THE EFFECTS OF SOURCE PRESENTATION AND TEST FORMAT ON RECOGNITION MEMORY FOR ITEM AND SOURCE

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ABSTRACT

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Source monitoring is a cognitive process through which memory records are attributed to their origins. In the literature, source monitoring tasks are used to examine the old/new recognition decisions, as well as decisions for source. However, there is not an agreed on standard for test formats and the way in which source information is presented. In fact, these different methods are used interchangeably despite words of caution from several researchers regarding the confounds they may give rise to when making source attributions. Thus, in order to shed light on the concerns having to do with the measurement of source monitoring processes, the current study aimed to investigate source monitoring test formats and source presentation within the same experimental design. More false alarms for new items and fewer source misattributions were expected for the simultaneous source monitoring test format compared to the sequential source monitoring test format. Furthermore, it was hypothesized that fewer source misattributions and better item recognition would be seen in the blocked source presentation condition relative to the mixed source presentation condition. The results of our planned analyses did not show any significant differences between the conditions. However, when the data was analyzed separately for each test cycle, analyses for the second cycle showed more false alarms for new items in the simultaneous source monitoring test format compared to the sequential source monitoring test format. Findings were discussed in relation to the use of encoding strategies and source cues as well as criterion shifts.

Keywords: source memory, source monitoring theory, source monitoring test formats, source presentation, recognition memory

ÖZ

KAYNAĞIN SUNUMUNUN VE TEST FORMATININ KAYNAK VE TANIMA BELLEĞİ ÜZERİNDEKİ ETKİSİ

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Kaynak izleme, bellek kayıtlarının kökenlerine atfedildiği bir bilişsel süreçtir. Alanyazında, kaynak belleği test formatları, kaynak atfının yanı sıra tanıma belleğini ölçmek için de kullanılmaktadır. Ancak, test formatları ve kaynağın nasıl sunulduğu konusunda standart bir deneysel işlem yolu bulunmamaktadır. Bazı araştırmacıların, bu durumun kaynak atfı esnasında karıştırıcı etki oluşturabileceği hakkındaki uyarılarına rağmen, farklı metotlar birbirlerinin yerine alternatif olarak kullanılmaya devam edilmektedir. Kaynak izleme süreçlerinin ölçümü ile ilgili endişeleri aydınlatmak adına, bu çalışma kaynak izleme test formatları ve kaynağın sunumunun etkisini aynı deney deseninde incelemeyi amaçlamıştır. İki aşamalı kaynak izleme test formatına kıyasla, tek aşamalı test formatında çeldirici kelimelere karşı daha fazla yanlış alarm ve daha az yanlış kaynak atfı beklenmiştir. Ayrıca, kaynağın karıştırılarak sunulduğu koşula nazaran, kaynağın bloklar halinde sunulduğu koşulda daha az yanlış kaynak atfı ve daha iyi tanıma belleği performansı öngörülmüştür. Planlanan analizlerin sonuçları, deney koşulları arasında anlamlı bir fark göstermemiştir. Ancak, veri test döngülerine ayrılarak incelendiğinde, ikinci test döngüsü analizi tek aşamalı test formatında, iki aşamalı test formatına göre, çeldirici kelimelere karşı daha çok yanlış alarm olduğunu göstermiştir. Bulgular, kriter değişimine ek olarak kodlama stratejileri ve kaynak bilgisi kullanımı ile ilişkili olarak tartışılmıştır.

Anahtar Kelimeler: kaynak belleği, kaynak izleme teorisi, kaynak izleme test formatları, kaynağın sunumu, tanıma belleği

To My Lovely Mom

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SMF	Source Monitoring Framework
RT	Response Times

CHAPTER 1

INTRODUCTION

The main objective of the present thesis was to approach source memory from a methodological perspective, and focus on the measurement of the concept. More specifically, it aimed to investigate the different methods used in the source memory literature. A second aim was to investigate the shared components of and the differences between memory for item and source. The basic research question was whether there was a difference between the simultaneous and the sequential source monitoring test formats in terms of source misattributions and recognition performance and whether there was a difference between source presentation in a blocked or a mixed manner for item and source recognition.

In Chapter 1, the literature on source monitoring was introduced, in which the relation between memory for item and its source and the methods used in source memory research were presented, respectively.

1.1 Source Monitoring

Source monitoring is the process of attributing memory records to their origins or sources (Johnson, Hashtroudi, & Lindsay, 1993; Johnson & Mitchell, 2002). In this context, *source* may refer to any construct which remarks how memory records are obtained. It may consist of different kinds of information involving temporal and spatial context, modality, and the agent of those records (Johnson et al., 1993; Lindsay, 2008). Source monitoring is required both for identifying the origin of a mental experience, and for discriminating a specific memory record among numerous memory traces (Lindsay, 2008).

Source monitoring framework (SMF) is an extended version of *reality monitoring* (Johnson & Mitchell, 2002). Reality monitoring indicates the process of differentiating internally derived memories (e.g., thoughts, dreams or imaginations) from externally derived memories, such as sensory or perceived events (Johnson et al., 1993). Memory records consist of different types of attributes, and these attributes are informative cues for reality monitoring. To illustrate, externally derived memories have more contextual and perceptual information; and they include more semantic content compared to internally derived ones. In contrast, more cognitive operations are engaged during internally derived memories (Johnson & Raye, 1981). Therefore, it is possible to evaluate reality monitoring in the scope of source monitoring framework, since it also depends on the discrimination between memories acquired from different sources (Lindsay, Johnson, & Kwon, 1991).

There are several theories related to source monitoring attributions in the literature. One such theory is the *memory attribution approach* (Jacoby, Kelley, & Dywan, 1989). According to this approach, remembering includes a feeling of familiarity, depending on an attribution of fluency. In other words, if the process of an item is fluently experienced, this fluency may be attributed to the existence of a memory record (Lindsay, 2008). In Whittlesea and Williams, (1998), this view was put forward in a more restricted way by stating that not only fluency but also unexpectedness of an event is required for the feeling of familiarity. This feeling of familiarity might be useful for monitoring the source of a memory record, but it might also pose a problem due to misattributions.

Another theory is the *dual-process approach* which is basically based on familiarity and recollection (Lindsay, 2008). *Familiarity* is described as the feeling of having encountered with an event previously, whereas *recollection* necessitates episodic details and more deliberation. This perspective indicates that the source monitoring process demands more elaboration and distinction of memory records.

When considered from the viewpoint of SMF, false memories could also be evaluated as a failure in source monitoring (Gallo, 2010). For instance, in the work of Schacter (1999), *misattribution* is reflected as a failed memory for source, i.e., the ability to remember the context of a memory record, but not the correct source. Moreover, the effects of reality monitoring failures or, more inclusively, source monitoring failures are observed in *imagination inflation*, the *misinformation paradigm*, and implanted autobiographical memories (Marsh, Eslick, & Fazio, 2008). Other examples of empirical phenomena explained by the SMF are *cryptomnesia* (unconscious plagiarism), *false fame effect* (misattribution of familiarity to fame) and *eyewitness testimony* (Jacoby et al., 1989; Johnson et al., 1993; Lindsay, 2008).

To conclude, memory records are not always processed and retrieved accurately; rather, they are formed in a more reconstructive nature (Loftus, 2003). Therefore, investigating the situations in which memory records are more apt to be fragile, and in which they are more resistant to these cognitive errors is essential to gain more understanding of source monitoring processes.

1.2 The Relation between Memory for Item and Source

The interaction of source monitoring and recognition (item) memory, one of the main interests of the current study, has been extensively investigated. *Recognition memory* is defined as the ability to recognize the previously encountered items among other new items that the participant has never been exposed to (Shiffrin & Steyvers, 1997). In other words, recognition memory requires discrimination between old (previously experienced) and new (not experienced at all) items. On the other hand, in source identification, discrimination occurs between different sources. Thus, these two processes are independent in spite of using the same knowledge base (Banks, 2000). However, it should be also noted that recognition might be relatively easier than source monitoring. Recency or non-specified familiarity is sufficient to decide whether the item is old or new, whereas source monitoring needs more detailed information (Johnson, Kounios, & Nolde, 1997). Therefore, source monitoring involves more specific memories relative to recognition memory (Lindsay, 2008).

The association between source and item memory may change according to the demands of the circumstances (Lindsay & Johnson, 1991). To illustrate, they might be influenced by some manipulations similarly, such as divided attention and delay (Glanzer, Hilford, & Kim, 2004), but some other manipulations, including source similarity, might affect one more in magnitude compared to the other (Lindsay et al., 1991; Lindsay & Johnson, 1991). Furthermore, adding cognitive operation tasks has been shown to affect recognition memory and source monitoring in the opposite direction (see Johnson, De Leonardis, Hashtroudi, & Ferguson, 1995; Johnson & Raye, 1981). These tasks were chosen to orient the participants to encode the word in a relatively shallow or deep level (Craik & Lockhart, 1972; Craik & Tulving, 1975). For instance, when participants were tested on a list comprising of target and distractor words, deeply encoded target words increased recognition memory performance. However, when participants had engaged deep processing for items coming from varied sources, their source discrimination performance decreased (Lindsay & Johnson, 1991). Therefore, any observed advantage for item recognition is not necessarily extended to memory for source, or vice versa.

The differences between item memory and source monitoring were also demonstrated via neuropsychological studies, and the variation between the two was observed in frontal site activity of event-related potentials (Johnson et al., 1997). As opposed to these studies, there are some challenging findings specifying that any variable which influences recognition memory in a specific way should also influence source monitoring in a similar way (Glanzer et al., 2004).

The theoretical debate aside, in order to shed light on the similarities and the differences between these two cognitive processes, the ways in which they are measured has to be paid attention to. Recognition memory tasks are classified as episodic memory tasks, and they are not entirely similar to source monitoring tasks. Recognition memory tasks are related to the occurrence of an item while source monitoring tasks inquire the origins of said item. Nonetheless, these two processes are not completely different from each other either, due to the fact that the same information is utilized differently (Banks, 2000). In conclusion, it could be inferred that investigating the underlying mechanisms of these tasks is crucial, and identifying the shared components and the differences across these tasks could bring more understanding to the source monitoring literature, as well as the recognition memory literature (Johnson, 2005).

1.3 Methods Used in Source Memory Research

In the source monitoring literature, no one true measure of memory for source exists. In fact, measures are chosen according to the existing circumstances (Lindsay, 2008). Generally, source monitoring tasks are used to examine the decisions of old/new recognition, as well as the source (Johnson, 2005).

In a *standard source monitoring task*, participants are exposed to the stimuli from different sources in the study phase. After that, in the test phase, they are tested on a list which comprises of items from both sources that were studied and new items. Basically, they are asked to decide from which source they had acquired the item. However, if they think that they had not experienced that item, they need to label it as new (Lindsay, 2008; Marsh & Hicks, 1998). Thus, from the same task, both recognition and source monitoring performances are inferred. Recognition scores are calculated with the correct identification of items as old without taking into consideration attributions to the correct source, while source monitoring performance is obtained by the proportion of old words correctly attributed to their sources within the correctly recognized old words (Johnson et al., 1995; Lindsay et al., 1991).

In addition, there are also other studies examining source and old/new judgements in two steps, rather than in a single step, which is named the *sequential source monitoring task*. In these studies, the subjects are firstly questioned about whether the item is "old" or "new", and if they answer "old", then they have to indicate in which source they were exposed to that item (Glanzer et al., 2004; Mawdsley, Grasby, & Talk, 2014; Meyer, Bell, & Buchner, 2015). Similar to the simultaneous source monitoring test format, both source and recognition memory performance can also be calculated from the sequential test format.

There are rarely used test formats in both source monitoring and item memory studies. For example, Lindsay and Johnson (1991) preferred to utilize separate tasks by assigning half of the subjects to a source memory task and the other half to a recognition memory task. However, unlike the standard source monitoring task, their source memory task included items studied from different sources, and not new items.

In addition to the mentioned tasks, more restricted source memory tests were also preferred by Jacoby and his colleagues (2005). In their study, the subjects were required to accept only items coming from a specific source while they had to reject the items from another source, in addition to new items.

Although these varied tasks are used interchangeably, because of this variability, there might be certain important caveats for the interpretations of their results. To illustrate, old/new recognition which is acquired from source monitoring tasks might be viewed as the same with a standard recognition memory task. In fact, Mulligan, Besken, and Peterson (2010) argued that old/new recognition performance in source monitoring tasks could be qualitatively different from that of standard recognition tasks, since the instructions of source monitoring might change the sensitivity of the recognition decision.

Moreover, there might be confounds for misattributions among source monitoring tasks. For instance, in the simultaneous condition, new items and items from both sources are presented simultaneously at test. In the sequential condition, however, the decision of old or new is asked first, and if an item was identified as old, the sources are asked. Marsh, Cook, and Hicks (2006) indicated that more false alarms for new items were seen in the simultaneous condition relative to the sequential condition. This was accounted for by a possible bias occurring when two options are "old" in the simultaneous condition. In other words, when all possible choices were presented at the same time (e.g., an item could be labeled as "Source A", "Source B", or "New"), two out of these three options actually indicate that the item is an old word.

Furthermore, Dodson and Johnson (1993) indicated that test formats could direct participants differently during source evaluations. Specifically, they argued that fewer source misattributions would occur if this process was investigated by presenting all possible sources all at once, as participants would probably use more stringent criteria in the simultaneous condition. In short, since the requirements of source memory tests may influence the decision making processes, the source monitoring task and the questions should be carefully considered (Marsh & Hicks, 1998).

1.3.1 A Comparison: Lindsay and Johnson (1991) vs. Hunt (2003)

Both for investigating the importance of test formats and for exemplifying how they might cause different interpretations of the results, two critical studies, namely, Lindsay and Johnson (1991) and Hunt (2003) are compared in this section.

