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Influences of Fluency and Familiarity Misattribution on Autobiographical Memory Judgments[1]

Akıcılık ve Aşinalığın Yanlış Atfedilmesinin Otobiyografik Bellek Yargılarına Etkileri

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Abstract

Familiarity caused by fluent processing may be misattributed to past experiences if the source of fluency cannot be determined. This explanation has been presented as the misattribution hypothesis of familiarity to explain the effects of fluency and familiarity in studies using recognition tests on episodic memory. In this study repetition priming was used for autobiographical memory to test the familiarity misattribution hypothesis, which states that familiarity caused by fluent processing can be misattributed to past experience if the source of fluency cannot be identified. The participants' awareness of the source of fluency was manipulated by presenting either a subliminal or a supraliminal prime before they responded to a Life Event Inventory (LEI) item. The prime was either the same as the verb of the LEI sentence or a different verb. Participants gave higher confidence ratings if subliminal primes were identical to, rather than different from, the verb of the sentence. Consistent with the hypothesis, if the participants were aware of seeing the primes, this difference disappeared. The results of the experiment showed that manipulating fluency, that is, the ease of processing, could affect confidence ratings about whether an event occurred in the respondents' past.

Keywords: *Autobiographical memory, Repetition priming, Fluency, Familiarity misattribution, Life Event Inventory*

Öz

Akıcı işlemenin neden olduğu aşinalık, akıcılığın kaynağı belirlenemezse geçmiş deneyimlere yanlış atfedilebilir. Bu akıcılık ve aşinalık etkisi epizodik bellek çalışmalarında aşinalığın yanlış atfedilmesi hipotezi olarak sunulmuştur. Bu çalışmada akıcı işlemeden kaynaklanan aşinalığın yanlış atfedilmesi hipotezi otobiyografik bellek için test edilmiştir. Bu hipotezi test etmek için tekrarın ön hazırlama etkisi kullanılmıştır. Akıcılığın kaynağına ilişkin farkındalık ön hazırlayıcının eşik üstü ya da eşik altı sunulması ile belirlenmiştir. Yaşam Olayları Envanteri insanların başlarından geçen olaylar hakkında güven derecelendirmesi yapmalarına imkan sağlayan ve otobiyografik bellek çalışmalarında kullanılan bir yöntemdir. Bu çalışmada katılımcılara bir Yaşam Olayları Envanteri maddesine yanıt vermeden önce eşik altı ya da eşik üstü bir ön hazırlayıcı sunulmuştur. Ön hazırlayıcı Yaşam Olayları Envanteri cümlesinin yüklemiyle aynı ya da farklı bir yüklem olarak gösterilmiştir. Katılımcıların eşik altı ön hazırlayıcıların cümlenin yüklemiyle aynı olduğu olaylar için eşik altı ön hazırlayıcıların cümlenin yükleminden farklı olduğu olaylara kıyasla daha yüksek güven derecelendirmesi verdikleri gözlemlenmiştir. Aşinalığın yanlış atfedilmesi hipotezi ile tutarlı olarak, ön hazırlayıcıların eşik üstü olması dolayısı ile katılımcıların ön hazırlayıcıları gördüklerinin farkında olmaları durumunda güven derecelendirmesinde görülen bu fark ortadan kalkmıştır. Deneyin sonuçları, daha akıcı işlemenin diğer bir deyişle işleme kolaylığının artmasının, katılımcıların geçmişlerinde bir olayın olup olmadığına ilişkin verdikleri güven derecelendirmelerini etkileyebileceğini göstermiştir.

Anahtar Kelimeler: *Otobiyografik bellek, Tekrarın ön hazırlama etkisi, Akıcılık, Aşinalığın yanlış atfedilmesi, Yaşam Olayları Envanteri*

