Saariluoma & Kalakoski, 1998; Vecchi, 1998).

Here, it should be noted that, subjects in the studies related to neurological damages on visual cortex are not totally blind people. They have visual agnosia and cannot identify the objects even though they can draw by looking at them. As such, those studies may not be the most appropriate ones to inform us about the autobiographical memory in blind individuals. It is clear that a lot of the totally blind people have neither retrograde more anterograde amnesia. The cause of their blindness is mostly related to genetic reasons or diseases and most of those reasons are not related to brain damage. Here the question is if the visual imagery system in the brain is intact but

the person is totally blind because of other reasons, how is his or her memory influenced by this in the absense of visual imagery system?

Although there are several studies on memory abilities of blind individuals, especially with regard to visuospatial skills, he question of how blind individuals, remember autobiographical memories have been largely ignored despite the fact that visual imagery is considered to be sine qua non of remembering one's past experiences (e.g., Brewer, 1996).

We were able to locate only one published study (Ogden & Barker, 2001) on autobiographical memory in blind individuals. Ogden and Barker (2001) compared the dominant modalities in autobiographical memories of sighted, early-blind (before 2 years of age) and late-blind (after 8 years of age) participants. They asked participants to remember certain early (e.g., "Describe the first school you ever went to", "Describe the animals you have memories of when you were at primary school") and recent experiences (e.g., "Describe a party, gathering or major event that you have attended in the last few months", "Describe a person who is very important in your life now"). Ogden and Barker (2001) reported several important results. First, in their descriptions of childhood memories the most common modality was visual followed by spatial imagery. For the early-blind group, as expected, there were no visual imagery reported; the most common was the spatial modality followed by tactile and auditory modalities. Second, for recent memories, sighted participants' recollections heavily referred to visual imagery, with minimal referance to remaining modalities. For the early blind group, the most common modality was again spatial followed by auditory and tactile. For the late blind group, there was minimal visual imagery and auditory, tactile and spatial imagery were equally likely (between 20-30%).

One observation Ogden and Barker (2001) emphasized was the unexpected predominance of spatial modality for all groups for childhood memories and for both blind groups for recent memories. Another important point is that the loss of visual imagery seems to be compansated by imagery in other modalities in remembering autobiographical memories. Comparison of early- and late-blind participants further suggest that especially auditory and tactile modality seem to take over, since the spatial imagery remains relatively unchanged. For instance, among the late-blind approximately 30% of the references were to spatial imagery in the childhood memories, and 45% to visual imagery. When one looks at the same group's recent memories, percentage of references to spatial imagery remains approximately the same, but auditory and tactile now combine to make up somwhere around 47%. Statistically, visual imagery was more common in sighted than early blind participants for both childhood memories. All other types of imagery were more frequently used by early blind than by sighted participants again for both types of events.

In addition to addressing the modalities used in remembering autobiographical experiences, we wanted to see if there is a difference in terms of other characteristics such as recollection and belief in the remembered memories. Moreover, another fundamental purpose was to understand what imagery etc. characteristic predicts the degree to which blind participants recollect and believe in their memories. In addition to word-cued autobiographical memories, we also compared the two groups on flashbulb memories of how they heard about 9/11.

In addressing these questions, our study was different from that by Ogden and Barker (2001) in a number of respects. First of all, we wanted to investigate a larger pool of autobiographical memories, and therefore used the more common method of word-

cuing autobiographical memories. Second, we wanted to investigate autobiographical memories in a more strict sense. It could be argued that at least some of the memories elicited by Ogden and Barker are close to semantic knowledge than to autobiographical memory; for instance, describing the first school one went to may lead to a generalized memory of what the school was like (formed as a result of being in that school repeatedly), rather than referring to a single instance that happened in a short period of time (i.e., less than a day). This latter type of events is what is meant by autobiographical memory and corresponds to Conway and Pleydell-Pearce's (2000) event specific knowledge. Third, in addition to comparing imagery differences between the sighted and the blind, we also wanted to look at two subjective aspects of the sense of remembering an experience; to what degree these two groups have the sense of recollection and to what degree they believe in the accuracy of what is remembered. These two are fundamental characteristics of having and reporting autobiographical memories (Brewer, 1996; Rubin et al., 2003). Forth, we wanted to see what predicts these metacognitive judgments (especially in terms of imagery modality). Fifth, we also wanted to compare the groups on a single event that was the same for all participants. Therefore we investigated our participants' (flashbulb) memories of how they first learned about the 9/11 attacks. We compared not only the amount of detail recalled but also the ratings of recollection and component processes just like "regular" autobiographical memories. Finally, we had a relatively large sample size of 36 blind and 36 sighted participants, so that we could have more power in our tests compared to Ogden and Barker (2001), who had 8 participants in each group.

In addition Ogden and Barker (2001), an experimental study on what may be called a simulation for blindness by Rubin, Burt and Fifield (2003) is very relevant to

the present study. Rubin et al. investigated how being blindfolded during encoding of an autobiographical experience influences phenomenological properties of autobiographical memory at retrieval. In their Experiment 1, which is the most relevant to our purposes, participants took part in a discussion group while they were blindfolded. Ten days later and not-blindfolded, they recollected the event and rated several aspects of their memory (recollection, belief, imagery etc.). Regarding the component processes of memory, having been blindfolded lowered ratings of visual and spatial imagery ratings as well as spatial layout. This difference extended to ratings taken after another week later. In addition, blindfolding at encoding also decreased the ratings of recollection and belief. They found that measures of both recollection and belief declined as a result of limiting use of visual input.

The Main Questions of Interests and Hypotheses

The main questions of interests and hypotheses in the study can be summarized as follows:

Differences in Metacognitive Judgments

Recollection: Literature shows that loss of visual memory leads to loss of autobiographical memory (Greenberg & Rubin). Moreover, Rubin and colleagues shoed that limiting access to visual information during encoding leads to a diminished sense of recollection at retrieval. These lead to the prediction that congenitally blind participants will score lower on measures of recollection. However, as Ogden and Barker (2001) found, senses other than vision seem to take over as the dominant modality in which blind participants recollections of autobiographical memories. Therefore, although blind participants may score lower on visual imagery, other imagery modalities will

compansate leading to an equally strong sense of recollection. Therefore, no difference is between the sighted and blind participants in measures of reliving and back in time.

Belief: Previous research consistently showed that visual imagery contributes minimally to the belief in the accuracy of what is remembered. Therefore, no difference is expected between the sighted and blind participants in measures of belief.

Differences in Component Processes

Compared to sighted participants, blind participants will score lower on measures of visual imagery, equal or higher in spatial imagery and layout and higher on other imagery measures.

Correlations and the factor analytic structure of variables

Paralel to the previous literature (Gülgöz and Rubin, 2001), auditory and language related variables will be highly correlated on blind and sighted individuals. In addition, component processes and the properties of autobiographical memory which are importance and rehersal will be loaded to different factors. We don't any difference between blind and sighted individuals on factor analysis. However, correlations between and see and other variables will be lower on blind individuals.

Differences in how the Component Processes Predict Recollection and Belief

For sighted individuals, recollection and belief will be predicted by the same variables reported in previous studies (Rubin et al., 2003). We expected language-related variables to play a significant role as well, given the earlier findings with Turkish samples. For the blind individuals however, visual imagery will have a minor contribution, if at all, and auditory imagery and spatial context will contribute more than they did for the sighted individuals.

Flashbulb Memory

As this is the first study to look at flashbulb memory performance in sighted versus blind individuals, there is not much empirical work to build on regarding amount of recall. Ogden and Barker (2001) found that sighted, early-blind, and late-blind participants did not differ in the amount of details they remembered about past events. Given that the 9/11 attacks were very emotional and significant, and that people remembered their personal details even a year after this event (Tekcan et al., Weaver & Krug, 2004), there would be no difference in the amount of details recalled.

Regarding component processes, models of flashbulb memory formation have emphasized factors at encoding such as emotional intensity, surprise, background knowledge, and interest. As such, these variables are not expected to be different in the two groups of participants in response to the flashbulb event (9/11 attacks in this case). On the other hand, formation of a vivid visual image is considered to be an integral part of having a flashbulb memory (Schmidt, 2004). On this basis, regarding phenomenological aspects of remembering the moment one learned about 9/11 attacks, we predict that blind participants will score lower on measures of recollection, belief, and visual imagery, equal or higher in spatial imagery and layout, and higher on all remaining imagery measures.

Method

Participants.

A total of 30 congenitally total-blind (8 females, 22 males) and 36 sighted (25 females, 11 males) adults participated in this study. The blind participants were slightly older (M= 29.4, SD = 8.22) than the sighted participants (M = 23.61, SD = 7.57); this difference was significant, t() = . There were no differences between the means years of education for blind (M = 12.43) and sighted (M = 12.50) participants The blind participants were recruited through various nongovernmental organizations for the blind (Altı Nokta Körler Derneği, Altı Nokta Rehabilitasyon Merkezi, Bakırköy Halkeğitim Merkezi, Kadıköy Halk eğitim Merkezi, Ankara Evrensel Görme Özürlüler Derneği) as well as through e-mail groups. Sighted participants were undergraduate students taking psychology classes at Boğaziçi University, or were older adult volunteers recruited through snowball sampling. The student participants were given extra credit towards their course grade.

Materials.

Three questionnaires were used, one to measure sight level of the blind participants and two to measure memory performance.

The Sight Questionnaire. This questionnaire, intended to measure the sight level (or visual capabilities such as light and color perception) of the blind individuals was developed by the first author. It consisted of seven-questions that could be answered on a 3-point scale. This questionnaire was administered only to the blind participants, and the main purpose was to group blind participants into one of the following categories: 1) totally blind people who do not have any light or color perception, 2) blind people who have some light perception but no color perception, and who are unable to identify or

discriminate the details of objects by sight, and 3) blind people who have light and color perception and have the capability to recognize faces, to read print materials and can discriminate many details of objects by sight. There were seven questions in the sight questionaire related to general sight level (whether there is any sight or not), finger sight (whether fingers shown from far away can be seen and the number of them can be understood by sight), print reading (whether inc materials can be seen and read), color sight (whether colors can be recognized), photograph sight (whether details in a photograph can be understood), object sight (whether an object far a way can be seen and defined properly)and face recognition (whether faces of people can be recognized). The list of the questions in this questionnaire is given in Appendix 1.