In the former study (Lindsay & Johnson, 1991), the subjects were presented with words either on their left or on their right in the study phase. There were two experimental conditions: the deep-deep and deep-shallow conditions. The subjects had to make up a sentence with words from both sides in the deep-deep condition and had to make up a sentence with words coming from left side, but they had to count the number of Es for words coming from right side if they were in the deep-shallow condition. In each condition, the participants were randomly assigned to source memory or recognition memory tasks. The source memory task consisted of target words presented both on the right and left, whereas the recognition memory task contained target words presented only on the right together with new words. Because the subjects were required to identify words on the right, the subjects in the deep-deep condition had to identify deeply encoded words, but the subjects in the deep-shallow condition had to identify shallowly encoded words. Recognition memory performance increased for deeply encoded words. However, source monitoring performance for these words decreased, since the subjects had performed the same orienting tasks with words from different sources. Therefore, the authors inferred from this study that different orienting tasks might pose as an informative cue for discrimination of memory for source, and that the variables that increase recognition decisions are not necessarily the same as those that increase source monitoring decisions (Lindsay & Johnson, 1991).

In Hunt (2003), firstly, a pre-exposure list was presented to the subjects, followed by a study list, and they were instructed that they would be tested for their memory for the latter list. Subjects either performed the same or different orienting tasks for the two lists. The orienting tasks were category membership or pleasantness judgements about the words. This manipulation resulted in four experimental groups; category-category (CC), pleasantness-pleasantness (PP), category-pleasantness (CP), and pleasantness-category (PC). After the encoding phase, subjects took a recognition test involving target items, pre-exposed distracters and new distractors. Critically, the subjects were asked to respond “old” only if the word came from the second list; all other words had to be indicated as “new”. CP and PP conditions were expected to improve item-based distinctive processing due to pleasantness judgements on the target list, which would result in higher hit rates. On the other hand, CP and PC conditions were expected to improve event-based distinctive processing due to use of different orienting tasks for the two lists, and in turn, lead to lower false alarm rates. The results were analyzed separately as discrimination of study list items from pre-exposed distractors and as discrimination between studied items from new distractors. For the former, accuracy was highest in the CP condition, since it took the benefit of both item-based and event-based distinction. For the latter one, however, PP condition was advantageous, since the subjects processed the words from each list strongly, and this processing increased accuracy when these target words were differentiated from the new distractors.

Critically, Hunt (2003) further investigated his data regarding recognition memory vs. source monitoring. Due to the similarity of his results with Lindsay and Johnson (1991), he referred to their study. Lindsay and Johnson (1991) justified the dissociation of source monitoring and recognition memory processes in their experiment. However, Hunt (2003) interpreted his data differently and concluded that discriminating target items from pre-exposed distracters could not simply be reduced to source monitoring because orienting task conditions influenced hits and false alarms differently. In other words, he argued that conditions favoring correct attribution of the source of distracters should have affected targets in a similar way.

Although Hunt (2003) compared his data with the results of Lindsay and Johnson (1991), there are many notable differences in the methods that might make this comparison problematic. Despite general similarities, these critical differences should not be ruled out. For instance, both studies made use of an orienting task. Lindsay and Johnson (1991) selected a sentence formation task while Hunt (2003) preferred pleasantness ratings, which is another highly used semantic encoding task in the literature (Jacoby et al., 2005; Toglia, 1999). For the relatively shallow task, however, Hunt (2003) chose category judgements, whereas Lindsay and Johnson (1991) chose a vowel counting task (see Bodner & Lindsay, 2003).

In spite of these common points, there is quite crucial and overlooked difference between the studies, which is the test format. In fact, Hunt (2003) argued that discriminating targets from pre-exposed distracters could not be explained away by the source monitoring account. He supported his view by stating that source monitoring required both a precise acceptance of targets and a precise rejection of distractors. Nevertheless, in his recognition test, the subjects were told to label an item as old only if it was presented in the second list. Thus, the subjects were only asked to discriminate items from the second list. In other words, they were not asked to indicate to classify others as pre-exposed or new. Had the subjects been required to classify all test items, targets and false alarms would be affected the same.

In addition, in Hunt (2003)'s design, while labeling target words, intrusions from both pre-exposure items and new distractors could occur. Despite these intrusions coming from different directions in the test session, the analysis of target discrimination from pre-exposed items and from new distractors were examined separately. In contrast, in Lindsay and Johnson (1991), because recognition memory and source monitoring tasks were used independently via a between-subjects design, the subjects were exposed to an intrusion from only one type of source, either source "left" or new list. In other words, the subject might mark the word not because they remembered a word on the right, but because they were sure they had not seen it on the left.

To conclude, when the two different approaches of these two studies are considered, it could be inferred that the use of different test formats could lead to these varied interpretations of the findings.

1.3.1.1 Source Monitoring Test Formats

There is not agreed on standard for test formats in the source memory literature. More importantly, various tests were treated as the same despite their instructions and underlying decision processes being highly different. As a result, all these differences make it necessary to examine test format as a variable (see Tanyaş & Mısırlısoy, 2018, for a similar argument). For this purpose, in this current study, two of the mostly used test formats were selected to be further investigated. These are the standard/simultaneous source monitoring test, in which item and source information are asked simultaneously, and the sequential source monitoring test, in which source attribution is asked after a test item is identified as "old". These tests were highly preferred since the authors could calculate both source memory and recognition memory performance at the same test. However, as Dodson and Johnson (1993) stated, subjects could use either relatively loose or relatively strict criteria in these test formats. Therefore, in the current study, the aim was not to refute any testing method; instead, it was to underscore the differences in test formats. This criterion shift possibly led to the different interpretations of source and recognition memory performance.

1.3.1.2 Source Presentation

In addition to the test format, source presentation is another crucial variable which could affect the monitoring process. The comparison in the previous section also underlines the importance of adhering to a standard method for source presentation. In Hunt (2003), words from different sources were presented in a blocked design. In other words, subjects saw firstly a pre-exposure list, then the target list. However, in Lindsay and Johnson (1991), the source manipulation was conducted in a mixed manner. Consequently, source switching was random and frequent. In fact, source presentation could also be a critical factor, that may lead to varied levels of encoding. Thus, in order to investigate the possible effect of salience of source discrimination, it was included in the current study design as well.

There might be several reasons for the possible differences between mixed and blocked source presentation, the first one being the difficulty of encoding. On the one hand, in the blocked presentation, the stimuli from varied sources are coded respectively, and source switching occurs only once between the lists. On the other hand, in the mixed presentation, the stimuli from different sources have to be encoded at the same time. This would mean that source switching would occur frequently at the encoding phase, which, in turn, would require more effort. Presenting source information in a blocked or mixed manner also influences the temporal distinctiveness. More specifically, compared to the mixed source presentation, sources are temporally more distinct in the blocked source presentation (Bayen & Murnane, 1996). Moreover, subjects might establish relational/temporal encoding with the stimuli coming from the same source/list in the blocked presentation, and this could ease source monitoring (see Misirlisoy, Tanyas, & Atalay, 2019, for a similar argument).

Accordingly, one might posit that source misattributions would be more pronounced in the mixed source presentation condition compared to the blocked source presentation condition, and item recognition would be better in the blocked source presentation condition relative to the mixed source presentation condition.

1.4 Aim of the Study

To the knowledge of the author, there is no such study in the literature examining the effect of test format and source presentation on memory for item and source, in a systematic manner within the same experimental design. Accordingly, the main aim of the current study was twofold: to investigate the possible differences between the simultaneous and the sequential source monitoring test in terms of source misattributions and recognition performance and to investigate the effect of source presentation also on item and source recognition. The study also has the potential to provide further converging evidence for the findings of Dodson and Johnson (1993) and Marsh and Hicks (1998).

Similar to Dodson and Johnson (1993), in the current study, fewer source misattributions were expected in the simultaneous source monitoring test relative to the sequential source monitoring test. If all possible sources were presented all at once, participants would probably use more stringent criteria in the simultaneous condition. Consequently, hits for source recognition were expected to be higher in the simultaneous source monitoring test than the sequential source monitoring test. Secondly, as Marsh and his colleagues (2006) indicated, it was also hypothesized that more false alarms for new items, i.e., distractors, would be seen in the simultaneous source monitoring test relative to the sequential source monitoring test. In fact, in the simultaneous source monitoring test format, two out of three options actually indicate that the item is an old word, which, in turn, may possibly lead to a bias to label the item as old. Thus, participants who have taken the sequential source monitoring test could correctly reject more new items at the test phase compared to the participants who have taken the simultaneous source monitoring test.

Regarding source presentation, more source misattributions were expected for the mixed source presentation condition compared to the blocked source presentation condition. In the mixed source presentation, source switching would occur frequently at the encoding phase, which, in turn, would require more effort. Moreover, the blocked presentation could provide an opportunity for the temporal distinctiveness among the sources as well as relational/temporal encoding with the stimuli coming from the same source, and this could ease source monitoring (Bayen & Murnane, 1996; Misirlisoy et al., 2019). Therefore, hits for source recognition were expected to be higher in the blocked source presentation condition than the mixed source presentation condition. Similarly, item recognition was also expected to be better in the blocked source presentation condition relative to the mixed source presentation condition. In other words, hits for item recognition would be higher in the blocked source presentation condition.

Given that source monitoring test formats provide any advantage over each other, in terms of source or item attribution, that advantage would be partially confounded with the possible effect of source presentation. Therefore, the current study aimed to investigate source monitoring test formats and source presentation within the same experimental design. For this aim, it was also investigated whether source monitoring test formats differed across different types of source presentation.

CHAPTER 2

METHOD

The current study was pre-registered in the Open Science Framework. All materials, including experiment scripts and analyses are available online at https://osf.io/xkmc2/.

The main aim of the study was to investigate the effect of source presentation and test format on source and recognition memory performance with a between-subjects experimental design. Similar to a substantial amount of studies (Crump, Gong, & Milliken, 2006; Glanzer et al., 2004; Mawdsley et al., 2014), a location cue ‒left or right‒ was chosen to indicate the source for the present study. In order to strengthen source information, color information was added to the location. In other words, a specific color was matched with a specific location (e.g., the left side of the screen with a green background and the right side of the screen with a red background).

More false alarms for new items and fewer source misattributions were expected in the simultaneous source monitoring test format compared to the sequential source monitoring test format. Furthermore, it was hypothesized that fewer source misattributions and better item recognition would be observed for the blocked source presentation condition relative to the mixed source presentation condition.

2.1 Participants

In the literature, there was no exact effect size for the interests of the current study. Based on the reported effect sizes in the source memory literature, .10 was chosen for the partial eta squared value. Power analysis using the G*Power-3 software (Faul, Erdfelder, Lang, & Buchner, 2007) indicated that a sample size of 120 would provide .95 power to detect effect size *f* of .33 with alpha set at .05. It was attempted to recruit up to 132 participants in total. It was determined according to 10% more than the number of our target participants in case not all participants comply with the requirements of the experiment, or not follow the instructions. Because the number of participants that fulfilled the inclusion criteria fall under the target sample size, new participants were recruited.

One hundred and thirty-four native speakers of Turkish participated in the experiment. Nine participants were excluded from the data analysis, because they did not follow the experimental protocol, or due to data exclusion criteria. Analyses were carried out with the remaining 125 (M_{age}= 21.63 years).

Participants were students at Middle East Technical University (METU) who volunteered for partial course credit or 10 Turkish Liras. All participants reported normal or corrected-to-normal visual acuity and normal color vision.

2.2 Materials

Stimuli consisted of 160 nouns that were chosen from Turkish Word Norms (Göz, Tekcan, & Erciyes, 2017; Tekcan & Göz, 2005). These words were selected by controlling for certain characteristics (number of syllables: 2-3, frequency: 50-1000, concreteness: 5.00-7.00, and imageability: 4.50-7.00). The words were divided randomly into four lists in order to be used in two separate test cycles (see Appendix A). There was no significant difference between the lists in terms of imageability, $F(3, 156) = 1.11$, $MSE = 0.29$, $p = .35$, $\eta_p^2 = .02$; concreteness, $F(3, 156) = 1.45$, $MSE = 0.17$, $p = .23$, $\eta_p^2 = .03$; and frequency, $F < 1$. In each test cycle of the experiment, a list of 40 words were further divided into two lists of 20 (List Right and List Left) for the study phase. Another list of 40 words was set aside to be used as filler items for the subsequent test. The remaining two lists were used for the second test cycle, in a similar way. The words chosen for the target and distractor lists were counterbalanced across participants.

2.3 Design and Procedure

The experiment was 2 (test format: the simultaneous source monitoring test, the sequential source monitoring test) X 2 (source presentation: mixed presentation, blocked presentation) between-subjects design. The study was approved by the METU Human Research Ethics Committee (see Appendix B). Participants were randomly assigned to the experimental conditions upon arrival. They were individually tested in a silent room. Before the experiment, participants signed the informed consent form (see Appendix C), and filled a brief questionnaire on color blindness, reading and attentional disability, and proficiency in Turkish.

Automatic stimulus display and data collection were controlled with a PC running E-Prime 2.0 software. There were three phases including a study phase, filler task, and test phase. This cycle was repeated twice. Firstly, words from different sources were presented in the study phase. The stimuli on the left were printed in a green (R:0, G:128, B:0) background while the stimuli on the right were printed in a red (R:255, G:0, B:0) background, with 36-point Arial font (see Figure 1). The stimuli were presented in a different random order for each participant and stayed on the screen until a 2-second deadline was reached.

As in most previous studies of source memory (Ferguson, Hashtroudi, & Johnson, 1992; Hashtroudi, Johnson, & Chrosniak, 1989; Henkel, Johnson, & De Leonardis, 1998), participants were instructed to pay close attention and to learn the items and the list they belonged to. A separate list of 20 words were presented on the left and right half of the screen. For the participants in the mixed source presentation condition, words from different sources were presented randomly on the left or right half of the screen. Thus, source switching occurred frequently during the study phase. For the participants in the blocked source presentation condition, however, words from different sources were presented in a blocked manner. Consequently, source switching occurred only once in the study phase, during transition from the first list to the second list.