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Introduction

How do people decide if a certain event happened to them in childhood; what kinds of factors affect the final decision? For instance, if you were questioned about whether you broke the wheel of your toy car as a child, do you base this judgment on detailed visual recollection or can factors that influence how fluently you process this statement affect your judgment? Fluency, which is defined as the ease of processing of a present activity (Jacoby, Kelley, & Dywan, 1989; Jacoby & Whitehouse, 1989; Jacoby, 1991; Lindsay & Kelley, 1996; Kelley & Rhodes, 2002; Oppenheimer, 2008; Rajaram, 1993; Whittlesea & Leboe, 2000; Whittlesea, 1993) is found to be influential for episodic memory judgments. We are trying to find an answer to whether fluency is also contributing to these autobiographical memory judgments. For episodic memory, dual process model of recognition suggests that true recognition judgments are based on recollection and familiarity (Jacoby, 1991; Yonelinas, 2002). The dual process model of recognition have also been supported by neuropsychological and neuroimaging studies (Addante, Ranganath, Olichney, & Yonelinas, 2012; Bastin et al., 2019). According to this account, familiarity is a fast, automatic process that is associated with feelings of remembering, while recollection requires conscious retrieval of past experiences leading to a kind of feeling of reliving (Yonelinas, 2002). To dissociate the two processes of recognition, Tulving (1985) has developed the Remember-know (R – K) procedure, which requires the participants to give a Remember (R) or a Know (K) judgment when they decide that a test item is from the study list. According to the Remember – Know procedure, R judgments require retrieval with details and therefore reflects recollection. On the contrary, K judgments are based on the belief that the item is from the study list without retrieval and correspondingly reflect familiarity. An alternative account for recognition memory, the Fuzzy-trace theory proposes that there are two independent memory representations of studied items that are stored (Reyna & Brainerd, 1995). According to this account, the verbatim representation contains the details of the events, while the gist representation represents the meaning content. When a new item has a gist representation that is falsely attributed to experience it can lead to false recollection, which is also called phantom recollection (Brainerd, Reyna, & Mojardin, 1999; Brainerd, Wright, Reyna, & Mojardin, 2001; Higham & Vokey, 2004; Kurilla & Westerman,2008). According to Fuzzy-trace theory, false recognition can result from gist based representations leading to phantom recollection. According to the dual process model of recognition, familiarity, which is used for true recognition judgments, can be one of the reasons for false recognition, when familiarity that arises from fluency is misattributed to past experience (Jacoby et al., 1989; Jacoby & Whitehouse, 1989; Mecklinger & Bader, 2020; Whittlesea, 1993). Does familiarity misattribution cause false recognition also for autobiographical memory judgments? To find some answers to these questions, in the present study, we investigated the role of fluency and familiarity misattribution on decisions about autobiographical memory and autobiographical belief by using a Life Event Inventory (LEI).

The effects of fluency and familiarity misattribution on recognition judgments in episodic memory tests have been investigated in a number of studies (Jacoby et al., 1989; Jacoby & Whitehouse, 1989; Lucas, Taylor, Henson, & Paller, 2012 ; Whittlesea, 1993). Attributional model of memory proposes that the judgment that a recognition test item is from a study list, in other words judging that the item is old does not arise from the activation of memory traces. Instead, the subjective feeling of “oldness” arises from nonconscious decision processes through which cognitive processes at test are attributed to memory (Jacoby et al.,1989; Mecklinger & Bader, 2020). This hypothesis is based on the idea that prior exposure to an item facilitates the processing of an item when it is encountered again. Therefore, the attributional approach to memory proposes that our cognitive system has the nonconscious assumption that if something is processed fluently; it seems familiar, and this apparent familiarity should be caused by a past experience. This nonconscious assumption works when people are oriented to make a memory judgment. According to the attributional approach to memory, fluency can be a useful cue for memory judgments (Jacoby et al., 1989; Jacoby & Whitehouse, 1989; Jacoby, 1991; Lindsay & Kelley, 1996; Kelley & Rhodes, 2002; Oppenheimer, 2008; Rajaram, 1993; Whittlesea, 1993; Whittlesea & Leboe, 2000). However, when the source of fluency is present conditions that is misattributed to past experience, it can lead to memory errors and can be a basis for memory illusions (Brown & Marsh, 2008, 2009; Jacoby & Whitehouse, 1989; Whittlesea, Jacoby, & Girard, 1990; Whittlesea, 1993).

Support for the attributional approach to memory came from studies on episodic memory (Jacoby & Whitehouse, 1989; Mecklinger & Bader, 2020; Whittlesea et al., 1990; Whittlesea, 1993), which indicated that the recognition judgments may be based on the ease of perceptual processing. Jacoby and Whitehouse (1989) hypothesized that fluency of processing results in a feeling of familiarity, which would be attributed to past experience when subliminal primes were used, in other words, when the participants were unaware of the real source of the fluency. However, if the participants were aware of the source of fluency, that is, seeing the tested item before as a prime, they would discount the familiarity and would not misattribute it to past experience. To test this fluency hypothesis, Jacoby and Whitehouse (1989) conducted a study on episodic memory in which participants were first given a study list to be remembered for a recognition test and at retrieval they were either presented by prime words identical to the tested words or by a string of letters like xoxoxox subliminally for 50 msec. In this condition, the participants were more likely to give old judgments after the identical primes compared to the meaningless string of letters. The opposite results were obtained when the exposure times of the primes were

extended to 200 ms. The results support the viewpoint that a sense of subjective familiarity that results from fluent processing is misattributed to past experience if there is no other source to be attributed.

