THE ROLE OF SCENE RECALL IMAGERY AND VISUAL IMAGERY IN THE RECALL OF EMOTIONAL AUTOBIOGRAPHICAL MEMORIES

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ABSTRACT

THE ROLE OF SCENE CONSTRUCTION AND VISUAL IMAGERY IN POSITIVE AND NEGATIVE AUTOBIOGRAPHICAL MEMORIES

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Keywords: object imagery, spatial imagery, scene construction theory, affective memory

A large body of evidence demonstrates that emotion impacts memory. Although visual information dominates the emotional memories, no study examined the role of visual imagery as an individual difference variable in the representation of emotional memories. This study examines the role of visual imagery and scene recall imagery skills on emotional memories. Participants ($N = 115$) recalled positive, negative, and neutral events in response to the cue words and then rated the phenomenology of each event. Event accounts were coded for episodic detail categories (event, place, perceptual, time, emotion-thought details). The results showed that visual and scene recall imagery skills contributed to the details of positive memories and the phenomenology of both positive and negative events. Overall, this study emphasizes the importance of considering the individual differences in memory research and highlights the differences between emotional and neutral events.

ÖZET

DUYGUSAL OTOBİYOGRAFİK ANILARIN HATIRLANMASINDA SAHNE HATIRLAMA İMGELEMİ VE GÖRSEL İMGELEM BECERİLERİNİN ROLÜ

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Anahtar Kelimeler: obje imgelem becerisi, uzamsal imgelem becerisi, sahne kurma teorisi, afektif anılar

Duygunun hafıza üzerindeki etkisi birçok çalışma tarafından gösterilmiştir. Görsel bilgi, duyusal anılar içinde oldukça baskın bir şekilde yer alıyor olsa da önceki çalışmalar duygusal anıların temsilinde görsel imgelemenin bir bireysel farklılık değişkeni olarak nasıl bir role sahip olduğunu incelememiştir. Bu çalışma, görsel imgelem ve sahne hatırlama imgeleminin duygusal anılar üzerindeki rolünü incelemektedir. Bu amaçla katılımcılardan onlara verilen kelimeler karşılığında olumlu, olumsuz ve nötr anılarını hatırlamaları ve bunların öznel karakteristiklerini derecelendirmeleri istenmiştir. Anlatılan anılardaki epizodik detaylar gerekli kategorilere ayrılarak kodlanmıştır (olay, yer, algısal, zaman, duygu-düşünce detayları). Sonuçlar, görsel imgelem ve sahne hatırlama imgeleminin, olumlu anıların detaylarına, olumlu ve olumsuz anıların ise fenomenolojisine katkıda bulunduğunu göstermiştir. Genel olarak, bu çalışma bellek araştırmalarında bireysel farklılıkları dikkate almanın önemini vurgularken duygusal ve nötr olaylar arasındaki farklılıkları da ortaya koymaktadır.

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To the littlest member of our family, my precious Derin Yaşamak...

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1. INTRODUCTION

While some memories are easily forgotten, others are highly salient and remembered in greater detail than others. One answer to the question of what makes some memories qualitatively different is emotion. Compared to neutral events, memories imbued with emotion are easier to remember and rich in detail (Kensinger and Ford 2020, for review). They are higher in the sense of recollection (Kensinger and Corkin 2003), the number of sensory details (Comblain, D'Argembeau, and Van der Linden 2005), clarity of visual details, and level of vividness (Schaefer and Philippot 2005). Heightened attention, sensory processing (Talmi et al. 2008), and arousal (Madan et al. 2017) are suggested as the reasons why emotion enriches memories. An additional explanation is the availability of visual information within the emotional events since visual elements dominate emotional memories (Pillemer 2009). Because of their various sensory, perceptual, and visual characteristics (e.g., El Haj et al. 2017) emotional memories seem to be preserved better than other memories. Taken together, these explanations imply that visual imagery may play a major role in the impact of emotion on the representation of autobiographical memories. To date, no study has investigated the role of visual imagery on emotional memories despite its central role in autobiographical memory (e.g., Brewer 1988; Butler et al. 2016; Conway and Fthenaki 2000; Rubin 2006). Therefore, the current study examines the role of different imagery types, namely, scene recall imagery and visual imagery, in the recall of emotional autobiographical memories. In the following sections, I review the relevant literature on emotion and memory, particularly about the relationship between emotion and the episodic elements in autobiographical memories. Then I move on to the literature on visual imagery and autobiographical memory. In the final section, I consider the ways visual imagery differences across individuals may affect how emotional events are remembered.

1.1 Autobiographical Memories

Before thinking about particular effects of emotion, it is critical to understand how autobiographical events are represented. Autobiographical memory representation is a combination of self-related conceptual, generic, and schematic information (e.g., a person's favorite activities, personality, and facts about the person, such as the place of birth) and personal episodic events that can be pinpointed at the time and place (Brewer et al. 1986; Conway and Rubin 1993). These specific events contain precise "internal details" which are internal to the event, such as the time, place, weather, people, people's actions, and perceptual information. For instance, consider the following event:

> "I remember the times I was living in Izmir. Throughout primary school, I was a very shy person. One day, I needed to do a presentation in my chemistry class. I was extremely nervous. My hands were shaking; my voice was shaking. Almost like a picture, I can vividly remember everyone staring at me. When I started to talk, I misspelled a word, and one girl laughed at me. I still feel very insecure when I think about her."

This narrative consists of both schematic and generic self-related information, which are "external details" (e.g., primary school years, being shy, living in Izmir at a specific time) because they are external to the main event as well as the internal details about a particular episode (e.g., being nervous, visual and auditory information about the shaky hands and voice, perceptual picture-like information of classmates, one specific girl).

As the example demonstrates, internal details related to the episodic events are distinguished from generic self-related external details by having an accompanying feeling of traveling back in time (Tulving 1985). According to this distinction, remembering events specific in time and place requires a level of consciousness and the recognition of oneself as a continuous entity over time. In contrast, information about self does not require time travel; rather, it is more similar to a coherent pile of information that has been built over time (Tulving 1985). For instance, remembering the incident where "you were very nervous about your chemistry presentation" requires you to mentally travel to that specific time and place, and this travel probably elicits the feeling of reliving, which results in feeling the same intense negative

emotions. However, knowing that you are a "shy person" was probably built based on accumulated several different but coherent incidents. These two types of details (internal and external) also differ in the level of representation in the Self-Memory System (Conway and Pleydell-Pearce 2000). As a lower level representation, personal events which have internal details are more prone to be impaired than the self-related and schematic external details (Cohen 2000) since the episodic events rely on one specific event representation. Given the nature of episodic memories, this study focuses on these episodic (internal) details in personal events since these details are more sensitive to change under the influence of emotions.

Before moving on to the current literature about autobiographical memory and emotion, I take a step back and review laboratory studies examining episodic memory performance for emotionally varying words, lists, and pictures in a controlled lab environment. In addition to looking at item memory, some of these studies focused on emotional memory for spatial context, which may be important for understanding the relationship between emotion and spatial imagery.

1.2 Laboratory Studies

Known as the emotional enhancement of memory effect (EEM; Hamann 2001). previous literature has shown that emotion helps memory (for reviews, see Cahill and McGaugh 1998; Dolan 2002; LaBar and Cabeza 2006; Levine and Edelstein 2009; Madan et al. 2020). The emotional content was retained better than neutral in tasks such as remembering slides, word lists, pictures, and sentences (see Buchanan and Adolphs 2002; Hamann 2001). These laboratory studies also tested the influence of emotion with the remember/know paradigm (Tulving 1985). In this paradigm, people learn a list of items; then, when the items are represented, they need to indicate whether they *remember* the moment they learned the item or *know* that they learned the item even though they are not confident about remembering the exact moment they learned it. People generally remember the moments when they learned the emotional words more than neutral ones (Dewhurst and Parry 2000).

The effects of emotion on memory are not uniform, however. For example, the type of information remembered heavily depends on the valence of emotion (Kensinger and Corkin 2003). Various studies have shown that *negative emotion* strengthens memory performance for central details yet impairs it for peripheral ones (e.g., Easterbrook 1959; Levine and Edelstein 2009; Reisberg and Heuer 2004). For instance, people tend to remember the snake but forget the information about the background

of the snake. This phenomenon is known as memory narrowing (see for a review, Levine and Edelstein 2009), memory trade-off effect (Reisberg and Heuer 2004), or tunnel memory (Safer et al. 1998). Second, due to the impaired retrieval of peripheral details in negative events (Kensinger, Garoff-Eaton, and Schacter 2007; Palombo et al. 2021) where people allocate their limited sources of attention and working memory to the central items only (Levine and Edelstein 2009); people have impaired association skills (Bisby and Burgess 2014) to combine central and peripheral details. *Positive emotion*, on the other hand, seems to foster memory for both central and peripheral details (Yegiyan and Yonelinas 2011). The mechanism behind this is suggested to be positive emotion facilitating the association performance (Madan, Scott, and Kensinger 2019).

Positive and negative emotional memories also present different patterns regarding their phenomenology, in other words, the subjective sense of recollection. *Negative emotion* leads memories to be remembered more vividly (Cooper, Kensinger, and Ritchey 2019), with more visual details than *positive and neutral events* (Kensinger, Garoff-Eaton, and Schacter 2007). Mechanistically, this is attributed to triggered sensory processing (Bowen, Kark, and Kensinger 2018; Kark and Kensinger 2015; Mickley and Kensinger 2008). The advantage of *negative emotion* is also displayed in the remember/know paradigms so that people remember negative items and know the *positive items* in this paradigm (Ochsner 2000).

In summary, these studies assert that positive and negative memories differ from each other in terms of their effects. Positive emotion, through increased associative processing, leads to better performance for both central and peripheral details, while peripheral information is impaired in negative memories. However, negative memories are remembered with a greater sense of recollection and include more visual details than neutral memories.

1.3 Emotion in Autobiographical Memories

Remembering specific autobiographical memories is challenging, and these memories are more prone to be impaired in the face of emotional disorders such as depression (Söderlund et al. 2014; Williams et al. 2007; Wilson and Gregory 2018), depression period of bipolar disorder (Silva et al. 2021), PTSD (Kleim and Ehlers 2008), eating disorder (Dalgleish et al. 2003), and acute stress disorder (Harvey, Bryant, and Dang 1998). For instance, individuals with depression tend to recall general memories rather than specific ones, and their level of episodic detail is generally

compromised. Given these characteristic impairments of autobiographical memories and close ties with emotional disorders, it can be suggested that emotion has a great role in remembering specific autobiographical memories in detail. So what is the effect of emotion on autobiographical memories in typical individuals?

The influence of emotion on autobiographical memories has been studied by either focusing on the influence of emotion on the objective aspect of memories, such as the presence of episodic details or on the subjective sense of recollection.

Similar to the laboratory studies, literature has shown that positive and negative emotions influence the type of details people remember. Central information is remembered more frequently in highly negative and traumatic experiences such as getting injured (Peterson and Bell 1996), experiencing a natural disaster (e.g., flood, Sotgiu and Galati 2007), and witnessing a crime (Christianson and Hübinette 1993). In one study (Peterson and Whalen 2001), even after five years from an actual injury, children were better at remembering central details of an injury (related to injury) compared to peripheral details (e.g., coming to the hospital, nurse giving a popsicle). Likewise, another study investigating positive and negative events demonstrated that people reported more peripheral details for their positive events and more central details for the negative events (Berntsen 2002; Talarico, Berntsen, and Rubin 2009).

In addition to central-peripheral detail distinction, relatively recent studies categorized episodic details in memory by using more detailed and robust coding schemes such as Autobiographical Interview (AI). This coding system was originally developed by Levine and his colleagues (2002), and it enables to code every unique unit of information (internal details: event, place, person, perceptual, time, emotion/thought details, external details: semantic details, repetitions, etc.) in autobiographical memory.

A handful of studies using the AI (St. Jacques and Levine 2007; Wardell et al. 2021) have reported that emotional memories contain a higher number of event details and emotion-thought details than neutral events, and no differences concerning detail categories were reported between positive and negative memories. Similarly, De Brigard and colleagues (2016) also showed that the number of total internal details in positive and negative memories do not differ in young adults. However, only Wardell and colleagues (2021) recently reported that negative events contained fewer place details than positive and neutral events. Given that place details can be categorized as contextual information, this finding is in line with the laboratory studies that display the adverse effect of negative emotion on the peripheral details and their binding with central details (Bisby and Burgess 2014) as well as the studies

examining real-life events such as getting injured (Peterson and Bell 1996).

Regarding the sense of recollection, studies cannot depict a clear distinction between positive and negative memories. Although several studies have reported that both positive and negative memories contain similar amounts of sensory, contextual (Comblain, D'Argembeau, and Van der Linden 2005), visual details, and they are both more vivid than neutral events (Schaefer and Philippot 2005; Wardell et al. 2021), several studies have demonstrated that positive memories are more vivid, they are richer in terms of sensory, temporal, and contextual details (D'Argembeau and Van der Linden 2008; Destun and Kuiper 1999; Raspotnig 1997), and perceived as more colorful than negative events (Ritchie and Batteson 2013). On the other hand, if a negative event is highly arousing, it has a higher vividness than a positive event. In fact, the effect of arousal on increasing vividness is only observed for negative events but not for positive events (Ford, Addis, and Giovanello 2012). Flashbulb memories can be noted in favor of this idea. People vividly remember their highly negative and arousing traumatic experiences (Brown and Kulik 1977), and their vividness increases with the intensity of negative emotions such as anger and sadness (Bluck and Li 2001).

Thus, one may again argue that although positive emotion has mnemonic advantages so that these memories are easily remembered (see Holland and Kensinger 2010), this effect is not consistent and negative emotions trigger a more powerful recollective experience when the level of arousal is considered. Similar to lab studies, there is not much of a clear distinction between the effects of positive and negative emotion on the sense of recollection ratings.

1.4 The discrepancy between memory details and sense of recollection

Taken together, the available evidence shows that the presence of memory details and subjective phenomenology are differently influenced by emotion. Recently, Wardell et al. (2021) observed that even though participants reported higher vividness for the emotional memories, these memory accounts did not contain the corresponding perceptual and sensory information that is expected to contribute to their subjective sense of vividness. Wardell et al.'s (2021) interpretation were that the higher vividness in emotional memories might be due to the lively but single snapshots of events rather than the continuing unfolding of an event with every detail in mind (Muzzulini et al. 2020). These single images of emotional events would lead to reporting a higher sense of recollection (e.g., vividness, reliving) but prevent elaborating on

further event details. Therefore, findings such as lower levels of episodic details in emotional memories -compared to non-emotional ones- were accompanied by high levels of recollective feelings in the literature. Taken together, an implicit assumption made in the aforementioned autobiographical memory studies is that the sense of recollection is driven by visual imagery (i.e., the snapshots of the events). Also, researchers have suggested heightened sensory processing as a mechanism responsible for vivid emotional memories. Therefore, I explored the role of visual imagery in the present study on emotional memories. For instance, if it is true that people rely on single snapshots in emotional memory for enhanced vividness, it follows that individuals with certain imagery skills (e.g., object imagery -as outlined below) should report higher subjective experience. Similarly, if negative emotion leads to remembering central details at the expense of peripheral, spatial context details (Berntsen 2002; Talarico and Rubin 2003), it is possible that stronger spatial or scene imagery skills (see below) may act as a buffer and more episodic details are remembered. Thus, as suggested by Kensinger and Ford (2020, p. 256), an individual differences approach is adopted in order to examine the role of visual imagery in remembering emotional autobiographical memories.