(a)Blocked source presentation (b)Mixed source presentation

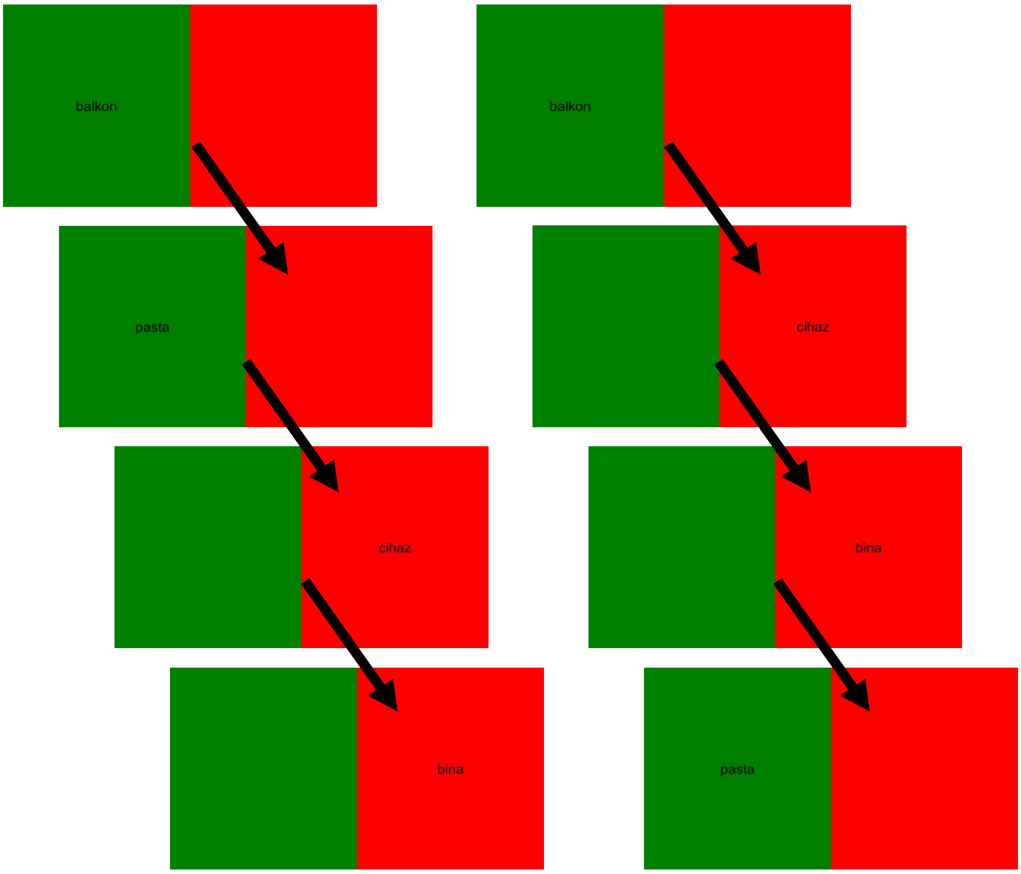

Figure 1. Source presentation in a blocked and mixed manner

The notion that recent memory records come to mind more easily than the distant ones is highly robust in memory (Sederberg, Howard, & Kahana, 2008). For instance, participants may become more apt to remember items coming from the more recent source in the blocked presentation, creating the ideal conditions for the recency effect.

Therefore, in order to eliminate the recency effect, the rating task was followed by a 3-minute distractor task, which consisted of counting backwards from 837 by 9s and from 856 by 7s.

Following the distractor task, participants were presented with a self-paced source monitoring test. At the test phase, the stimuli were presented at the center of the monitor screen against a silver gray (R:192, G:192, B:192) background (see Figure 2). The participants were tested on a list which consisted of the items from both sources and new items. Forty old, i.e., 20 right and 20 left list words, and forty new words were presented in a different random order for each participant. They responded by pressing the appropriate keyboard key.

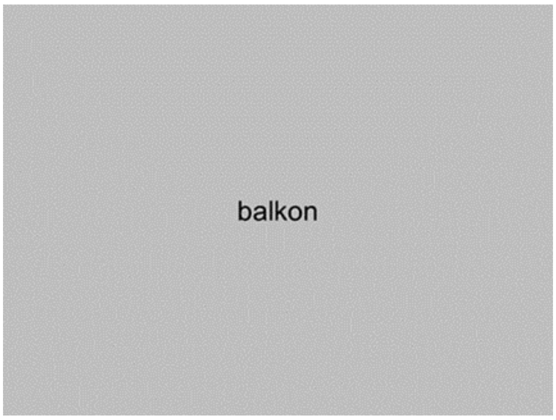

Figure 2. Stimuli presentation in the test phase

The participants who have taken the simultaneous test format were asked to decide in which source they had acquired the item, and if there was no record, they needed to label the item as new (see Figure 3). In the keyboard, “j”, “k”, and “l” were labeled as “left/green”, “right/red” and “no”, respectively.

Figure 3. The simultaneous source monitoring test format

The participants who have taken the sequential test format, however, decided on old/new recognition and source attribution sequentially, in which the decisions for old or new were asked first, and if identified as old, sources were asked later (see Figure 4). In the keyboard, “n” and “m” were labeled as “yes” and “no”, respectively. If the participants responded to the stimulus as old, i.e., the “yes” labeled key, then, in order to indicate source information, they were required to press “j” or “k” key, standing for “left” and “right”, respectively. Response times were automatically recorded with E-Prime scripts (Since there is a large amount of code – about 1000 pages –, E-Prime scripts were registered in the Open Science Framework as a repository for archiving experiments, rather than giving them as an Appendix).

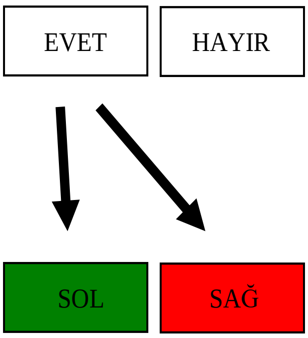

Figure 4. The sequential source monitoring test format

CHAPTER 3

RESULTS

For all analyses, response times (RT) less than 200 ms were removed (Bugg, 2014; Bugg & Hutchison, 2013; Bugg, Jacoby, & Toth, 2008), which indicates the assumption that participants responded erroneously. Since participants gave their item and source decisions simultaneously in the simultaneous source monitoring test format, RTs less than 200 ms were very rare. However, in the sequential test format, participants gave their item and source decisions sequentially. Again, RTs less than 200 ms were very rare in the first step of the sequential source monitoring test format, standing for the item decision query. Critically, in the second step of the sequential format, standing for the source decision query, RTs less than 200 ms were quite common. Accordingly, when it was asked to indicate their item decision in the first step of the sequential source monitoring test format, the participants must have considered source decision as well. Consequently, in order not to cause possible loss of information, RTs less than 200 ms were removed only for the simultaneous test as well as the first step of the sequential test. The data points whose hit rates were below or above three standard deviations were also removed from the analysis.

The alpha level was set at .05, and partial eta squared (η_p^2) was reported as the measure of effect size. Only significant main effects and interactions were reported, unless otherwise indicated. Separate 2 (test format: the simultaneous source monitoring test format, the sequential source monitoring test format) X 2 (source presentation: mixed presentation, blocked presentation) between-subjects design analyses of variance (ANOVAs) were conducted for proportion of hits and false alarms for old/new recognition, source misattributions, and conditionalized proportion of correct source attributions.

Hit rates were calculated for both item and source recognition separately. Recognition scores were calculated with the correct identification of items as old without taking into consideration attributions to the correct source. For source recognition, however, two types of scores were calculated. Firstly, source recognition was obtained by the proportion of old words correctly attributed to their sources within the all old words, that is, source recognition out of old words. Secondly, source measures were conditionalized on correct performance, that is, source recognition out of hits. More specifically, conditionalized correct source attribution was calculated by the proportion of old words correctly attributed to their sources within the correctly recognized old words (Marsh et al., 2006). Tables 1 and 2 show means and standard deviations for all dependent variables for test formats and source presentation.

Table 1. *Means and Standard Deviations for Test Formats*

Levels	*Hits*	*False Alarms*	*Source Misattributions*	*Conditionalized Correct Source Attributions*
sequential	0.75 (0.16)	0.14 (0.11)	0.12 (0.07)	0.83 (0.11)
simultaneous	0.79 (0.13)	0.18 (0.15)	0.15 (0.08)	0.81 (0.11)

Note. Standard deviations are presented in parenthesis.

For hit rates, the main effect of test format, $F(1, 121) = 2.17$, $MSE = 0.02$, $p = .14$, $\eta_p^2 = .02$, the main effect of source presentation, $F < 1$, and the test format x source presentation interaction, $F < 1$, were not significant.

For false alarm rates, the main effect of test format, $F(1, 121) = 3.47$, $MSE = 0.02$, $p = .07$, $\eta_p^2 = .03$, the main effect of source presentation, $F < 1$, and the test format x source presentation interaction, $F < 1$, were not significant.

Table 2. *Means and Standard Deviations for Source Presentation*

Levels	*Hits*	*False Alarms*	*Source Misattributions*	*Conditionalized Correct Source Attributions*
blocked	0.79 (0.15)	0.16 (0.14)	0.13 (0.08)	0.82 (0.11)
mixed	0.76 (0.15)	0.16 (0.12)	0.14 (0.08)	0.81 (0.12)

Note. Standard deviations are presented in parenthesis.

For source misattributions, the main effect of test format, $F(1, 121) = 3.22$, $MSE = 0.006$, $p = .08$, $\eta_p^2 = .03$, the main effect of source presentation, $F < 1$, and the test format x source presentation interaction, $F < 1$, were not significant.

For conditionalized correct source attributions, the main effect of test format, $F(1, 121) = 1.02$, $MSE = 0.01$, $p = .31$, $\eta_p^2 = .008$, the main effect of source presentation, $F < 1$, and the test format x source presentation interaction, $F < 1$, were not significant.

3.1 Separate Test Cycle Analyses

Separate analyses were conducted for each test cycle in order to see whether the findings could be replicated in each cycle. For this aim, separate 2 (test format: the simultaneous source monitoring test format, the sequential source monitoring test format) X 2 (source presentation: mixed presentation, blocked presentation) between-subjects design ANOVAs were conducted for proportion of hits and false alarms for old/new recognition, source misattributions, and conditionalized proportion of correct source attributions, for the two test cycles. Tables 3-4 and Tables 5-6 show means and standard deviations for all dependent variables for test formats and source presentation, for the first and second test cycle, respectively.

Table 3. *Means and Standard Deviations for Test Formats in the First Test Cycle*

Levels	*Hits*	*False Alarms*	*Source Misattributions*	*Conditionalized Correct Source Attributions*
sequential	0.76 (0.16)	0.14 (0.14)	0.14 (0.09)	0.81 (0.14)
simultaneous	0.80 (0.14)	0.17 (0.15)	0.17 (0.10)	0.79 (0.13)

Note. Standard deviations are presented in parenthesis.

For hit rates in the first test cycle, the main effect of test format, $F(1, 121) = 3.02$, $MSE = 0.02$, $p = .09$, $\eta_p^2 = .02$, the main effect of source presentation, $F(1, 121) = 1.32$, $MSE = 0.02$, $p = .25$, $\eta_p^2 = .01$, and the test format x source presentation interaction, $F < 1$, were not significant. For hit rates in the second test cycle, the main effect of test format, $F(1, 121) = 1.01$, $MSE = 0.03$, $p = .32$, $\eta_p^2 = .008$, the main effect of source presentation, $F < 1$, and the test format x source presentation interaction, $F < 1$, were not significant.

For false alarm rates in the first test cycle, the main effect of test format, $F < 1$, the main effect of source presentation, $F < 1$, and the test format x source presentation interaction, $F < 1$, were not significant. For false alarm rates in the second test cycle, the main effect of test format, $F(1, 121) = 6.22$, $MSE = 0.02$, $p = .01$, $\eta_p^2 = .05$, was significant. False alarms were more pronounced for the simultaneous test format condition ($M = 0.20$, $SD = 0.17$) compared to the sequential test format condition ($M = 0.13$, $SD = 0.11$). The main effect of source presentation, $F < 1$, and the test format x source presentation interaction, $F < 1$, were not significant.

Table 4. *Means and Standard Deviations for Test Formats in the Second Test Cycle*

Levels	*Hits*	*False Alarms*	*Source Misattributions*	*Conditionalized Correct Source Attributions*
sequential	0.76 (0.19)	0.13 (0.11)	0.11 (0.08)	0.84 (0.13)
simultaneous	0.79 (0.15)	0.20 (0.17)	0.13 (0.09)	0.83 (0.14)

Note. Standard deviations are presented in parenthesis.

For source misattributions in the first test cycle, the main effect of test format, $F(1, 121) = 3.00$, $MSE = 0.009$, $p = .09$, $\eta_p^2 = .02$, the main effect of source presentation, $F < 1$, and the test format x source presentation interaction, $F < 1$, were not significant. For source misattributions in the second test cycle, the main effect of test format, $F(1, 121) = 1.83$, $MSE = 0.007$, $p = .18$, $\eta_p^2 = .02$, the main effect of source presentation, $F(1, 121) = 1.20$, $MSE = 0.007$, $p = .28$, $\eta_p^2 = .01$, and the test format x source presentation interaction, $F < 1$, were not significant.