Whittlesea et al. (1990) conducted a similar study also on episodic memories to test the attribution-based fluency account. Participants were presented with a list of seven words at the rate of one word every 60 ms, and at test they were shown target words and asked to decide if each word was in the study list. Target words were shown either in light or heavy visual noise. After the experiment, the participants were questioned if they were aware of the manipulation of the clarity. Only the data from those participants who were unaware of the manipulation were analyzed. The results showed that participants were more likely to judge that the target words were repeated if they were presented in light visual noise compared to targets presented with heavy visual noise. If the participants were informed at the beginning of the experiment about the manipulation of clarity, the increase of repetition judgments for light masking disappeared. Therefore, the important factor in recognition judgments was not the fluent processing of the items, but attribution of the fluency to repetition was required. When the participants were aware that the source of the fluency was presentation conditions at the time of test, they no longer misattributed it to past experience.

The possibility of extending the familiarity misattribution findings from episodic memories to autobiographical memories was mostly investigated using Life Event Inventories (LEI). A Life Event Inventory is a questionnaire that requires the participants to give a confidence rating about the occurrence of the events described by the LEI items. For studies investigating autobiographical memory with LEI, since the researchers cannot check the accuracy of the memory report, studies concentrated on the effects of manipulations done during the retrieval phase of recognition for autobiographical memory. Some examples for these retrieval phase manipulations are the imagination inflation studies (Garry, Manning, Loftus, & Sherman, 1996; Heaps & Nash, 1999; Sharman, Garry, & Beuke, 2004; Sharman & Barnier, 2008) and the studies conducted on the revelation effect for autobiographical memory (Bernstein, Whittlesea, & Loftus, 2002; Bernstein, Godfrey, Davison, & Loftus, 2004; Bernstein, Rudd, Erdfelder, Godfrey, & Loftus, 2009). In imagination inflation studies, participants are required to imagine the occurrence of half of the LEI items before making a confidence judgment about the occurrence of the events in their childhood described by the LEI items. Imagination inflation research showed that requiring participants to imagine a childhood event enhanced confidence that the event occurred in childhood (Garry et al., 1996; Heaps & Nash, 1999; Sharman et al., 2004; Sharman & Barnier, 2008). For the revelation effect studies, anagram solving was used as the revelation task (Bernstein et al., 2002, 2004, 2009). For half of the LEI items that were presented with an anagram in them, participants were required to solve the anagram before making a confidence judgment about the occurrence of the events in their childhood described by the LEI items. Requiring participants to solve an anagram before making a confidence judgment about the occurrence of the event led to an enhancement in confidence that the event occurred in childhood, similar to imagination inflation (Bernstein et al., 2002, 2004, 2009).

Fluency of processing appears as an important aspect of how the imagination inflation effect (Sharman et al., 2004) and the revelation effect for autobiographical memory are explained (Bernstein et al., 2002, 2004). It is proposed that a feeling of familiarity arises from fluent processing and this is misattributed to the occurrence of the events described by the LEI items in the distant past of the person.

Brown and Marsh (2008) conducted experiments using photographs in order to extend the familiarity misattribution findings from episodic memories to autobiographical memories by using a method other than using LEIs. They found misattributions of familiarity by exposing participants to unfamiliar campus photos on a cross-detection task prior to making decisions about visiting those locations in real life. Their results indicate that prior shallow processing of unfamiliar campus photos led to an increase in false visit judgments for those photos and they reported that within their knowledge their results were the first successful example of implicit effects of brief laboratory experience on autobiographical memories. Brown and Marsh (2009) also used novel symbols to show familiarity misattribution effects for a distant time and they replicated the result of subliminal priming condition of Jacoby and Whitehouse's (1989) study. They presented either same or different novel symbols subliminally as primes or no primes between masks. Then the participants were presented with a test symbol and made a decision about whether they have encountered this symbol prior to the experiment. The participants judged encountering the novel symbols prior to the experiment if the symbols were preceded by the same primes subliminally. This finding indicates how influential familiarity misattribution is, since its effects can even be observed for novel symbols, which could not have been encountered before. These findings demonstrated the extension of misattributions of familiarity to a more distal time by using Jacoby and Whitehouse's (1989) subliminal priming condition.