1.5 Individual Differences: Visual Imagery & Scene Recall Imagery

Visual imagery is known as a core component of autobiographical memories (Greenberg and Knowlton 2014). Previous work on the relationship between visual imagery and autobiographical remembering relies on the object-spatial imagery distinction. Object imagery is the preference to imagine features of objects such as color, shape, and size rather than their relationship (see Blajenkova, Kozhevnikov, and Motes 2006). It has been shown to be associated with the presence of sensory and perceptual information (Aydin 2018; Vannucci, Chiorri, and Marchetti 2020), the recollective experience, and emotional reliving (Vannucci, Chiorri, and Marchetti 2020), and vividness (Clark and Maguire 2020). On the other hand, spatial imagery, which is the preference for imagining spatial relations among objects, people, and locations as abstract representations, has been related to the binding of all the components of a memory (Sheldon and Levine 2016; Sheldon, Amaral, and Levine 2017) as well as the elaboration of the episodic details (Aydin 2018). Thus, visual imagery constructs are differentially related to memory characteristics and details. Specifically, spatial imagery is expected to be positively related to the binding of memories, which, as noted above, is particularly impaired in negative memories (Palombo et al. 2021; Wardell et al. 2021) and contribute to the presence of episodic and particularly place

details in negative memories, while Object Imagery is expected to increase the sense of recollection. These skills are both expected to be recruited for emotional events.

Another variable that may explain why some individuals remember with more episodic details and a better phenomenology is the scene recall imagery ability. It is the skill to recall autobiographical memories as coherent scenes and is measured by the performance of remembering the layout of events from a specific perspective (Rubin 2020). It is based on Scene Construction Theory (SCT; Hassabis and Maguire 2007) which also proposes that the central skill to remember an event is the ability to construct coherent atemporal scenes. The SCT is suggested to be the main skill for episodic memories, future thinking, imagination, and navigation (Clark et al. 2019) because an image of the spatial context - scene serves as a scaffold for the elaboration of other details since these skills enable people to package various information effectively within the given scene (Clark et al. 2019; Konkle et al. 2010). It follows that individuals who are able to form strong and vivid mental images of scenes should have a corresponding benefit in recollecting past autobiographical episodes (Greenberg and Knowlton 2014). This personal skill has been found to be related to a couple of recollection measures, such as belief for the accuracy, vividness, and reliving of memories (Rubin, Deffler, and Umanath 2019). Given the higher sense of recollection with higher scene imagery and its facilitation for the scaffolding of further details, it is expected to observe a higher sense of recollection and episodic details for individuals with great scene recall imagery skills. Although this skill's stability and relations with recollective experience have been studied (Gehrt et al. 2021; Rubin 2020; Rubin, Deffler, and Umanath 2019), its relation with the episodic details has not been looked into. Also, although Wardell et al.(2021) and St. Jacques and Levine (2007) studied the sense of recollection and details of emotional memories, no study has investigated the role of scene recall imagery on emotional memories. Since scenes facilitate the scaffolding and the binding of memory details (Robin and Olsen 2019), scene recall imagery is expected to benefit the binding of details which is especially impaired in negative memories. Therefore, differential recruitment of scene imagery skills may be observed during the recall of positive, negative, and neutral memories.

1.6 The Present Study: Imagery constructs and remembering emotional events

All in all, the present study aims to investigate whether (1) positive, negative, and neutral autobiographical memories differ in terms of memory details and subjective phenomenology and whether (2) visual imagery skills are recruited differently by positive, negative, and neutral event details.

Negative emotion has been reported to have an impairing effect on peripheral details and the binding of these details with the central details of an event, while positive emotion increases memory for both types of details and their associations. Therefore, their main difference lies in the binding processes of memory details. To date, there are not any studies that examine the impact of *scene recall imagery* and *spatial imagery* as individual difference variables that might be instrumental in the binding processes. Furthermore, findings on negative and positive emotion's effects on recollective experience are mixed. Some studies suggest that they are equally influential; others state that they have advantages over others in specific circumstances. The variety of these findings might depend on the individual's visual imagery skills, specifically *object imagery*, which was reported to contribute to the subjective phenomenology of events. However, no study has investigated the role of object imagery to answer why negative and positive emotion has changeable roles in memory recollections. Therefore, the present study is the first study to delve into how scene recall, spatial and object imagery skills, as well as their performance-based metrics, are recruited in the positive, negative, and neutral autobiographical memories with a specific focus on the types of episodic details, and sense of recollection.

I also assessed spatial ability through the Mental Rotation Task (MRT; Peters et al. 1995; Vandenberg and Kuse 1978, as the original source) and vividness of visual imagery with the Vividness of Visual Imagery Questionnaire (VVIQ; Marks 1973). These relatively more objective performance tests are included to check the validity of Object and Spatial Imagery scales since they were correlated with Spatial and Object Imagery, respectively (Kozhevnikov, Blazhenkova, and Becker 2010). It is important to note that these scales were examined together according to their conceptual similarity. For instance, the influence of VVIQ and OSIQ - Object on the sense of recollection ratings were analyzed together, whereas SRIT, MRT, and OSIQ - Spatial were grouped to test whether they predict the memory details.

2. METHOD

2.1 Participants

119 Turkish-speaking participants were recruited through the SONA research participation system of Sabanci University. The literature (Pan et al. 2018) suggests that 80 participants for achieving adequate power for a linear model with one categorical variable (Emotion: negative-positive-neutral) and three continuous variables (e.g., MRT, OSIQ - Spatial, SRIT), .05 alpha, .95 power, and medium effect size (f = .25). Since the participants were university students, one relatively older participant (44 years old) was excluded from the study. Also, one outlier whose individual differences score is even more than three interquartile range below the first quartile of the sample and two other participants who did not provide at least three memories out of six were removed from the dataset. The final sample consisted of 115 participants (73 female, 2 other, 40 male, $M_{age} = 21.87, SD_{age} = 1.37$).

2.2 Procedure

The experiment was conducted online. Participants were directed to the survey link through the research system of the university. After consenting to participate online, they were explained what constitutes a specific and a general event (adapted from Aydin 2018), then they started the memory phase of the study. As a common technique in autobiographical memory literature (Crovitz and Schiffman 1974; Gehrt et al. 2021; Rubin and Schulkind 1997), participants received two positive, two neutral, and two negative cues. They were requested to write down their personal (positive, negative, and neutral) memories which are specific in time and place. Participants always received the neutral words first, and the order of the positive and negative cues was counterbalanced. Within each emotion block, the

order of the cue words was also randomized. These words were selected from the Turkish Emotional Word Norms List (Kapucu et al. 2021) according to their valence (positive, negative, neutral) and the level of arousal. Since arousal level influences memories' detailedness (Sheldon et al. 2020), equally arousing words were picked. The negative words were "mezarlık" (graveyard), "hastane" (hospital), neutral ones were: "dağ" (mountain), "koridor" (corridor), and positive words were "deniz" (sea) and "lunapark" (amusement park). When participants retrieved their memories, they were asked to rate the characteristics of each memory by filling a set of questions which are selected from the Autobiographical Memory Questionnaire (AMQ; Berntsen and Rubin 2006; Butler et al. 2016; Rubin, Schrauf, and Greenberg 2003); and the Memory Characteristics Questionnaire (MCQ; Johnson et al. 1988). The questions were standard memory characteristics questions about the accessibility of memories, vividness, rehearsal, visual perspective (field/observer), importance, reiving, intensity, mental time travel, temporal distance, verbal details, and valence of emotions (AMQ, MCQ, also listed in Butler et al. 2016). The sensory detail questions related to the level of auditory, visual, odor-taste, and tactile details were also included (from Aydin 2018; Boyacioglu and Akfirat 2015; Johnson et al. 1988). All these items were rated on a 7-point Likert scale; only the rehearsal question was rated on a 5-point Likert scale. In addition to the memory ratings, they also completed Scene Recall Imagery questions for each memory (SRIT; Rubin 2020). The total score for these questions was also calculated to form an individual SRIT score. Addedly, the arousal and the valence of each memory were controlled to ensure that participants' memories were appropriate for the emotional condition; these control questions were rated on a 9-point scale. After completing the memory phase, participants continued with the individual differences scales (MRT, VVIQ, and OSIQ in the given order) and provided demographic information.

2.2.1 Coding

Six written events were collected from each participant and then coded according to the Turkish version of the Autobiographical Interview's coding scheme (AI; Levine et al. 2002). Two independent researchers experienced in coding the narratives first identified each memory's main event and then coded the details of these events. Details were mainly separated into two categories: internal and external. Internal details are about the main event, such as the event's unfoldings (event details), perceptual information about the event, such as the color of the sky and the warmness of the day (perceptual details), time of the event (time details), the place where the event happened (place details), emotions and thoughts of people during the event

(emotion-thought details). In addition to the main event, all other events mentioned are semantic details related to schematic knowledge about the self and facts about the world, repetitions, and other details that do not fit any detail category coded as external details. Any unique piece of information received one point, and the overall score for each event was calculated for each detail category. Randomly selected 153 events corresponding to 22% of all data were coded to calculate the inter-rater agreement. The intraclass correlations (ICC; one-way random effects model; McGraw and Wong 1996) were calculated to evaluate the reliability of internal and external details. Coefficients for internal (.98) and external details (.93) indicated excellent agreement (Koo and Li 2016).

2.3 Materials

2.3.1 Scene Recall Imagery Test (Rubin 2020)

Scene Recall Imagery Test is a 6-item self-report test aiming to measure individuals' scene recall imagery skills. Participants were asked to rate two items for each of the three categories (layout, content, and perspective) for each memory they provided on a scale of 1 (not at all) to 7 (as if it were happening now). One example for the layout is "While remembering the event, I know where I am in relation to the individual things that I am remembering." while an example for the content is "While remembering, I can identify or name the setting where the memory occurred, although I might not be able to describe it clearly." Lastly, the perspective category can be exemplified with the item, "While remembering the event, I have the sense of seeing the event from my own eyes." The scale has sufficient test-retest reliability; correlations among the repeated applications of these scales range from 0.70 to 0.89 (Rubin, 2020). The SRIT items were used as separate ratings, and composite scene recall imagery scores were calculated by averaging the layout and perspective questions through all events that participants had rated. Averaging these questions constituted an individual difference score for the scene recall imagery test (SRIT). The aim of the inclusion of these self-ratings is to understand whether the lack of perceptual details in narratives (e.g., Wardell et al., 2021) is due to narration style (people do not verbally express these details even though they retrieve them) or the differences in memory constructions (people construct the event without these details).

2.3.2 Mental Rotation Task (MRT; Peters et al. 1995; Vandenberg and Kuse 1978, as the original source)

Mental Rotation Task, a widely used performance task to determine spatial ability, consisted of 24 questions. Each question includes a target block figure and four additional block figures. All block figures are combined from ten cubes. Two option figures are identical with the target block but rotated, while the other two are different from the target. Participants have to choose both correct figures that match the target block figure to receive 1 point for the question within a given time. Otherwise, participants cannot be credited any points from the question. The task needed to be completed in 6 minutes in total. The total score of the participants can range from 0 to 24. The MRT also has adequate split-half reliability ($\alpha = .80$) and Cronbach's alpha ($\alpha = .87$) (Geiser, Lehmann, and Eid 2006).

2.3.3 Vividness of Visual Imagery(VVIQ; Marks 1973)

VVIQ is a conventional performance test that measures individual differences in the imagination of the vividness of images. The task instructs participants to imagine four scenarios (e.g., "Think of the front of a shop which you often go to. Consider the picture that comes before your mind's eye.") and rate the vividness of the image by answering four questions related to the scene (e.g., "A window display including colors, shapes, and details of individual items for sale."). Participants rated the vividness of these images in 5-point Likert (1: "No image at all, only "knowing" that you are thinking of the object," 5: "Perfectly clear and as vivid as normal vision"). The original study reports a 0.74 test-retest reliability for the scale.

2.3.4 Object and Spatial Imagery Questionnaire(OSIQ; Blajenkova, Kozhevnikov, and Motes 2006)

The Object and Spatial Imagery scale aims to measure two different types of visual imagery. Object imagery assesses the preferences for constructing vivid, colorful, detailed images of objects. In contrast, spatial imagery measures the preferences for constructing schematic representations and spatial relationships between objects and spatial transformations of these objects. The scale consists of 30 questions. Participants were asked to rate the object imagery (e.g., "My images are very colorful and bright") and spatial imagery questions (e.g., " My images are more like schematic representations of things and events rather than like detailed pictures.")

on a scale of 1 to 5 (1: "totally disagree," 5: "totally agree"). Both the object scale (r = 0.81) and spatial scale ($r = 0.95$) have sufficient test-retest reliability (Blajenkova et al., 2006). Because in previous studies, not all items loaded clearly to one imagery type (e.g., Fan et al., 2021), I first conducted a principal component analysis (PCA, parallel analysis, with the varimax method, and loadings higher than .4) to select spatial and object imagery items that are perfectly loaded to orthogonal components. This analysis left 12 object imagery and 14 spatial imagery items behind; the new scales have .89 and .86 Cronbach's alphas, respectively. These versions were included in the analyses throughout the study.

3. RESULTS

3.1 Data Analytic Strategy

In this study, several recollection ratings (e.g., vividness, reliving, intensity) and internal memory details were examined. These ratings and details were measured for each participant's positive, negative and neutral memories. Due to the repeated measurement of individuals, memories were nested within people. Employing a conventional regression analysis that ignores the nested structure of the data might jeopardize the independence assumption, which is taken care of in HLM, and thus reduce the Type-I errors (Peugh 2010). This method is more advantageous than repeated measures analysis of variance since it does not require excluding participants who have missing data points from the dataset. Participants of this study also failed to provide all the memories they had been asked for. HLM also minimizes the biases for estimating missing data without excluding them (Peugh 2010). All the analyses were conducted in HLM 8: Hierarchical linear and nonlinear modeling (Raudenbush et al. 2019).

There were two levels of data. Memories were at level 1 ($N = 670$), and individuals were at level 2 ($N = 115$). The memories were clustered for each individual. This kind of clustering facilitates observing the influence of individual variance. Because the emotion and temporal distance of events are related to the memories, dummy variables of negative and positive emotions as well as the temporal distance, which is a control variable, were added to the models as level 1 predictors. Dependent variables were also located in level 1 (Castro 2002). Since individual differences scores (MRT, VVIQ, SRIT, OSIQ) differ from person to person yet stay the same within the individual, all of these variables are incorporated as level 2 predictors. Regarding the model structure, all level-1 predictors were uncentered, and the other variables were grand-centered so that they could reflect the variance of the sample. All slopes and intercepts were enabled to vary among individuals.

The fit of the models was evaluated with the chi-square statistic that compares the current model with a comparison model. First, null models (intercept only, no predictors) for each dependent variable were calculated. Then negative and positive emotions were entered into these models, and these current models were compared with null models. After that, individual differences scores (MRT, VVIQ, SRIT, OSIQ) were included in the model and compared with models with only emotions. Lastly, the temporal distance was included in the latter models as a control variable, and these models with the temporal distance variable were compared with the former models. Since positive, negative, and neutral events I collected differed from each other regarding their temporal distance ($x^2(2) = 10.4, p = .005$) and the passage of time after an event alters the memory characteristics tremendously (Wardell et al. 2021), whereas especially emotional cues tend to evoke recently experienced events (Robinson 1976), I decided to control the temporal distance of the events.

An example model is illustrated below, and all of the models and summary results tables are included in the Appendix C.

Level 1: $Vividness = \beta_{0j} + \beta_{1j} * (NEGATIVE) + \beta_{2j} * (POSITIVE) + r_{ij}$

Level 2:

$B_{0j} = \gamma_{00} + \gamma_{01} * (VVIQ) + \gamma_{02} * (OBJECT) + u_{0j}$
4 $B_{1j} = \gamma_{10} + \gamma_{11} * (VVIQ) + \gamma_{12} * (OBJECT) + u_{1j}$
$B_{2j} = \gamma_{20} + \gamma_{21} * (VVIQ) + \gamma_{22} * (OBJECT) + u_{2j}$

Mixed Model:

$$Vividness = \gamma_{00} + \gamma_{01} * VVIQ_j + \gamma_{02} * OBJECT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * VVIQ_j * NEGATIVE_{mj} + \gamma_{12} * OBJECT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * VVIQ_j * POSITIVE_{mj} + \gamma_{22} * OBJECT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + r_{ij}$$

As the following step, Intraclass Correlation Coefficients (ICC) for each null model (intercept only) were calculated and checked whether ICCs were higher enough (at least 5%; Bliese 2000) to conduct a mixed model analysis. Since almost all of the ICCs were higher than 20% (ranging from 13 to 34), which means that the data has a sufficient level of between-variation in individuals (Level 2), multilevel linear model analyses with a full likelihood estimation were conducted to clarify the dependency in memory-level data clustered by individuals (Raudenbush and Bryk 2002). The results showed that at least 13% of the variance in dependent variables occurred

between individuals (Level 2), while the rest occurred within individuals (Level 1). Given that the higher portion of variance came from memory level (Level 1), one may argue that emotion has a greater influence on memory details and characteristics.