Table 5. *Means and Standard Deviations for Source Presentation in the First Test Cycle*

Levels	*Hits*	*False Alarms*	*Source Misattributions*	*Conditionalized Correct Source Attributions*
blocked	0.79 (0.14)	0.16 (0.16)	0.16 (0.10)	0.79 (0.14)
mixed	0.76 (0.17)	0.15 (0.13)	0.15 (0.09)	0.80 (0.13)

Note. Standard deviations are presented in parenthesis.

For conditionalized correct source attributions in the first test cycle, the main effect of test format, $F < 1$, the main effect of source presentation, $F < 1$, and the test format x source presentation interaction, $F < 1$, were not significant. For conditionalized correct source attributions in the second test cycle, the main effect of test format, $F < 1$, the main effect of source presentation, $F < 1$, and the test format x source presentation interaction, $F < 1$, were not significant.

Table 6. *Means and Standard Deviations for Source Presentation in the Second Test Cycle*

Levels	*Hits*	*False Alarms*	*Source Misattributions*	*Conditionalized Correct Source Attributions*
blocked	0.78 (0.19)	0.16 (0.14)	0.11 (0.08)	0.84 (0.14)
mixed	0.76 (0.16)	0.17 (0.15)	0.12 (0.09)	0.82 (0.13)

Note. Standard deviations are presented in parenthesis.

3.2 Inter-Test Cycle Analyses

It was also investigated whether there were any differences between the first and second test cycle in terms of item and source recognition performance. For this aim, one-way within-subject design ANOVAs were conducted for proportion of hits and false alarms for old/new recognition, source misattributions, and conditionalized proportion of correct source attributions, separately. Table 7 shows means and standard deviations for all dependent variables across the test cycles.

The main effect of test cycle was not significant for hit rates, $F < 1$, and for false alarm rates, $F(1, 124) = 1.18$, $MSE = 0.008$, $p = .28$, $\eta_p^2 = .009$. For source misattributions, however, the main effect of test cycle, $F(1, 124) = 20.24$, $MSE =$

0.004, $p < .001$, $\eta_p^2 = .14$, was significant. Source misattributions were significantly attenuated for the second test cycle (*M* = 0.12, *SD* = 0.08) relative to the first test cycle (*M* = 0.15, *SD* = 0.10). For conditionalized correct source attributions, the main effect of test cycle, *F*(1, 124) = 8.98, *MSE* = 0.01, *p* = .003, $\eta_p^2 = .07$, was also significant. Conditionalized correct source attributions were higher for the second test cycle (*M* = 0.83, *SD* = 0.14) compared to the first test cycle (*M* = 0.80, *SD* = 0.13).

Table 7. *Means and Standard Deviations across the Test Cycles*

Test Cycles	*Hits*	*False Alarms*	*Source Misattributions*	*Conditionalized Correct Source Attributions*
first cycle	0.78 (0.16)	0.15 (0.15)	0.15 (0.10)	0.80 (0.13)
second cycle	0.77 (0.17)	0.17 (0.14)	0.12 (0.08)	0.83 (0.14)

Note. Standard deviations are presented in parenthesis.

The findings from the inter-test cycle analyses indicated that overall source attribution performance was better in the second test cycle. In order to see whether the dependent variables differed across different test cycles, the data was further investigated by adding test cycle as an independent variable. For this aim, separate 2 (test format: the simultaneous source monitoring test format, the sequential source monitoring test format) X 2 (source presentation: mixed presentation, blocked presentation) X 2 (test cycle: the first test cycle, the second test cycle) mixed-design ANOVAs were conducted for proportion of hits and false alarms for old/new recognition, source misattributions, and conditionalized proportion of correct source attributions, with test format and source presentation as between-subjects factors, and test cycle as a within-subject factor.

For hit rates, the main effect of test cycle, $F < 1$, the test cycle x test format interaction, $F < 1$, the test cycle x source presentation interaction, $F < 1$, and the three-way interaction were not significant, $F < 1$.

For false alarm rates, the main effect of test cycle, $F(1, 121) = 1.24$, $MSE = 0.008$, $p = .27$, $\eta_p^2 = .01$, the test cycle x test format interaction, $F(1, 121) = 3.26$, $MSE = 0.008$, $p = .07$, $\eta_p^2 = .03$, the test cycle x source presentation interaction, $F(1, 121) = 1.33$, $MSE = 0.008$, $p = .25$, $\eta_p^2 = .01$, and the three-way interaction were not significant, $F < 1$.

For source misattributions, the main effect of test cycle, $F(1, 121) = 20.15$, $MSE = 0.004$, $p < .001$, $\eta_p^2 = .14$, was significant. Source misattributions were significantly attenuated for the second test cycle (M = 0.12, SD = 0.08) relative to the first test cycle (M = 0.15, SD = 0.10). The test cycle x test format interaction, $F < 1$, the test cycle x source presentation interaction, $F(1, 121) = 2.59$, $MSE = 0.004$, $p = .11$, $\eta_p^2 = .02$, and the three-way interaction were not significant, $F < 1$.

For conditionalized correct source attributions, the main effect of test cycle, $F(1, 121) = 8.80$, $MSE = 0.01$, $p = .004$, $\eta_p^2 = .07$, was significant. Conditionalized correct source attributions were higher for the second test cycle ($M = 0.83$, $SD = 0.14$) compared to the first test cycle ($M = 0.80$, $SD = 0.13$). The test cycle x test format interaction, $F < 1$, the test cycle x source presentation interaction, $F(1, 121) = 1.04$, $MSE = 0.01$, $p = .31$, $\eta_p^2 = .008$, and the three-way interaction were not significant, $F < 1$.

3.3 Model-Based Analyses

In a source monitoring task based on the discrimination between two discrete sources, there are basically three possible options; each item may come from Source A or Source B, or it may be a totally new item, i.e., distractor. Therefore, in these tasks, both item recognition and source discrimination are required. However, guessing biases also play a role in the monitoring processes, in which participants could guess an item or its source in a specific way (Murnane & Bayen, 1996). However, empirical measures based on hit scores do not provide an optimal tool to separate source memory from item memory. Moreover, these measures are not able to estimate guessing bias at all (Bayen, Murnane, & Erdfelder, 1996). Multinomial source monitoring modeling is advised to overcome these concerns by estimating guessing bias and process-pure measures for memory for item and source (Bröder & Meiser, 2007).

Similar to a substantial amount of studies (Bayen & Kuhlmann, 2011; Besken & Gülgöz, 2008, Kroneisen & Bell, 2018; Misirlisoy et al., 2019), in the current study, a two high-threshold multinomial processing tree model of source monitoring was employed to further estimate guessing bias (see Figure 5). In this model, there are four crucial parameters; parameters *D* and *d* corresponding to item and source memory while parameters *b* and *g* standing for item and source guessing, respectively (Moshagen, 2010).

Figure 5 displays certain parameters standing for some concepts in the source monitoring processes. In the model, there are three different trees which correspond to items coming from Source Left (Green), items coming from Source Right (Red) and distractor items, respectively. As the logic of probability indicates, each parameter which derivates from the same state completes each other to reach 1. More specifically, the *D* parameter refers to the probability of detecting a specific item as old. Thus, the complementary parameter *1-D* indicates the probability of not detecting that item as old, which, in turn, requires guessing for item information represented by *b*. However, the *d* parameter corresponds to the probability of correctly discriminating the source of that item. If a participant fails to correctly identify the source, which is represented by *1-d*, the *g* parameter referring to guessing the source, plays a role in the monitoring processes.

Critically, the *g* parameter should be ideally .50, from which a strong deviation indicates a source guessing bias in a specific way. In the current study, the tendency to guess towards the source "left", or "green background", was investigated. The data was analyzed using the multiTree software (Moshagen, 2010). The model analysis did not indicate any bias for guessing (g = .50, CI: 0.47-0.52). In addition, when the source guessing factor was further investigated in test formats, neither the simultaneous (g = .49, CI: 0.46-0.53) nor the sequential (g = .51, CI: 0.47-0.55) source monitoring test indicated any bias. To conclude, our findings were not confounded with the guessing bias.

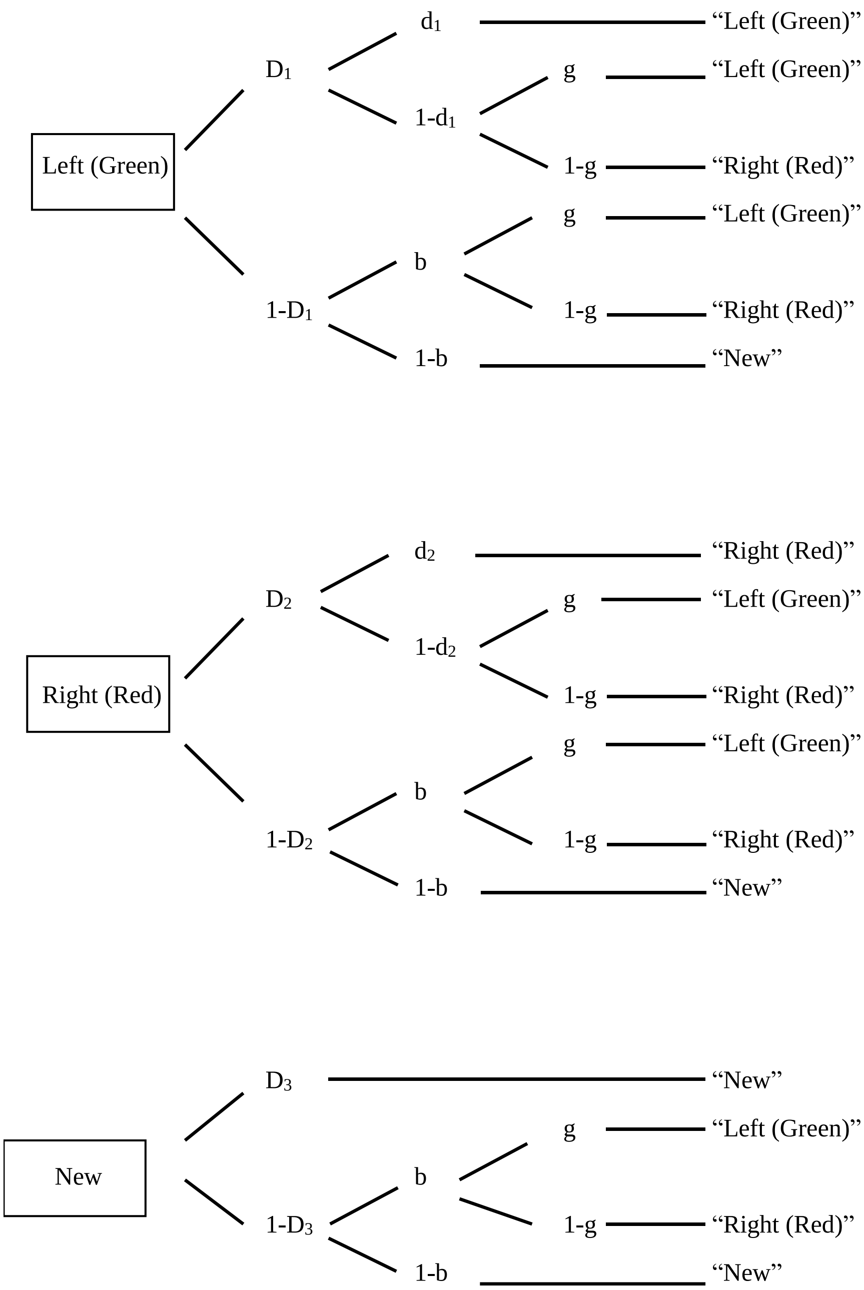

Figure 5. Two-high-threshold MPT model of source monitoring. D_1 = probability of detecting source “left” item as old; D_2 = probability of detecting source “right” item as old; D_3 = probability of detecting a new item as new; d_1 = probability of remembering an item’s source as “left”; d_2 = probability of remembering an item’s source as “right”; b = probability of guessing “old” if item is not detected as old; g = probability of guessing that an item had been presented by source “left”. Adapted from Bayen and Kuhlmann (2011).

CHAPTER 4

DISCUSSION

4.1 Overview

In the present study, the effects of test format and source presentation were examined with a between-subjects design. Similar to the findings of Dodson and Johnson (1993) and Marsh and Hicks (1998), more false alarms for new items and fewer source misattributions were expected in the simultaneous source monitoring test format compared to the sequential source monitoring test format. Moreover, fewer source misattributions and better item recognition were expected for the blocked source presentation condition relative to the mixed source presentation condition. For this aim, proportion of hits and false alarms for old/new recognition, source misattributions, and conditionalized proportion of correct source attributions were reported.

Contrary to our expectations, however, observed data was not in support of hypothesized differences between the simultaneous and sequential test. In other words, item and source recognition performance were statistically equivalent across the test formats. Interestingly, there were also no significant differences between the source presentation conditions. In fact, hit rates for item and source recognition did not significantly differ for the blocked and mixed source presentation conditions. The interaction between test format and source presentation was not significant for both item and source recognition, as well.

It was also investigated whether the findings could be replicated in each test cycle. For this aim, the same analyses were repeated for the first and second test cycle, respectively, and most findings were replicated. More specifically, for the first test cycle, the main effects of test format and source presentation as well as the interaction between test formats and source presentation were not significant for all dependent variables. In a similar vein, the main effect of source presentation and the interaction between test formats and source presentation were not significant for the second test cycle analyses. The main effect of test format was also not significant for all dependent variables, except for false alarm rates. Critically, as expected, false alarms were more pronounced for the simultaneous test format condition compared to the sequential test format condition in the second test cycle.

It was also investigated whether there were any differences between the first and second test cycle in terms of item and source recognition performance. The main effect of test cycle was not significant for hit rates and for false alarm rates. However, there was a significant difference across the test cycles for both source misattributions and conditionalized correct source attributions. More specifically, source misattributions were significantly attenuated for the second test cycle relative to the first test cycle, and conditionalized correct source attributions were higher for the second test cycle compared to the first test cycle. Therefore, it could be concluded that source discrimination performance was better in the second test cycle.