In the present experiment we further extended the misattributions of familiarity by using Jacoby and Whitehouse's (1989) subliminal and supraliminal priming on autobiographical memory by using an LEI. The aims of the present study were to test the possibility of changing autobiographical belief by manipulating processing of fluency during retrieval using repetition priming and to test the effect of the awareness of the source of fluency on autobiographical belief judgments. We investigated if repetition priming effects, which were found in episodic memory, could also be extended to autobiographical memories (Jacoby & Whitehouse, 1989; Whittlesea et al., 1990; Whittlesea, 1993). The repetition priming

effects for episodic memories (Jacoby & Whitehouse, 1989; Whittlesea et al., 1990), the revelation effect of autobiographical memories (Bernstein et al., 2004), the imagination inflation effect (Sharman et al., 2004) and the increase in false visit judgments to college campuses (Brown & Marsh, 2008) were explained by the familiarity misattribution hypothesis. By using subliminal and supraliminal primes before presenting LEI items, the same familiarity misattribution hypothesis proposed for these effects was tested for beliefs about the occurrence of remote autobiographical memories.

1. Experiment

According to the familiarity misattribution hypothesis, fluent processing that results from subliminal primes would cause familiarity misattribution. Also, according to the familiarity misattribution hypothesis, if people are aware of the source of the fluency, they do not misattribute familiarity caused by fluency to past experience (Bernstein et al., 2004; Jacoby & Whitehouse, 1989; Whittlesea et al., 1990; Whittlesea, 1993). Presenting the verb of the LEI as a subliminal prime would cause more fluent processing compared to a different verb. Therefore, an increase in confidence judgments when the subliminal prime was the same as the verb of the LEI would be expected. For half of the participants the primes were presented subliminally, for 35 ms, while for the other half the primes were presented supraliminally, for 200 ms. Fluency was manipulated in a way that the source of fluency was obvious to half of the participants, while it was not obvious for the other half of the participants. We expected that, with primes exposed for 200 ms average confidence levels would be the same regardless of the relation of the prime to the sentence, like Jacoby and Whitehouse's (1989) findings for episodic memories, because the participants were aware of the source of the familiarity, which was seeing the verb as a prime before the sentence. They would not misattribute this familiarity to the occurrence of the event. Such results would be extending the effects of sub- and supraliminal priming on judgments of episodic recognition (Jacoby & Whitehouse, 1989; Whittlesea et al., 1990; Whittlesea, 1993) to autobiographical memories by using LEIs.

1.1. Method

1.1.1 Participants

One hundred sixty students of Atilim University who volunteered, participated in the experiment. The participants' age range was 17 to 26. The mean age of the participants was 22.5. All participants were tested individually.

1.1.2 Materials

The LEI items used for this study were selected from among 163 sentences that were taken from the work of Bernstein et al. (2004) or constructed by asking to a group of people what kind of events could have happened to a child before the age of ten. Plausible but vague and not too salient events were selected according to the responses of 895 undergraduate and graduate university students, who did not participate in the present experiment. They were asked to rate the probability that that event would happen to a child and the probability that it would be remembered if it had happened. Impossible events and events sure to happen to any child were eliminated. In addition, to ensure the vagueness condition, events that were either unforgettable or impossible to remember if they happened were not included either. Sixty six sentences that satisfied these conditions were selected. There were some sentences, which ended with the same verbs. Therefore, one of each pair of sentences, which had the same verb, was discarded. After removing 10 sentences from the LEI, all of the sentences ended with distinct verbs and 56 sentences were used in this study, which is given in the Appendix.

1.1.3 Procedure

The experiment was performed by using Super Lab Pro for Windows Software. The participants' task was to give confidence ratings for the occurrence of the events described by the LEI items in their childhood, which were presented on the computer screen. Before the presentation of each LEI item, participants were exposed to a verb for 35 ms or 200 ms between a premask and a postmask, which consisted of &&&&&&&&&&, presented for 75 ms. The verb was either the same as the verb of the LEI item or an unrelated verb that did not match the verb of that sentence. The sentences primed by related and unrelated verbs were counterbalanced across participants.