3.2 Descriptives and Manipulation Checks

Since the range of the independent variables differs from each other, z-scores for MRT, VVIQ, SRIT, OSIQ - Object, and OSIQ - Spatial were used rather than raw scores. These variables were also checked for normality, skewness, and kurtosis, highly skewed variables (positively skewed: internal, event, perceptual, place, emotion-thought details; negatively skewed: vividness, visual ratings) logarithmically transformed before the analysis. Since the results did not change for the main effects, I reported the analyses conducted with untransformed variables here. Descriptive statistics (see Table 3.1 and Table 3.2) and correlations of individual differences scales (see Table 3.3) were provided below.

Table 3.1 Descriptives of Individual-level and Memory-level Variables

	M or %	SD	Min	Max
Memory-level (N = 670)				
Positive Emotion	33.9			
Negative Emotion	33.3			
Sex (% female)	58.9			
Age	22.4	1.3	19	26
Vividness	6.43	1.21	1	7
Reliving	4.96	1.8	1	7
Intensity	4.82	1.71	1	7
Importance	4.43	1.94	1	7
MTT	4.85	1.78	1	7
Visual	5.83	1.35	1	7
Auditory	4.56	2.03	1	7
Odor-taste	2.86	2.1	1	7
Tactile	4.09	2.22	1	7
Verbal	2.80	1.83	1	7
Individual-level (N = 115)				
MRT	8.75	4.75	0	21
VVIQ	60.1	8.25	43	79
SRIT	4.95	0.89	2.79	7
OSIQ - Object	3.63	0.76	1.58	5
OSIQ - Spatial	2.63	0.76	1	4.29

Notes: MTT: Mental time travel, MRT: Mental Rotation Task.

Table 3.2 Descriptives of Internal Detail Categories

M (SD)	Positive	Negative	Neutral
Internal (Total)	8.52 *(6.44)*	7.89 *(7.10)*	7.90 *(7.07)*
Event	5.07 *(4.25)*	4.82 *(4.60)*	4.62 *(4.44)*
Place	1.20 *(1.08)*	0.89 *(0.93)*	1.20 *(1.24)*
Time	0.45 *(0.70)*	0.32 *(0.67)*	0.32 *(0.61)*
Emotion/thought	0.85 *(1.18)*	0.83 *(1.35)*	0.55 *(1.15)*
Perceptual	0.96 *(1.58)*	1.02 *(1.65)*	1.21 *(1.73)*

Table 3.3 Descriptives of Internal Detail Categories

N = 115	M (SD)	Range	1	2	3	4	5
1. MRT	8.75 (4.75)	0-24	–				
2. VVIQ	60.14 (8.25)	16-80	0.05	–			
3. SRIT	4.95 (0.9)	0-7	-0.05	0.23**	–		
4. OSIQ - Object	3.63 (0.76)	0-5	0.01	0.25**	0.24**	–	
5. OSIQ - Spatial	2.63 (0.76)	0-5	0.13*	-0.02	0.03	0.09	–

Notes. Kendal's tau was reported in the table. MRT: Mental Rotation Task, VVIQ: Vividness of Visual Imagery Questionnaire, SRIT: Scene Recall Imagery Test. p <.10. *p <.05. **p <.01. ***p <.001.

Prior to the analysis, memories were checked whether they met the expectations for time (e.g., happening at least one month ago) and content (e.g., being personal memories rather than dreams or narrations of videoclips). From six memories of 115 participants, twenty of the memories were excluded. Overall, six hundreds-seventy memories were included in the analysis. After the memory elimination, manipulations for the valence and arousal were checked. A Wilcoxon signed-rank test indicated that valence ratings significantly differed between neutral ($Mdn = 4$) and positive ($Mdn = 2$), $T = 1.398$, $z = -7.99$, $p < .001$; neutral and negative ($Mdn = 7$), $T = 15.242$, $z = -11.06$, $p < .001$, and positive and negative conditions, $T = 12$, $z = -12.40$, $p < .001$. For the arousal ratings, positive ($Mdn = 4$) and negative ($Mdn = 6$) events ($T = 1.490$, $z = -8.89$, $p < .001$), and negative and neutral events ($Mdn = 4$) were significantly different, $T = 13.291$, $z = -8.800$, $p < .001$. However, positive and neutral events did not differ from each other significantly in arousal ratings, $T = 6.530$, $z = -0.21$, $p = .91$.

Overall, these results demonstrate that the valence manipulation worked well to separate emotional conditions. However, despite the fact that the cue words were selected based on both their valence and arousal, neutral and positive memories of individuals did not differ in their level of arousal. Because arousal did not correlate with the number of details and vividness of events that were previously reported to be related Sheldon et al. (2020), arousal was not controlled due to not anticipating significant effect of its on memory representations.

3.3 Memory Details

3.3.1 Emotion Only

At first, the influence of emotion on episodic detail categories (e.g., internal, event, place, perceptual, emotion/thought details) were examined. Event and emotion-thought details were expected to be higher in emotional memories, yet negative memories were assumed to have lower place details due to the previous findings (Wardell et al., 2021). The results confirmed these expectations except for the event details.

As it is expected, addition of emotion variables to the model improved the null model for internal details, $\Delta\chi^2$ (Δdf = 10) = 4347.81, p = .001, place details, $\Delta\chi^2$ (Δdf = 10) = 38.09, $p < .001$, emotion and thought details, $\Delta\chi^2$ (Δdf = 8) = 27.22, $p < .001$. Yet this significance for internal details did not survive the comparison tests; therefore, no influence of negative or positive emotion was observed. Addedly, no influence of emotion was observed for perceptual details, $\Delta\chi^2$ (Δdf = 8)= 3.40, $p > .500$ and event details, $\Delta\chi^2$ (Δdf = 10)= 7.21, $p > .500$.

Emotion and thought details were higher in both positive (b = .31, SE = .011, t (114) = 2.762, p = .007) and negative memories than neutral ones (b = .28, SE = .120, t (114) = 2.321, p = .022). Place details were lower in negative events compared to neutral ones (b = -.31, SE = .094, t (114) = -3.300, p =.001). Perceptual, internal, and event details did not differ between neutral and emotional memories.

3.3.2 Emotion, MRT, SRIT, and OSIQ-Spatial Imagery

The model with emotions improved with the addition of MRT, SRIT, and OSIQ - Spatial for only internal details, $\Delta\chi^2$ (Δdf = 9) = 17.6, p = .04, while the other models did not improve. According to the model with both emotion and these variables, the effect of emotion stayed the same for the emotion-thought details and place details. Both positive events (b = .31, SE = .11, t (111) = 2.820, p = .006) and negative events still had higher emotion-thought details (b = .28, SE = .12, t (111) = 2.322, p = .022) and negative events had lower place details compared to neutral events (b = -.31, SE = .094, t (114) = -3.300, p =.001).

Considering the individual differences, spatial imagery was expected to increase the memory details. Conversely OSIQ - Spatial decreased the internal details (b = -.89,

SE = .043, *t* (111) = -2.056, *p* = .04), event details (*b* = -.56, *SE* = .25, *t* (111) = -2.258, *p* = .026), and perceptual details (*b* = -.29, *SE* = .11, *t* (111) = -2.529, *p* = .013). It did not interact with emotion.

On the other hand, MRT was expected to increase memory details. The interaction between MRT and positive emotion partially confirmed the expectations. People with higher MRT scores narrated more internal details (*b* = 1.03, *SE* = .43, *t* (113) = 2.38, *p* =.019), event details (*b* = .55, *SE* = .026, *t* (111) = 2.08, *p* = .04), and perceptual details (*b* = .23, *SE* = .11, *t* (111) = 2.02, *p* = .045) for their positive memories only.

To sum up, no effect of SRIT on memory details was found. Contrarily, the negative effect of OSIQ - Spatial was observed. Thus, the results partially confirmed the expectations so that having higher MRT scores increased the memory details in positive events. However, no interaction between these individual differences with negative emotion was observed. Thus, one cannot argue that these skills protect against the effects of negative emotions. Rather, only MRT was related to memory details in positive events.

3.3.3 Emotion, MRT, SRIT, OSIQ-Spatial Imagery, and Temporal Distance

When the temporal distance of the events was controlled, the model with emotions, MRT, SRIT, OSIQ - Spatial improved only for emotion-thought details, $\Delta\chi^2$ (Δdf = 7) = 32.77, $p < .001$ compared to the model in which temporal distance was not considered.

Regarding the separate effects of emotion, MRT, SRIT, and OSIQ - Spatial scale, no difference was observed. Again, place details were lower in negative events (*b* = -.32, *SE* = .09, *t* (111) = -3.461, $p < .001$), emotion-thought details were higher in both emotional events (positive; *b* = .29, *SE* = .10, *t* (111) = 2.979, *p* = .004, negative; *b* = .25, *SE* = .12, *t* (111) = 2.136, *p* = .035). OSIQ - Spatial again adversely influenced internal (*b* = -.97, *SE* = .47, *t* (111) = -2.050, *p* = .043), event (*b* = -.64, *SE* = .32, *t* (111) = -2.021, *p* = .046), and perceptual details (*b* = -.29, *SE* = .11, *t* (111) = -2.496, *p* = .014). MRT was still predicting a higher number of internal details in positive events (*b* = .99, *SE* = .46, *t* (111) = 2.165, *p* = .033). However, the interactions of MRT, SRIT, and emotion have altered with the consideration of temporal distance.

Even though the effect of MRT on event details (*b* = .54, *SE* = .027, *t* (111) =

1.966, p = .052) and perceptual details (b = .22, SE = .12, t (111) = 1.896, p = .061) were no longer significant for positive events, MRT was still related with the internal details in positive events (b = .99, SE = .046, t (111) = 2.165, p = .033).

Lastly, internal details (b = -.007, SE = .01, t (321) = -2.137, p = .033) and emotion-thought details (b = -.002, SE = .001, t (321) = -2.934, p = .004) were lowered when the temporal distance was increased. Also, there was an interaction between SRIT and temporal distance for perceptual details (b = .001, SE = .001, t (111) = 2.066, p = .04). Thus, people with low SRIT scores had less number of perceptual details for their far distant events, but people with higher SRIT scores were not influenced by the negative influence of being temporally distant.

3.4 Sense of Recollection

3.4.1 Emotion Only

For the sense of recollection metrics, emotion was expected to be positively related with all sense of recollection ratings. The results confirmed this expectation except for vividness ratings. The addition of negative and positive emotion improved the null models by lowering the deviance statistics for vividness, $\Delta\chi^2$ (Δdf = 10) = 597.14, $p < .001$, intensity, $\Delta\chi^2$ (Δdf = 8) = 57.37, $p < .001$, importance, $\Delta\chi^2$ (Δdf = 8) = 99.69, $p < .001$, auditory details, $\Delta\chi^2$ (Δdf = 8) = 16.92, p = .03, odor-taste details, $\Delta\chi^2$ (Δdf = 8) = 16.78, p = .032, and verbal details, $\Delta\chi^2$ (Δdf = 10) = 26.34, p = .004. Although the model for visual details, $\Delta\chi^2$ (Δdf = 10) = 21.94, p = .015, was improved with the addition of emotions, these details did not differ between emotional and neutral events. Lastly, there was no improvement in models for reliving, mental time travel, and tactile details; in other words emotional memories did not differ from neutral ones in these ratings.

Regarding the influence of emotion on recollection, auditory details in both negative (b = .46, SE = .018, t (114) = 2.471, p = .015) and positive events reported as higher than neutral events (b = .49, SE = .015, t (114) = 3.230, p = .002). Both positive (b = .29, SE = .014, t (114) = 2.011, p = .047) and negative events rated as more important than neutral events (b = 1.46, SE = .017, t (114) = 8.448, $p < .001$). Intensity (b = .96, SE = .014, t (114) = 6.656, $p < .001$) and verbal details (b = .38, SE = .016, t (114) = 2.391, p = .018) were higher in negative events compared to neutral events. There were more odor-taste details in positive events than neutral events, b = .59, SE = .014, t (114) = 4.168, $p < .001$. Contrarily, only vividness

ratings were significantly lower in negative memories than neutral events (b = -1.38, SE = .012, t (553) = -11.534, $p < .001$).

3.4.2 Emotion, VVIQ, and OSIQ-Object Imagery

In general, VVIQ and OSIQ - Object were expected to increase the sense of recollection ratings, especially their interaction with emotion was supposed to be related to the recollection ratings. Except for one finding (e.g., interaction of VVIQ and negative emotion for MTT), these skills predict the phenomenology ratings.

When VVIQ and OSIQ - Object were added to the models with emotions, the models for reliving, $\Delta\chi^2$ (Δdf = 6) = 28.06, $p < .001$, intensity, $\Delta\chi^2$ (Δdf = 6) = 26.77, $p < .001$, importance, $\Delta\chi^2$ (Δdf = 6) = 13.61, $p = .034$, mental time travel, $\Delta\chi^2$ (Δdf = 6) = 26.23, $p < .001$, visual details, $\Delta\chi^2$ (Δdf = 6) = 31.01, $p < .001$, auditory details, $\Delta\chi^2$ (Δdf = 6) = 25.47, $p < .001$. On the other hand, models for vividness, odor-taste, tactile, and verbal details did not improve. So, an additional variance in vividness, verbal and odor-taste details were not explained by VVIQ and OSIQ - Object even though their models were improved with the addition of emotion. Moreover, tactile details were not explained with both emotion and these individual differences scales.

Similar to the previous models with emotion only, negative events kept having higher number of verbal details (b = .37, SE = .15, t (112) = 2.426, p = .017) and intensity (b = .97, SE = .14, t (112) = 6.695, $p < .001$) but lower vividness than neutral events (b = -1.37, SE = .11, t (112) = -11.97, $p < .001$). Both negative (b = 1.46, SE = .17, t (112) = 8.498, $p < .001$) and positive events (b =.28, SE = .14, t (112) = 2.026, p = .045) rated as more important than neutral events and they had higher auditory details, (for positive: b = .47 SE = .18, t (112) = 2.541, p = .012, for negative: b = .50, SE = .15, t (112) = 3.252, p = .002). Again, odor-taste details were higher in positive events compared to neutral ones (b =.59, SE = .14, t (112) = 4.177, $p < .001$).

VVIQ led to a higher reliving (b = .38, SE = .015, t (112) = 2.550, p = .012), odor-taste details (b = .31, SE = .015, t (112) = 2.080, p = .040), and visual details (b =.31, SE = .09, t (112) = 3.389, $p < .001$). Moreover, VVIQ displayed an interaction with negative emotion. Even though negative emotion decreases the vividness, having higher VVIQ scores led to having more vivid negative events compared to neutral events (b = .34, SE = .12, t (112) = 2.642, p = .006). Another interaction of VVIQ with positive emotion was for the mental time travel ratings.

People with higher VVIQ scores had a decreased mental time travel in positive events only (b = -.34, SE = .015, t (112) = -2.310, p = .023). This finding was contrary to the expectations.

On the other hand, OSIQ - Object was not related to any ratings, and it did not display interaction with emotion similar to the OSIQ - Spatial scale.