In summary, no evidence was found for our hypothesis predicting fewer source misattributions and better item recognition in the blocked source presentation condition relative to the mixed source presentation condition. Furthermore, although fewer misattributions were expected for the simultaneous source monitoring test compared to the sequential source monitoring test, the analyses, including the test cycle analyses, did not reveal a significant difference between the test formats. Lastly, more false alarms were expected in the simultaneous test format. Critical to this hypothesis, only the second test cycle analyses did indicate more false alarms for new items in the simultaneous source monitoring test format compared to the sequential source monitoring test format. Additional test cycle analyses also showed that source discrimination performance was better for the second test cycle relative to the first test cycle.

4.2 Source Presentation

Considering the effects of source presentation on memory for item and source, fewer source misattributions and better item recognition were expected when stimuli coming from varied sources were presented in a blocked manner. In this condition, it was assumed that source discrimination could be more salient since source switching occurs only once during transition from the one list to the other list. However, in the mixed source presentation condition, the stimuli coming from different sources have to be encoded rapidly, since there is random and frequent source switching, which could be more difficult to follow. Moreover, compared to the mixed source presentation, sources are temporally more distinct in the blocked source presentation (Bayen & Murnane, 1996). Furthermore, the blocked source presentation could have provided an opportunity for temporal/relational contiguity with the stimuli coming from the same source (see Misirlisoy et al., 2019, for a similar argument). Thus, it was expected that the blocked source presentation condition could demonstrate an advantage for both item and source discrimination over the mixed source presentation condition. Interestingly, neither an item memory nor a source memory advantage was observed across these conditions.

Our null results may be due to the strength of the source cues used in our study. In most previous studies of source memory (Hunt, 2003; Jacoby et al., 2005; Lindsay & Johnson, 1991; Toglia, 1999), participants were instructed to engage in several encoding tasks (e.g., making yes/no decisions about whether the stimulus contained the letter “a”, or making pleasantness judgement about the stimuli, etc.) to aid processing the source information in a more effective way. Critically, in the current study, these encoding tasks were deliberately not employed, in order to see the pure effect of test format and source presentation. In order to strengthen source information, color information was added to the location information, both of which can be regarded as relatively superficial cues. However, if stronger source information, that is, encouraging relatively deep level of encoding, had been chosen, participants would have been completely immersed in the relevant source. Consequently, they would have established relational encoding with both the relevant source and the other stimuli coming from that source. Accordingly, if the selected sources had been more distinctive and more inviting in terms of temporal/relational contiguity, the effect of source presentation might have been more pronounced.

4.3 Source Monitoring Test Formats

Fewer source misattributions were hypothesized in the simultaneous source monitoring test format compared to the sequential test format. However, this hypothesis was not supported. Dodson and Johnson (1993) indicated that participants could use either relatively loose or relatively strict criteria in these test formats. When the monitoring process is investigated by presenting all possible sources at once, participants could use more stringent criteria in the simultaneous condition, and consequently, correctly attribute more items to their sources.

Interestingly, our results were in conflict with those of Dodson and Johnson (1993). The lack of difference between the test formats in our study might be taken to indicate that our participants did not employ different criteria for the different test formats. The RT data may actually reveal converging evidence for this possible explanation. RTs less than 200 ms were very rare in the simultaneous test format, and also in the first step of the sequential test format, which stands for the item decision query. However, RTs less than 200 ms were very common in the second step of the sequential source monitoring test format, which stands for the source decision query. Accordingly, when they were asked to indicate their item decision in the first step of the sequential source monitoring test format, the participants must have considered their source decision as well, in a similar way with the simultaneous test format. Therefore, it is plausible that they may have used the same criteria for both the simultaneous and the sequential test formats, resulting in statistically equivalent performance for source misattributions.

More false alarms for new items were hypothesized in the simultaneous source monitoring test format compared to the sequential test format. This was explained by a possible bias occurring when two out of three options refer to “old” in the simultaneous test (Marsh et al., 2006). In the current study, however, evidence is somewhat mixed regarding false alarm rates. Although the planned analyses did not indicate any significant difference for false alarm rates, evidence for this hypothesis was found in the test cycle analyses. Indeed, the second test cycle analysis showed more false alarms for new items in the simultaneous source monitoring test format compared to the sequential source monitoring test format. Therefore, it could be too early to assume the equity of these tests in terms of memory performance. Further research is needed to replicate the present findings.

4.4 Test Cycle Analyses

Considering the test cycle analyses, overall source attribution performance was better in the second test cycle. These findings could be due to differential encoding strategies. As in most previous studies on source memory (Ferguson et al., 1992; Hashtroudi et al., 1989; Henkel et al., 1998), in the current study, participants were instructed to pay close attention and to learn the items and the list they belonged to. However, after the first test cycle, participants could have learned the exact nature of the source monitoring test and might have had the opportunity to develop better encoding strategies for the second test cycle. Accordingly, one might posit that the strategies used in the first and the second test cycles were different, leading to a better source memory performance for the second test cycle.

Interestingly, however, the item memory performance did not change across the test cycles while the source memory performance increased. In addition, the data did not indicate a ceiling effect. Therefore, these findings could provide further converging evidence for the notion that any factor which influences source memory in a specific way does not necessarily influence recognition memory in a similar way.

4.5 Limitations and Further Directions

In the present study, location and color were chosen deliberately as source cues. Rather than employing an additional encoding tasks, only source cues, were used, in order not to confound the main interests of the study. Moreover, these source cues were also selected to ensure that the sources did not have an advantage over each other in terms of guessing bias. As expected, the model-based analysis indicated no source guessing bias.

Critically, however, these selected sources could have affected the obtained results. If such conditions were established, in which sources had been more distinctive, or they had favored deep level of encoding, the effects of test format and source presentation would have been more pronounced on memory for item and source.

Moreover, Lindsay (2008) argued that when participants were instructed to attend to memory sources, or warned about potential source misattributions, they engaged more systematic monitoring processes, and, in turn, they were less prone to source errors. In the current study, however, participants were not directly warned about the source memory test and the potential source monitoring confusions. If they had been directly warned about the source monitoring test and the likelihood of such errors, or if they had been provided information about the encoding strategies at the beginning of the experiment, participants could have engaged in more elaborative encoding for the items and the sources they belonged to, in the first test cycle in addition to the second test cycle.

The current study also underscores the importance of time course analysis for the source monitoring process. In source attributions, a stimulus could be recognized firstly, and then it could be attributed to its source, or it might be identified directly as belonging to a specific source, whereby coming from a specific source would mean that that stimulus was already recognized as old (Lindsay, 2008).

In the present study, it should be noted that the direct comparison of the simultaneous and the sequential test formats in terms of response times was not possible. In the simultaneous test format, source and item information were collected in one step. Therefore, with a single RT, it was not possible to distinguish exactly when a decision was reached for source and item information. However, there were two separate RTs in the sequential test format, in which source and item information were collected in two steps. Nevertheless, it was not possible to distinguish when a decision was reached for source and item information, even in the sequential test format. When participants were asked to indicate item information in the first step, they could have already decided on the source information as well.

To conclude, it is very difficult to make an inference from the RT data of the current study. Further systematic research is needed to gain more understanding of the time course analysis of the source monitoring processes.

4.6 Contributions of the Study

The aim of the present study was to investigate source memory from a methodological perspective. There is no such study examining the effect of test format and source presentation on memory for item and source, in a systematic manner, within the same experimental design, making this study the first one in the literature.

Despite its limitations, the present study sheds lights on the methods used in source memory research with both its significant and nonsignificant results. Different versions of source monitoring tasks were used interchangeably in the literature in spite of the certain important caveats (Dodson & Johnson, 1993; Marsh &Hicks, 1998). Parallel to the previous findings in the literature, more false alarms for new items and fewer source misattributions were expected in the simultaneous source monitoring test format compared to the sequential source monitoring test format. Moreover, it was hypothesized that fewer source misattributions and better item recognition would be seen in the blocked source presentation condition relative to the mixed source presentation condition. Critically, only the second test cycle analyses indicated more false alarms for new items in the simultaneous source monitoring test format compared to the sequential source monitoring test format. However, the remaining hypotheses were not supported.

In summary, the main objective of the present thesis was to focus on the importance of adhering to a standard method for source monitoring studies. The ways in which the source monitoring process is measured has to be paid attention to, since certain methodological differences may possibly lead to the different interpretations of recognition memory and source memory performance. This study could guide further research regarding the concerns about the measurement of source monitoring.

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APPENDICES

APPENDIX A: WORD LISTS

List A.1

Word	Translation	List	Imageability	Concreteness	Frequency
hayvan	animal	A	6,1	6,49	334
heykel	sculpture	A	6,26	6,78	69
metal	metal	A	5,32	6,51	87
kitap	book	A	6,77	6,65	816
maaş	salary	A	4,89	5,22	108
sofra	table	A	6,27	6,37	93
eşya	furnishing	A	5,15	6,56	199
nehir	river	A	6,25	6,67	53
nefes	breath	A	4,52	5,68	128
kuzu	lamb	A	6,54	6,79	57
alkol	alcohol	A	5,87	6,46	133
arkadaş	friend	A	5,85	5,25	764
tekne	boat	A	6,25	6,84	108
yara	wound	A	5,71	6,21	82
çiçek	flower	A	6,61	6,67	177
balkon	balcony	A	6,45	6,87	57
eşek	donkey	A	6,4	6,8	52
üzüm	grape	A	6,57	6,93	61
manken	mannequin	A	6,3	6,28	58
dudak	lip	A	6,46	6,8	157

List A.2

Word	Translation	List	Imageability	Concreteness	Frequency
fırça	brush	A	6,11	6,73	52
depo	storage	A	5,58	6,67	92
reklam	advertisement	A	5,06	5,39	211
çamaşır	laundry	A	6,04	6,78	52
yoğurt	yogurt	A	6,51	6,79	71
taksi	taxi	A	6,38	6,79	56
asker	soldier	A	6,5	6,7	181
gürültü	rumble	A	4,55	5,29	131
pasta	cake	A	6,48	6,77	79
büro	bureau	A	5,43	6,37	69
altın	gold	A	6,3	6,72	168
belge	document	A	5,03	6,5	190
çığlık	scream	A	4,6	5,2	74
mobilya	furniture	A	6,14	6,76	89
ilaç	medication	A	6,36	6,56	233
lamba	lamp	A	6,36	6,84	83
deniz	sea	A	6,49	6,57	509
saray	palace	A	6,05	6,56	129
tepsi	tray	A	6,13	6,75	69
vali	governor	A	5,09	6,11	80

List B.1

Word	Translation	List	Imageability	Concreteness	Frequency
ceket	jacket	B	6,39	7	64
tırnak	nail	B	6,62	6,9	62
gözlük	glasses	B	6,63	6,87	78
ayna	mirror	B	6,41	6,79	144
bina	building	B	6,05	6,78	313
damla	drop	B	5,87	6,64	84
orman	forest	B	6,43	6,57	217
makyaj	makeup	B	5,39	5,93	79
garson	waiter	B	6,24	6,61	90
peynir	cheese	B	6,43	6,88	143
kaşık	spoon	B	6,71	6,86	102
gölge	shadow	B	5,05	5,55	105
yağmur	rain	B	6,45	6,55	160
lokanta	restaurant	B	6,32	6,71	141
pencere	window	B	6,54	6,93	276
petrol	petroleum	B	5,57	6,56	150
sebze	vegetable	B	6,19	6,71	128
bıçak	knife	B	6,55	6,87	100
şair	poet	B	4,99	5,59	125
limon	lemon	B	6,57	6,93	60

List B.2

Word	Translation	List	Imageability	Concreteness	Frequency
çerçeve	frame	B	6,11	6,76	179
kamyon	lorry	B	6,49	6,96	84
müzik	music	B	5,49	5,34	399
cihaz	device	B	4,76	6,43	173
arsa	terrain	B	5,74	6,69	57
kulak	ear	B	6,6	6,75	311
torba	bag	B	6,03	6,87	96
kemik	bone	B	6,21	6,82	159
bayrak	flag	B	6,51	6,59	55
parmak	finger	B	6,49	6,89	226
cadde	street	B	6,11	6,52	320
dükkan	shop	B	6,17	6,73	205
kutu	box	B	6,27	6,84	126
mektup	letter	B	6,22	6,89	240
lise	high school	B	6,02	5,8	148
ekran	screen	B	6,27	6,74	144
kamera	camera	B	6,58	6,76	87
masa	table	B	6,42	6,9	401
kapı	door	B	6,74	6,86	817
deri	leather	B	5,55	6,74	204

List C.1

Word	Translation	List	Imageability	Concreteness	Frequency
radyo	radio	C	6,47	6,75	140
pilav	rice	C	6,58	6,85	53
kapak	cover	C	5,63	6,69	142
boya	dye	C	5,35	6,43	98
dere	brook	C	5,96	6,86	58
meyve	fruit	C	6,31	6,63	186
polis	police	C	6,28	6,55	278
bulut	cloud	C	6,45	6,29	66
zeytin	olive	C	6,51	6,92	64
rüzgar	wind	C	5,14	6,09	185
damar	vessel	C	5,29	6,52	96
pilot	pilot	C	6,08	6,35	51
harita	map	C	6,26	6,7	61
avuç	palm	C	6,2	6,63	71
salon	saloon	C	5,59	6,33	244
hamur	dough	C	5,91	6,55	85
kağıt	paper	C	6,56	6,83	323
kablo	cable	C	6,07	6,87	90
biber	pepper	C	6,51	6,75	73
evlat	offspring	C	5,29	6	78