Cue-Words. Six cue words were selected from that composed by Gülgöz (2001) for Turkish samples for word-cued autobiographical memory studies. A total of 9 words were selected; six of those words were used to elicit autobiographical memories from the participants. These words were *glass* (bardak), *ship* (vapur), *pillow* (yastık), *soup* (çorba), *tree* (ağaç), *bell* (zil). An additional three words were used as substitutes if the participants were unable to produce any memory in response to the six main words. These substitutes were *carpet* (halı), *newspaper* (gazete) and *strawberry* (çilek).

Autobiographical Memory Questionnaire. The Autobiographical Memory Questionnaire (AMQ) was developed by Rubin and colleagues (e.g., Rubin, Schrauf, and Greenberg, 2003) to measure phenomenological properties of autobiographical memories, and has been used in several autobiographical memory studies. This questionnaire consists of 19 statements all but two of which are rated on a seven-point scale. The questionnaire is intended for measuring several properties of autobiographical

memory. These properties and the statements intended to measure them are given in Table 1.

Table 1: The autobiographical memory variables and the Turkish and English versions of the statements measuring them

Variable	Turkish Statement	English Statement
Reliving	Olayı hatırladığımda, olayı yeniden yaşıyormuş gibi hissediyorum	As I remember the event, I feel as though I am reliving the original event
Hear	Olayı hatırladığımda, onu zihnimde işitebiliyorum	As I remember the event, I can hear it in my mind
See	Olayı hatırladığımda, onu zihnimmde görebiliyorum	As I remember the event, I can hear it in my mind
Talk	Olayı hatırladığımda, ben ya da başka insanlar konuşuyor	As I remember the event, I or other people are talking
Emotion	Olayı hatırladığımda, o zamanki duyguları şimdi de hissediyorum.	As I remember the event, I can feel now the emotions that I felt then
Setting	Olayı hatırladığımda, olayın geçtiği yeri anımsayabiliyorum.	As I remember the event, I can recall the setting where it occured
Remember/ know	İnsanlar bazı olayları, detaylarını hatırlamasalar da başlarından geçtiğini bilirler. Ben anımı hatırlarken, bu olayın başımdan geçtiğini bilmekten öte, onu gerçekten hatırlayabiliyorum	Sometimes people know something happened to them without being able to actually remember it. When I thing about the event, I can actually remember it rather than just knowing that it happened
In words	Olayı kelimeler halinde hatırlıyorum	As I remember the event, it comes to me in words
Back in time	Olayı hatırladığımda, olayın olduğu zamana geri döndüğümü ve olayı dışarıdan seyreden biri değil, ona yeniden doğrudan katılan biri olduğumu hissediyorum	As I remember the event, I feel that I travel back to the time it happened, that I am a subject in it again, rather than an outside observer tied to the present
Story	Olayı hatırladığımda, olay aklıma yalnızca bir durum, gözlem ya da sahne olarak değil, sözcükler ya da resimlerden oluşan bütün bir hikaye ya da olay olarak geliyor	As I remember the event, it comes to me in words or in pictures *as a coherent story* or episode and not as an isolated fact, observation, or scene
Importance	Bu olay bana bir mesaj verdiği için, ya da yaşamımda kritik bir zamanı veya dönüm noktasını simgelediği için benim için önemli bir anıdır	This memory is *significant* for my life because it imparts an important message for me or represents an anchor, critical juncture, or a turning point
Real / Imagine	Bu olayın gerçekten hatırladığım şekilde gerçekleştiğine ve olmamış herhangi bir şeyi hayal etmediğime ya da kurmadığıma inanıyorum	I believe the event in my memory *really occurred* in the way I remember it and that I have not imagined or fabricated anything that did not occur
Frequency	Olduğundan beri, bu olay hakkında düşündüm ya da konuştum	Since it happened, I have thought or talked about this event

AMQ was translated to Turkish and then compared with another Turkish translation that has been used with a Turkish sample (Gülgöz and Rubin, 2001), and has been given its final form by the authors. The final version of the AMQ we used had 14 statements. The rating regarding merge/extended variable ("The event I remember is a merging of events versus an extended event") was eliminated because this is one variable that had considerable missing data on previous studies (e.g., 69% in Rubin et al., Expt 1) and had been left out at the analysis stage in those studies.

All statements except the date of memory were rated on a 7-point scale. The verbal anchors for questions 1 through 6 this scale ranged from 1 (not at all), to 3 (vaguely), to 5 (distinctly), to 7 (as clearly as if it were happening right now). For questions 7 through 10, it ranged from 1 (not at all), to 3 (vaguely), to 5 (distinctly), to 7 (very distinctly). For question 11 it ranged from 1 (not at all), to 3 (vaguely), to 5 (important), to 7 (very important). For question 12, while 1 represented %100 imaginary, 7 represented %100 real. For question 13 the scale ranged from 1 (not at all), to 3 (Sometimes), to 5 (Most of the times), to 7 (one of the events that I most frequently talked or thought about in my life). We made one change in the verbal anchors; in the original AMQ, for statements 7-10, a ranking of 7 refers to "as much as any memory". The Turkish translation of that statement turned out to be somewhat awkward and vague, and did not express the sense of extremeness the English version indicates. Therefore, the endpoint was changed to "very distinctly". The Turkish version of AMQ used in our study is presented in ependix2.

The Flashbulb Memory Questionnaire. The flashbulb memory questionnaire (FBMQ) consisted of six questions regarding how the participants first learned about September 11, 2001 attacks on World Trade Center. These questions were selected from

a comprehensive flashbulb memory questionnaire (Tekcan, 2001; Tekcan, Ece, Gülgöz, & Er, 2003; Tekcan & Peynircioğlu, 2002), which benefitted from questionnaires used by Chrstianson (1989) and Weaver (1993). The questions asked the participants about the source (how they learned), location (where they were), activity (what they were doing), others (who they were with), time (what the time was), and clothes (what they were wearing) at the time they learned about the event.

This questionnaire is presented in ependix3. Each question on the FBMQ was coded by 2 raters (other than the authors) independently on a three point scale from 0 to 2 (e.g. Neisser Harsch, 1992; Tekcan & Peynircioğlu, 2002; Tekcan et al. 2003). A score of 0 was given for "no answer"s or for guessing, 2 points were given if there was a specific answer, and 1 was given if there was an answer to the question but was not specific. For instance, regarding the question on activity, the answer "I was working" was given 1 point, but "I was working on a psychology homework" was given 2 points. Of the six questions, those regarding source, location, activity, and others are considered to be central details (e.g., Neisser & Harsch, 1992), and have been used frequently in the flashbulb memory literature. Therefore, we limit our analyses to these questions. Thus, each subject had a FBM score ranging from 0 to 8.

Procedure.

All participants were interviewed individually; blind participants were interviewed by the first author accompanied by a sighted participant. The sighted participants were tested by sighted interviewers who were trained by the first author. Blind participants were tested in the rooms provided by the associations where interviews were made or on different places arranged by the first author and blind

subjects. The sighted participants were tested in a laboratory at Boğaziçi University. All interviews were tape-recorded.

In the interview, participants were first informed that this was a study about how people remember events from their personal past, and that there were no right or wrong answers. Then they were asked to respond to background questions, such as age. Then, the following instruction was read to the participants: "This is an authobiographical memory questionaire. On each page you will se a word and I would like you to tell me a specific memory that this word reminds you of. By a specific memory, I mean an event that happened in a particular place in particular time. We don't ask you to tell general or repeated events. For example, when I give you a word "simit" (Turkish bagle), the response "I used to eat simit every day when I was in primary school". After you tell your memory related to word, I will record your memory and you will answer the questions related to that word. There will be six words in total. If you could not recall any memory related to one word, we will pass to the next word and at the end of all words, we will return to it again. If you stil remember any memory for this word, you can use a substitute word given at the end of questionaire instead of that word. As long as an episodic event, which kind of memory you told is not important for us. It may be important or not, meaningful or not, all of those are acceptable. Do you have any questions?"

Then each word was presented to the participants, and after the participant provided a memory, he/she was asked to respond to the questions on the AMQ. Then the next word was presented, and so on, until all six words were presented, and the AMQ was filled out. The order of presentation for words. If the participants were unable to recall any memory for any word for about 3 minutes, then the experimenter moved to

the next word. Then at the end of the questionnaire, the participant was given the same word again. If he/she failed to produce any memories this time as well, then the first substitute word was given.

Once the AMQ was completed, participants were given the flashbulb memory questions. They were asked to answer the six flashbulb memory questions, and then were given the AMQ, and asked to rate each sentence thinking about the moment they first learned about the 9/11 attacks on the World Trade Center. The question regarding the date was not asked to the participants for the 9/11 attacks.

Blind participants were given the Sight Questionnaire at the end of the session. All participants were debriefed and thanked for their participation. The session took approximately 45 minutes for sighted participants and 60 minutes for blind participants.

Results

We address three questions in the Results section. First, we report differences between the two groups on phenomenological properties (as measured by the AMQ) of autobiographical and flashbulb memories. Second, we report the correlations among the component processes for the two groups, along with the factor structure of the components. Finally, we report multiple regression analyses of how measures of recollection and belief are predicted by the measures of component processes.

Recollection, Belief and Component Processes in Blind and Sighted Individuals

We report the comparison of AMQ ratings for the word-cued autobiographical memories followed by the ratings for the flashbulb memories. The fact that we treat them separately does not imply that we see them as theoretically distinct type of memories. Indeed, more likely conclusion on the basis of published studies is that flashbulb memories are not qualitatively different from other autobiographical memories. A couple of notes are in order regarding flashbulb memories. First we use the term in a theoretically neutral manner simply to refer to recall of personal circumstances for public events. Second, we treat flashbulb memories separately but in connection with autobiographical memories because a) this is the first study to provide data on flashbulb memory performance in the blind; b) it provides another means of comparing regular autobiographical and flashbulb memories regarding the similarities and differences between the two.