After the presentation of each prime between masks a sentence was displayed on the screen. The participants were to give a confidence rating for the occurrence of the event described in the sentence. They were to enter a digit between 1 and 8 from the keyboard: "1" indicated that they were absolutely sure that the event did not happen to them before age of 10 and "8" indicated that they were absolutely sure that the event happened to them before age of 10. Illustrations of a trial for the Subliminal and Supraliminal prime conditions are given in Figure 1 and Figure 2, respectively.

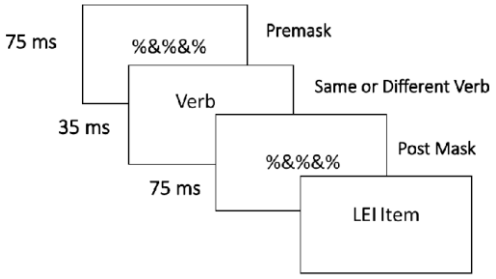

Figure 1. Illustration of a Trial Presented in the Subliminal Prime Condition

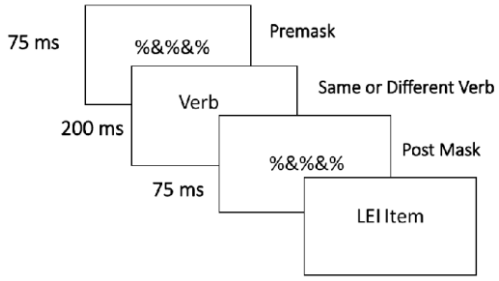

Figure 2. Illustration of a Trial Presented in the Supraliminal Prime Condition

2. Results

The average confidence ratings for LEI items, followed by subliminal and supraliminal primes, when the prime was the same as the verb of the sentence and the average confidence ratings for LEI items, followed by subliminal and supraliminal primes when the prime was an unrelated prime were calculated for each participant.

A two-way ANOVA with prime duration (subliminal vs. supraliminal) as the between-subjects factor and prime type (same vs. different) as the within-subjects factor revealed a significant interaction between prime duration and prime type, $F(1, 158) = 6.273$, $p < .05$, $\eta^2 = .038$. A paired-samples t-test was conducted to compare the confidence ratings given for LEI items after identical subliminal prime and unrelated subliminal prime conditions. There was a significant difference in the confidence ratings for sentences when the subliminal prime was the same as the verb of the sentence (*M*= 4.668, *SD*= 0.976) and confidence ratings for sentences with unrelated subliminal primes (*M*= 4.466, *SD*= 1.103) conditions; $t(79)= 2.507$, $p= .014$, $r= 0.27$. These results suggest that participants gave higher confidence ratings for sentences when the subliminal prime was the same as the verb of the sentence (*M*= 4.668) when compared to confidence ratings for sentences with unrelated subliminal primes (*M*= 4.466).

These results indicate that when the participants were unaware of the source of fluency, which was caused by being exposed to subliminal primes, they misattributed the familiarity caused by this fluency (Jacoby & Whitehouse, 1989; Whittlesea et al., 1990; Whittlesea, 1993) to the occurrence of the events described by the sentences. These results were important for autobiographical memory research since they provided further support to the other studies (Bernstein et al., 2004), which showed that autobiographical beliefs about the occurrence of events in distant past are subject to distortion without the person's awareness.

A paired-samples t-test was conducted to compare the confidence ratings given for LEI items after identical supraliminal prime and unrelated supraliminal prime conditions. There was not a significant difference in the confidence ratings for sentences when the supraliminal prime was the same as the verb of the sentence (*M*= 4.622, *SD*= 0.878) and confidence ratings for sentences with unrelated supraliminal primes (*M*= 4.719, *SD*= 1.088) conditions; $t(79)= -1.10$, $p= .274$, $r= -0.12$. These results suggest that participants did not give higher confidence ratings for sentences when the supraliminal prime was the same as the verb of the sentence when they were aware of the presentation of the prime (*M*= 4.622) compared to confidence ratings for sentences with unrelated supraliminal primes (*M*= 4.719).

The results were consistent with the hypothesis that if the participants were aware of the source of fluency, they would not misattribute the familiarity caused by this fluency to past experience (Jacoby & Whitehouse, 1989; Whittlesea et al., 1990; Whittlesea, 1993). These results indicate that the familiarity misattribution account proposed for episodic memories held for autobiographical beliefs about the occurrence of the events also. That is, if people process information about events

that could have happened to them more fluently without being aware of the source of fluency, they incorrectly attribute this fluency to having experienced that event in the past. This illusion can be eliminated by making the source of fluency available to people.