List C.2

Word	Translation	List	Imageability	Concreteness	Frequency
tavuk	chicken	C	6,69	6,88	92
gazete	newspaper	C	6,51	6,81	532
gömlek	shirt	C	6,64	6,89	73
iskele	pier	C	5,93	6,71	50
şeker	sugar	C	6,18	6,63	143
liman	port	C	6,03	6,52	76
ahşap	wood	C	5,48	6,42	111
imza	signature	C	5,8	6,02	111
yüzük	ring	C	6,7	6,81	50
giysi	clothes	C	6,08	6,54	125
memur	civil servant	C	5,94	6,27	191
kadeh	wineglass	C	6,35	6,75	65
elma	apple	C	6,73	6,95	64
uçak	airplane	C	6,47	6,91	194
mühendis	engineer	C	4,63	5,49	108
kahvaltı	breakfast	C	6,25	6,37	71
fotoğraf	photo	C	6,27	6,62	335
köpük	foam	C	5,78	6,49	54
otel	hotel	C	6,06	6,62	183
sigara	cigarette	C	6,52	6,78	315

List D.1

Word	Translation	List	Imageability	Concreteness	Frequency
demir	iron	D	5,5	6,77	135
soğan	onion	D	6,36	6,9	95
cami	mosque	D	6,56	6,59	188
tahta	wood	D	6,24	6,94	155
pirinç	rice	D	6,5	6,69	101
çukur	hollow	D	5,93	6,39	70
vitrin	showcase	D	5,99	6,56	64
pamuk	cotton	D	6,24	6,77	55
alet	device	D	4,61	6,63	137
sahil	coast	D	6,29	6,38	73
gemi	ship	D	6,61	6,92	164
içki	drink	D	6,02	6,44	141
tabanca	revolver	D	6,44	6,93	72
bisiklet	bicycle	D	6,51	6,86	64
örtü	cover	D	6,04	6,75	81
gelin	bride	D	6,18	6,28	67
misafir	guest	D	5,36	6,07	66
boru	pipe	D	6,32	6,89	80
hastane	hospital	D	6,34	6,68	209
sinema	cinema	D	5,92	5,59	265

List D.2

Word	Translation	List	Imageability	Concreteness	Frequency
omuz	shoulder	D	6,32	6,86	100
bacak	leg	D	6,5	6,86	185
mezar	grave	D	6,11	6,21	78
araba	car	D	6,63	6,87	422
bitki	plant	D	5,89	6,6	234
gündüz	daytime	D	4,94	5,27	57
havuz	pool	D	6,45	6,83	71
komşu	neighbor	D	5,41	5,76	132
sergi	exhibition	D	5,94	6,11	71
taşıt	vehicle	D	5,93	6,63	92
balık	fish	D	6,67	6,79	300
yangın	fire	D	5,74	6,07	103
yakıt	fuel	D	4,98	6,48	72
yastık	pillow	D	6,57	6,91	77
mutfak	kitchen	D	6,24	6,75	365
okul	school	D	6,44	6,6	565
otobüs	bus	D	6,53	6,86	213
salata	salad	D	6,51	6,79	72
patron	boss	D	5,36	5,81	102
dede	grandfather	D	6,39	6,48	118

APPENDIX B: APPROVAL OF METU HUMAN SUBJECTS ETHICS COMMITTEE

UYGULAMALI ETİK ARAŞTIRMA MERKEZİ
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15 ARALIK 2017

Konu: Değerlendirme Sonucu

Gönderen: ODTÜ İnsan Araştırmaları Etik Kurulu (İAEK)

İlgi: İnsan Araştırmaları Etik Kurulu Başvurusu

Sayın Doç.Dr. Mine MISIRLISOY;

Danışmanlığını yaptığınız yüksek lisans öğrencisi Hilal TANYAŞ'ın **"The Effects of Source Presentation and Test Format on Recognition Memory for Item and Source"** başlıklı araştırması İnsan Araştırmaları Etik Kurulu tarafından uygun görülerek gerekli onay **2017-SOS-201** protokol numarası ile **15.12.2017-30.08.2019** tarihleri arasında geçerli olmak üzere verilmiştir.

Bilgilerinize saygılarımla sunarım.

Prof. Dr. Ş. Halil TURAN
Başkan V

Prof. Dr. Ayhan SOL
Üye

Prof. Dr. Ayhan Gürbüz DEMİR
Üye

Doç. Dr. Yaşar KONDAKÇI
Üye

Doç. Dr. Zana ÇITAK
Üye

Yrd. Doç. Dr. Pınar KAYGAN
Üye

Yrd. Doç. Dr. Emre SELÇUK
Üye

APPENDIX C: INFORMED CONSENT FORM

ARAŞTIRMAYA GÖNÜLLÜ KATILIM FORMU

Bu çalışma ODTÜ Psikoloji Bölümü öğrencisi Hilal Tanyaş tarafından, Doç. Dr. Mine Mısırlısoy danışmanlığında, yüksek lisans tezi kapsamında yürütülmektedir. Bu form sizi araştırma koşulları hakkında bilgilendirmek için hazırlanmıştır.

Çalışmanın Amacı Nedir?

Bellek, uyarıcıların sunumuna ve ölçme yöntemlerine bağlı olarak farklılıklar gösterebilir. Bu çalışmanın amacı uyarıcıların sunumu ve farklı tip test formatlarının kaynak ve tanıma belleği süreçleri üzerindeki etkisini incelemektir.

Bize Nasıl Yardımcı Olmanızı İsteyeceğiz?

Araştırma ODTÜ Bilişsel Psikoloji Bölümü laboratuvarında yapılacaktır. Üniversite öğrencileri katılımcı olarak davet edilecek, katılmak isteyenler yaklaşık 30 dakikalık bir laboratuvar seansına katılacaklardır. Çalışmada size çeşitli kelimeler gösterilecek ve bu kelimelerle ilgili kararlar almanız beklenecektir.

Katılımınızla ilgili bilmeniz gerekenler:

Bu çalışmaya katılmak tamamen gönüllülük esasına dayalıdır. Herhangi bir yaptırıma veya cezaya maruz kalmadan çalışmaya katılmayı reddedebilir veya çalışmayı bırakabilirsiniz.

Araştırmaya katılanlardan toplanan veriler tamamen gizli tutulacak, veriler ve kimlik bilgileri herhangi bir şekilde eşleştirilmeyecektir. Katılımcıların isimleri bağımsız bir listede toplanacaktır. Bu araştırmanın sonuçları bilimsel ve profesyonel yayınlarda veya eğitim amaçlı kullanılabilir, fakat katılımcıların kimliği gizli tutulacaktır.

Çalışmaya katıldığınız için şimdiden teşekkür ederiz.

Araştırmayla ilgili daha fazla bilgi almak isterseniz:

Çalışmayla ilgili soru ve yorumlarınızı mmine@metu.edu.tr veya tan.hilal05@gmail.com adresinden iletebilirsiniz.

Yukarıdaki bilgileri okudum ve bu çalışmaya tamamen gönüllü olarak katılıyorum.
(Formu doldurup imzaladıktan sonra yürütücüye geri veriniz)

Katılımcı İsim Soyad	Tarih	İmza
	---/----/-----	

Yürütücü İsim Soyad	Tarih	İmza
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APPENDIX D: TURKISH SUMMARY / TÜRKÇE ÖZET

BÖLÜM 1

GİRİŞ

Çalışmanın temel amacı, kaynak izleme süreçlerini metodolojik açıdan ele almaktır. Bu amaçla, farklı tip kaynak izleme test formatları arasında kaynak atfı ve tanıma belleği performansı bakımından bir fark olup olmadığı araştırılmıştır. Bunun yanı sıra, kaynağın sunumunun kaynak ve tanıma belleği üzerindeki etkisi incelenmiştir. Özetle, tek aşamalı veya iki aşamalı kaynak izleme test formatları ile kaynağın bloklar halinde veya karıştırılarak sunulması sistematik olarak araştırılmıştır. Sonuçlar, kaynak ve tanıma belleği performansı açısından değerlendirilmiştir.

Kaynak İzleme

Kaynak izleme, bellek kayıtlarının kaynaklarına/orijinlerine atfedildiği bir denetleme mekanizmasıdır (Johnson, Hashtroudi ve Lindsay, 1993; Johnson ve Mitchell, 2002). Yer, zaman, yöntem veya kişi gibi bellek kaydının nasıl elde edildiğine işaret eden her türlü bilgi, kaynak bilgisi olarak değerlendirilmektedir (Johnson ve ark., 1993; Lindsay, 2008). Kaynak izleme, hem belli bir bellek kaydının kökeninin incelenmesini hem de belleğimizde var olan sayısız kaydın ayrımının yapılmasını sağlayan bir bilişsel süreçtir (Lindsay, 2008).

Bellek kayıtlarında gerçek her zaman doğru ve eksiksiz bir şekilde kodlanmayabilir. Var olan bellek kaydının geri çağrılmasında da birtakım bilişsel hatalar meydana gelebilir. Dolayısıyla, bellek kayıtlarının yeniden inşa süreçleri doğrultusunda oluştuğu öne sürülmektedir (Loftus, 2003). Kaynak izleme teorisi, bellek yanılmalarını kaynak izleme sürecinde oluşan hataların sonucu olarak değerlendirir (Gallo, 2010).

Sonuç olarak, bellek kayıtlarının hangi durumlarda bu hatalara daha yatkın ve daha dayanıklı olduğunu incelemek kaynak izleme süreçlerinin daha iyi anlaşılmasını sağlayacaktır.

Kaynak ve Tanıma Belleği Arasındaki İlişki

Tanıma belleğinde, bir uyarıcının daha önceden deneyimlenip deneyimlenmediği araştırılır (Shiffrin ve Steyvers, 1997). Bir başka deyişle, tanıma belleğinde kişinin bir uyarıcıya maruz kalıp kalmadığını belirlemesi istenirken, kaynak belleğinde kişinin deneyimlediğini düşündüğü bu uyarıcının kökenini doğru bir şekilde ayırt etmesi beklenmektedir. Dolayısıyla, kaynak belleği daha spesifik bir bellek bilgisine dayandığından, tanıma belleğine kıyasla daha kontrollü bir bilişsel denetim gerektirir (Johnson, Kounios ve Nolde, 1997; Lindsay, 2008).

Kaynak ve tanıma belleği aynı veri tabanına dayanır, ama aynı bellek bilgisi farklı şekilde kullanılır (Banks, 2000). Bu sebeple, her ne kadar bazı faktörler kaynak ve tanıma belleğini aynı doğrultuda etkilese de (Glanzer, Hilford ve Kim, 2004), kaynak belleğini etkileyen her değişken tanıma belleğini aynı yönde (Johnson, De Leonardis, Hashtroudi ve Ferguson, 1995; Johnson ve Raye, 1981) veya aynı büyüklükte (Lindsay, Johnson ve Kwon, 1991; Lindsay ve Johnson, 1991) etkilemeyebilir.

Özetle, bu iki bilişsel süreç arasındaki benzerlik ve farklılıkların aydınlatılabilmesi için, kaynak ve tanıma belleği ölçme yöntemlerinin incelenmesi gereklidir. Temel olarak, tanıma belleği testinde kişiden bir uyarıcıyı deneyimleyip deneyimlemediğini belirtmesi istenirken, kaynak belleği testinde kişiden deneyimlediğini düşündüğü bu uyarıcının kökenine karar vermesi beklenmektedir. Dolayısıyla, bellek performansının ölçüldüğü bu süreçleri incelemek, hem kaynak hem de tanıma belleği alanyazını açısından önem arz etmektedir (Johnson, 2005).

Kaynak Belleği Çalışmalarında Kullanılan Yöntemler

Kaynak belleği alanyazında, çeşitli kaynak izleme test formatları kullanılmaktadır (Lindsay, 2008). Bu testlerden kaynak belleği performansının yanı sıra tanıma belleği performansı da hesaplanabilmektedir (Johnson, 2005).

En yaygın kullanılan test formatları tek aşamalı ve iki aşamalı kaynak izleme testleridir. Temel olarak kaynak belleği çalışmalarında, katılımcılara farklı kaynaklardan gelen uyarıcılar sunulmaktadır. Daha sonrasında ise, katılımcılara hem daha önceden deneyimledikleri bu uyarıcılardan hem de çeldirici kelimelerden oluşan bir test uygulanmaktadır. Tek aşamalı kaynak izleme test formatında katılımcıların görevi kendilerine sunulan uyarıcıların kaynaklarını belirlemektir. Eğer katılımcılar uyarıcıyı daha önce deneyimlemediklerini düşünüyorlarsa, onlardan bu uyarıcıyı "yeni/çeldirici" olarak işaretlemeleri beklenmektedir (Lindsay, 2008; Marsh ve Hicks, 1998). Böylelikle bu test formatında, tanıma ve kaynak bilgisi tek aşamada toplanmış olur.

İki aşamalı kaynak izleme test formatında ise, katılımcılara öncelikle uyarıcıyı deneyimleyip deneyimlemedikleri sorulmaktadır. Eğer katılımcı uyarıcıyı daha önceden deneyimlediğini belirtirse, bir sonraki aşamada kendisinden bu uyarıcının kaynağını işaretlemesi beklenmektedir (Glanzer ve ark., 2004; Mawdsley, Grasby ve Talk, 2014; Meyer, Bell ve Buchner, 2015). Dolayısıyla, bu test formatında tanıma ve kaynak bilgisi iki aşamada toplanmış olur.