Word-Cued Autobiographical Memories

The descriptive data for measures of recollection, belief and component processes are presented in Table 2. A MANOVA revealed a main effect of group on the set of dependent variables (metacognitive judgments and component processes), F (13,

64) = 5.39, $p < .05$. Follow-up univariate ANOVAs showed a group effect only for one of the four metacognitive judgments; blind participants provided higher ratings of remember/know (6.37) than the sighted participants (5.85), $F(1, 64) = 6.65$, $p < .02$.

Table 2. Recollection, Belief, and Component Process Measures in ABM

	Blind		**Sighted**	
	Mean	SD	Mean	SD
Reliving	4.98	1.05	5.15	.96
Back in Time	5.23	1.04	5.15	1.10
Remember/Know*	6.37	.60	5.85	.97
Real/Imagine	6.65	.47	6.42	.71
See*	4.85	1.33	5.38	.82
Setting	6.19	.73	6.13	.64
Hear*	5.30	.93	4.77	1.07
Talk	4.26	1.27	4.28	1.21
In Words	4.54	1.19	4.64	1.34
Story	5.31	1.18	5.14	1.11
Emotion	4.60	1.36	5.04	1.11
Importance*	4.30	1.17	3.54	1.40
Rehearsal	3.30	1.14	3.67	1.03
Age of Event*	14.22	8.50	7.06	5.48

There were group differences in four of the component process measures. Compared to sighted participants, the blind participants reported lower levels of visual imagery (see), $F(1, 64) = 3.74$, $p = .05$ and higher levels of auditory imagery (hear), $F(1, 64) = 4.58$, $p < .05$. Apparently interesting was the finding that blind participants seemed to remember older memories ($M = 14.2$ years old) than the sighted participants ($M = 7.1$ years old), $F(15, 50) = 16.96$, $p < .01$. However, it seems that this age difference was simply due to presence of older participants in the blind group; when we compared the average age-at-event for the two groups, the means were virtually identical (16.5 for the blind and 16.6 for the sighted, $t < 1$. This shows that participants in both groups tended to remember more memories from the bump period, although caution should be exercised in this interpretation for especially the sighted participants since they were mostly in their twenties and therefore it is possible that participants are reporting recent memories. Finally, the blind gave higher importance ratings to their memories (4.30) than the sighted did for their own (3.54), $F(1, 64) = 5.61$, $p < .05$.

Flashbulb Memories

Descriptive data regarding participants' ratings for the moment when they first heard about 9/11 are given in Table 3. A MANOVA with the metacognitive judgment and component process mesaures as comprising the dependent variable showed that there was a main effect of group, $F(13, 50) = 2.43$, $p < .05$. This was followed by univariate ANOVAs. A number of differences were observed. Blind participants reported higher ratings on two metacognitive judgments and two component process measures. In terms of metacognitive judgments, blind participants reported higher ratings on both remember/know, $F(1, 62) = 4.56$, $p < .05$ and real/imagine, $F(1, 62) =$

8.39, $p < .01$). In terms of component processes, blind participants gave higher auditory imagery, $F(1, 62) = 3.50$, $p < .05$ and spatial imagery ratings, $F(1, 62) = 4.13$, $p < .05$.

Table 3. Recollection, Belief, and Component Process Measures in FBM

	Blind		**Sighted**	
	Mean	SD	Mean	SD
Reliving	4.28	2.12	4.60	1.88
Back in Time	5.03	1.88	4.57	1.90
Remember/Know*	6.17	1.10	5.40	1.67
Real/Imagine*	6.72	.59	5.86	1.52
See	4.93	1.94	5.17	1.54
Setting*	6.55	0.99	5.97	1.25
Hear*	5.38	1.40	4.66	1.64
Talk	5.17	1.73	4.37	1.75
In Words	4.86	1.87	4.43	1.79
Story	5.24	1.77	4.63	1.77
Emotion	4.66	1.97	4.63	1.65
Importance	4.52	2.18	4.20	1.91
Rehearsal	4.31	1.98	3.94	1.57

In addition to phenomenological characteristics, we investigated whether the blind and sighted groups would differ in the amount of details they reported about how they first heard about the 9/11 attacks (see Table 4). We compared the two groups' FBM

scores for the central information (source, activity, location and others). There was no difference between the groups, $t(64) = 0.43$, $p > .10$. When we looked at each of the central questions separately, the only group difference emerged in the "location" question; blind participants scored higher ($M = 1.47$) than the sighted participants ($M = 1.17$), $t(64) = 2.26$, $p < .05$.

Table 4. Recall of Flashbulb Memory Details for 9/11 (out of 2 points)

	Blind		**Sighted**	
	Mean	SD	Mean	SD
Location	1.47	.51	1.17	.56
Activity	1.40	.72	1.56	.81
Source	1.83	.46	1.83	.51
Other	1.70	.53	1.67	.72
Time	1.39	.73	1.14	.90
Clothes	.67	.86	.61	.87
Central Questions	6.40	1.57	6.22	1.77
Overall	8.31	2.65	7.97	2.68

Comparison of the blind and sighted individuals in the phenomenology of word-cued autobiographical memories and flashbulb memories revealed consistent findings. As expected, for both memories blind participants reported higher auditory imagery than the sighted participants. In remembering autobiographical memories they reported lower levels of visual imagery. However, in flashbulb memories their see ratings were equally

high as the sighted but they reported higher setting (spatial imagery) ratings. In other words, in terms of component processes it seems that lower levels of visual imagery due to their lack of sight are accompanied by stronger experiences in other modalities, namely auditory and spatial imagery, in line with what Ogden and Barker (2001) reported. Moreover, most importantly, blind participants' recall of autobiographical and flashbulb experiences were not less intense; if anything, they reported stronger remember ratings for autobiographical memories, and stronger remember and real/imagine ratings for flashbulb memories, suggesting that their belief in their memories are stronger.

Factor Structure of Component Processes

Next, we calculated the zero-level correlations between all variables. Tables 5 and 6 present between-subjects correlations for the sighted and blind participants, and tables 7 and 8 presents correlations for sighted and blind subjects across all memories respectively. In general correlations were higher for the sighted participants; 59 of the 90 correlation coefficients were higher for the sighted than for the blind. Moreover, a pattern was observed: the correlations that were higher for the blind were those between age and other variables and those between talk and words, story, emotions, importance, rehearsal and age. It therefore seems that intercorrelations between language and auditory imagery variables and importance and rehearsal were higher.

Table 5. Correlations Among All Variables for Sighted Participants (between subjects)

	Reliv	Back	R/K	R/Im	See	Setting	Hear	Talk	Words	Story	Emot.	Imp	Reh.	Age
Reliv														
Back	**.79**													
R/K	**.70**	**.77**												
R/Im	**.36**	**.50**	**.71**											
See	**.80**	**.67**	**.53**	.18										
Setting	**.53**	**.53**	**.47**	.19	**.57**									
Hear	**.84**	**.78**	**.63**	**.34**	**.74**	.31								
Talk	**.51**	**.47**	**.40**	.10	**.56**	**.35**	**.59**							
Words	**.59**	**.70**	**.65**	**.41**	**.42**	.25	**.79**	**.36**						
Story	**.66**	**.79**	**.72**	**.50**	**.50**	**.44**	**.78**	**.42**	**.82**					
Emot.	**.76**	**.69**	**.59**	.30	**.66**	**.43**	**.83**	**.59**	**.70**	**.62**				
Imp.	.32	.30	.16	.06	.23	.31	.27	.27	.26	.11	**.47**			
Reh.	.28	.080	.26	.06	.16	.31	.18	.21	.17	.10	.21	**.55**		
Age	-.01	-.01	-.10	.10	.05	.15	-.10	.11	-.20	.02	-.19	-.07	-.03	

Table 6. Correlations Among All Variables for Blind Participants (between subjects)

	Reliv	Back	R/K	R/Im	See	Setting	Hear	Talk	Words	Story	Emot.	Imp	Reh.	Age
Reliv														
Back	**.47**													
R/K	.32	.35												
R/Im	.09	**.38**	**.43**											
See	**.64**	.15	.14	.06										
Setting	**.45**	.33	.16	**.38**	**.44**									
Hear	**.48**	**.47**	**.44**	.23	**.46**	.22								
Talk	**.41**	**.53**	.16	.26	.23	.33	**.53**							
Words	.20	**.63**	.20	.29	.11	.05	**.38**	**.66**						
Story	**.41**	**.67**	.32	.25	**.38**	.30	**.60**	**.71**	**.71**					
Emot.	**.62**	**.42**	**.46**	.29	**.35**	.17	**.56**	.34	**.39**	**.53**				
Imp.	**.41**	.15	.16	-.11	**.49**	-.09	**-.46**	.21	.29	**.44**	**.61**			
Reh.	**.52**	.16	-.11	**-.38**	.33	-.08	.16	.20	.17	.19	**.37**	**.56**		
Age	-.18	-.28	-.22	-.11	.29	.17	-.04	-.14	-.13	-.12	-.25	.00	.03	

Table 7. Correlations Among All Variables for Sighted Participants (all memories)

	Reliv	Back	R/K	R/Im	See	Setting	Hear	Talk	Words	Story	Emot.	Imp	Reh.	Age
Reliv														
Back	.62													
R/K	.62	.68												
R/Im	.38	.47	.63											
See	.66	.53	.56	.32										
Setting	.43	.36	.45	.29	.46									
Hear	.70	.63	.53	.31	.62	.27								
Talk	.45	.32	.33	.18	.42	.24	.50							
Words	.53	.61	.63	.43	.44	.34	.61	.34						
Story	.61	.73	.69	.46	.51	.44	.63	.35	.74					
Emot.	.61	.62	.51	.40	.50	.27	.59	.37	.56	.49				
Imp.	.41	.34	.29	.26	.28	.25	.30	.26	.31	.26	.47			
Reh.	.39	.22	.30	.12	.25	.14	.30	.23	.21	.27	.22	.50		
Age	-.10	-.15	-.04	-.08	-.07	-.06	-.21	-.10	-.24	-.10	-.23	-.12	-.01	