3.4.3 Emotion, VVIQ, OSIQ-Object Imagery, and Temporal Distance

When the temporal distance of the event was controlled, the distance significantly decreased ratings for reliving (b = -.005, SE = .01, t (322) = –4.568, $p < .001$), vividness (b = -.001, SE = .001, t (322) = -3.228, p = .001), mental time travel (b = -.004, SE = .01, t (322) = -4.039, $p < .001$), intensity (b = -.004, SE = .001, t (322) = -4.147, $p < .001$), as well as visual (b = -.004, SE = .001, t (322) = -5.165, $p < .001$), auditory (b = -.003, SE = .01, t (322) = -3.097, p = .002), odor-taste (b = -.003, SE = .01, t (322) = -2.526, p = .012), and tactile details (b = -.003, SE = .01, t (322) = -2.742, p = .006). The influence of emotion on the vividness, intensity, verbal details, odor-taste details, and auditory details did not change. Negative events still had lower vividness (b = -.1.31, SE = .11, t (112) = -11.91, $p < .001$) but higher verbal details (b = .39, SE = .15, t (112) = 2.536, p = .013) and intensity (b = .88, SE = .15, t (112) = 6.043, $p < .001$) than neutral events. Positive events had higher odor-taste details (b = .57, SE = .14, t (112) = 4.035, $p < .001$). Both negative (b = .39, SE = .18, t (112) = 2.199, p = .03) and positive events (b =.48, SE = .15, t (112) = 3.212, p = .002) kept having higher auditory details than neutral events. However, positive events were no longer significantly more important than neutral events (b = .28, SE = .14, t (112) = 1.959, p =.053), while negative events were still more important than neutral ones (b = 1.42, SE = .17, t (112) = 8.289, $p < .001$). Also, negative emotion started to predict .24 point decrease in the visual details (b = -.24, SE = .11, t (112) = -2.175, p = .032).

The effect of VVIQ stayed intact for reliving (b = .33, SE = .15, t (112) = 2.173, p = .032) and visual details (b = .33, SE = .12, t (112) = 2.841, p = .005), yet it disappeared for the odor-taste details (b =.30, SE = .15, t (112) = 1.960, p = .052). Regarding interactions, VVIQ was still increasing the vividness in negative events (b = .37, SE = .12, t (112) = 3.063, p = .003) and decreasing mental time travel in positive events (b = -.32, SE = .15, t (112) = -2.188, p = .031). Also, it displayed an interaction with the temporal distance of the event for both odor-taste (b = -.002, SE = .001, t (322) = -2.379, p = .018) and tactile details (b = -.002, SE = .001, t (322) = -2.012, p = .045). So, in distant events the number of these

details decreased for the people with higher VVIQ scores.

On the other hand, controlling the temporal distance resulted in OSIQ - Object becoming a significant predictor of reliving (respectively, $b = .32$, $SE = .15$, t (112) $= 2.158$, $p = .033$), mental time travel ($b = .28$, $SE = .014$, t (112) $= 2.012$, $p = .047$), and auditory details ($b = .33$, $SE = .15$, t (112) $= 2.192$, $p = .03$). Again, it did not display any interaction with emotion.

Overall, I observed that VVIQ increased the recollection ratings as predicted. At the same time, its interaction with emotion displayed mixed results by decreasing mental time travel ratings in positive events but increasing vividness ratings in negative events. These interactions were intact even after the event's temporal distance was controlled. VVIQ negatively influenced the number of the odor-taste and tactile details in distant events. VVIQ and OSIQ - Object especially explained the variance in the feeling of reliving and mental time travel which was the phenomenology ratings free from the influence of emotion. Notwithstanding, OSIQ - Object was not a predictor of phenomenology until the temporal distance was controlled. After considering the events' temporal distance, it started to predict reliving, auditory details, and mental time travel regardless of the emotion of the event.

3.4.4 Emotion and SRIT

Another scale, SRIT, which was hypothesized to increase both the recollection ratings and memory details, showed that it only predicted the sense of recollection ratings but not the memory details.

When emotion and SRIT were added to the models, it improved the null model for all recollection ratings except for the verbal details. It improved the models for vividness, $\Delta\chi^2$ (Δdf $= 3$) $= 36$, $p < .001$, reliving, $\Delta\chi^2$ (Δdf $= 3$) $= 19.36$, $p < .001$, mental time travel, $\Delta\chi^2$ (Δdf $= 3$) $= 57.12$, $p < .001$, intensity, $\Delta\chi^2$ (Δdf $= 3$) $= 62.65$, $p < .001$, importance, $\Delta\chi^2$ (Δdf $= 3$) $= 51.74$, $p < .001$, visual details, $\Delta\chi^2$ (Δdf $= 3$) $= 55.98$, $p < .001$, auditory details, $\Delta\chi^2$ (Δdf $= 3$) $= 46.06$, $p < .001$, odor-taste details, $\Delta\chi^2$ (Δdf $= 3$) $= 11.18$, $p = .011$, tactile details, $\Delta\chi^2$ (Δdf $= 3$) $= 30.21$, $p < .001$.

Positive and negative emotions kept predicting the same ratings in the previous. These emotions predicted the auditory details (respectively, $b = .50$, $SE = .15$, t (113) $= 3.247$, $p = .002$; $b = .46$, $SE = .18$, t (113) $= 2.474$, $p = .015$) and importance in positive and negative events (respectively, $b = .29$, $SE = .14$, t (113) $= 2.055$, $p = .042$; $b = 1.46$, $SE = .17$, t (113) $= 8.467$, $p < .001$). Similarly, negative emotion

was still predicting verbal details (b = .37, SE = .16, t (113) = 2.416, p = .017), intensity (b = .96, SE = .14, t (113) = 6.652, p < .001) and vividness (b = -1.39, SE = .11, t (113) = -13.123, p < .001), while positive emotion was predicting higher odor-taste details (b = .59, SE = .14, t (113) = 4.194, p < .001).

One unit increase in SRIT scores predicted a higher reliving (b = .58, SE = .13, t (113) = 4.525, p < .001), intensity (b = .70, SE = .11, t (113) = 6.146, p < .001), importance (b = .62, SE = .12, t (113) = 5.051, p < .001), mental time travel ratings (b = .79, SE = .12, t (113) = 6.521, p < .001), auditory details (b = .66, SE = .12, t (113) = 5.278, p < .001), verbal details (b = .30, SE = .14, t (113) = 2.103, p = .038), visual details (b = .43, SE = .01, t (113) = 4.582, p < .001), and tactile details (b = .52, SE = .17, t (113) = 3.053, p = .003). Contrary to expectations, it did not increase vividness ratings (b = .04, SE = .06, t (113) = 0.738, p = .462). However, the interaction of SRIT with negative emotion showed that despite negative emotion was decreasing vividness (b = -1.39, SE = .11, t (113) = -13.123, p < .001), people with higher SRIT had more vivid negative memories (b = .60, SE = .11, t (113) = 5.676, p < .001).

3.4.5 Emotion, SRIT, and Temporal Distance

When the temporal distance of the event was added as a control variable to the model, distance of the events started to decrease all ratings except verbal details. Positive memories became no longer different from neutral events regarding their importance, (b = .28, SE = .14, t (113) = 1.967, p = .052) but kept having higher odor-taste (b = .56, SE = .14, t (113) = 4.009, p < .001) and auditory details (b = .48, SE = .15, t (113) = 3.210, p = .002). Negative emotion started to decrease the visual details (b = -.24, SE = .09, t (113) = 7.256, p < .001) in addition to its negative influence on vividness (b = -1.32, SE = .12, t (113) = -11.351, p < .001) and positive influence on verbal details (b = .38, SE = .16, t (113) = 2.466, p = .015), importance (b = 1.42, SE = .17, t (113) = 8.139, p < .001), intensity (b = .89, SE = .15, t (113) = 5.969, p < .001) and auditory details (b = .37, SE = .18, t (113) = 2.068, p = .041). The interaction of SRIT and negative emotion for vividness stayed intact.(b = .64, SE = .11, t (113) = -2.253, p =.026). However, SRIT displayed an interaction with temporal distance for visual details, b = .002, SE = .001, t (323) = 2.347, p = .020 and reliving, b = .002, SE = .001, t (323) = 2.036, p = .043; so that it was positively related with the visual details and reliving regardless of the temporal distance of the events. Addedly, SRIT started to predict odor-taste details (b = .31, SE = .15, t (113) = 2.104, p = .038). All other effects

stayed intact.

3.5 Exploratory Analyses for Memory Details

3.5.1 MRT

Since MRT was the most powerful predictor of memory details, its separate influence was explored for both memory details and phenomenology ratings. When only MRT and emotion were added to the model, similar to the previous models, emotion-thought details were influenced by the negative (b = .28, SE = .12, t (113) = 2.322, p = .022) and positive emotion (b = .31, SE = .11, t (113) = 2.762, p = .007). Also, place details were again lower in negative events compared to neutral events (b = -.31, SE = .09, t (113) = -3.314, p = .001). Regarding MRT, it predicted higher internal details (b = .84, SE = .41, t (113) = 2.039, p = .044) and perceptual details in positive events (b = .25, SE = .11, t (111) = 2.400, p = .018). So that people with higher MRT scores had higher number of internal and perceptual details in their positive events (b = .25, SE = .11, t (111) = 2.400, p = .018). The other memory details were not influenced by MRT.

After the control of temporal distance, the influence of emotion did not change. Place details stayed lower in negative events (b = -.33, SE = .09, t (113) = -3.546, p < .001), while emotion-thought details were still being influenced by the negative (b = .25, SE = .12, t (113) = 2.080, p = .04) and positive emotion (b = .28, SE = .10, t (113) = 2.763, p = .007). However, being temporally distant decreased the internal (b = -.01, SE = .003, t (323) = -2.258, p = .025) and emotion-thought details (b = -.001, SE = .001, t (323) = -2.784, p = .006). The effect of MRT on internal details disappeared with the consideration of temporal distance (b = .78, SE = .45, t (113) = 1.751, p = .083). Positive emotion started to significantly decrease the perceptual details (b = -.25, SE = .12, t (113) = -1.977, p = .05), yet the interaction of MRT with positive emotion for perceptual details stayed significant (b = .25, SE = .11, t (113) = 2.254, p = .026). Thus, MRT protected the perceptual details in positive events.

3.6 Exploratory Analyses for Sense of Recollection

3.6.1 MRT

Even though the effect of MRT on the sense of recollections was neither hypothesized nor anticipated, the effect of MRT on recollective ratings was also examined.

The impact of emotion has not changed. Addedly, MRT had interactions with emotion. In positive events, it increased the visual details (b = .33, SE = .13, t (113) = 2.478, p = .015) and decreased the tactile details (b = -.39, SE = .015, t (113) = -2.619, p = .01). When temporal distance was controlled, the contribution of emotion has not changed. Only, positive memories became no longer more important than neutral ones (b = .26, SE = .14, t (113) = 1.851, p = .067) and negative emotion started to decrease the visual details (b = -.24, SE = .11, t (113) = -2.256, p =.026). The effect of MRT on visual details (b = .22, SE = .11, t (113) = 2.027, p =.045) and tactile details in positive events stayed intact (b = -.49, SE = .14, t (113) = -3.449, p <.001).

4. DISCUSSION

The present study explored the contribution of visual imagery and scene recall imagery skills and their performance-based measures (e.g., VVIQ and MRT) to the representation of emotional autobiographical memories. The findings showed that similar to the previous studies (St. Jacques and Levine 2007; Wardell et al. 2021), emotional memories were rich in detail and sense of recollection. The two components of the recollections, remembering the episodic details and the subjective sense of remembering (phenomenology), benefitted from different visual imagery skills. Also, the degree of involvement of these skills was different in negative, positive, and neutral events. Only positive emotion interacted with individual imagery skills for the memory details, but phenomenology was influenced by both negative and positive emotion. While the extent of the effects of MRT, SRIT, and VVIQ differed in the face of different types of emotion, the influence of object and spatial imagery did not change with emotion. As predicted, VVIQ, OSIQ - Object, and SRIT were influential on memory phenomenology, and only MRT, not SRIT or OSIQ - Spatial, positively related to memory details. SRIT partially confirmed the hypotheses by interacting with temporal distance for perceptual details and increasing these details. Contrarily, OSIQ - Spatial negatively influenced the details. These findings are discussed in detail in the following sections.

4.1 Memory Details

Regarding memory details, findings replicated the recent literature (St. Jacques and Levine 2007; Wardell et al. 2021). Although the total number of episodic details did not differ between emotional and neutral events, and the results failed to replicate the difference found for event details (Wardell et al. 2021). Both positive and negative memories were richer in emotion and thought details available in the narratives (St. Jacques and Levine 2007; Wardell et al. 2021). This finding implies that people

talk about their feelings and opinions more during an emotional event than during a neutral one. Another replicated pattern was that negative events had fewer place details (Wardell et al. 2021). As Wardell et al. (2021) discussed, fewer place details show that negative emotion has an impairing effect on peripheral and contextual details of a memory. This result also aligned with previous laboratory studies (Levine and Edelstein 2009). While some researchers think that it is due to the diminished attention toward peripheral details (Talmi et al. 2008), others suggest that it occurs due to decreased binding (Bisby and Burgess 2014). Since the reduced number of place details observed consistently both in the current and previous studies, it might be pointing out a robust phenomenon whose underlying mechanisms necessitate further investigations.

Regarding the impact of visual imagery, MRT was found to interact with emotion; in particular, it increased the internal details in positive events. OSIQ-Spatial, on the other hand, decreased the internal, event, and place details regardless of their valence. Finally, SRIT did not influence the details.

Why does spatial imagery reflect an opposite pattern with MRT for memory details? Since MRT and OSIQ - Spatial capture spatial skills, they were expected to display similar effects. Although similar to the previous studies (Aydin 2018; Rizza and Price 2012), in which they were correlated ($r = .13$), they displayed reverse effects on memory details. One point to consider is the nature of these scales. OSIQ Spatial is a subjective self-report; however, MRT is a performance task. Therefore, OSIQ - Spatial might be reflecting preferences rather than reliable and objective performance scores as MRT reflects. People with lower spatial abilities (lower scores in MRT) can think they have great imagery skills for spatial representations (higher scores in OSIQ - Spatial), or people with great spatial abilities might not prefer to imagine events spatially. Thus, these scales might capture two distinct but overlapping concepts. Future studies should consider the nature of these two tasks.

As a second question, why does MRT have a role in positive events only? The role of MRT in upholding memory details in positive events might indicate that spatial ability is influential for memory details. Still, it is not sufficient enough to compensate for the disruption of negative emotion. Rather it might be benefitting memory details when people are capable of remembering their memories freely. This interpretation is in line with the mood literature, suggesting that a positive mood increases cognitive flexibility (Baas, De Dreu, and Nijstad 2008). In a similar vein, individuals might feel more flexible when recollecting positive events, and at this point, these skills rely on mental flexibility and might get in charge. So, people with spatial skills (e.g., MRT) may benefit from this cognitive flexibility when construct-

ing positive events. Another explanation may come from the functional perspective since positive emotion tends to trigger memories that carry a social function (Harris, Rasmussen, and Berntsen 2014). Events with social functions are protected better than others regardless of the age of the people (Wolf and Zimprich 2015); they might have the advantage of being remembered in detail. Therefore, positive events might have benefited more from individual skills such as the spatial ability. Future research should examine the contribution of individual differences in visual imagery to functional memories to test this argument.

Considering the role of MRT on memory, two points should be clarified. First, this study assumes that higher MRT benefits memory performance during the retrieval of the events. People with better rotation skills might have a corresponding benefit in visually rotating the events when they are unfolding it, and it leads these individuals to have more detailed memories. However, in this assumption, it is not clear which part of the memories is affected by having better MRT skills. Does it only enhance the encoding in the first place, which leads to a better retrieval, or is this skill only recruited during retrieval? Future studies which examine the contribution of MRT to each phase of memory are needed to answer these questions. Following that, if the better memory of individuals with high MRT scores depends mostly on the encoding of the events, the executive function rather than MRT might have a role since executive function was related to the spatial ability (Miyake et al. 2001) and it predicts better working memory for the given input (McCabe et al. 2010). Thus, further research should also inspect the role of executive function in specifying the contribution of the visual imagery on memory details.