Discussion

The present study investigated if familiarity misattribution would affect participants' confidence judgments about autobiographical memories using an LEI. Familiarity misattribution and the contribution of the nonconscious processing of familiarity to memory judgments have already been shown for episodic memory (Jacoby & Whitehouse, 1989; Whittlesea et al., 1990; Whittlesea, 1993) and also for autobiographical memory judgments (Bernstein et al., 2002, 2004, 2009; Brown & Marsh, 2008; Sharman et al., 2004). In the present study, the effect of familiarity misattribution for autobiographical memory was investigated by using repetition priming. Either the verb of the sentence or a different verb was presented as a prime between masks before the presentation of the LEI items subliminally and supraliminally. Since its source was not known, fluent processing created by subliminal primes, which in turn caused familiarity was expected to be misattributed to past experience (Jacoby & Whitehouse, 1989; Whittlesea et al., 1990; Whittlesea, 1993). Subliminally presented primes that matched the verbs of the sentences caused an increase in the confidence levels of the judgment of the occurrence of the childhood event described by the LEI item compared to the non-match primes. Our results supported the effects of familiarity misattribution on memory judgments by extending the repetition priming findings on episodic memory (Jacoby & Whitehouse, 1989) to autobiographical memory (Bernstein et al., 2002, 2004, 2009; Brown & Marsh, 2008; Sharman et al., 2004).

Finding similar results for recognition decisions for both recent and remote episodic memories, point out that the same processes may be acting for both of them. According to the dual process model of recognition the processes that determine the production of a positive or a negative recognition judgment are recollection and familiarity (Jacoby, 1991; Yonelinas, 2002). Recollection is conscious recovery of an item accompanied by detailed information such as when and how it was encoded, while familiarity is the assessment of processing fluency. Finding familiarity misattribution effects in the present study, suggests that people use familiarity as a cue for their judgments about their autobiographical memories as they do for episodic memory judgments.

A facilitation effect that results from subliminal priming in autobiographical memory judgments brings a different insight to our knowledge about autobiographical memory, because it points out that when people are making a recognition judgment for their remote past experiences, they may base this decision more on the familiarity of the event that depends on personal-semantic knowledge, than recollection (Mendelsohn, Furman, Navon, & Dudai, 2009). That is, when people are making recognition judgments about their distant past, they may base this judgment more on the belief of the occurrence of the event compared to vivid recollection of the instance. Until recently there was an implicit assumption that LEI was a measure of memory for events. However, what LEI requires from the participants is to make a decision of whether the events have occurred rather than whether they remember the occurrence of the events. Therefore, the answer to the question could be based on a memory or another source. Scoboria, Mazzoni, Kirsch, and Relyea (2004) have introduced the idea of autobiographical belief which is closely related to autobiographical knowledge (Conway & Pleydell-Pierce, 2000; Conway, 2005). According to Scoboria et al. (2004) autobiographical belief is all of the autobiographical information, which may be both accurate and inaccurate about oneself. Scoboria, Mazzoni, Kirsch, and Jimenez (2006) made a distinction between autobiographical memory and autobiographical belief such that autobiographical memory refers to recollecting an event and autobiographical belief is believing that an event occurred whether or not it is remembered. What Scoboria et al. (2004) propose is that by using LEI researchers do not actually measure the autobiographical memory, instead they measure autobiographical belief. In studies using LEI, researchers have the tacit assumption that autobiographical beliefs are based on autobiographical memory and are using one construct, which is the autobiographical belief as an indication of a measurement of autobiographical memory (Scoboria et al., 2004, 2006; Smeets, Merkelbach, Horselenberg, & Jelicic, 2005). Therefore, finding differences in the confidence levels due to retrieval manipulations using LEI research may not be an indication of a change in autobiographical memory, instead it shows that these manipulations changes the beliefs of the people about the occurrence of the events.

The results we obtained also replicated previous findings that indicated that fluency itself was not sufficient to cause a memory illusion (Bernstein et al., 2004; Jacoby & Whitehouse, 1989; Whittlesea et al., 1990; Whittlesea, 1993). The source of the sense of subjective familiarity that accompanies fluent processing should not be obvious so that it would be misattributed to past experience. Otherwise, it could be attributed to its correct source (Bernstein et al., 2004; Jacoby & Whitehouse, 1989; Whittlesea et al., 1990; Whittlesea, 1993). Decisions we make about our memories are sometimes the results of nonconscious processing, which causes misattributions and the state of awareness during making these

decisions affects the final outcome (Bernstein et al., 2004; Jacoby & Whitehouse, 1989; Jacoby et al., 1989; Kelley & Rhodes, 2002; Whittlesea et al., 1990; Whittlesea, 1993).