Table 8. Correlations Among All Variables for Blind Participants (all memories)

	Reliv	Back	R/K	R/Im	See	Setting	Hear	Talk	Words	Story	Emot.	Imp	Reh.	Age
Reliv														
Back	.59													
R/K	.49	.45												
R/Im	.22	.22	.28											
See	.55	.35	.33	.09										
Setting	.37	.37	.36	.29	.31									
Hear	.60	.50	.46	.12	.49	.24								
Talk	.38	.38	.22	.06	.30	.21	.48							
Words	.39	.56	.33	.22	.28	.21	.44	.54						
Story	.51	.68	.42	.20	.45	.34	.54	.54	.61					
Emot.	.44	.39	.38	.14	.27	.15	.36	.27	.31	.41				
Imp.	.37	.27	.28	-.02	.36	.09	.38	.21	.33	.30	.43			
Reh.	.41	.27	.12	-.02	.28	.03	.23	.25	.24	.25	.38	.51		
Age	-.21	-.20	-.20	.00	.01	.04	-.09	-.17	-.16	.22	-.17	-.00	.02	

In order to see how the components fit together, factor analyses were carried out using principle component analysis with varimax rotation (Gülgöz and Rubin, 2000; Rubin et al., 2003). The resulting factor structures are given in Tables 9-12. Tables 9 and 10 gives the factors for the between subjects analyses, and 11-12 gives the factors for all memories. Comparison of Table 9 and 10 present a clear picture. First, for both groups three factors emerged. For sighted participants all forms of imagery as well as emotion and language mesaures (talk, in words, and story) loaded to the first factor. Importance and rehearsal, what Rubin et al. (2003) called properties of memories, loaded onto the second factor. Setting and age of memory loaded to the third factor, although setting also

loaded less strongly to the first and second factors as well. This structure is very similar to that Gülgöz and Rubin (2000) obtained with Turkish participants, except that they had two factors with age of event and setting loading to the first factor.

Table 9. Factor Analysis of Components for the Sighted Participants (between subjects)

Variable	**Factor I**	**Factor II**	**Factor III**
Hear	**.945**	.111	-.010
See	**.728**	.177	.370
Talk	**.604**	.226	.354
Feel	**.848**	.320	-..050
Setting	.415	.386	**.528**
In Words	**.857**	.090	-.250
Story	**.871**	-.046	.062
Importance	.180	**.859**	-.042
Rehearsal	.045	**.851**	.039
Age of Event	-.138	-.123	**.844**

Table 10. Factor Analysis of Components for the Blind Participants (between subjects)

Variable	Factor I	Factor II	Factor III
Hear	**.643**	.368	.211
See	.216	.488	**.731**
Talk	**.865**	.023	.081
Feel	**.518**	**.613**	-.030
Setting	.378	-.231	**.724**
In Words	**.798**	.126	-.168
Story	**.868**	.235	.112
Importance	.229	**.879**	.048
Rehearsal	.022	**.789**	.002
Age of Event	-.304	.023	**.697**

For the blind participants, again a three-factor structure emerged albeit with a different pattern of loadings. Similar to the findings for the sighted participants, auditory imagery and language variables loaded onto the first factor and importance and rehearsal loaded onto the second factor. However, there were also two differences; first, emotion loaded onto the second factor, and second, and more importantly, see and setting, measures of visual and spatial imagery loaded onto the third factor along with age of event. These data suggest that visual imagery and spatial imagery are parts of the same construct for the blind participants.

Table 11. Factor Analysis of Components for the Sighted Participants (all memories)

Variable	Factor I	Factor II	Factor III
Hear	**.774**	.199	.266
See	**.775**	.172	.052
Talk	**.548**	.232	.076
Feel	**.592**	.353	.386
Setting	**.632**	.070	-.214
In Words	**.747**	.114	.330
Story	**.829**	.104	.073
Importance	.203	**.833**	.153
Rehearsal	.159	**.837**	-.108
Age of Event	.005	.004	**-.899**

Table 12. Factor Analysis of Components for the Blind Participants (all memories)

Variable	Factor I	Factor II	Factor III
Hear	**.686**	.329	-.050
See	**.630**	.337	.234
Talk	**.645**	.169	-.351
Feel	.253	**.636**	-.222
Setting	**.691**	-.149	.299
In Words	**.633**	.245	-.373
Story	**.759**	.236	-.302
Importance	.197	**.806**	.059
Rehearsal	.074	**.825**	.021
Age of Event	-.048	.025	**.844**

Factor structure based on all memories revealed structures that were more similar for sighted and blind participants. As can be seen in Tables 11 and 12, again a three factor structure emerged for both groups. For the sighted participants all imagery variables (including emotions) loaded on to the first factor, importance and rehearsal to the second factor, and age of event to the third factor. For the blind participants, the only difference was that emotion loaded onto the second factor along with importance and rehearsal. It has to be noted that for the sighted although emotion's highest loading was to the first factor (.592), it also loaded onto the second and third factors (.353 and .386).

Prediction of Recollection and Belief by the Component Processes

A fundamental question we attempted to answer was whether and how the measures of recollection and belief would be predicted by the component processes of autobiographical memory (Gülgöz and Rubin, 2000; Rubin et al., 2003). Following on Rubin et al. (2003), and Gülgöz and Rubin (2000), we carried out separate multiple regression analyses for all recollection and belief measures separately for sighted and blind participants. As mentioned in the introduction section, there are three alternative ways of carrying out multiple regression analyses to predict recollection and belief measures by the component processes. We use two of these approached; first, we use between-subjects multiple regressions (Rubin et al., 2003; Rubin and Siegler, 2004) and regressions based on all memories regardless of who produced tham Gülgöz and Rubin (2001). We choose not to discuss within-subjects multiple regression results because we believe that they are not very reliable since they are based on averages of regressions for each individual separately, which in turn carried out on only 6 or fewer memories. Multiple regressions for flashbulb memories were only possible as a between-subjects analysis, since we collected rating only for one event.

Results of between-subjects multiple regression analyses for autobiographical memories are given in Table 13 (between-subjects) and Table 15 (all memories), and for flashbulb memories in Table 14.

Table 13. Predicting recollection and belief from component processes: Multiple Regression between subjects

	See	Setting	Hear	Talk	In Word	Story	Emotions	Importance	Rehearsal
Reliving									
Sighted		.30	.75						
Blind	.48						.46		
Back in time									
Sighted	.36					.61			
Blind						.67			
R/K									
Sighted						.72			
Blind							.46		
Real/Imag									
Sighted						.50			
Blind		.27					.43		-.52

In between-subjects regressions for word-cued autobiographical memories, it is apparent that individual differences in metacognitive measures are explained by different set of variables for the sighted and blind participants. Starting with measures of recollection, reliving is predicted by setting and hear for the sighted, and by see and emotion for the blind.

The other measure of recollection, back in time is predicted by story for both groups, with additional contribution of see for the sighted participants.

Remember/know is predicted by story for the sighted, and emotions for the blind. The same pattern held for real/imagine for both groups, with setting and rehearsal (negatively) contributing. Overall story seemed to be the most common variable for the sighted and emotions for the blind participants.

Table 14. Predicting Recollection and Belief from Component Processes in FBM: Multiple Regression

	See	Setting	Hear	In Word	Story	Imp.	Reh.	R2
Reliving								
Sighted			.56	.35				.71
Blind					.70			.47
Back in time								
Sighted		.33			.56			.63
Blind		.25		.74				.76
R/K								
Sighted				.73		.25		.72
Blind	.37		.55					.62
Real/Imag.								
Sighted				.66				.42
Blind				.58				.31

Analysis of the regression for flashbulb memories (Table 14) shows again that individual differences in recollection and belief are predicted by different variables for the blind and the sighted participants. Moreover, it is clear that some measure of auditory or linguistic variables enter almost all the equations.

Table 15. Predicting recollection and belief from component processes: Multiple Regression for all memories

	See	Setting	Hear	Talk	In Words	Story	Emotions	Imp.	Reh.	R2
Reliving										
Sighted	.24	.12	.27			.12	.22		.14	.65
Blind	.23	.21	.36						.26	.56
Back in time										
Sighted			.15			.49	.29			.63
Blind		.13	.17		.18	.44				.53
R/K										
Sighted	.20	.12			.18	.34	.12			.56
Blind		.24	.34				.23			.33
Real/Imag										
Sighted						.36	.22			.25
Blind		.25			.17					.10

Table 15 shows the regression results based on all memories, showing what makes some memories receive higher ratings of reliving, back in time etc. There is more overlap of variables here, possibly due to more variables entering into the equations.

See, setting, hear, and rehearsal contributes to sense of reliving for both sighted and blind participants; story and emotions also with some contribution for the sighted. Despite this similarity, it is clear that these variables have different impacts. Although see contributes similarly to reliving for both groups, both setting and hear have larger contributions for the blind than for the sighted. More generally, setting and hear seems to be the most important variables for the blind participants; as the first one enters equations for all metacognitive measures and hear to three. For sighted participants,story and emotions turn out to be the most important variables.

Corollary Findings

For the present study we tested a third group of participants consisting of people who had some visual ability at some point in their lives. Because these individuals had different levels of visual ability, and because there were differences in onset of blindness, and because there were fewer (19) participants, we did not include them in our analyses. However, we would like to briefly report the results of our analysis comparing these three groups on the basis of AMQ ratings. Here we report ANOVAs that led to significant group differences. First, although the overall ANOVA was not significant for hear ($p=.12$) and see ($p = .09$), post-hoc LSD tests showed that sighted participants reported higher see ratings ($M =5.38$) than blind participants ($M = 4.85$); the "partially sighted" group ($M = 5.37$), did not differ from the blind group significantly. However, the mean ratings of the "partially sighted" group is very close to the sighted group. In terms of the hear variable, blind group had higher ratings ($M =$

5.30) than the sighted group (M = 4.77), with partially sighted groups close to the blind group in the middle (M=5.03). For both remember/know and importance ratings the only significant differences were between the sighted and the blind groups, but "partially sighted" group was closer to the blind group. In other words, they tended to provide higher remember ratings and considered their memories more important than the sighted participants.