Alanyazında, bu iki test formatı birbirlerinin yerine alternatif olarak kullanılmaktadır. Ancak, bazı çalışmalarda (Dodson ve Johnson, 1993; Marsh, Cook ve Hicks, 2006) tek aşamalı test formatında, iki aşamalı test formatına kıyasla, yeni kelimelere karşı daha çok yanlış alarm ve daha az kaynak atfetme hatası görülmüştür. Tek aşamalı kaynak izleme test formatında daha fazla yanlış alarm görülmesi, testteki üç seçenekten (A kaynağı, B kaynağı, yeni/çeldirici kelime) ikisinin aslında kelimenin "eski/deneyde görülen" bir kelime olduğuna işaret etmesi sonucu katılımcılarda görülen yanlılık olarak açıklanmaktadır. (Marsh ve ark., 2006). Tek aşamalı kaynak izleme test formatında katılımcıların daha az kaynak atfetme hatası yapmaları ise, bu formatta daha kontrollü kriter kullanmaları ile açıklanmıştır (Dodson ve Johnson, 1993). Bu çalışmalar ışığında, farklı tip kaynak izleme test formatlarının kaynak ve tanıma belleği üzerindeki etkisinin sistematik olarak incelenmesi gerektiği kanısına varılmıştır (ayrıca bakınız Tanyaş ve Mısırlısoy, 2018).

Kaynak belleği alanyazında, ölçme yöntemlerinin yanı sıra, kaynağın sunumu konusunda da uzlaşma bulunmamaktadır. Öğrenme sürecinde, farklı kaynaklardan gelen uyarıcılar bazen bloklar halinde bazen de karıştırılarak sunulmaktadır. Kaynağın bloklar halinde sunulduğu koşulda, katılımcılar önce aynı kaynaktan gelen uyarıcıları kodlayıp daha sonra diğer kaynaktan gelen uyarıcılara geçerler. Böylelikle, kaynak değişimi sadece uyarıcı listeleri arası geçişte olur. Buna karşılık, uyarıcı listelerinin karıştırılarak sunulduğu koşulda, farklı kaynaklardan gelen uyarıcılar aynı anda kodlanmak durumunda kalınır ve kaynak değişimi seçkisiz ve sıklıkla gerçekleşir. Dolayısıyla, kaynağın bloklar halinde sunulduğu koşula kıyasla, kaynağın karıştırılarak sunulduğu koşulda kaynak değişimin takibinin daha zor olması beklenebilir. Ayrıca, kaynağın bloklar halinde sunulduğu koşulda, farklı kaynakların ayrımı zamansal açıdan daha kolay yapılmaktadır (Bayen ve Murnane, 1996). Bunun yanı sıra, kaynağın bloklar halinde sunulduğu koşulda, kişiler aynı kaynaktan gelen uyarıcılar arasında ilişkisel/zamansal bir yakınlık kurabilir ve bu durum, kaynak izleme süreçlerini kolaylaştırabilir (bkz. Misirlisoy, Tanyas ve Atalay, 2019).

Özetle, araştırmacıların gelişigüzel yaptığı bu seçimlerin, kaynak ve tanıma belleği performanslarını etkileyebileceği düşünülmektedir. Bu sebeple, kaynağın sunumunun olası etkisinin araştırılması gerekli görülmüştür.

Çalışmanın Amacı

Bu çalışmanın amacı, kaynak izleme test formatlarının ve kaynağın sunumunun kaynak ve tanıma belleği üzerindeki etkisini sistematik olarak incelemektir. Farklı test formatı kullanımında, daha önceki çalışmaların (Dodson ve Johnson, 1993; Marsh ve ark., 2006) bulgularının tekrar edilmesi beklenmektedir. Özetle, iki aşamalı kaynak izleme test formatına oranla, tek aşamalı kaynak izleme test formatında yeni kelimelere karşı daha çok yanlış alarm hipotez edilmiştir. Çünkü tek aşamalı kaynak izleme testindeki üç seçenekten ikisi aslında kelimenin "eski/deneyde görülen" bir kelime olduğuna işaret etmektedir. Dolayısıyla, katılımcılar çeldirici bir kelimeyi "eski/deneyde görülen" olarak işaretlemeye yatkın olabilirler. (Marsh ve ark., 2006). Ayrıca, iki aşamalı kaynak izleme test formatına kıyasla, tek aşamalı kaynak izleme test formatında daha az kaynak atfı hatası öngörülmüştür. Çünkü tüm olası seçeneklerin aynı anda sunulduğu tek aşamalı test formatında, katılımcıların daha kontrollü kriter kullanmaları beklenmiştir (Dodson ve Johnson, 1993).

Bu hipotezlere ek olarak, kaynağın karıştırılarak sunulduğu koşula kıyasla, kaynağın bloklar halinde sunulduğu koşulda daha iyi bir kaynak ve tanıma belleği performansı öngörülmüştür. Uyarıcı listelerinin karıştırılarak sunulduğu koşulda, katılımcıların farklı kaynaklardan gelen uyarıcıları aynı anda kodlamak durumunda kalmalarının kaynak değişiminin takibini zorlaştırması beklenmiştir. Ayrıca, kaynağın bloklar halinde sunulduğu koşulda, farklı kaynakların ayrımı zamansal açıdan daha kolay olmaktadır (Bayen ve Murnane, 1996). Bunun yanı sıra, kaynağın bloklar halinde sunulduğu koşulun, aynı kaynaktan gelen uyarıcılar arasında ilişkisel/zamansal bir yakınlık kurulmasına zemin hazırlaması ve dolayısıyla, kaynak izleme süreçlerini kolaylaşması beklenmiştir (bkz. Misirlisoy, Tanyas ve Atalay, 2019).

Kaynak izleme test formatlarının eğer ki birbirleri üzerinde kaynak veya tanıma belleği performansı açısından herhangi bir avantajı varsa; bu avantaj, kaynağın sunumunun olası karıştırıcı etkisinden desteklenmesin diye, kaynak izleme test formatları ve kaynağın sunumu aynı çalışmada incelenmiştir. Böylelikle, kaynak izleme test formatları arasındaki farkın, kaynağın sunumunun bloklar halinde veya karıştırılarak sunulduğu koşullarda değişip değişmediği araştırılmıştır.

Özetle, bu çalışmada, kaynak izleme süreçleri metodolojik açıdan ele alınarak kullanılan çeşitli yöntemlerin kaynak ve tanım belleği performansı üzerindeki olası etkisi incelenmiştir. Bulguların hem kaynak hem de tanıma belleği alanyazına katkı sağlaması beklenmektedir.

BÖLÜM 2

YÖNTEM

Bu çalışma Open Science Framework sitesine kaydedilmiştir. Çalışmaya dair hipotezlere, materyallere, deneylere ve analizlere https://osf.io/xkmc2/ adresinden ulaşılabilmektedir.

Çalışmanın temel amacı, kaynağın sunumu ve test formatlarının kaynak ve tanıma belleği üzerindeki etkisini denekler arası bir deney deseni ile incelemektir. Alanyazındaki birçok çalışma gibi (Crump, Gong ve Milliken, 2006; Glanzer ve ark., 2004; Mawdsley ve ark., 2014), sağ-sol yön bilgisi kaynak bilgisi olarak seçilmiştir. Kaynak bilgisini güçlendirmek adına, yön bilgisine ilave olarak renk bilgisi de kullanılmıştır (örn. ekranın solu yeşil arka fonda sunulurken, ekranın sağının kırmızı arka fonda sunulması).

Katılımcılar

Kaynak belleği alanyazındaki rapor edilen etki büyüklükleri temel alınarak, $\eta_p^2 = .10$ olarak belirlenmiştir. G*Power-3 (Faul, Erdfelder, Lang ve Buchner, 2007) yazılımı kullanılarak yapılan güç analizi sonucunda hedef katılımcı sayısının 120 olduğu görülmüştür. Katılımcıların yönergeye uymama ihtimali göz önünde bulundurularak, hedef katılımcı sayısının %10'u kadar daha katılımcıdan veri toplanmıştır. Veri atma süreci sonucunda, hedef katılımcı sayısına ulaşana kadar veri toplanmaya devam edilmiştir.

Deneye 134 kişi, ek puan veya 10 TL karşılığında gönüllü olarak katılmıştır. Veri atma kriterleri veya yönergeye uymama sebeplerinden ötürü, 9 kişi analizden çıkartılmıştır. Analiz, kalan 125 kişi (M_{age}= 21.63 years) ile yapılmıştır. Katılımcıların hepsinin ana dili Türkçedir ve katılımcıların hiçbiri deneye engel olacak bir görme problemi rapor etmemiştir.

Kelime Listeleri

Bu çalışma için, Türkçe Kelime Normları (Göz, Tekcan ve Erciyes, 2017; Tekcan ve Göz, 2005) kullanılarak, toplamda 160 kelime seçilmiştir. Bu kelimeler, 2 ayrı test döngüsünde sunulmak üzere 4 farklı kelime listesine seçkisiz olarak atanmıştır. Kelimeler hece sayısı (2-3), sıklık (50-1000), somutluk (5.00-7.00) ve imgelem (4.50-7.00) değerleri kontrol edilerek seçilmiştir. Kelime listeleri arasında sıklık, somutluk ve imgelem değerleri bakımından anlamlı bir fark gözlemlenmemiştir. Her bir test döngüsü için, 40 kelimeden oluşan kelime listesi, ekranın solunda ve sağında sunulmak üzere, ikiye bölünmüştür. Kırk kelimeden oluşan bir diğer kelime listesi ise çeldirici olarak kullanılmıştır. Hedef ve çeldirici kelimeler katılımcılar arasında dengelenmiştir.

İşlem

Deneyde 2 (kaynak izleme test formatı: tek aşamalı kaynak izleme testi, iki aşamalı kaynak izleme testi) X 2 (kaynağını sunumu: kaynağın karıştırılarak sunumu, kaynağın bloklar halinde sunumu) denekler arası bir deney deseni kullanılmıştır. Araştırma için Orta Doğu Teknik Üniversitesi İnsan Araştırmaları Etik Kurulu'ndan onay alınmıştır. Deneyden önce katılımcılardan katılım onay formunu okuyup imzalamaları istenmiştir. Katılımcı bilgi formu olarak, katılımcılara Türkçe yeterlik seviyesinin yanı sıra renk körlüğü, dikkat ve okuma problemlerinin olup olmadığı sorulmuştur.

Deney E-Prime 2.0 programı yardımıyla hazırlanmıştır. Çalışma temel olarak 3 aşamadan oluşmuştur. İlk olarak, katılımcılara ekranın solunda ve sağında kelimeler gösterilmiştir. Ekranın solunda sunulan kelimeler yeşil arka fonda, ekranın sağında sunulan kelimeler kırmızı arka fonda gösterilmiştir. Her kelime ekranda 2 saniye süreyle kalmış ve süre bitiminde bir sonraki kelimeye geçilmiştir. Uyarıcıların gösterilme sırası her katılımcı için farklı ve seçkisiz olarak E-Prime programı aracılığıyla hazırlanmıştır.

Kaynak belleği alanyazındaki birçok çalışma gibi (Ferguson, Hashtroudi ve Johnson, 1992; Hashtroudi, Johnson ve Chrosniak, 1989; Henkel, Johnson ve De Leonardis, 1998), katılımcılara sonradan girecekleri bellek testi hakkında doğrudan bilgi verilmemiştir. Katılımcılardan sadece kelimeleri ve bu kelimelerin hangi listeye ait olduklarını öğrenmeleri beklenmiştir. Katılımcılara solda ve sağda 20 kelime olmak üzere, toplamda 40 kelime gösterilmiştir. Kaynağın karıştırılarak sunulduğu koşulda bulunan katılımcılara, kelimeler bazen sağda bazen solda seçkisiz olarak sunulmuştur. Öte yandan, kaynağın bloklar halinde sunulduğu koşulda bulunan katılımcılara, farklı kaynaklardan gelen kelimeler sıra ile sunulmuştur. Dolayısıyla, bu koşulda kaynaklar arası geçiş sadece bir kere gerçekleşmiştir.

Kelimeleri kodlama kısmı bittikten sonra, katılımcılara oyalayıcı görev olarak üç dakika boyunca belli sayılardan 9'arlı veya 7'şerli geriye doğru sayma görevi verilmiştir. Katılımcıların yanıtları deney yürütücüsü tarafından takip edilmiş, katılımcılar yanlış yaptıkları takdirde başa dönmeleri için uyarılmıştır. Oyalama görevinin ardından katılımcılar kaynak izleme testine tâbi tutulmuşlardır. Uyarıcıların geçme hızı katılımcılar tarafından belirlenmiştir. Test aşamasında 40 tane daha önceden sunulmuş eski kelime ve 40 tane çeldirici/yeni kelime gri arka fonda gösterilmiştir. Katılımcılardan ilgili tuşlara basarak cevap vermeleri istenmiştir.

Tek aşamalı kaynak izleme testini alan katılımcılardan kendilerine sunulan uyarıcıların kaynaklarını belirlemeleri beklenmiştir. Eğer katılımcılar uyarıcıyı daha önce deneyimlemediklerini düşünüyorlarsa, onlardan bu uyarıcıyı "yeni/çeldirici" olarak işaretlemeleri istenmiştir. İki aşamalı kaynak izleme testini alan katılımcılardan ise, öncelikle uyarıcıyı daha önceki kodlama aşamasında deneyimleyip deneyimlemediklerini belirtmeleri beklenmiştir. Eğer katılımcı uyarıcıyı daha önceden deneyimlediğini belirtirse, bir sonraki aşamada kendisinden bu uyarıcının kaynağını işaretlemesi istenmiştir. Her bir katılımcının kaynak ve tanıma belleği performansı ayrı ayrı hesaplanmış ve tepki süreleri E-Prime programı aracılığıyla otomatik olarak kaydedilmiştir. Deneyin 8 ayrı sürümü olduğundan, kod sayısı bir hayli uzundur (yaklaşık 1000 sayfa). Bu sebeple, deneyde kullanılan kodlar ve programlamaya dair diğer detaylar, tezin ekler bölümü yerine, Open Science Framework sitesine kaydedilmiştir.