Lastly, why did SRIT not display any effect on memory details? Although the Scene Recall Imagery Test (SRIT) was expected to be related to memory details, expectations were partially confirmed. Even though it did not increase the number of memory details, SRIT was positively related to perceptual details regardless of temporal distance and emotion. People with low SRIT scores had a lower number of perceptual details for distant events, while people with high SRIT scores were not influenced by the passage of time. One possible explanation for why this scale was not related to memory details may again depend on the subjective nature of this scale. People might be bad at estimating their own skills as good as the objective measures. Future studies should include objective measures for scene construction, such as the scene construction experiential index (Hassabis and Maguire 2007), which was also found to be moderately correlated with internal details ($b = .36$, $p < .001$, Clark et al. 2019).

Overall, MRT, SRIT, and OSIQ - Spatial were recruited for memory construction.

Even though their influence was not sufficient enough to eliminate the adverse relationship between memory details and negative emotion, they relatively compensated for the impairing effects of temporal distance and emotion.

4.2 Sense of Recollection

Concerning the sense of recollection, in line with the literature, both positive and negative events were found to have higher recollection ratings, namely auditory details and importance. However, emotional memories differ from each other in the other ratings. While verbal details and intensity ratings were higher and vividness was lower in negative events, positive events had more odor-taste details than neutral events. Thus, positive events seem to be protected as images with a greater number of sensory details, while negative events tend to be preserved verbally. Since the verbal representation of emotional events decreases the emotional representation of this memory by lowering the amygdala activation (Lieberman et al. 2007), people might have been trying to lower the emotional activation of the negative memory in their mind.

When the effects of VVIQ, OSIQ - Object, and SRIT were considered, they all were positively associated with phenomenology. VVIQ and SRIT protected the sense of recollection when it was impaired due to emotion, and OSIQ - Object was only recruited when the temporal distance was controlled, and the emotion did not influence it.

There are two points to discuss. First, to what extent do VVIQ and SRIT protect phenomenology? After adding temporal distance as the control variable, vividness and visual details in negative events seem to decrease. This change might have occurred due to the emotion regulation strategies of individuals since when people suppress negative emotions, the phenomenology of memories, including visual details and feelings, starts to decrease (D'Argembeau and Van der Linden 2008). At this point, the impact of visual imagery skills was crucial. Indeed, the results showed that people with higher scores both in VVIQ and SRIT had more vivid negative events. These two skills also increased the visual details, which were lowered in negative events. Thus, one may argue that visual imagery skills were positively related to the visual information in negative events. Furthermore, VVIQ interacted with temporal distance for odor-taste and tactile details, which means having higher VVIQ scores increased the number of the odor-taste and tactile details for recent events but decreased these details in distant events. Therefore, protection of sensory

details with imagery skills is limited.

As the second question, why is OSIQ - Object not related to memory characteristics? The control of temporal distance demonstrated that OSIQ - Object started to predict reliving, auditory details, and mental time travel ratings, even though it did not predict them beforehand. This finding highlights that OSIQ - Object does not have a powerful effect, so it was obscured due to the variance stemming from the event time. Additionally, the effect of OSIQ - Object does not depend on emotion. Similar to OSIQ - Spatial, it is also a self-report scale that measures preferences. Accordingly, it might depict individuals' general tendencies, which is why its effect might not be protective against the influence of emotion since it does not interact with emotion. To summarize, visual and scene recall imagery skills are crucial for the recollective experience. They did protect the sense of recollection in the face of the adverse impact of negative emotion and the temporal distance. Although SRIT was resistant to the influence of temporal distance, VVIQ and OSIQ - Object were ineffective for the sense of recollections of distant events. Thus, the extent of their power to protect the sense of recollection was limited.

4.3 Applied Relevance

Despite tremendous progress in the laboratory studies which aim to clarify the power of emotion on memories, not an adequate number of studies investigate the role of emotion on personal memories. This study illuminates the characteristics of mildly emotional daily memories, which are more applicable to real-world situations. Importantly, such research establishes a critical standard for determining how emotional memories of neurotypicals differ from the memories of patients. Since the specificity of personal memories indicates greater mental health (Kleim and Ehlers 2008), understanding the mechanisms behind daily emotional events and especially considering the effect of visual and scene recall imagery is highly crucial for designing interventions that aim to increase the specificity of autobiographical memories. Several techniques are employed as interventions to increase memory specificity (Erten and Brown 2018; Madore, Gaesser, and Schacter 2014; Watkins 2009). However, the current research displays that improving spatial ability through MRT training which aims to reach a higher performance through enlarging the focused area during the encoding (Moen et al. 2020), may also increase memory specificity. It can also be a more practical and effective intervention for the prevention of mental disorders in neurotypical individuals.

Additionally, this study emphasizes the importance of investigating the individual differences in memory research for the applied practices. For instance, phenomenology findings showed that mental time travel and reliving ratings were not influenced by the emotion but only by individual skills (e.g., VVIQ, SRIT, and OSIQ - Object). So, the overall feeling of recollection might be only depending on the imagery skills of individuals rather than the emotion of the events. These feelings, rather than the emotion of events, might explain the extent to which the event itself influences people. Similarly, people with higher imagery skills remembered their negative events more vividly than others. Thus, these people with better visual imagery skills might be at a higher risk of developing psychological disorders after experiencing intensely negative events due to their highly preserved sense of recollections. All in all, understanding the role of individual differences in memory may facilitate the early detection of risk groups and the prevention of psychological disorders.

4.4 Limitations and Future Directions

This study has limited scope to provide a complete picture of the role of visual imagery and scene recall imagery on emotional memories for several reasons. Firstly, it is limited regarding the sample characteristics. The current results only reflect memory patterns in young adults. Since memory characteristics and details alter with age (Levine et al. 2002; St. Jacques and Levine 2007), future research should examine the role of these individual differences in the older population to obtain a comprehensive picture. Another limitation due to collecting memories from younger participants is that their memories mostly came from their childhood and adolescence since, on average, the age of the events occurred 7.5 years ago. Although the temporal distance of the events is controlled, it might still have been an important factor that changed the characteristics of memories. Moreover, in this study, cue words were preferred to elicit personal memories, which was common in autobiographical memory studies (e.g., Crovitz and Schiffman 1974; Gehrt et al. 2021; Rubin and Schulkind 1997) Even though the chosen cue words were reported to be equally arousing (Kapucu et al. 2021), the arousal of negative events was higher than positive and neutral events. Since the number of details and vividness of events were not related to arousal, I did not control its influence on memories despite its power to change the amount of memory details (Sheldon et al. 2020). However, future studies should develop better techniques than cue words to obtain similarly arousing memories.

4.5 Conclusion

The current study showed that recollection of emotional events differs in several aspects, and some components of these memories are contingent on visual and scene recall imagery skills. Although these skills are not powerful enough to proliferate the memory representations (e.g., details and sense of recollections) in the face of adverse effects of emotion and temporal distance, they are recruited to protect these memory components. These findings certainly showed that emotion is a fundamental feature that influences the memory recollections since positive and negative memories differ regarding their contents, despite the fact that emotion was not necessarily indicated as the inherent component of a memory (Beike 2007). To my knowledge, this is the first study that adopts an individual differences approach to investigate the role of emotion in memory. In this way, the current study provides an opportunity to clarify the underlying mechanisms behind emotional memories, which allude to visual and scene imagery.

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APPENDIX A

A.1 Onam Formu

Sayın katılımcı, Bu araştırmanın amacı bireylerin anı özelliklerini ve bireysel farklılıklar arasındaki ilişkiyi incelemektir. Sizi bu araştırmaya katılmaya davet etmek istememizin sebebi istenen yaş aralığında olmanızdır. Sizden, aşağıda listelediğimiz detayları dikkatlice okumanızı ve katılma kararınızı ona göre vermenizi rica ediyoruz.

Çalışma süresince sizde istenecekler:

Araştırmaya katılmaya karar verirseniz, sunacağımız kelimelerin size çağrıştırdığı kişisel olayları anımsamanızı ve bunları yazmanızı isteyeceğiz. Ardından, bu olaylar hakkında birtakım derecelendirmeler yapmanızı rica edeceğiz. En son olarak bireysel beceri ölçeklerini tamamlayarak çalışmayı bitirebileceksiniz. Tüm bu aşamalar yaklaşık olarak (ve en fazla) 1 saatinizi alacaktır. Bu araştırmaya katılmak tamamen isteğe bağlıdır. Katıldığınız takdirde çalışmanın herhangi bir aşamasında sebep göstermeden çalışmadan ayrılma hakkına sahipsiniz, bu durumun sizin açınızdan hiçbir yaptırımı olmayacaktır.

Katılım sonrası: Katılımınıza karşılık olarak SONA sisteminde belirlenmiş olan bonus puan miktarı istediğiniz derse aktarılacaktır, çalışmaya katılımınız için bir para ödülü olmayacaktır.

Gizlilik ilkesi:

Bu araştırma bilimsel bir amaçla yapılmaktadır, toplanan veriler bilimsel yayın amaçlı kullanılacaktır ve katılımcı bilgilerinin gizliliği esas tutulmaktadır. İncelemeler, bilimsel yayınlarda, kişi düzeyinde değil, katılımcı grubu düzeyinde rapor edilecektir. Bu olay anlatıları araştırmacı dışında her türlü erişime kapalı tutulacak; kesinlikle hiçbir yerde yayınlanmayacaktır. Bu araştırmada sizden kimliğinizi veya kurumunuzu belirtmeniz istenmemektedir. Toplanan veriler, çalışmayla ilgili ileride yapılacak herhangi bir araştırma için en az beş yıl boyunca güvenli bir ortamda saklanacaktır.

İletişim:

Bu araştırmanın yürütücüleri Çağla Aydın ve Ege Ötenen'dir. Çalışma hakkında sorularınız olursa otenenege@sabanciuniv.edu ve cagla.aydin@sabanciuniv.edu adresleri üzerinden kendilerine ulaşabilirsiniz. Eğer katılımcı olarak haklarınızla ilgili sorularınız olursa, Sabancı Üniversitesi Araştırma Etik Kurulu'na 0216-483 9099 no'lu telefondan ve Araştırma Etik Kurul'u başkanı Mehmet Yıldız'a mehmet.yildiz@sabanciuniv.edu adresinden ulaşabilirsiniz. İleri adıma geçmeniz katılımı kabul ettiğinizi gösterecektir.

APPENDIX B

B.0.1 Otobiyografik Anı Yönergeleri

"Bu bölümde birkaç kelime göreceksiniz. Bu kelimeler için, kelimenin size çağrıştırdığı bir anınızı (geçmiş olay) hatırlamanızı isteyeceğiz. Bu olayların yeri ve zamanının belli olması ve 24 saatten uzun sürmemiş olması gerekmektedir. Lütfen geçen hafta yaşadığınız olayları anlatmayınız. Hatırladığınız anının doğrudan verilen kelime ile ilgili olması gerekmez. Kelimenin aklınıza getirdiği ilk olayı yazmanız yeterlidir. Anıyı yazmak için kısıtlı süreniz olacaktır, ve süre dahilinde ilerlemediğiniz takdirde anket otomatik olarak ileriki sayfaya geçecektir. Daha sonra sizden bu olaylar hakkında birkaç değerlendirme yapmanızı isteyeceğiz."

"Lütfen ..... kelimesinin size anımsattığı (olumlu/olumsuz/...) spesifik bir anınızı anlatınız."

Kelimeler:

deniz, lunapark, mezarlık, hastane, koridor, dağ

B.0.2 Anı Karakteristiği Soruları (Rubin, Schrauf, Greenberg, 2003; Butler, Rice, Wooldridge, Rubin, 2016; Bernsten Rubin, 2006; Johnson, Foley, Suengas, Raye, 1988)

1. Bu olay zihnimde canlı bir şekilde beliriyor. *(1: Oldukça belirsiz, 7: Tüm detaylarıyla beliriyor; çok canlı)*
2. Olayı yeniden yaşıyormuş gibi hissettim. *(1: Kesinlikle katılmıyorum, 7: Kesinlikle katılıyorum)*
3. Bu olaya dair hatırladıklarım görsel detaylar içeriyor. *(1: Hiç içermiyor, 7: Oldukça fazla içeriyor)*
4. Bu olaya dair hatırladıklarım ses ve benzeri işitsel detaylar içeriyor. *(1: Hiç içermiyor, 7: Oldukça fazla içeriyor)*

5. Bu olaya dair hatırladıklarım koku ve tat türü detaylar içeriyor. *(1: Hiç içermiyor, 7: Oldukça fazla içeriyor)*
6. Bu olaya dair hatırladıklarım dokunma hissi ile ilgili detaylar içeriyor (örn., sıcaklık, acı, fiziksel temas). *(1: Hiç içermiyor, 7: Oldukça fazla içeriyor)*
7. Olayı görsel imgelerden çok, sözler ve kelimeler olarak hatırlıyorum. *(1: Kesinlikle katılmıyorum, 7: Kesinlikle katılıyorum)*
8. Bu olayı aklıma getirmek benim için çok zor oldu. *(1: Kesinlikle katılmıyorum, 7:Kesinlikle katılıyorum)*
9. Bu anıyı hatırlamak olayı yaşadığım zamana geri gitmiş gibi hissettirdi. *(1: Kesinlikle katılmıyorum, 7: Kesinlikle katılıyorum)*
10. Bu olay sizin için ne ölçüde olumlu duygular içeriyor? *(1: Hiç, 7: Oldukça fazla miktarda)*
11. Bu olay sizin için ne ölçüde olumsuz duygular içeriyor? *(1: Hiç, 7: Oldukça fazla miktarda)*
12. Bu olayı hatırlarken hissettiklerim: *(1: Hiç yoğun değil, 7: Çok yoğun)*
13. Bu olay sizin için kişisel olarak ne kadar önemlidir? *(1: Hiç önemli değil, 7: Oldukça önemli)*
14. Bu olayı daha önce başkalarına anlattınız mı? *(1: Hiç anlatmadım, 7: Sıklıkla paylaştım)*
15. Bu olay ne kadar zaman önce gerçekleşti? Lütfen sayı cinsinden kaç ay önce gerçekleştiğini belirtiniz.
16. Bu olayı hatırlarken o andaki gibi kendi gözümden, içeriden bir perspektifle görüyorum. *(1: Kesinlikle hayır, 7: Tamamen)*
17. Bu olayı hatırlarken, olayı dışarıdan bir gözlemci gözüyle görüyorum. *(1: Kesinlikle hayır, 7: Tamamen)*

B.0.3 Sahne Hatırlama İmgelemi Testi (SRIT; Rubin, 2020)

Tüm sorular 7'li ölçekte yanıtlanacaktır.
1- *(Perspective)* Olayı hatırlarken, hatırladığım her nesneye/kişiye göre nerede durduğumu ayrı ayrı belirleyebiliyorum.
2- *(Content)* Olayı hatırlarken, neyin nerede olduğunu tam olarak hatırlayamasam bile, anının içinde yer alan eylemleri, nesneleri ve insanları belirleyebiliyorum.
3- *(Scene-Layout)* Olayı hatırlarken, olayın merkezindeki eylemlerin, nesnelerin ve insanların nerede bulunduğunu söyleyebiliyorum.
4- *(Content)* Olayı hatırlarken, olayın gerçekleştiği ortamı tam olarak tarif edemesem bile ortamı tanımlayabiliyor veya adlandırabiliyorum.

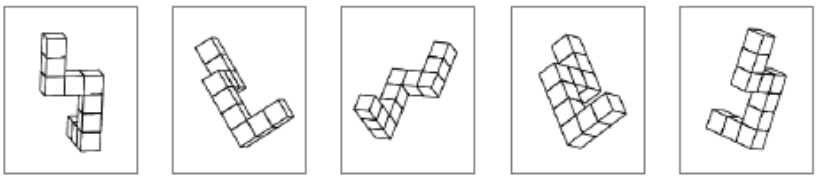
5- *(Scene-Layout)* Olayı hatırlarken, olayın gerçekleştiği ortamın arka planını, tarif edebiliyorum.
6- *(Perspective)* Olayı hatırlarken, olayı kendi gözümden görür gibi hatırlayabiliyorum.