Conclusions and Discussion

To our knowledge, this is the first study to address the phenomenological experiences of word-cued autobiographical memories in blind and sighted individuals. It is also the first to compare recall and phenomenology of flashbulb memory in blind individuals.

Phenomenology of Autobiographical and Flashbulb Memories

Autobiographical Memories. Blind participants gave higher ratings of remember/know, which measured the degree to which a person believes that he/she is actually remembering that the event occured rather than just know that it happened. They also reported lower ratings of visual imagery, higher ratings of auditory imagery and rated their memories as more important than the sighted participants did theirs. Phenomenological ratings for flashbulb memories were very similar: blind participants provided higher belief ratings (both remember/know and real/imagine), in addition to giving higher ratings of auditory and spatial imagery. Their visual imagery ratings were not different from the sighted though.

These findings suggest that being blind and having no visual input does not make it impossible to have visual imagery, as indicated by non-zero, or non-floor see ratings. It is just that the reported visual imagery is less vivid than it is in the sighted. This idea that people blind from birth are able to form visual imagery has been reported (e.g., Carpenter & Eisenberg, 1978; Kerr, 1983). Although some of these studies indicated that early blind individuals perform less well than sighted participants (De Beni & Cornoldi, 1988), some studies indicate that early blind participants perform equally well as late-blind and sighted participants even when the memory task requires more than passive

storage of information (e.g., Vanlierde & Wanet-Defalque, 2004). Our findings add to these results indicating that forming visual imagery is not totally dependent on visual input, and that people are able to form visual images by transforming input from other modalities.

A related idea is that of compensation; blind participants use other modalities more efficiently in carrying out cognitive tasks. This idea has recieved empirical support (e.g., Arnold and Heiron, 2002). Our blind participants seem to compansate their lack of visual ability, by use of other modalities at encoding, as reflected by higher auditory imagery (in remembering autobiographical memories) and spatial imagery (in remembering flashbulb memories). These findings are in line with Ogden and Barker (2001) who found that early blind people refer mostly to spatial, auditory and tactile imagery when they remember events, people or locations from their past. Although we found that compensation occurs through auditory and spatial modalities, other modalities are potential contributors. One drawback of the present study is that tactile imagery was not measured, which has been mentioned by the blind participants in the Ogden and Barker (2001) study, albeit much less frequently than spatial imagery.

Two unexpected findings were that blind participants had higher remember/know ratings than sighted participants, and that they rated their memories as more important. We are not clear about why, but could offer two plausible explanations. First, it is possible that lack of visual input may lead blind individuals to expand more effort into encoding information leading to a stronger representation of the experience which leads to high remember ratings when recollected. A second possibility is that, for some reason that is not clear, blind participants indeed report memories that are more

important. If indeed that is the case, higher remember ratings could simply be a function of that fact that important events are remembered with more confidence.

Why were remember/know and real/imagine ratings higher for flashbulb memory as well ? For remember/know, the above explanation again seems possible, especially given the very visual nature of the events and their presentation by the media. The difference in the real/imagine variable could be due to media presentation. The events of 9/11 have been presented very graphically and very frequently. The images of the planes crashing into the buildings, people jumping from the buildings, and buildings collapsing have been presented endless times with different perspectives or images. Although imagery is generally thought to improve memory performance (Paivio, 1971), recent research on false memory (Goff & Roediger, 1996; Thomas and Loftus, 2000) as well as research on memory confidence indicates the opposite is true as well. For instance, Van der Kolk reported that repeated imaginings by individuals of an event decreases confidence in whether the event really happened or not. Thus, it is indeed possible that the difference in real/imagine ratings for flashbulb memories may be a function of such repeated exposure to images of the event, which decreased the ratings for the sighted participants. For blind people this type of huge exposure would not be possible.

We also found that the two groups did not differ in recall of central FBM details, except in location; blind participants had better recall of where they were when they heard about 9/11. This was also paralleled in their ratings of spatial imagery in the AMQ, which was higher than that for the sighted. Therefore, not only does the blind remember more specific information about the setting, but they also believe that they are more clear about it than the sighted individuals.

All these findings regarding phenomenological ratings suggest that blind individuals do compansate their lack of visual information through information in different modalities (auditory and spatial), and that they report stronger belief in what they remember.

Correlations and the Factor Structure of the Component Processes

Although intercorrelations between all the variables in the AMQ were generally positive and significant, they were generally lower for the blind than the sighted participants. The factor analyses both between-subjects and based on all memories revealed 3-factor structures. Of special note were that a) in the between subjects analyses, see and setting loaded onto a separate third factor for the blind, and b) in the analyses based on all memories, emotion, which loaded onto the first factor with all other imagery variables, loaded onto a second factor alongside rehearsal and importance again on blind group. This three factor structure as well as the patterns of loadings are very consistent with findings by Gülgöz and Rubin (2000) whose participants were sighted.

However, it should be kept in mind that for blind individuals, the picture seems not complete when tactual and olfactory modalities are absent and this is one of the most important negatives of this study. As noted earlier, Ogden and Barker (2001) suggested that spatial, tactual and auditory modalities together play a significant role on the memory systems of blind people and in this study the tactual part does not exist. Thus, in further studies adding tactual and olfactory systems as separate component processes would present more organized and complete picture autobiographical memory in blind individuals.

Prediction of Recollection and Belief from Component Processes

A number of conclusions can be reached from the between-subjects analysis. First, narrative emerged to be the most important variables that contribute to metacognitive judgments, especially for sighted participants. Second, the emotion variable contributes to three of four metacognitive judgments. Third, the two variables thought to be measuring recollection are predicted by different set of component processes for both groups. For sighted participants reliving is accounted for by setting and hear, and back in time by see and narrative. For the blind participants, reliving is predicted by see and emotions, and back in time by narrative alone. However, the remember/know and real/imagine variables were accounted by generally the same variables for both groups. For sighted participants, narrative was the only significant contributor to both belief variables. For blind participants emotion predicted these two judgments, with setting and rehearsal making additional contributions for real/imagine. The regression results for word-cued autobiographical memories become more meaningful once when regressions for flashbulb memories are also considered. In general it is seen that in word contributes to both recollection and belief measures for both the blind and the sighted. Although blinds and sighted seem to differ in terms of which variables predict metacognitive judgments, the difference may be more apparent than real. Reliving is predicted by hear and in word for sighted, and story for the blind; all of these variables are language-related variables. A similar situation exists for back in time setting contributes for both groups, in addition to narrative for sighted and in word for the blind, both of which are language variables. Thus, for both measures of recollection strongest predictor of to what degree memories will be recollected are the

strength of linguistic variables for reliving, and that and setting for back in time. For belief measures; in word is the only significant contributor to real/imagine for both groups. Remember/know is a bit different; importance and in word contributes for the sighted and hear and see for the blind. Although, again, the contribution of linguistic variables is clear for both groups, it should be kept in mind that remember/know has always been problematic as to what it measures with regard to autobiographical memory.

When the prediction of metacognitive factors of autobiographical memory is examined on Flashbulb memory, on both blind and sighted participants the dominant contribution of language factor can be clearly seen. Namely, on 3 of 4 recollection and belief variables, in word and one of them story enter to the equasion. Similarly, on blind participants, of 4 metacognitive variables 2 of them are predicted by in word and one of them predicted by story variable. In addition for both group auditory imagery also enter to the equasion. Actually dominancy of hear, story and language factors should be expected due to the nature of the event. Most of the blind and sighted subjects reported that they learn the event from televisions or radios. Thus, remembering that moment with the conversations on radios or televisions would not be surprising.

The memory comparison analysis on word-cued autobiographical memories revealed somewhat different patterns in sighted participants. The reliving variable was predicted by see, hear, emotion, story and setting variable, and back int time variable was predicted by hear, story and emotion variables. In other words, the memory comparison analysis seems closer to the study of Rubin, Schrauf, & Greenberg (2003) and the study of Gülgöz & Rubin (2001). Recollection factors were mostly predicted by see, hear and emotion variables. On belief factors in memory comparison analysis, while

remember/know variable was predicted by see, setting and in word, real/imagine variable was predicted by story and emotion variables. As can be seen setting entered to the equasion with the contribution of story and in word variables. Overall, two conclusions could be drawn from this table: first, as Gülgöz and Rubin (2001) and rubin et al. (2005) suggested, hear and language factors for both recollection and belief make more contribution on Turkish population and second, the results of memory comparison analysis more fit the results of previous studies for sighted population.

When we examine the results of blind participants on between-subject analysis, we can see that for reliving variable see and emotion and for back in time variable story entered to the equasion. For belief variables, while remember/know was predicted by emotion, real/imagine is predicted by setting and emotion positively and by rehersal negatively. These results are easier to interpret compared to sighted group. First of all, as in the study of Rubin, Schrauf, & Greenberg (2003,), recollection variables were predicted by see and emotion with the contribution of narrative factor. In addition, again supporting the previous literature, setting made contribution on prediction of belief variables although it did not make any contribution to the reliving or back in time variables. Besides, we see that emotion have equal contribution to the prediction of recollection and belief as story did on sighted participants.

The memory comparison analysis of blind subjects again showed an interesting picture. The reliving and back in time variables were predicted by see, setting, hear, story and in word. Similarly, remember/know and real/imagine variables were predicted by setting, hear, emotion and in word variables. Similar to sighted subjects, the effects of hear and language factors are very strong on the prediction of both metacognitive factors. Interestingly, setting entered to the equasion on the prediction of all 4 variables

that measure recollection and belief. This could indicate that, spatial system have different roles for blind people. It could be asumed that in the points where spatial and visual systems are more related, spatial system enter to the equasion for recollection factors and in the points where it is more related to the contextual factors as it did in sighted people, it more contributed to the prediction of belief factors. Again, the meaning of spatial system on blind people should be closely examined and highlighted with further studies in detail.