A large number of laboratory studies using forms of suggestions or misinformation about the occurrence of events (Alpar, Er, & Uçar Boyraz, 2007; Er, Alpar, & Uçar, 2005; Göz, Tekin, & Ayçiçeği-Dinn, 2015; Lindsay, Hagen, Read, Wade, & Garry, 2004; Loftus & Pickrell 1995; Loftus 2003) exhibits the alterability of confidence levels about autobiographical memories. By using repetition priming we contributed further evidence to the manipulability of confidence levels about autobiographical memories, which was already demonstrated by imagination inflation studies (Garry et al., 1996; Sharman et al., 2004; Sharman & Barnier, 2008) and by the revelation effect found for autobiographical memories (Bernstein et al., 2002, 2004).

A fluency effect for autobiographical memories shows that people's confidence judgments or beliefs about their memories can be changed by retrieval manipulations. The results of the present study demonstrated that when people were not aware of the source of fluency, they could misattribute the familiarity caused by fluent processing to past occurrence. However, when the source of the fluency was obvious they did not make this misattribution. The results also demonstrated that people's ratings of confidence in the occurrence of an event can be manipulated with the ease of processing of the memories to be remembered. However, there is one important factor in this process: awareness. For this manipulation to increase the participants' confidence level for the occurrence of events, the participants must not be aware of the source of the fluency. Our results support the viewpoint that remembering is a subjective experience. People mostly judge the occurrence of an event through an evaluation of the subjective familiarity that is caused by the present conditions. Therefore, memory is not only related to past experience, but it also involves processing of the present conditions. Memory judgments are results of attributions (Jacoby et al., 1989).

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Appendix

LEI Used in The Experiment

1. Hit your head and had to stop what you were doing.
2. Forgot your lunch box and were left hungry.
3. Died your clothes while trying to dye your shoes.
4. Broke glasses by hitting them to each other.
5. Got on a ferris wheel in your dream.
6. Lost some pieces of the puzzle.
7. Had to get help to get down a tree you climbed.
8. Recorded sound.
9. Could not get out of where you were locked.
10. Caused your friend to fall by pulling his/her chair.
11. Tried to push your finger to the plug.
12. Got out of your house and got lost trying to go somewhere.
13. Ate the cake your mother made for the guest before they came.
14. Had a sunstroke because you stayed under the sun for a long time.
15. Broke the wheel of your toy car.
16. Had a dream about what you read before going to sleep.
17. Pushed and knocked of your friend while playing during the brake.
18. Got some complaints from your neighbors because you played ball in the house.
19. Fell off the swing and got injured.
20. Were punished by your teacher because you did not do your homework.
21. Changed your mind to get on a toy at the last minute because you were scared.
22. Made pictures with pencils on the walls of your house.
23. Cut your hair with a scissor.
24. Scared the birds while playing in the park.
25. Spilled a drink at a birthday party.
26. Wore different colors of socks and went to school.
27. Tried to walk down the escalator, which was going up.
28. Tore out your teddy bear's fur.
29. Helped your mother to prepare a cake.
30. Looked for a four-leaved clover.
31. Left the exterior door of your house open while you were alone in the house.

32. Mixed the sugar in the sugar cup and the salt in the salt cup.
33. Dropped the frame on the wall.
34. Thought you would suffocate while taking out your sweater.
35. Hit your finger with a hammer.
36. Broke down the radio while examining it.
37. Hid an electronic device you ruined from your father.
38. Ran away after spitting on people's head from the balcony.
39. Spared something you loved for someone else.
40. Laughed so hard that you were almost choking.
41. Pulled off the leaves of the flowers in your house.
42. Regretted killing a bug.
43. Starting running across the street after letting go of your mother's hand.
44. Got chewing gum stuck in your hair.
45. Got a piece of glass stuck in your foot.
46. Went to a theater with your classroom.
47. Put the blame on your sibling after you broke something in the house.
48. Got worried and cried because your sibling was ill.
49. Forgot the half of the poem you memorized while reading it at school.
50. Dropped the net curtain with the cornice because you pulled it harshly.
51. Got embarrassed because the back of your pants were ripped.
52. Soaked your clothes while trying to wash your hands in the washbowl.
53. Fell asleep while watching a movie.
54. Found 100 TL in a parking lot.
55. Got your classmate's pencil, because you liked it, without permission.
56. Burned your hand on the oven.