B.0.4 Mental Rotasyon Testi (MRT; Peters et al., 1995, originally by Vanderberg Kuse, 1978)

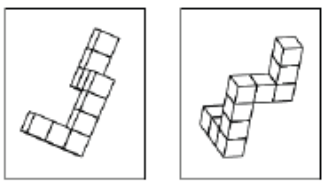
Katılımcı Kodu _____

MENTAL ROTASYON TESTİ

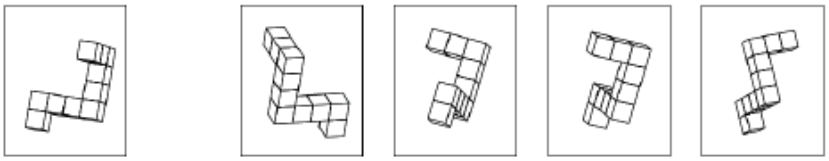
Bu ölçek, bir nesne çizimine bakarak, o nesneyi farklı nesnelerin bulunduğu bir kümenin içinden bulma becerinizi test etmektedir. Verilen nesne ile seçilecek nesnenin arasındaki tek fark; değişik açılardan yansıtılmış olmasıdır.



Şimdi aşağıdaki iki şekli inceleyiniz ve bunların yukarıdaki beş şekilden farklı nesneler olduklarını anlamaya çalışınız. Bu iki şeklin yukarıdakilere benzeyecek şekilde döndürülemeyeceğinden emin olunuz.



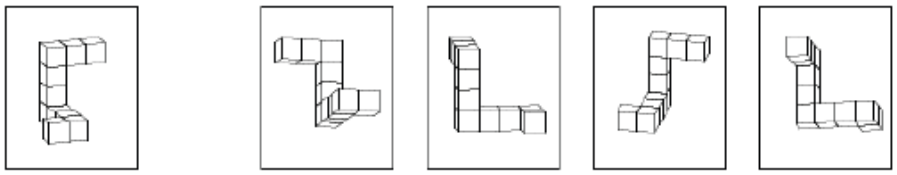
Şimdi sıradaki nesneye bakınız. (Aşağıda en soldaki). Yanındaki dört nesneden iki tanesi soldaki nesne ile aynı. Bunları bulabilir misiniz? Üstlerine iki tane çarpı işareti koyarak işaretleyiniz.



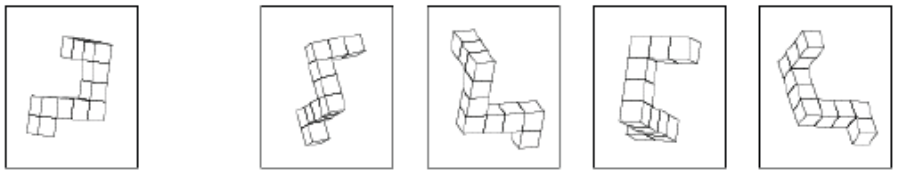
Eğer birinci ve üçüncü nesneleri seçtiyseniz, doğru işaretlediniz.

Aşağıda iki tane daha örnek göreceksiniz. Sizden istenen sağdaki dört nesneden, en soldaki nesne ile aynı olan iki taneyi bulmanızdır. Her seferinde, tüm örnekler için, dört nesnenin sadece iki tanesi soldaki nesne ile aynıdır. Doğru olduğunu düşündüğünüz nesnelerin üzerine X koymanız, yanlış olan nesneleri boş bırakmanız gerekmektedir.

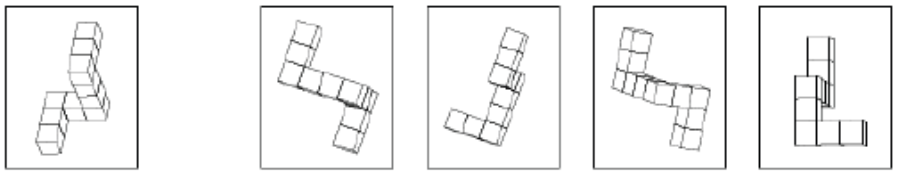
2.a



3.a



4.a

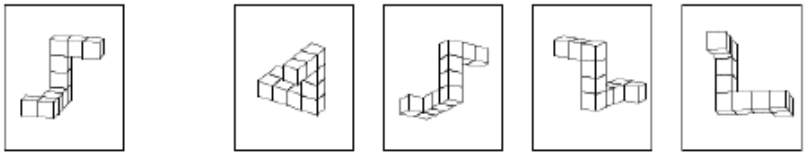


Buradaki yanıtlar 2: ikinci ve üçüncü
3: birinci ve dördüncü
4: birinci ve üçüncü

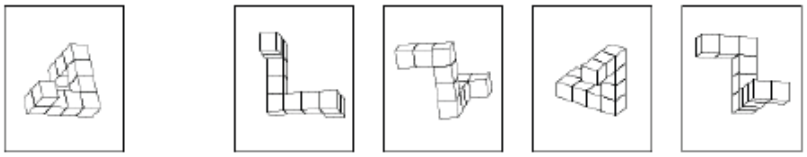
Her zaman iki ve sadece iki cevap olduğunu hatırlayınız. Şimdi teste geçebilirsiniz.

3

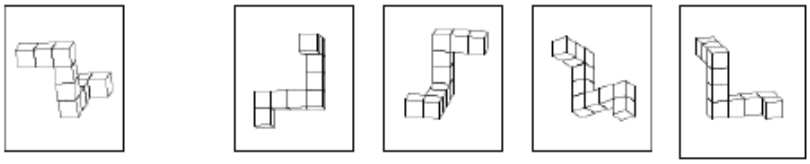
1.a



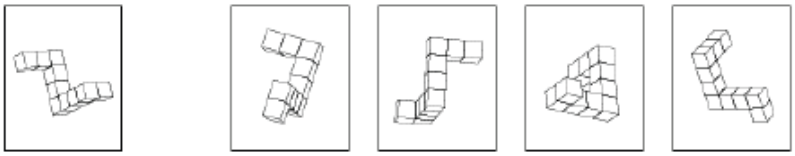
2.a



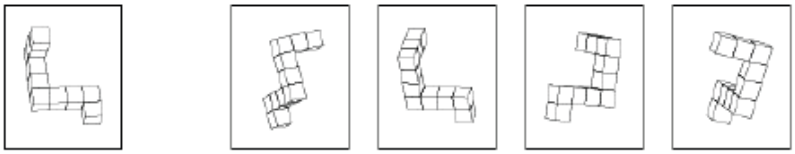
3.a



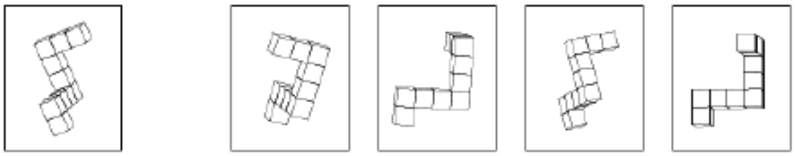
4.a



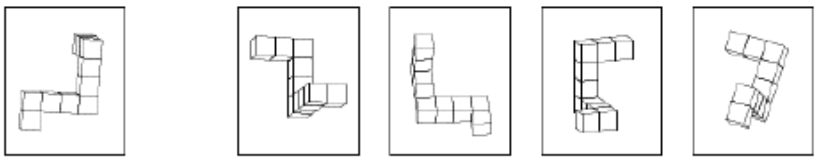
5.a



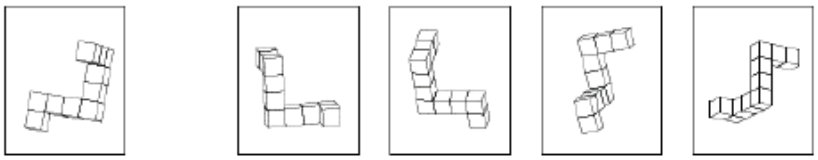
6.a



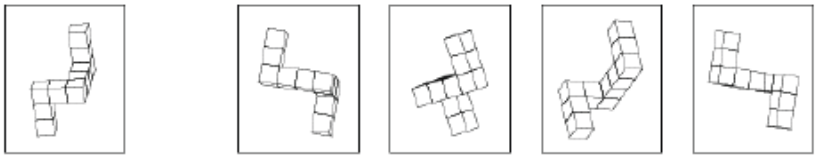
7.a



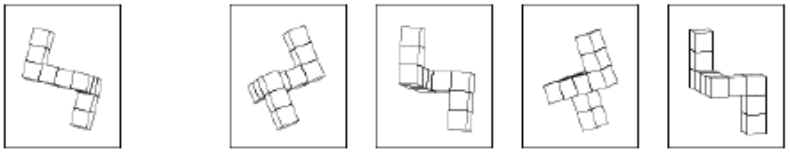
8.a



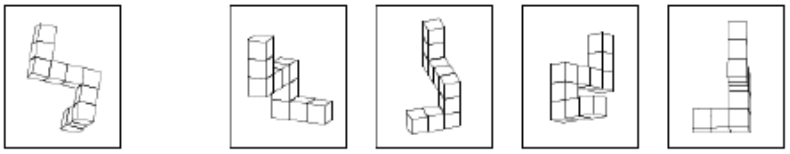
9.a



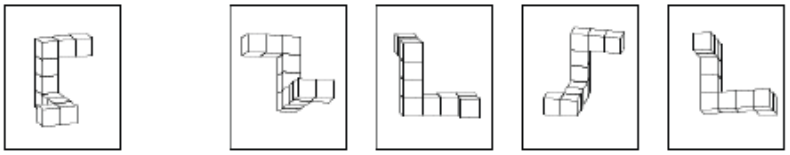
10.a



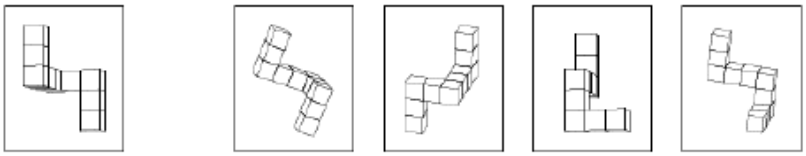
11.a



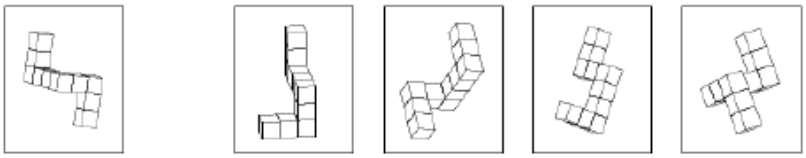
12.a



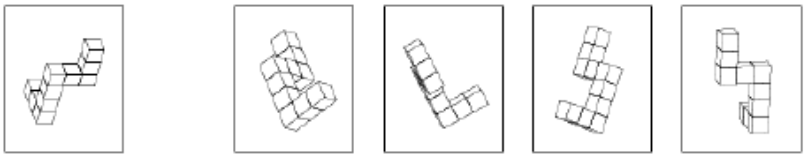
13.a



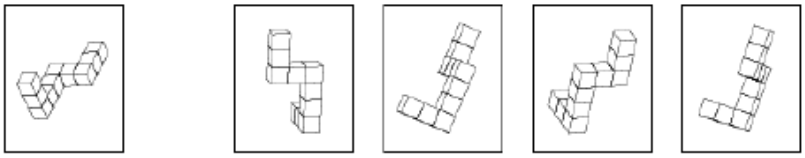
14.a



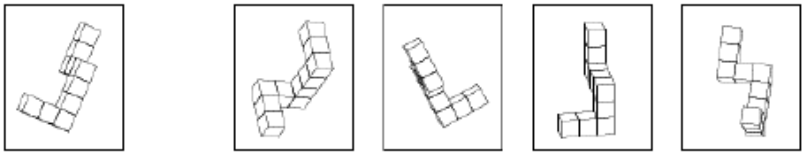
15.a



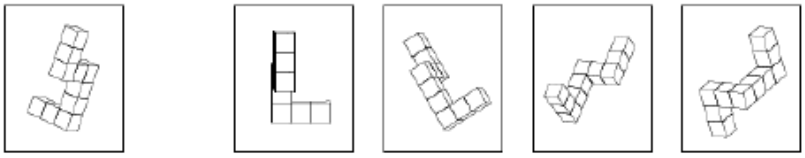
16.a

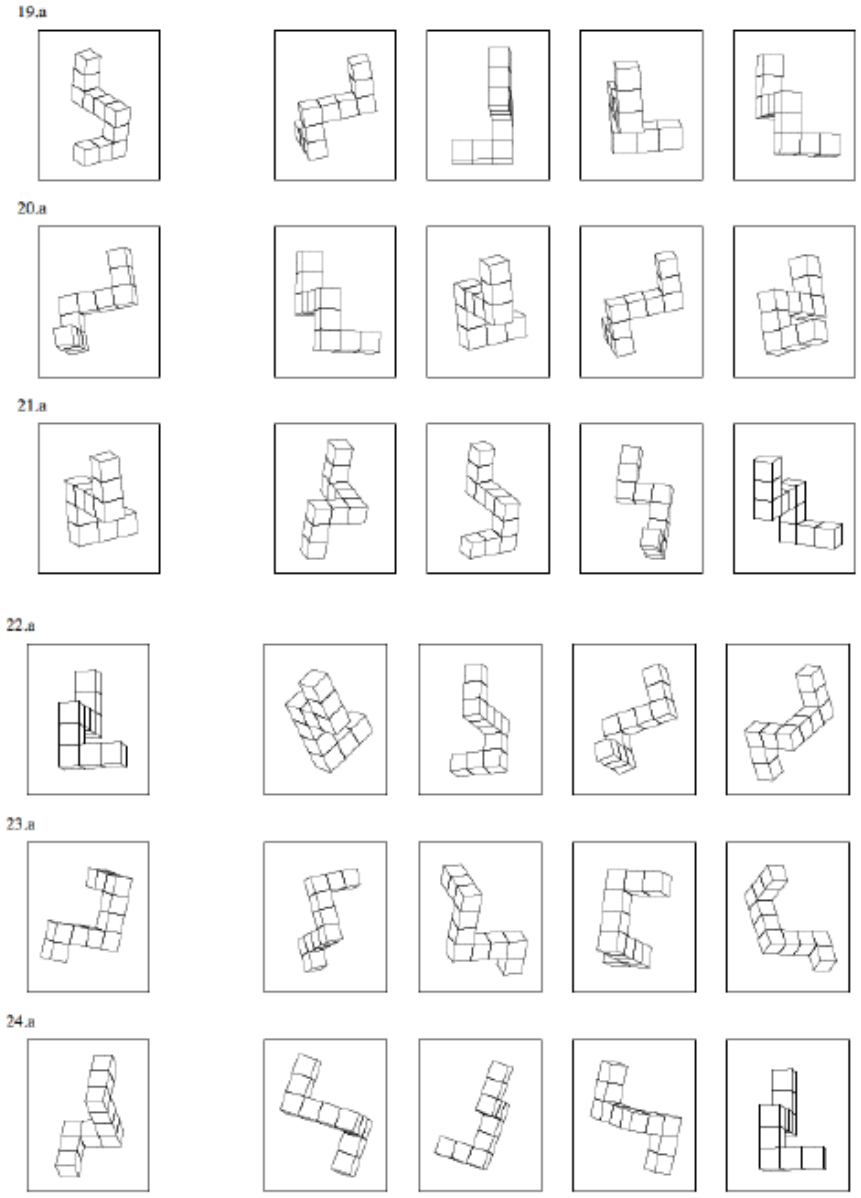


17.a



18.a





B.0.5 Görsel İmgelemin Canlılığı Anketi (VVIQ; Marks, 1973)

Lütfen aşağıdaki 16 madde hakkında zihninizdeki görsel imgelerin canlılığını 1 ile 5 arasında derecelendiriniz. Derecelendirme sonucunu her ifadenin yanında yer alan boşluğa yazınız.