Weaknesses of the Study

As also mentioned above, the most important weakness of this study is lack of tactual and olfactory component processes on Autobiographical questionaire. When those points are included to AMQ, understanding the results for both blind and sighted people will be easier.

Another very important weakness of this study is that compared to previous studies, (Rubin, Schrauf, & Greenberg, 2003; Gülgöz & Rubin, 2001), fewer cue words (only 6) were used in this study. It is obvious that within-subjects regression results would be less reliable compared to previous studies. In addition, when the number of cue words are increased, the factors which have negative influences on AMQ scores of subjects deriving from the nature of any cue word would be decreased in to minimum levels. Nevertheless, actually, using 30 cue words in this type of study seemms also very difficult. Since the questions to the blind subjects were read aloud by the experimenter, the time of answering the questions increased (60 minutes for 6 cue words) and for each blind subject an individual interview is necessary under those conditions. As such, increasing the number of cue words might cause fatigue effect and it will take very

longer time to collect data from such kind of pool with this method. Giving the questions on braille format to blind subjects could be an alternative solution. On the other hand, because blind people who use braille efficiently in Turkey are very rare due to lack of braille materials after secondary schools, this method would not be possible in our study. However, in further studies, reaching to a blind population who can use computer and answers the questions on their on, could enable us to use more cue words.

In this study, although we could collect data from wider pool of blind people compared to similar studies (Ogden & Barker, 2001), the heterogenic structure of this data could contaminate our results. The age range on blind participant is 19 to 48 and the differences on education level are not homogenic compared to sighted subjects. Because most of the sighted participants were recruited from the students who took psychology class in boğaziçi university student, groups have become different from each others in terms of age, gender and education level. Thus, in further studies, collecting data from more comparable groups would be useful.

Conclusion

It can be argued that although vision plays a very significant role on autobiographical memory, (Rubin & Greenberg, 1998; Rubin, 1998; Williams, Healy and Ellis, 1999; Greenberg, Eacott, Brechin, and Rubin, 2005), it is not compulsory for remembering and autobiographical memory and in the absense of vision, spatial, auditory, language factors and other modalities can fill its gap on memory system. Thus, Blind individuals' subjective experiences when remembering their past is equally strong in terms of recollection and even higher in terms of belief than sighted individuals.

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Appendices

APPENDIX A: The Sight Questionnaire

Görme Derecesi Anketi

Bu anket görme derecenizin şu anki düzeyile ilgili somut bilgiler edinmeyi amaçlamaktadır. Lütfen sorulara size en yakın hissettiğiniz ifadeyi kullanarak cevap veriniz.

1. Lütfen şu anki görme düzeyinize en çok uyan aşağıdaki ifadelerden birini seçiniz.

1	2	3
Hiç görüşüm yok	Sadece ışığı ve cisimlerin karartısını görebiliyorum	Cisimlerdeki detayların bir çoğunu ayrıdedebilecek kadar görebiliyorum

2. Size uzaktan parmaklar gösterildiğinde kaç olduğunu biliyor musunuz?

1	2	3
Kesinlikle bilemiyorum	Çok yakından gösterildiğinde biliyorum	Genellikle Uzaktan gösterildiğinde bile doğru şekilde biliyorum

3. Renkleri ayırdedebiliyor musunuz?

1	2	3
Hiç ayırt edemiyorum	Sadece bir cismin açık ya da koyu renkte olduğunu anlayabiliyorum	Tüm renkleri ayırt edebiliyorum

4. Yazıları görebiliyor musunuz?

1	2	3
Hiç göremiyorum	Çok büyük puntolarla yazılmış yazıları görebiliyorum	Yazıya yakından bakarak ya da büyüteç kullanarak bir şeyi okuyabilecek kadar görebiliyorum

5. Bir fotoğraf karesindeki detayları ayırt edebiliyor musunuz?

1	2	3
Hiç ayırdedemiyorum	Detay sayısı azsa ayırt edebiliyorum	Genellikle bir çok detayı ayırt edebiliyorum

6. bir yerde yürürken önünüzdeki cisimleri görebiliyor musunuz?

1	2	3
Hiç göremiyorum	Büyük cisimleri bir karartı olarak görebiliyorum	Nisbeten daha küçük cisimleri deBaston kullanmadan onlara çarpmayacak kadar görebiliyorum

7. Tanıdığınız kişilerle karşılaştığınızda, onlara dokunmadan ya da onlarla konuşmadan sadece görme duyunuza dayanarak kim olduklarını görebiliyor musunuz?

1	2	3
Hiç göremiyorum	Çok yakından tanıdığım insanları görebiliyorum	Genellikle bir çok tanıdığım kişiyi görebiliyorumm

APPENDIX B: The Autobiographical Memory Questionnaire

Lütfen aşağıdaki kişisel bilgilerinizi doldurunuz

Denek No:
Doğum yılı:
Cinsiyet:
En son bitirdiğiniz yada yarıda bıraktığınız okul(Bir okulu bitirmeden bıraktıysanız lütfen hangi sınıfta bıraktığınızı belirtiniz):

Aşağıda size bir otobiyografik hafıza anketi verilmiştir. Lütfen her sayfada verilecek kelimeleri dikkatle inceleyerek anılarınızı belirtiniz ve bu anılarla ilgili soruları yanıtlayınız.

Lütfen, **"BARDAK"** sözcüğünün size hatırlattığı kendi yaşantınıza ait bir anınızı birkaç kelime ile anlatınız. Bu anının sürekli tekrar eden rutin bir şey değil, bir kerede yaşanıp sona ermiş bir olay olmasına dikkat ediniz. Bu anıyla ilgili her hangi bir şey anımsayamıyorsanız lütfen diğer kelimeye geçip anket sonunda bu kelimeye tekrar dönünüz. Eğer halen bir şey anımsayamazsanız anket sonundaki yedek kelimelerden biri için aynı anketi yanıtlayınız ve bu yedek kelimeyi yukarıdaki parantez içinde belirtiniz.

Yedek Kelime ( ) "Eğer yedek kelime kullanmadıysanız bu alanı boş bırakın"

Lütfen, soruları yanıtlamaya başlamadan önce bu anı hakkında biraz düşünün ve size en uygun olan rakamı işaretleyin.

1. Olayı hatırladığımda, olayı **yeniden yaşıyormuş** gibi hissediyorum.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

2. Olayı hatırladığımda, onu zihnimde işitebiliyorum.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

3. Olayı hatırladığımda, onu zihnimde **görebiliyorum**.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

4. Olayı hatırladığımda, ben ya da başka insanlar **konuşuyor**.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

5.Olayı hatırladığımda, o zamanki **duyguları** şimdi de hissediyorum

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

6.Olayı hatırladığımda, olayın geçtiği **yeri** anımsayabiliyorum.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

7. İnsanlar bazı olayları, detaylarını hatırlamasalar da başlarından geçtiğini bilirler. Ben anımı hatırladığımda, bu olayın başımdan geçtiğini bilmekten öte onu gerçekten **hatırlayabiliyorum**.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Son derece net bir biçimde

8. Olayı **kelimesi kelimesine** hatırlıyorum.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Son derece net bir biçimde

9. Olayı hatırladığımda, olayın **olduğu ana geri döndüğümü** ve olayı dışarıdan seyreden biri değil olaya yeniden doğrudan katılan biri olduğumu hissediyorum.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Son derece net bir biçimde

10. Olayı hatırladığımda, olay aklıma yalnızca bir durum, gözlem ya da sahne olarak değil; sözcükler ya da resimlerden oluşan **bütün bir hikaye** ya da olay olarak geliyor.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Son derece net bir biçimde

11.Bu olay bana bir mesaj verdiği için ya da yaşamımda kritik bir zamanı veya dönüm noktasını simgelediği için benim için **önemli** bir anıdır.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Son derece önemlidir

12.Bu olayın **gerçekten hatırladığım şekilde gerçekleştiğine** ve olmamış herhangi bir şeyi hayal etmediğime ya da kurmadığıma inanıyorum.

1	2	3	4	5	6	7
% 100 hayal ürünü						% 100 gerçek

13.Olduğundan beri, bu olay hakkında **düşündüm** ya da **konuştum**.

1	2	3	4	5	6	7
Hiç		Bazen		Bir çok		Hayatımda hakkında en sık düşünüp konuştuğum olaylardan biri

14 Lütfen olayın **tarihini** (gün / ay / yıl) olabildiğince doğru bir şekilde hatırlamaya çalışın. *Tahmin etmeniz gerekse bile lütfen bir gün, ay ve yıl yazın*. Eğer ayı biliyor ama günü bilmiyorsanız, ayın başı, ortası veya sonu için sırasıyla 1, 15 ya da 30 yazın. Bazen olayın tarihini hatırlamak için tatiller, doğum günleri ya da okulda olduğunuz yıllar gibi bilinen tarihler kullanmak yardımcı olabilir.

_____/_____/_____

Lütfen, "**VAPUR**" sözcüğünün size hatırlattığı kendi yaşantınıza ait bir anınızı birkaç kelime ile anlatınız. Bu anının sürekli tekrar eden rutin bir şey değil, bir kerede yaşanıp sona ermiş bir olay olmasına dikkat ediniz. Bu anıyla ilgili her hangi bir şey anımsayamıyorsanız lütfen diğer kelimeye geçip anket sonunda bu kelimeye tekrar dönünüz. Eğer halen bir şey anımsayamazsanız anket sonundaki yedek kelimelerden biri için aynı anketi yanıtlayınız ve bu yedek kelimeyi yukarıdaki parantez içinde belirtiniz.

Yedek Kelime ( ) "Eğer yedek kelime kullanmadıysanız bu alanı boş bırakın"

Lütfen, soruları yanıtlamaya başlamadan önce bu anı hakkında biraz düşünün ve size en uygun olan rakamı işaretleyin.