BÖLÜM 3

SONUÇLAR

Tepki süresi 200 ms altında olan veriler, katılımcıların cevapları yanlışlıkla verdiği düşünülerek, analizden çıkarılmıştır (Bugg, 2014; Bugg ve Hutchison, 2013; Bugg, Jacoby ve Toth, 2008). Tek aşamalı kaynak izleme testinde ve iki aşamalı kaynak izleme testinin ilk basamağında tepki süresi 200 ms altındaki verinin yok denecek kadar az olduğu gözlemlenmiştir. Ancak, iki aşamalı kaynak izleme testinin ikinci basamağında tepki süresi 200 ms altında olan çok fazla veri çıkmıştır. Kritik olarak, iki aşamalı kaynak izleme testinin ilk basamağında katılımcılar uyarıcının tanıma bilgisine karar verirken aynı zamanda kaynak bilgisine de karar vermiş olabilirler; dolayısıyla, ikinci basamakta cevaplarını hızlı bir şekilde belirtmiş olabilirler. Bu durum göz önünde bulundurularak, olası bir bilgi kaybını önlemek adına, tek aşamalı test formatı ile iki aşamalı test formatının ilk basamağındaki tepki süreleri temel alınarak veri atma işlemi yapılmıştır. Bunun yanı sıra, isabet oranlarının +/- 3 standart sapması içinde olmasına dikkat edilmiştir.

Katılımcıların bellek performansı kaynak ve tanıma belleği performansı içi ayrı ayrı hesaplanmıştır. Tanıma belleği performansı, katılımcıların kaynak atıflarını göze almaksızın, kendilerine gösterilen kelimeleri ne oranda tanıdıkları temel alınarak yapılmıştır. Ancak, kaynak belleği performansı için iki ayrı skor hesaplanmıştır. Bir tanesinde, doğru kaynak atıfları tüm "eski" cevaplara oranlanarak hesaplanırken, diğerinde isabet oranlarına göre değerlendirilmiştir.

Kaynak ve tanıma belleği performansı 2 (kaynak izleme test formatı: tek aşamalı kaynak izleme testi, iki aşamalı kaynak izleme testi) X 2 (kaynağını sunumu: kaynağın karıştırılarak sunumu, kaynağın bloklar halinde sunumu) denekler arası ANOVA ile analiz edilmiştir. Analizlerin sonucunda, hiçbir temel etki veya etkileşim anlamlı çıkmamıştır.

Test Döngüsü Analizleri

Planlanan analizler sonucunda elde edilen bulguların her iki test döngüsünde de tekrarlanıp tekrarlanmadığını incelemek için, verinin test döngüsü analizleri yapılmıştır. Her bir test döngüsündeki kaynak ve tanıma belleği performansı 2 (kaynak izleme test formatı: tek aşamalı kaynak izleme testi, iki aşamalı kaynak izleme testi) X 2 (kaynağını sunumu: kaynağın karıştırılarak sunumu, kaynağın bloklar halinde sunumu) denekler arası ANOVA ile analiz edilmiştir. Birinci test döngüsünün analizlerinde, hiçbir temel etki veya etkileşim anlamlı çıkmamıştır. İkinci test döngüsünün analizlerinde ise, sadece kaynak izleme test formatının yanlış alarmlar üzerindeki temel etkisi anlamlı bulunmuştur. Bir başka deyişle, tek aşamalı test formatında, iki aşamalı test formatına göre, çeldirici kelimelere karşı daha çok yanlış alarm olduğu gözlemlenmiştir.

Birinci ve ikinci test döngüsü arasında, kaynak ve tanıma belleği performansı bakımından bir fark olup olmadığını incelemek için, bağımlı değişkenler tek yönlü denek içi ANOVA ile analiz edilmiştir. Kaynak belleği performansının, birinci döngüye kıyasla, ikinci döngüde daha yüksek olduğu gözlemlenmiştir. Yani, katılımcılar ikinci test döngüsünde kelimelerin kaynağını daha başarılı bir şekilde ayırt edebilmişlerdir.

Model Analizi

İki kaynağın ayrımını gerektiren kaynak izleme testlerinde, katılımcıların cevabı için 3 ayrı seçenek bulunmaktadır: Uyarıcı A kaynağından gelebilir, uyarıcı B kaynağından gelebilir veya uyarıcı daha önce deneyimlenmemiş, çeldirici bir kelime olabilir. Dolayısıyla, kaynak izleme hem bir uyarıcının tanıma hem de kaynak bilgisini gerektirmektedir. Bunun yanı sıra, kaynak izleme süreçlerinde tahmin etme faktörünün de rolü göz ardı edilmemelidir. Bir başka deyişle, katılımcılar belli bir kaynağa atfetmeye daha yatkın olabilirler (Murnane ve Bayen, 1996). Bu sebeple, kaynak izleme sürecine tahmin etme parametresini de dâhil eden modelleme çalışmaları yapılmaktadır (Bayen, Murnane ve Erdfelder, 1996; Bröder ve Meiser, 2007; Moshagen, 2010). Bu çalışmalar temel alınarak yapılan model analizi sonucunda, katılımcıların spesifik bir kaynağa karşı yanlı olmadıkları ve tahmin etme parametresinin ideal sınırda, yani 0.50 civarında, olduğu gözlemlenmiştir.

BÖLÜM 4

TARTIŞMA

Bu çalışmanın temel amacı kaynak belleği alanyazınındaki farklı kullanımların kaynak ve tanıma belleği performansına etkisini sistematik olarak araştırmaktır. Bu amaçla, tek aşamalı veya iki aşamalı kaynak izleme test formatları ile kaynağın bloklar halinde veya karıştırılarak sunulması denekler arası bir deney deseni ile incelenmiştir. İki aşamalı kaynak izleme test formatına oranla, tek aşamalı kaynak izleme test formatında yeni kelimelere karşı daha çok yanlış alarm ve daha az kaynak atfı hatası beklenmiştir. Bunun yanı sıra, kaynağın karıştırılarak sunulduğu koşula kıyasla, kaynağın bloklar halinde sunulduğu koşulda daha iyi bir kaynak ve tanıma belleği performansı öngörülmüştür. Ancak, yapılan analizler sonucunda, bu hipotezlere dair bir kanıt bulunamamıştır.

Hipotez edilen bu analizlere ek olarak, test döngüleri için ayrı analizler yapılmıştır. Kritik olarak, sadece ikinci test döngüsü analizi tek aşamalı test formatında, iki aşamalı test formatına göre, çeldirici kelimelere karşı daha çok yanlış alarm olduğunu göstermiştir. Ancak, diğer tüm analizlerin sonuçları anlamlı bir etkiye işaret etmemiştir.

İlk hipotez kaynağın sunumunun kaynak ve tanıma belleği üzerindeki temel etkisidir. Kaynağın bloklar halinde sunulduğu koşula kıyasla, kaynağın karıştırılarak sunulduğu koşulda kaynak değişimin takibinin daha zor olması beklenmiş ve dolayısıyla, bu koşulda daha zayıf bir kaynak ve tanıma belleği performansı hipotez edilmiştir. Ayrıca, kaynağın bloklar halinde sunulduğu koşulda, farklı kaynakların ayrımının zamansal açıdan daha kolay olması beklenmiştir. (Bayen ve Murnane, 1996). Bunun yanı sıra, kaynağın bloklar halinde sunulduğu koşulda, kişilerin aynı kaynaktan gelen uyarıcılar arasında ilişkisel/zamansal bir yakınlık kurması ihtimali göz önünde bulundurulmuş ve bu durumun kaynak izleme süreçlerini kolaylaştırması düşünülmüştür. Fakat yapılan analizler sonucunda bu hipotezler desteklenmemiştir. Kaynağın sunumunun etkisine dair anlamlı bir bulgu elde edilmemesi kaynak kullanımı ve kodlama stratejileri doğrultusunda tartışılmıştır.

Kaynak belleği alanyazınında kaynak bilgisinin daha iyi kodlanmasını sağlamak için çeşitli yönlendirici görevler veren birçok çalışma bulunmaktadır (Hunt, 2003; Jacoby, Shimizu, Daniels ve Rhodes, 2005; Lindsay ve Johnson, 1991; Toglia, 1999). Ancak, bu çalışmada, olası karıştırıcı etkileri önlemek adına, katılımcılara yönlendirici görev özellikle verilmemiştir. Bunun yerine, kaynak ayrımının güçlendirilebilmesi için ikinci bir kaynak bilgisi eklenmiştir. Yer/yön ve renk gibi daha yüzeysel seviyede bir kodlama gerektiren kaynak bilgisi yerine, hem kaynağın kendisiyle hem de aynı kaynaktan gelen kelimeler arasında ilişkisel/zamansal bir yakınlık kurulmasını sağlayan daha güçlü bir kaynak bilgisi kullanılsaydı, kaynağın sunumunun etkisinin daha belirgin olacağı ihtimali üzerinde durulmuştur.

Bir diğer hipotez olarak, kaynak izleme test formatlarının kaynak ve tanıma belleği üzerindeki etkisi öne sürülmüştür. Dodson ve Johnson (1993) tarafından gözlemlenen bulguların tekrarlanması beklenmiş, iki aşamalı kaynak izleme test formatına oranla, tek aşamalı kaynak izleme test formatında daha az kaynak atfı hatası hipotez edilmiştir. Ancak, bu hipotez yapılan analizler sonucunda desteklenememiştir. Dodson ve Johnson (1993) tarafından, tek aşamalı kaynak izleme test formatında katılımcıların daha az kaynak atfetme hatası yapmaları bu formatta daha kontrollü kriter kullanma ihtimaline dayandırılmıştır. Fakat bu çalışmanın sonuçları, katılımcıların aslında her iki test formatında da benzer bir kriter kullanımına başvurduklarına işaret etmiştir. Tepki süreleri göz önünde bulundurulduğunda bu olasılık daha da güçlenmiştir. Tek aşamalı kaynak izleme testinde ve iki aşamalı kaynak izleme testinin ilk basamağında tepki süresi 200 ms altındaki verinin yok denecek kadar az olduğu gözlemlenmiştir. Ancak, iki aşamalı kaynak izleme testinin ikinci basamağında tepki süresi 200 ms altında olan çok fazla veri çıkmıştır.

Dolayısıyla, tek aşamalı kaynak izleme testindeki gibi, iki aşamalı kaynak izleme testinin ilk basamağında da aslında katılımcıların tanıma bilgisine karar verirken aynı zamanda kaynak bilgisine de karar vermiş olma ihtimali üzerinde durulmuştur.

Bir diğer hipotez olarak, iki aşamalı kaynak izleme test formatına oranla, tek aşamalı kaynak izleme test formatında yeni kelimelere karşı daha çok yanlış alarm öngörülmüştür. Tek aşamalı kaynak izleme test formatında daha fazla yanlış alarm beklenmesi, testteki üç seçenekten ikisinin aslında kelimenin "eski/deneyde görülen" bir kelime olduğuna işaret etmesi sonucu katılımcılarda görülen yanlılık olarak açıklanmıştır. (Marsh ve ark., 2006). Kritik olarak, sadece ikinci test döngüsü analizi tek aşamalı test formatında, iki aşamalı test formatına göre, çeldirici kelimelere karşı daha çok yanlış alarm olduğunu göstermiştir. Dolayısıyla, bu bulgunun yeni çalışmalarla tekrarlanması gerekmektedir.

Alanyazındaki çoğu çalışmada olduğu gibi bu çalışmada da (Ferguson ve ark., 1992; Hashtroudi ve ark., 1989; Henkel ve ark., 1998), deneyden önce katılımcılara, sonradan girecekleri kaynak izleme testi hakkında doğrudan bir bilgi sunulmamıştır. Katılımcılardan sadece kelimeleri ve bu kelimelerin hangi listeye ait olduklarını öğrenmeleri beklenmiştir. İkinci test döngüsünde kaynak belleği performansının, birinci test döngüsüne oranla, daha yüksek olduğunun gözlemlenmesi, katılımcıların birinci test döngüsünden sonra deneyi daha iyi öğrenmeleri ve ikinci döngü için çeşitli kodlama stratejileri geliştirmeleri ile açıklanmıştır. Dolayısıyla, katılımcılara sonradan girecekleri kaynak izleme testi ve olası kaynak atfı hataları için en baştan bilgilendirme yapılsaydı (Lindsay, 2008) ilk test döngüsü için kaynak belleği performansı daha yüksek olabilir ve hipotez edilen farklılıklar daha belirgin gözlemlenebilirdi.

Kritik olarak ikinci test döngüsünde daha iyi bir kaynak belleği performansı gözlemlenirken, bu avantaj tanıma belleğine genellenmemiştir. Dolayısıyla, bulgular, kaynak belleğini etkileyen her faktörün tanıma belleğini de aynı yönde etkilemeyebileceğine işaret etmektedir.

Özetle, bu çalışma kaynak belleği çalışmalarında kullanılan deneysel işlem yolunun standardize edilmesinin önemini vurgulamaktadır. Çeşitli metodolojik kullanımlar kaynak ve tanıma belleği performansının farklı yorumlanmasına sebep olabileceğinden, kaynak izleme süreçlerinin ölçme yöntemleri dikkatli bir şekilde ele alınmalıdır. Bu tez çalışması, alanyazındaki kaynak izleme süreçlerinin ölçümü ile ilgili endişelere dikkat çekmiştir. Dolayısıyla, çalışmanın bulgularının, gelecekteki araştırmaları yönlendirmesi beklenmektedir.

APPENDIX E: TEZ İZİN FORMU / THESIS PERMISSION FORM

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Soyadı / Surname : Tanyaş

Adı / Name : Hilal

Bölümü / Department : Psikoloji / Psychology

TEZİN ADI / TITLE OF THE THESIS (**İngilizce** / English) : The Effects of Source Presentation and Test Format on Recognition Memory for Item and Source

TEZİN TÜRÜ / DEGREE**:** **Yüksek Lisans** / Master ■ **Doktora** / PhD ☐

1. **Tezin tamamı dünya çapında erişime açılacaktır. /** Release the entire work immediately for access worldwide. ■

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