Derecelendirme ölçeği aşağıdaki gibidir:
5 = Şu anda izliyormuş kadar mükemmel bir netlik ve canlılık
4 = Net ve oldukça canlı
3 = Kısmen net ve canlı
2 = Belirsiz ve donuk
1 = Herhangi bir görüntü yok, yalnızca objenin hayal edildiği biliniyor

1-4 arası maddeler için sık gördüğünüz bir arkadaşınızı ve akrabanızı düşünün (bu kişi şu an yanınızda olan biri olmamalı) ve gözünüzün önüne gelen görüntüyü değerlendirin.
1. Yüz, baş, omuz ve vücudun tam hatları _____
2. Başın karakteristik pozisyonu, vücudun duruşu, vb. _____
3. Duruş, adım mesafesi, yürüme stili vb. ayrıntılar _____
4. Giydiğini bildiğiniz kıyafetlerin içindeki renklerin canlılığı _____

5-8 arası madddeler için doğup yükselmekte olan güneşi gözünüzde canlandırın ve gözünüzün önüne gelen görüntüyü dikkatle değerlendirin.
5. Güneş, ufukta puslu gökyüzüne doğru yükseliyor. _____
6. Gökyüzü aydınlanıyor ve ile güneşi mavilik ile çevreliyor. _____
7. Bulutlar var. Fırtına kopuyor ve şimşekler çakıyor. _____
8. Bir gökkuşağı beliriyor. _____

9-12 arası maddeler için genellikle gittiğiniz bir dükkanın önünü düşünün ve gözünüzün önüne gelen görüntüyü dikkatle değerlendirin.
9. Dükkanının karşı caddeden genel görüntüsü _____
10. Vitrin düzenlemesi; satılık her bir ürünün rengi, şekli ve detayı _____
11. Dükkan girişinin yanındasınız. Kapının rengi, şekli ve detayı _____
12. Dükkana girdiniz ve tezgaha yönlendiniz. Tezgahtar size yardımcı oluyor ve para alışverişi gerçekleşiyor. _____

Son olarak, 13-16 arası maddeler için ağaçların, dağların ve gölün bulunduğu bir kırsal sahne ve gözünüzün önüne gelen görüntüyü dikkatle değerlendirin.
13. Manzaranın hatları, sınırları _____
14. Ağaçların rengi ve şekli _____
15. Gölün rengi ve şekli _____
16. Ağaçların ve gölün üzerinden güçlü bir rüzgar esiyor. Esen rüzgar gölde

dalgalara neden oluyor. _____

B.0.6 Görsel İmgelem Anketi (OSIQ; Blazhenkova et al., 2006)

Bu anket bireylerin görsel imgelemlerini ya da sözel temsilleri kullanma tercihleri hakkındadır. Zihinsel imaj yaratımı bir şeyleri(özellikle görsel objeleri) doğrudan algılama yerine hafıza ve hayalgücü yardımı ile beyinde resmetme yeteneğidir. Soruların doğru ya da yanlış yanıtları yoktur; lütfen olabildiğinde dürüst yanıtlamaya çalışın. Anketteki tüm soruları cevaplamanız oldukça önemlidir. Bu anketi tamamlamak için, lütfen aşağıdaki önermeleri okuyarak, onları 1 ile 5 arasında değerlendiriniz Değerlendirirken, "5" puanı size kesinlikle uyduğunu düşündüğünüz önermeleri belirtmede, "1"puanı size kesinlikle uymayan önermeleri değerlendirmede kullanınız.

__ 1- Kesinlikle katılmıyorum
__ 5- Tamamen katılıyorum

1. 3 boyutlu şekilleri çözmede oldukça iyiyimdir.
2. Eğer mühendislik ve görsel sanatlar arasında seçim yapmam gerekse, meslek olarak mühendisliği seçerdim.
3. Mimarlık ilgimi resimden daha çok çeker.
4. Aklımdaki canlandırmalar (zihinsel imajlar) oldukça parlak ve renklidir.
5. Aklımdaki resimlerim (canlandırmalarım) daha çok detaylı betimlemeler yerine objelerin ve olayların şematik yansıtılması şeklindedir.
6. Bir romanı okurken, romanda geçen sahneyi veya odayı kafamda genellikle açık ve detaylı şekilde biçimlendiririm.
7. Eğer mühendislik ve görsel sanatlar arasında tercih yapmak durumunda kalsam, meslek olarak güzel sanatları seçerdim.
8. Fotoğrafik bir hafızaya sahibim.
9. Üç boyutlu cisimlerin döndürülmesini kolaylıkla gözümde canlandırabilirim.
10. Modern sanattaki gibi parlak ve renkli resimlerden ve alışılagelmemiş şekillerden hoşlanırım.
11. Soyut bir konsept veya bina üzerine düşünürken,onu somut ve belirgin olarak oluşturmak yerine, kafamda onun şematik bir halini veya detaylı planını kurgularım.
12. Daha önce girdiğim bir dükkana belirli bir ürün almak için gittiğimde, almak istediğim ürünün net yerini, durduğu rafı, etrafındakileri ve nasıl düzenlendiklerini kolayca resmedebilirim.

13. Kafamdaki resimler(canlandırmalar) güçlü ve fotoğraf gibidir.
14. Farklı objelerin zihnimdeki halleri, daha önce gördüklerimin gerçek boyları, şekilleri ve renkleri ile oldukça benzeşir.
15. Bir ders kitabı okurken, genellikle okuduklarımdan şemalar çıkartmaya veya onları gözümde canlandırmaya çalışmam.
16. Normalde zihinsel şekilledirmeleri(canlandırmaları) pek kullanmamama rağmen, onları matematikteki gibi problemleri çözmeye çalıştığımda kullanırım.
17. Bir arkadaşımın yüzünü hayal ettiğimde, gözümde oldukça net ve parlak bir görüntü canlanır.
18. Teknik resimde kusursuz bir yeteneğe sahibim.
19. Kimsenin farketmediği görsel bir detayı kolaylıkla hatırlayabilirim. Örneğin, bazı şeyleri direk hafızama alırım;birinin giydiği t-shört'ün rengi, birinin giydiği ayakkabının rengi gibi.
20. Daha önce gördüğüm bir binanın ayrıntılı tasarımını kolayca çizebilirim.
21. Okul yıllarımda, geometri ile hiç problem yaşamadım.
22. Lego, origami, tetris gibi blok veya kağıt inşaa etmeyi içeren uzlamsal (üç boyutlu) oyunlarda iyiyimdir.
23. Bazen kafamdaki resimler o kadar net ve sürekli oluyorki onları görmezden gelmekte zorlanıyorum.
24. Gözlerimi kapatıp daha önce yaşadığım bir anı kolayca resmedebilirim.
25. Kafamdaki resimler renkli resimsel betimlemelere göre daha şematik kalır.
26. Her şeyi görsel olarak hatırlarım. Muhtemelen birinin yemekte ne giydiği, nasıl oturdukları, nasıl göründükleri hakkında ne konuştuklarından daha fazla detay verebilirim.
27. Üç boyutlu bir cismi döndürdüğünde, tam olarak nasıl gözüktüğünü bulmayı "zor" olarak nitelendiririm.
28. Görsel şekillendirmelerim(canlandırmalarım) her zaman kafamda bir yerdedir. Hemen oradadır.
29. Benim mimari yeteneğim mimarlıkta diğer bölümlere göre daha kolay kariyer edinmemi sağlar.
30. Gerçekten görmediğim bir radyocunun veya DJ'nin sesini duyduğumda kendimi onun nasıl göründüğünü hayal ederken bulurum.

B.0.7 Demografik Bilgi Soruları

1-Annenizin adının ilk üç harfi ve doğum ayınızdan oluşacak şekilde bir kod oluşturunuz. (Örnek: ABC01)

2-Doğum tarihiniz nedir? (Örnek: gg/aa/yy)
3-Biyolojik cinsiyetinizi belirtiniz:
(Kadın, Erkek, Interseks, Belirtmek istemiyorum)
4-Cinsiyet beyanınız:
(Kadın, Erkek, Interseks, Non-binary(ikili cinsiyet dışı), genderfluid(akışkan cinsiyetli), Diğer)

APPENDIX C

C.1 Summary Results

C.1.1 Memory Details

Model	Predictor	Internal	Event	Perceptual	Place	Emotion-thought
Model 1	EMOTION			P ↓ (p =.064)	↓N	N & P ↑
Model 2	EMOTION*MRT	P ↑	P ↑	P ↑	P ↑ (p = .058)	
	EMOTION*SPATIAL					
	EMOTION			↓N (p = .056)	↓N	N & P ↑
	MRT					
	SPATIAL	↓	↓	↓		
Model 3	EMOTION*MRT	P ↑	P ↑ (p = .052)		P ↑ (p = .053)	
	EMOTION*SPATIAL					
	EMOTION				↓N	N & P ↑
	MRT	↑ (p = .057)				
	SPATIAL	↓	↓	↓		
	TEMP. DIS.	↓				↓
	TEMP. DIS.*SRIT			↑		

Model	Predictor	Internal	Event	Perceptual	Place	Emotion-thought
Model 1	EMOTION			P ↓ (p =.064)	↓N	N & P ↑
Model 8	EMOTION*MRT	P ↑		P ↑		
	EMOTION				↓N	N & P ↑
	MRT					
Model 9	EMOTION*MRT			P ↑		
	EMOTION			P↓	↓N	N & P ↑
	MRT					
	TEMP. DIS.	↓				↓
	TEMP. DIS.*MRT					

C.1.2 Phenomenology

Model	Predictor	Reliving	Vividness	Visual	Auditory	Odor-taste	Verbal	Tactile	MTT	Intensity	Importance
Model 1	EMOTION		N↓		N & P ↑	P ↑	N ↑			N ↑	N & P ↑
Model 4	EMOTION		N↓		N & P ↑	P ↑	N ↑			N ↑	N & P ↑
	VVIQ	↑		↑		↑					
	OBJECT	↑ (p = .054)						↑ (p = .052)			
	EMOTION*VVIQ		N↑	P↓ (p = .057)					P↓		
	EMOTION*OBJECT										
Model 5	EMOTION		N↓	N↓	N & P ↑	P ↑	N ↑			N ↑	N ↑
	VVIQ	↑		↑		↑ (p = .052)					
	OBJECT	↑			↑			↑ (p = .053)	↑		
	EMOTION*VVIQ		N↑						P↓		
	EMOTION*OBJECT										
	TEMP. DIS.*VVIQ					↓		↓			
	TEMP. DIS.*OBJECT										
	TEMP. DIS.	↓	↓	↓	↓	↓		↓	↓	↓	↓ (p = .053)

Model	Predictor	Reliving	Vividness	Visual	Auditory	Odor-taste	Verbal	Tactile	MTT	Intensity	Importance
Model 1	EMOTION		N↓		N & P ↑	P ↑	N ↑			N ↑	N & P ↑
Model 6	EMOTION		N↓		N & P ↑	P ↑	N ↑			N ↑	N & P ↑
	SRIT	↑		↑	↑	↑ (p = .054)	↑	↑	↑	↑	↑
	EMOTION*SRIT		N↑								
Model 7	EMOTION		N↓	N↓	N & P ↑	P ↑	N ↑			N↑	N ↑
	SRIT	↑		↑	↑	↑	↑	↑	↑	↑	↑
	EMOTION*SRIT		N↑								
	TEMP. DIS.*SRIT		↑	↑							
	TEMP. DIS.	↓	↓	↓	↓	↓		↓	↓	↓	↓

Model	Predictor	Reliving	Vividness	Visual	Auditory	Odor-taste	Verbal	Tactile	MTT	Intensity	Importance
Model 1	EMOTION		N↓		N & P ↑	*P ↑*	N ↑			N ↑	N & P ↑
Model 8	EMOTION		N↓		N & P ↑	P ↑	N ↑			N ↑	N & P ↑
	MRT										
	EMOTION*MRT			P ↑				P↓			
Model 9	EMOTION		N↓	N↓	N & P ↑	P ↑	N ↑			N ↑	N ↑
	MRT										
	EMOTION*MRT			P ↑				P ↓			
	TEMP. DIS.*MRT										
	TEMP. DIS.	↓	↓	↓	↓	↓		↓	↓	↓	↓

APPENDIX D

D.1 Conceptual Models

	Predictors								Dependent Variables	
	Level 1			**Level 2**						
	Negative Emotion	Positive Emotion	Temporal Distance	MRT	SRIT	OSIQ - Spatial	OSIQ - Object	VVIQ	Memory Details	Sense of Recollections
Model 1	✓	✓							✓	✓
Model 2	✓	✓		✓	✓	✓			✓	
Model 3	✓	✓	✓	✓	✓	✓			✓	
Model 4	✓	✓					✓	✓		✓
Model 5	✓	✓	✓				✓	✓		✓
Model 6	✓	✓			✓				✓	✓
Model 7	✓	✓	✓		✓				✓	✓
Model 8	✓	✓							✓	✓
Model 9	✓	✓	✓	✓					✓	✓

D.2 All Analyses Models

Model 1

$$\text{Internal Detailsl}_{mj} = \gamma_{00} + \gamma_{10} * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Event Details}_{mj} = \gamma_{00} + \gamma_{10} * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Place Details}_{mj} = \gamma_{00} + \gamma_{10} * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Emotion-thought Details}_{mj} = \gamma_{00} + \gamma_{10} * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Perceptual Details}_{mj} = \gamma_{00} + \gamma_{10} * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Vividness}_{mj} = \gamma_{00} + \gamma_{10} * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Reliving}_{mj} = \gamma_{00} + \gamma_{10} * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Intensity}_{mj} = \gamma_{00} + \gamma_{10} * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Importance}_{mj} = \gamma_{00} + \gamma_{10} * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Mental Time Travels}_{mj} = \gamma_{00} + \gamma_{10} * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

Visual Details$_{mj} = \gamma_{00} + \gamma_{10} * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$

Auditory Details$_{mj} = \gamma_{00} + \gamma_{10} * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$

Odort-taste Details$_{mj} = \gamma_{00} + \gamma_{10} * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$

Tactile Details$_{mj} = \gamma_{00} + \gamma_{10} * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$

Verbal Details$_{mj} = \gamma_{00} + \gamma_{10} * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$

Model 2

Internal Details$_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{02} * SRIT_j + \gamma_{03} * SPATIAL_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * MRT_j * NEGATIVE_{mj} + \gamma_{12} * SRIT_j * NEGATIVE_{mj} + \gamma_{13} * SPATIAL_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * MRT_j * POSITIVE_{mj} + \gamma_{22} * SRIT_j * POSITIVE_{mj} + \gamma 23 * SPATIAL_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$

Event Details$_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{02} * SRIT_j + \gamma_{03} * SPATIAL_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * MRT_j * NEGATIVE_{mj} + \gamma_{12} * SRIT_j *$

$NEGATIVE_{mj} + \gamma_{13} * SPATIAL_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * MRT_j * POSITIVE_{mj} + \gamma_{22} * SRIT_j * POSITIVE_{mj} + \gamma 23 * SPATIAL_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$

Place Details$_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{02} * SRIT_j + \gamma_{03} * SPATIAL_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * MRT_j * NEGATIVE_{mj} + \gamma_{12} * SRIT_j * NEGATIVE_{mj} + \gamma_{13} * SPATIAL_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * MRT_j * POSITIVE_{mj} + \gamma_{22} * SRIT_j * POSITIVE_{mj} + \gamma 23 * SPATIAL_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$

Perceptual Details$_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{02} * SRIT_j + \gamma_{03} * SPATIAL_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * MRT_j * NEGATIVE_{mj} + \gamma_{12} * SRIT_j * NEGATIVE_{mj} + \gamma_{13} * SPATIAL_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * MRT_j * POSITIVE_{mj} + \gamma_{22} * SRIT_j * POSITIVE_{mj} + \gamma 23 * SPATIAL_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$

Emotion-thought Details$_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{02} * SRIT_j + \gamma_{03} * SPATIAL_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * MRT_j * NEGATIVE_{mj} + \gamma_{12} * SRIT_j * NEGATIVE_{mj} + \gamma_{13} * SPATIAL_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * MRT_j * POSITIVE_{mj} + \gamma_{22} * SRIT_j * POSITIVE_{mj} + \gamma 23 * SPATIAL_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$