1. Olayı hatırladığımda, olayı **yeniden yaşıyormuş** gibi hissediyorum..

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

2. Olayı hatırladığımda, onu zihnimde işitebiliyorum.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

3. Olayı hatırladığımda, onu zihnimde **görebiliyorum**.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

4. Olayı hatırladığımda, ben ya da başka insanlar **konuşuyor**.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

5.Olayı hatırladığımda, o zamanki **duyguları** şimdi de hissediyorum

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

6.Olayı hatırladığımda, olayın geçtiği **yeri** anımsayabiliyorum.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

7. İnsanlar bazı olayları, detaylarını hatırlamasalar da başlarından geçtiğini bilirler. Ben anımı hatırladığımda, bu olayın başımdan geçtiğini bilmekten öte onu gerçekten **hatırlayabiliyorum**.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Son derece net bir biçimde

8. Olayı **kelimesi kelimesine** hatırlıyorum.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Son derece net bir biçimde

9. Olayı hatırladığımda, olayın **olduğu ana geri döndüğümü** ve olayı dışarıdan seyreden biri değil olaya yeniden doğrudan katılan biri olduğumu hissediyorum.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Son derece net bir biçimde

10. Olayı hatırladığımda, olay aklıma yalnızca bir durum, gözlem ya da sahne olarak değil; sözcükler ya da resimlerden oluşan **bütün bir hikaye** ya da olay olarak geliyor.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Son derece net bir biçimde

11.Bu olay bana bir mesaj verdiği için ya da yaşamımda kritik bir zamanı veya dönüm noktasını simgelediği için benim için **önemli** bir anıdır.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Son derece önemlidir

12.Bu olayın **gerçekten hatırladığım şekilde gerçekleştiğine** ve olmamış herhangi bir şeyi hayal etmediğime ya da kurmadığıma inanıyorum.

1	2	3	4	5	6	7
% 100 hayal ürünü						% 100 gerçek

13.Olduğundan beri, bu olay hakkında **düşündüm** ya da **konuştum**.

1	2	3	4	5	6	7
Hiç		Bazen		Bir çok		Hayatımda hakkında en sık düşünüp konuştuğum olaylardan biri

14.Lütfen olayın **tarihini** (gün / ay / yıl) olabildiğince doğru bir şekilde hatırlamaya çalışın. *Tahmin etmeniz gerekse bile lütfen bir gün, ay ve yıl yazın*. Eğer ayı biliyor ama günü bilmiyorsanız, ayın başı, ortası veya sonu için sırasıyla 1, 15 ya da 30 yazın. Bazen olayın tarihini hatırlamak için tatiller, doğum günleri ya da okulda olduğunuz yıllar gibi bilinen tarihler kullanmak yardımcı olabilir.

_____ / _____ / _____

Lütfen, **"YASTIK"** sözcüğünün size hatırlattığı kendi yaşantınıza ait bir anınızı birkaç kelime ile anlatınız. Bu anının sürekli tekrar eden rutin bir şey değil, bir kerede yaşanıp sona ermiş bir olay olmasına dikkat ediniz. Bu anıyla ilgili her hangi bir şey anımsayamıyorsanız lütfen diğer kelimeye geçip anket sonunda bu kelimeye tekrar dönünüz. Eğer halen bir şey anımsayamazsanız anket sonundaki yedek kelimelerden biri için aynı anketi yanıtlayınız ve bu yedek kelimeyi yukarıdaki parantez içinde belirtiniz.

Yedek Kelime ( ) "Eğer yedek kelime kullanmadıysanız bu alanı boş bırakın"

Lütfen, soruları yanıtlamaya başlamadan önce bu anı hakkında biraz düşünün ve size en uygun olan rakamı işaretleyin.

1. Olayı hatırladığımda, olayı **yeniden yaşıyormuş** gibi hissediyorum.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

2. Olayı hatırladığımda, onu zihnimde işitebiliyorum.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

3. Olayı hatırladığımda, onu zihnimde **görebiliyorum**.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

4. Olayı hatırladığımda, ben ya da başka insanlar **konuşuyor**.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

5.Olayı hatırladığımda, o zamanki **duyguları** şimdi de hissediyorum

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

6.Olayı hatırladığımda, olayın geçtiği **yeri** anımsayabiliyorum.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

7. İnsanlar bazı olayları, detaylarını hatırlamasalar da başlarından geçtiğini bilirler. Ben anımı hatırladığımda, bu olayın başımdan geçtiğini bilmekten öte onu gerçekten **hatırlayabiliyorum**.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Son derece net bir biçimde

8. Olayı **kelimesi kelimesine** hatırlıyorum.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Son derece net bir biçimde

9. Olayı hatırladığımda, olayın **olduğu ana geri döndüğümü** ve olayı dışarıdan seyreden biri değil olaya yeniden doğrudan katılan biri olduğumu hissediyorum.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Son derece net bir biçimde

10. Olayı hatırladığımda, olay aklıma yalnızca bir durum, gözlem ya da sahne olarak değil; sözcükler ya da resimlerden oluşan **bütün bir hikaye** ya da olay olarak geliyor.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Son derece net bir biçimde

11.Bu olay bana bir mesaj verdiği için ya da yaşamımda kritik bir zamanı veya dönüm noktasını simgelediği için benim için **önemli** bir anıdır.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Son derece önemlidir

12.Bu olayın **gerçekten hatırladığım şekilde gerçekleştiğine** ve olmamış herhangi bir şeyi hayal etmediğime ya da kurmadığıma inanıyorum.

1	2	3	4	5	6	7
% 100 hayal ürünü						% 100 gerçek

13.Olduğundan beri, bu olay hakkında **düşündüm** ya da **konuştum**.

1	2	3	4	5	6	7
Hiç		Bazen		Bir çok		Hayatımda hakkında en sık düşünüp konuştuğum olaylardan biri

14.Lütfen olayın **tarihini** (gün / ay / yıl) olabildiğince doğru bir şekilde hatırlamaya çalışın. *Tahmin etmeniz gerekse bile lütfen bir gün, ay ve yıl yazın*. Eğer ayı biliyor ama günü bilmiyorsanız, ayın başı, ortası veya sonu için sırasıyla 1, 15 ya da 30 yazın. Bazen olayın tarihini hatırlamak için tatiller, doğum günleri ya da okulda olduğunuz yıllar gibi bilinen tarihler kullanmak yardımcı olabilir.

_____ / _____ / _____

Lütfen, **"ÇORBA"** sözcüğünün size hatırlattığı kendi yaşantınıza ait bir anınızı birkaç kelime ile anlatınız. Bu anının sürekli tekrar eden rutin bir şey değil, bir kerede yaşanıp sona ermiş bir olay olmasına dikkat ediniz. Bu anıyla ilgili her hangi bir şey anımsayamıyorsanız lütfen diğer kelimeye geçip anket sonunda bu kelimeye tekrar dönünüz. Eğer halen bir şey anımsayamazsanız anket sonundaki yedek kelimelerden biri için aynı anketi yanıtlayınız ve bu yedek kelimeyi yukarıdaki parantez içinde belirtiniz.

Yedek Kelime ( ) "Eğer yedek kelime kullanmadıysanız bu alanı boş bırakın"

Lütfen, soruları yanıtlamaya başlamadan önce bu anı hakkında biraz düşünün ve size en uygun olan rakamı işaretleyin.

1. Olayı hatırladığımda, olayı **yeniden yaşıyormuş** gibi hissediyorum.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

2. Olayı hatırladığımda, onu zihnimde işitebiliyorum.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

3. Olayı hatırladığımda, onu zihnimde **görebiliyorum**.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

4. Olayı hatırladığımda, ben ya da başka insanlar **konuşuyor**.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

5.Olayı hatırladığımda, o zamanki **duyguları** şimdi de hissediyorum

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

6.Olayı hatırladığımda, olayın geçtiği **yeri** anımsayabiliyorum.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

7. İnsanlar bazı olayları, detaylarını hatırlamasalar da başlarından geçtiğini bilirler. Ben anımı hatırladığımda, bu olayın başımdan geçtiğini bilmekten öte onu gerçekten **hatırlayabiliyorum**.

1	2	3	4	5	6	7
Hiç değil			Belli belirsiz		Net bir biçimde	Son derece net bir biçimde

8. Olayı **kelimesi kelimesine** hatırlıyorum.

1	2	3	4	5	6	7
Hiç değil			Belli belirsiz		Net bir biçimde	Son derece net bir biçimde

9. Olayı hatırladığımda, olayın **olduğu ana geri döndüğümü** ve olayı dışarıdan seyreden biri değil olaya yeniden doğrudan katılan biri olduğumu hissediyorum.

1	2	3	4	5	6	7
Hiç değil			Belli belirsiz		Net bir biçimde	Son derece net bir biçimde

10. Olayı hatırladığımda, olay aklıma yalnızca bir durum, gözlem ya da sahne olarak değil; sözcükler ya da resimlerden oluşan **bütün bir hikaye** ya da olay olarak geliyor.

1	2	3	4	5	6	7
Hiç değil			Belli belirsiz		Net bir biçimde	Son derece net bir biçimde

11.Bu olay bana bir mesaj verdiği için ya da yaşamımda kritik bir zamanı veya dönüm noktasını simgelediği için benim için **önemli** bir anıdır.

1	2	3	4	5	6	7
Hiç değil			Belli belirsiz		Net bir biçimde	Son derece önemlidir

12.Bu olayın **gerçekten hatırladığım şekilde gerçekleştiğine** ve olmamış herhangi bir şeyi hayal etmediğime ya da kurmadığıma inanıyorum.

1	2	3	4	5	6	7
% 100 hayal ürünü						% 100 gerçek

13.Olduğundan beri, bu olay hakkında **düşündüm** ya da **konuştum**.

1	2	3	4	5	6	7
Hiç			Bazen		Bir çok	Hayatımda hakkında en sık düşünüp konuştuğum olaylardan biri

14.Lütfen olayın **tarihini** (gün / ay / yıl) olabildiğince doğru bir şekilde hatırlamaya çalışın. *Tahmin etmeniz gerekse bile lütfen bir gün, ay ve yıl yazın.* Eğer ayı biliyor ama günü bilmiyorsanız, ayın başı, ortası veya sonu için sırasıyla 1, 15 ya da 30 yazın. Bazen olayın tarihini hatırlamak için tatiller, doğum günleri ya da okulda olduğunuz yıllar gibi bilinen tarihler kullanmak yardımcı olabilir.