Çalışmada Kullanılan Yaşam Olayları Envanteri

1. Kafanızı çarpıp yaptığınız işi bırakmak zorunda kaldınız.
2. Beslenme çantanızı evde unutup aç kaldınız.
3. Ayakkabı boyasıyla ayakkabılarınızı boyamaya çalışırken üstünüzü başınızı boyadınız
4. Bardakları birbirine vurup kırdınız
5. Rüyanızda lunaparkta bir dönme dolaba bindiniz.
6. Puzzle'in parçalarını kaybettiniz.
7. Bir ağaçta mahsur kaldınız ve inmek için yardım almanız gerekti.
8. Bir ses kaydı yaptınız.
9. Bir yerde kilitli kalıp çıkamadınız.
10. Arkadaşınızın sandalyesini çekip düşmesine sebep oldunuz.
11. Prize parmağınızı sokmaya çalıştınız.
12. Bir yere gitmek için evden çıktınız ve kayboldunuz.
13. Annenizin yaptığı pastayı misafirler gelmeden yediniz.

14. Güneşte fazla kaldığınız için başınıza güneş geçti.
15. Oyuncak arabanızın tekerleğini kırdınız.
16. Bir masal okuyup yattığınızda rüyanızda o masalla ilgili birşeyler gördünüz.
17. Tenefüste oynarken arkadaşınızı itip düşürdünüz.
18. Evde top oynadığınız için komşudan şikayet geldi.
19. Salıncaktan düşüp yaralandınız.
20. Ev ödevinizi yapmadığınız için öğretmeniniz tarafından cezalandırıldınız.
21. Lunaparkta bir oyuncağa korktuğunuz için son anda binmekten vazgeçtiniz.
22. Evdeki duvarlara kalemle resim yaptınız.
23. Makasla saçınızı kestiniz.
24. Parkta oynarken kuşların yanına gidip onları kaçırdınız.
25. Bir doğumgünü partisinde bir içecek döktünüz.
26. Birbirinin eşi olmayan farklı renk çoraplar giyip okula gittiniz.
27. Yukarı çıkan yürüyen merdivenlerden aşağıya inmeye çalıştınız.
28. Oyuncak ayınızın tüylerini yoldunuz.
29. Annenize pasta pişirmesinde yardım ettiniz.
30. Bahçede dört yapraklı yonca aradınız.
31. Evde yalnızken dış kapıyı açık bıraktınız.
32. Şeker kabındaki şekerle tuz kabındaki tuzu karıştırdınız.
33. Duvardaki bir çerçeveyi uzanıp düşürdünüz.
34. Kazağınızı çıkarırken boynunuza takıldığı için boğulacağınızı zannettiniz.
35. Parmağınıza bir çekiçle vurdunuz.
36. Radyoyu kurcalarken bozdunuz.
37. Bir elektronik eşyayı bozup babanızdan sakladınız.
38. Balkondan aşağıya insanların kafasına tükürüp kaçtınız.
39. Sevdiğiniz birşeyi başkası için de ayırdınız.
40. O kadar çok güldünüz ki, neredeyse boğuluyordunuz (katılıyordunuz).
41. Evdeki çiçeklerin yapraklarını kopardınız.
42. Bir böcek öldürüp sonradan pişmanlık duydunuz.
43. Yolda karşıdan karşıya geçerken annenizin elini bırakıp koşmaya başladınız.
44. Saçınıza sakız yapıştı.
45. Ayağınıza bir cam parçası saplandı.
46. Sınıfça bir çocuk oyununa gittiniz.
47. Evde bir eşyayı kırıp suçu kardeşinizin üstüne attınız.
48. Kardeşiniz hastalandığı için telaşlanıp ağladınız.
49. Okulda ezberlediğiniz şiiri okurken yarısını unuttunuz.
50. Tül perdeyi hızla asılıp kornejiyle birlikte yere düşürdünüz.
51. Pantolonunuzun arkası yırtıldığı için çok utandınız.
52. Lavaboda elinizi yıkamak isterken bütün üstünüzü ıslattınız.

53. Sinemada uyuya kaldınız.
54. Bir otoparkta 100 bin lira buldunuz.
55. Sınıf arkadaşınızın kalemini beğenip izinsiz aldınız.
56. Ocakta elinizi yaktınız.