Model 3

Internal Details$_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{02} * SRIT_j + \gamma_{03} * SPATIAL_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * MRT_j * TIME_{mj} + \gamma_{12} * SRIT_j * TIME_{mj} + \gamma_{13} * SPATIAL_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * MRT_j * NEGATIVE_{mj} + \gamma_{22} * SRIT_j * NEGATIVE_{mj} + \gamma 23 * SPATIAL_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * MRT_j * POSITIVE_{mj} + \gamma_{32} * SRIT_j * POSITIVE_{mj} + \gamma 33 * SPATIAL_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$

$$\text{Event Details}_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{02} * SRIT_j + \gamma_{03} * SPATIAL_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * MRT_j * TIME_{mj} + \gamma_{12} * SRIT_j * TIME_{mj} + \gamma_{13} * SPATIAL_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * MRT_j * NEGATIVE_{mj} + \gamma_{22} * SRIT_j * NEGATIVE_{mj} + \gamma 23 * SPATIAL_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * MRT_j * POSITIVE_{mj} + \gamma_{32} * SRIT_j * POSITIVE_{mj} + \gamma 33 * SPATIAL_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Place Details}_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{02} * SRIT_j + \gamma_{03} * SPATIAL_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * MRT_j * TIME_{mj} + \gamma_{12} * SRIT_j * TIME_{mj} + \gamma_{13} * SPATIAL_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * MRT_j * NEGATIVE_{mj} + \gamma_{22} * SRIT_j * NEGATIVE_{mj} + \gamma 23 * SPATIAL_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * MRT_j * POSITIVE_{mj} + \gamma_{32} * SRIT_j * POSITIVE_{mj} + \gamma 33 * SPATIAL_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Perceptual Details}_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{02} * SRIT_j + \gamma_{03} * SPATIAL_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * MRT_j * TIME_{mj} + \gamma_{12} * SRIT_j * TIME_{mj} + \gamma_{13} * SPATIAL_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * MRT_j * NEGATIVE_{mj} + \gamma_{22} * SRIT_j * NEGATIVE_{mj} + \gamma 23 * SPATIAL_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * MRT_j * POSITIVE_{mj} + \gamma_{32} * SRIT_j * POSITIVE_{mj} + \gamma 33 * SPATIAL_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Emotion-thought Details}_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{02} * SRIT_j + \gamma_{03} * SPATIAL_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * MRT_j * TIME_{mj} + \gamma_{12} * SRIT_j * TIME_{mj} + \gamma_{13} * SPATIAL_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * MRT_j * NEGATIVE_{mj} + \gamma_{22} * SRIT_j * NEGATIVE_{mj} + \gamma 23 * SPATIAL_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * MRT_j * POSITIVE_{mj} + \gamma_{32} * SRIT_j * POSITIVE_{mj} + \gamma 33 * SPATIAL_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

Model 4

$$\text{Vividness}_{mj} = \gamma_{00} + \gamma_{01} * VVIQ_j + \gamma_{02} * OBJECT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * VVIQ_j * NEGATIVE_{mj} + \gamma_{12} * OBJECT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * VVIQ_j * POSITIVE_{mj} + \gamma_{22} * OBJECT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Reliving}_{mj} = \gamma_{00} + \gamma_{01} * VVIQ_j + \gamma_{02} * OBJECT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * VVIQ_j * NEGATIVE_{mj} + \gamma_{12} * OBJECT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * VVIQ_j * POSITIVE_{mj} + \gamma_{22} * OBJECT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Intensity}_{mj} = \gamma_{00} + \gamma_{01} * VVIQ_j + \gamma_{02} * OBJECT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * VVIQ_j * NEGATIVE_{mj} + \gamma_{12} * OBJECT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * VVIQ_j * POSITIVE_{mj} + \gamma_{22} * OBJECT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Importance}_{mj} = \gamma_{00} + \gamma_{01} * VVIQ_j + \gamma_{02} * OBJECT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * VVIQ_j * NEGATIVE_{mj} + \gamma_{12} * OBJECT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * VVIQ_j * POSITIVE_{mj} + \gamma_{22} * OBJECT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Mental Time Travel}_{mj} = \gamma_{00} + \gamma_{01} * VVIQ_j + \gamma_{02} * OBJECT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * VVIQ_j * NEGATIVE_{mj} + \gamma_{12} * OBJECT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * VVIQ_j * POSITIVE_{mj} + \gamma_{22} * OBJECT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Visual Details}_{mj} = \gamma_{00} + \gamma_{01} * VVIQ_j + \gamma_{02} * OBJECT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * VVIQ_j * NEGATIVE_{mj} + \gamma_{12} * OBJECT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * VVIQ_j * POSITIVE_{mj} + \gamma_{22} * OBJECT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Auditory Details}_{mj} = \gamma_{00} + \gamma_{01} * VVIQ_j + \gamma_{02} * OBJECT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * VVIQ_j * NEGATIVE_{mj} + \gamma_{12} * OBJECT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * VVIQ_j * POSITIVE_{mj} + \gamma_{22} * OBJECT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Odor-taste Details}_{mj} = \gamma_{00} + \gamma_{01} * VVIQ_j + \gamma_{02} * OBJECT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * VVIQ_j * NEGATIVE_{mj} + \gamma_{12} * OBJECT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * VVIQ_j * POSITIVE_{mj} + \gamma_{22} * OBJECT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Tactile Details}_{mj} = \gamma_{00} + \gamma_{01} * VVIQ_j + \gamma_{02} * OBJECT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * VVIQ_j * NEGATIVE_{mj} + \gamma_{12} * OBJECT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * VVIQ_j * POSITIVE_{mj} + \gamma_{22} * OBJECT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Verbal Details}_{mj} = \gamma_{00} + \gamma_{01} * VVIQ_j + \gamma_{02} * OBJECT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * VVIQ_j * NEGATIVE_{mj} + \gamma_{12} * OBJECT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * VVIQ_j * POSITIVE_{mj} + \gamma_{22} * OBJECT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

Model 5

$$\text{Vividness}_{mj} = \gamma_{00} + \gamma_{01} * VVIQ_j + \gamma_{02} * OBJECT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * VVIQ_j * TIME_{mj} + \gamma_{12} * OBJECT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * VVIQ_j * NEGATIVE_{mj} + \gamma_{22} * OBJECT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * VVIQ_j * POSITIVE_{mj} + \gamma_{32} * OBJECT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Reliving}_{mj} = \gamma_{00} + \gamma_{01} * VVIQ_j + \gamma_{02} * OBJECT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * VVIQ_j * TIME_{mj} + \gamma_{12} * OBJECT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * VVIQ_j * NEGATIVE_{mj} + \gamma_{22} * OBJECT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * VVIQ_j * POSITIVE_{mj} + \gamma_{32} * OBJECT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Intensity}_{mj} = \gamma_{00} + \gamma_{01} * VVIQ_j + \gamma_{02} * OBJECT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * VVIQ_j * TIME_{mj} + \gamma_{12} * OBJECT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * VVIQ_j * NEGATIVE_{mj} + \gamma_{22} * OBJECT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * VVIQ_j * POSITIVE_{mj} + \gamma_{32} * OBJECT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Importance}_{mj} = \gamma_{00} + \gamma_{01} * VVIQ_j + \gamma_{02} * OBJECT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * VVIQ_j * TIME_{mj} + \gamma_{12} * OBJECT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * VVIQ_j * NEGATIVE_{mj} + \gamma_{22} * OBJECT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * VVIQ_j * POSITIVE_{mj} + \gamma_{32} * OBJECT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Mental Time Travel}_{mj} = \gamma_{00} + \gamma_{01} * VVIQ_j + \gamma_{02} * OBJECT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * VVIQ_j * TIME_{mj} + \gamma_{12} * OBJECT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} +$$

$\gamma_{21} * VVIQ_j * NEGATIVE_{mj} + \gamma_{22} * OBJECT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * VVIQ_j * POSITIVE_{mj} + \gamma_{32} * OBJECT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$

$\text{Visual Details}_{mj} = \gamma_{00} + \gamma_{01} * VVIQ_j + \gamma_{02} * OBJECT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * VVIQ_j * TIME_{mj} + \gamma_{12} * OBJECT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * VVIQ_j * NEGATIVE_{mj} + \gamma_{22} * OBJECT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * VVIQ_j * POSITIVE_{mj} + \gamma_{32} * OBJECT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$

$\text{Auditory Details}_{mj} = \gamma_{00} + \gamma_{01} * VVIQ_j + \gamma_{02} * OBJECT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * VVIQ_j * TIME_{mj} + \gamma_{12} * OBJECT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * VVIQ_j * NEGATIVE_{mj} + \gamma_{22} * OBJECT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * VVIQ_j * POSITIVE_{mj} + \gamma_{32} * OBJECT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$

$\text{Odor-taste Details}_{mj} = \gamma_{00} + \gamma_{01} * VVIQ_j + \gamma_{02} * OBJECT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * VVIQ_j * TIME_{mj} + \gamma_{12} * OBJECT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * VVIQ_j * NEGATIVE_{mj} + \gamma_{22} * OBJECT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * VVIQ_j * POSITIVE_{mj} + \gamma_{32} * OBJECT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$

$\text{Tactile Details}_{mj} = \gamma_{00} + \gamma_{01} * VVIQ_j + \gamma_{02} * OBJECT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * VVIQ_j * TIME_{mj} + \gamma_{12} * OBJECT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * VVIQ_j * NEGATIVE_{mj} + \gamma_{22} * OBJECT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * VVIQ_j * POSITIVE_{mj} + \gamma_{32} * OBJECT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$

Verbal Details$_{mj}$ $= \gamma_{00} + \gamma_{01} * VVIQ_j + \gamma_{02} * OBJECT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * VVIQ_j * TIME_{mj} + \gamma_{12} * OBJECT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * VVIQ_j * NEGATIVE_{mj} + \gamma_{22} * OBJECT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * VVIQ_j * POSITIVE_{mj} + \gamma_{32} * OBJECT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$

Model 6

Internal Details$_{mj}$ $= \gamma_{00} + \gamma_{01} * SRIT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * SRIT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * SRIT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$

Event Details$_{mj}$ $= \gamma_{00} + \gamma_{01} * SRIT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * SRIT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * SRIT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$

Place Details$_{mj}$ $= \gamma_{00} + \gamma_{01} * SRIT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * SRIT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * SRIT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$

Perceptual Details$_{mj}$ $= \gamma_{00} + \gamma_{01} * SRIT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * SRIT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * SRIT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$

Emotion-thought Details$_{mj}$ $= \gamma_{00} + \gamma_{01} * SRIT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * SRIT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * SRIT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$

$$\text{Vividness}_{mj} = \gamma_{00} + \gamma_{01} * SRIT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * SRIT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * SRIT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{RelivingY}_{mj} = \gamma_{00} + \gamma_{01} * SRIT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * SRIT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * SRIT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Intensity}_{mj} = \gamma_{00} + \gamma_{01} * SRIT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * SRIT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * SRIT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Importance}_{mj} = \gamma_{00} + \gamma_{01} * SRIT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * SRIT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * SRIT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Mental Time Travel}_{mj} = \gamma_{00} + \gamma_{01} * SRIT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * SRIT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * SRIT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Visual Details}_{mj}j = \gamma_{00} + \gamma_{01} * SRIT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * SRIT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * SRIT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Auditory Details}_{mj} = \gamma_{00} + \gamma_{01} * SRIT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * SRIT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * SRIT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Odor-taste Details}_{mj} = \gamma_{00} + \gamma_{01} * SRIT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * SRIT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * SRIT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Tactile Details}_{mj} = \gamma_{00} + \gamma_{01} * SRIT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * SRIT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * SRIT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Verbal Details}_{mj} = \gamma_{00} + \gamma_{01} * SRIT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * SRIT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * SRIT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

Model 7

$$\text{Internal Details}_{mj} = \gamma_{00} + \gamma_{01} * SRIT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * SRIT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * SRIT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * SRIT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Event Details}_{mj} = \gamma_{00} + \gamma_{01} * SRIT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * SRIT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * SRIT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * SRIT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Place Details}_{mj} = \gamma_{00} + \gamma_{01} * SRIT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * SRIT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * SRIT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * SRIT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Perceptual Details}_{mj} = \gamma_{00} + \gamma_{01} * SRIT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * SRIT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * SRIT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * SRIT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Emotion-thought Details}_{mj} = \gamma_{00} + \gamma_{01} * SRIT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * SRIT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * SRIT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * SRIT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Vividness}_{mj} = \gamma_{00} + \gamma_{01} * SRIT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * SRIT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * SRIT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * SRIT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Reliving}_{mj} = \gamma_{00} + \gamma_{01} * SRIT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * SRIT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * SRIT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * SRIT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Intensity}_{mj} = \gamma_{00} + \gamma_{01} * SRIT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * SRIT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * SRIT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * SRIT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Importance}_{mj} = \gamma_{00} + \gamma_{01} * SRIT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * SRIT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * SRIT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * SRIT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Mental Time Travel}_{mj} = \gamma_{00} + \gamma_{01} * SRIT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * SRIT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * SRIT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * SRIT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Visual Details}_{mj} = \gamma_{00} + \gamma_{01} * SRIT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * SRIT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * SRIT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * SRIT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Auditory Details}_{mj} = \gamma_{00} + \gamma_{01} * SRIT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * SRIT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * SRIT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * SRIT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Odor-taste Details}_{mj} = \gamma_{00} + \gamma_{01} * SRIT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * SRIT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * SRIT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * SRIT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Tactile Details}_{mj} = \gamma_{00} + \gamma_{01} * SRIT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * SRIT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * SRIT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * SRIT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Verbal Details}_{mj} = \gamma_{00} + \gamma_{01} * SRIT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * SRIT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * SRIT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * SRIT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

Model 8

$$\text{Internal Details}_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * MRT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * MRT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Event Details}_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * MRT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * MRT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Place Details}_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * MRT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * MRT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Perceptual Details}_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * MRT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * MRT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Emotion-thought Details}_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * MRT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * MRT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Vividness}_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * MRT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * MRT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{RelivingY}_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * MRT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * MRT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Intensity}_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * MRT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * MRT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Importance}_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * MRT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * MRT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Mental TIME Travel}_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * MRT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * MRT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Visual Details}_{mj}j = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * MRT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * MRT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Auditory Details}_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * MRT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * MRT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Odor-taste Details}_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * MRT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * MRT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Tactile Details}_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * MRT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * MRT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Verbal Details}_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{10} * NEGATIVE_{mj} + \gamma_{11} * MRT_j * NEGATIVE_{mj} + \gamma_{20} * POSITIVE_{mj} + \gamma_{21} * MRT_j * POSITIVE_{mj} + u_{0j} + u_{1j} * NEGATIVE_{mj} + u_{2j} * POSITIVE_{mj} + e_{mj}$$

Model 9

$$\text{Internal Details}_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * MRT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * MRT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * MRT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Event Details}_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * MRT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * MRT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * MRT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Place Details}_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * MRT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * MRT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * MRT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Perceptual Details}_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * MRT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * MRT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * MRT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Emotion-thought Details}_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * MRT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * MRT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * MRT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Vividness}_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * MRT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * MRT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * MRT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Reliving}_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * MRT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * MRT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * MRT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Intensity}_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * MRT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * MRT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * MRT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Importance}_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * MRT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * MRT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * MRT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Mental TIME Travel}_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * MRT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * MRT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * MRT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Visual Details}_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * MRT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * MRT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * MRT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Auditory Details}_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * MRT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * MRT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * MRT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Odor-taste Details}_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * MRT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * MRT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * MRT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Tactile Details}_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * MRT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * MRT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * MRT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$

$$\text{Verbal Details}_{mj} = \gamma_{00} + \gamma_{01} * MRT_j + \gamma_{10} * TIME_{mj} + \gamma_{11} * MRT_j * TIME_{mj} + \gamma_{20} * NEGATIVE_{mj} + \gamma_{21} * MRT_j * NEGATIVE_{mj} + \gamma_{30} * POSITIVE_{mj} + \gamma_{31} * MRT_j * POSITIVE_{mj} + u_{0j} + u_{2j} * NEGATIVE_{mj} + u_{3j} * POSITIVE_{mj} + e_{mj}$$