_____ / _____ / _____

Lütfen, "AĞAÇ" sözcüğünün size hatırlattığı kendi yaşantınıza ait bir anınızı birkaç kelime ile anlatınız. Bu anının sürekli tekrar eden rutin bir şey değil, bir kerede yaşanıp sona ermiş bir olay olmasına dikkat ediniz. Bu anıyla ilgili her hangi bir şey anımsayamıyorsanız lütfen diğer kelimeye geçip anket sonunda bu kelimeye tekrar dönünüz. Eğer halen bir şey anımsayamazsanız anket sonundaki yedek kelimelerden biri için aynı anketi yanıtlayınız ve bu yedek kelimeyi yukarıdaki parantez içinde belirtiniz.

Yedek Kelime ( ) "Eğer yedek kelime kullanmadıysanız bu alanı boş bırakın"

Lütfen, soruları yanıtlamaya başlamadan önce bu anı hakkında biraz düşünün ve size en uygun olan rakamı işaretleyin.

1. Olayı hatırladığımda, olayı **yeniden yaşıyormuş** gibi hissediyorum.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

2. Olayı hatırladığımda, onu zihnimde işitebiliyorum.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

3. Olayı hatırladığımda, onu zihnimde **görebiliyorum**.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

4. Olayı hatırladığımda, ben ya da başka insanlar **konuşuyor**.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

5.Olayı hatırladığımda, o zamanki **duyguları** şimdi de hissediyorum

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

6.Olayı hatırladığımda, olayın geçtiği **yeri** anımsayabiliyorum.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

7. İnsanlar bazı olayları, detaylarını hatırlamasalar da başlarından geçtiğini bilirler. Ben anımı hatırladığımda, bu olayın başımdan geçtiğini bilmekten öte onu gerçekten **hatırlayabiliyorum**.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Son derece net bir biçimde

8. Olayı **kelimesi kelimesine** hatırlıyorum.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Son derece net bir biçimde

9. Olayı hatırladığımda, olayın **olduğu ana geri döndüğümü** ve olayı dışarıdan seyreden biri değil olaya yeniden doğrudan katılan biri olduğumu hissediyorum.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Son derece net bir biçimde

10. Olayı hatırladığımda, olay aklıma yalnızca bir durum, gözlem ya da sahne olarak değil; sözcükler ya da resimlerden oluşan **bütün bir hikaye** ya da olay olarak geliyor.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Son derece net bir biçimde

11.Bu olay bana bir mesaj verdiği için ya da yaşamımda kritik bir zamanı veya dönüm noktasını simgelediği için benim için **önemli** bir anıdır.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Son derece önemlidir

12.Bu olayın **gerçekten hatırladığım şekilde gerçekleştiğine** ve olmamış herhangi bir şeyi hayal etmediğime ya da kurmadığıma inanıyorum.

1	2	3	4	5	6	7
% 100 hayal ürünü						% 100 gerçek

13.Olduğundan beri, bu olay hakkında **düşündüm** ya da **konuştum**.

1	2	3	4	5	6	7
Hiç		Bazen		Bir çok		Hayatımda hakkında en sık düşünüp konuştuğum olaylardan biri

14.Lütfen olayın **tarihini** (gün / ay / yıl) olabildiğince doğru bir şekilde hatırlamaya çalışın. *Tahmin etmeniz gerekse bile lütfen bir gün, ay ve yıl yazın*. Eğer ayı biliyor ama günü bilmiyorsanız, ayın başı, ortası veya sonu için sırasıyla 1, 15 ya da 30 yazın. Bazen olayın tarihini hatırlamak için tatiller, doğum günleri ya da okulda olduğunuz yıllar gibi bilinen tarihler kullanmak yardımcı olabilir.

_____ / _____ / _____

Lütfen, "**ZİL**" sözcüğünün size hatırlattığı kendi yaşantınıza ait bir anınızı birkaç kelime ile anlatınız. Bu anının sürekli tekrar eden rutin bir şey değil, bir kerede yaşanıp sona ermiş bir olay olmasına dikkat ediniz. Bu anıyla ilgili her hangi bir şey anımsayamıyorsanız lütfen diğer kelimeye geçip anket sonunda bu kelimeye tekrar dönünüz. Eğer halen bir şey anımsayamazsanız anket sonundaki yedek kelimelerden biri için aynı anketi yanıtlayınız ve bu yedek kelimeyi yukarıdaki parantez içinde belirtiniz.

Yedek Kelime ( ) "Eğer yedek kelime kullanmadıysanız bu alanı boş bırakın"

Lütfen, soruları yanıtlamaya başlamadan önce bu anı hakkında biraz düşünün ve size en uygun olan rakamı işaretleyin.

1. Olayı hatırladığımda, olayı **yeniden yaşıyormuş** gibi hissediyorum.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

2. Olayı hatırladığımda, onu zihnimde işitebiliyorum.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

3. Olayı hatırladığımda, onu zihnimde **görebiliyorum**.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

4. Olayı hatırladığımda, ben ya da başka insanlar **konuşuyor**.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

5.Olayı hatırladığımda, o zamanki **duyguları** şimdi de hissediyorum

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

6.Olayı hatırladığımda, olayın geçtiği **yeri** anımsayabiliyorum.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

7. İnsanlar bazı olayları, detaylarını hatırlamasalar da başlarından geçtiğini bilirler. Ben anımı hatırladığımda, bu olayın başımdan geçtiğini bilmekten öte onu gerçekten **hatırlayabiliyorum**.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Son derece net bir biçimde

8. Olayı **kelimesi kelimesine** hatırlıyorum.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Son derece net bir biçimde

9. Olayı hatırladığımda, olayın **olduğu ana geri döndüğümü** ve olayı dışarıdan seyreden biri değil olaya yeniden doğrudan katılan biri olduğumu hissediyorum.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Son derece net bir biçimde

10. Olayı hatırladığımda, olay aklıma yalnızca bir durum, gözlem ya da sahne olarak değil; sözcükler ya da resimlerden oluşan **bütün bir hikaye** ya da olay olarak geliyor.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Son derece net bir biçimde

11. Bu olay bana bir mesaj verdiği için ya da yaşamımda kritik bir zamanı veya dönüm noktasını simgelediği için benim için **önemli** bir anıdır.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Son derece önemlidir

12. Bu olayın **gerçekten hatırladığım şekilde gerçekleştiğine** ve olmamış herhangi bir şeyi hayal etmediğime ya da kurmadığıma inanıyorum.

1	2	3	4	5	6	7
% 100 hayal ürünü						% 100 gerçek

13. Olduğundan beri, bu olay hakkında **düşündüm** ya da **konuştum**.

1	2	3	4	5	6	7
Hiç		Bazen		Bir çok		Hayatımda hakkında en sık düşünüp konuştuğum olaylardan biri

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_____ / _____ / _____

Eğer yukarıdaki kelimelerden bir yada birkaçıyla ilgili herhangi bir anı hatırlayamadıysanız hatırlayamadığınız kelimelerin yerine yedek kelimelerden birini kullanınız.

Hatırlayamadığınız kelime sayısı üçten fazlaysa yedek kelimeleri kullandıktan sonra diğer kelimeleri boş bırakınız.

YEDEK KELİMELER
"HALI"
"ÇİLEK"
GAZETE"

APPENDIX C: The Flashbulb Memory Questionnaire

Lütfen, 11 Eylül saldırısından ilk haberdar olduğunuz anı düşünerek aşağıdaki soruları yanıtlayın. Soruları yanıtlarken olayın kendisini değil sizin olayı ilk duyduğunuz anı düşünün.

Lütfen, soruları yanıtlamaya başlamadan önce bu anı hakkında biraz düşünün ve size en uygun olan rakamı işaretleyin.

2. Olayı hatırladığımda, olayı **yeniden yaşıyormuş** gibi hissediyorum.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

2. Olayı hatırladığımda, onu zihnimde işitebiliyorum.

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Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

3. Olayı hatırladığımda, onu zihnimde **görebiliyorum**.

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Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

4. Olayı hatırladığımda, ben ya da başka insanlar **konuşuyor**.

1	2	3	4	5	6	7
Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

5.Olayı hatırladığımda, o zamanki **duyguları** şimdi de hissediyorum

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Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

6.Olayı hatırladığımda, olayın geçtiği **yeri** anımsayabiliyorum.

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Hiç değil		Belli belirsiz		Net bir biçimde		Olay şu anda oluyormuş gibi

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Hiç değil		Belli belirsiz		Net bir biçimde		Son derece net bir biçimde

8. Olayı **kelimesi kelimesine** hatırlıyorum.

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Hiç değil		Belli belirsiz		Net bir biçimde		Son derece net bir biçimde

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% 100 hayal ürünü						% 100 gerçek

13.Olduğundan beri, bu olay hakkında **düşündüm** ya da **konuştum**.

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Hiç		Bazen		Bir çok		Hayatımda hakkında en sık düşünüp konuştuğum olaylardan biri

FLASH BELLLEK ANKETİ

Lütfen 11 Eylül 2001 tarihinde Amerika Birleşik Devletleri'ndeki Dünya Ticaret Merkezi'ne yapılan terör saldırısından ilk haberdar olduğunuz ana geri dönün ve o anla ilgili aşağıdaki soruları yanıtlayın.

Bu anketin amacı bu ve benzer olayların nasıl hatırlandığını anlamaya çalışmaktır. Eğer aşağıdaki soru ya da soruların yanıtlarıyla ilgili bir şey anımsamıyorsanız, lütfen anımsamadığınız soruyu yanıtlamayın.

1. Olayı duyduğunuz anda neredeydiniz?

2. Olayı duyduğunuz anda ne yapıyordunuz?

3. Olayı nereden ya da kimden duydunuz?

4. Olayı duyduğunuz anda yanınızda kimler vardı? (anımsıyorsanız isim belirtiniz)

5. Olayı duyduğunuz anda saat kaçtı?

Olayı duyduğunuz anda üstünüzde hangi kıyafetler vardı