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## Bittersweet Recollection: An Ecological Study of Nostalgia

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Bittersweet Recollection:  
An Ecological Study of Nostalgic Memories

A thesis submitted in partial fulfillment of the requirement  
for the degree of Bachelor of Science in Psychology from  
The College of William and Mary

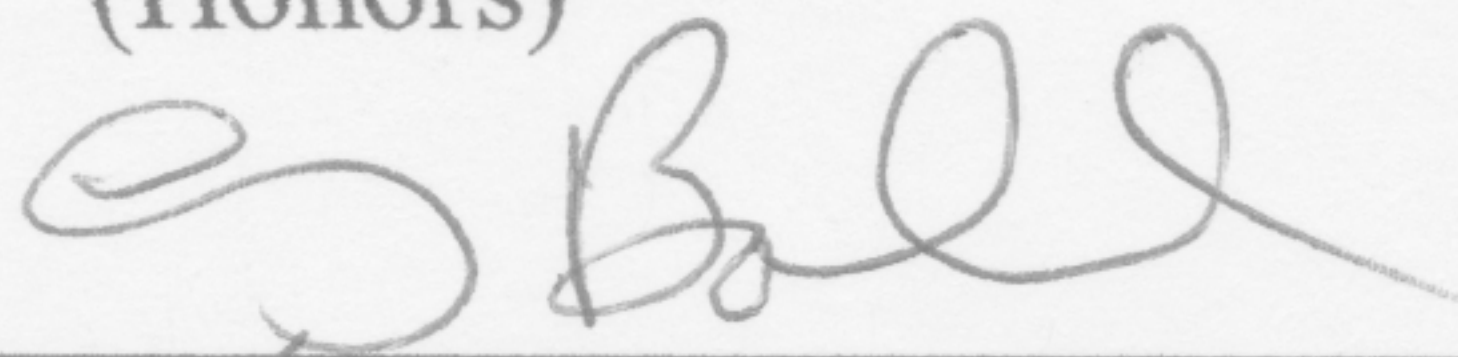
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### Abstract

Nostalgia has recently grown as a popular subject of study. Much of the research on it, however, has not been conducted in a naturalistic way. The current experiments use a diary study to analyze aspects of nostalgia in a natural setting, including its emotional timeline and self-relevance. Results found that nostalgia can behave like an involuntary memory and indeed has an emotional curve. Results support previous research showing that nostalgia is most often positive and most often involves missing others. Some results also suggest that nostalgia may be relevant to one's self-identity. Success of this diary study model illustrates that similar tasks can be used to study many more aspects of nostalgic experiences.

### Bittersweet Recollection: An Ecological Study of Nostalgic Memories

*“No sooner had the warm liquid mixed with the crumbs touched my palate than a shudder ran through me and I stopped, intent upon the extraordinary thing that was happening to me. An exquisite pleasure had invaded my senses, something isolated, detached, with no suggestion of its origin. And at once the vicissitudes of life had become indifferent to me, its disasters innocuous, its brevity illusory – this new sensation having had on me the effect which love has of filling me with a precious essence; or rather this essence was not in me it was me. ... Whence did it come? What did it mean? How could I seize and apprehend it? ... And suddenly the memory revealed itself. The taste was that of the little piece of madeleine which on Sunday mornings at Combray (because on those mornings I did not go out before mass), when I went to say good morning to her in her bedroom, my aunt Léonie used to give me, dipping it first in her own cup of tea or tisane. The sight of the little madeleine had recalled nothing to my mind before I tasted it. And all from my cup of tea.”*

— Marcel Proust, *In Search of Lost Time*

The Proust quote above is a prime example of a nostalgic experience. Nostalgia, which is defined as a sentimental longing for the past, is a phenomenon that has recently begun to be studied in depth (Baldwin & Landau, 2013; Verplanken, 2012; Wildschut, Sedikides, Routledge, & Arndt, 2006). The definition of nostalgia contains an affective component and a memory based sentimental longing of the past, but memory researchers have not been included in this resurgence of research interest in nostalgia. Much of the recent research on nostalgia has focused on the social components of nostalgia, such as nostalgic reverie being influenced by attachment-related avoidance, nostalgia inducing greater feelings of belongingness, and nostalgia decreasing feelings of loneliness (Abeyta et al., 2015; Cox et al., 2015, Wildschut et al., 2006; Zhou, Sedikides, Wildschut, & Gao, 2008). The missing memory component of nostalgia is also highlighted in the common method for measuring nostalgia that requires participants to think of things that make them feel nostalgic (Abeyta et al., 2015; Cox et al., 2015; Wildschut et al.,

2006). The goal of the current research is to focus on the role of memory in nostalgia and how memory and emotions are related in the nostalgic experience.

Homesickness and nostalgia were once considered to be the same experience, although recently these two experiences are discussed as separate constructs (Wildschut et al. 2006). The concept of nostalgia, at least while it was still associated with homesickness, was considered a form of psychological illness associated with increased anxiety and difficulty sleeping, amongst other symptoms (Baldwin & Landau, 2013; Sedikides et al., 2008; Stephan, Sedikides, & Wildschut, 2012; Wildschut et al, 2006). Recent research, however, has shown strong positive effects of nostalgia on affect and social connectedness. Baldwin and Landau (2013) found that engaging in nostalgic thoughts can result in improved positive affect and stronger feelings of belongingness. Cox et al. (2015) used the internet to induce nostalgia in their participants by having them read lines from a love website or view images of people at a location accompanied by a longing quote, and they found an increased positive affect as well as higher reports of relationship need satisfaction resulted from this manipulation. These findings are congruent with research by Wildschut and colleagues who found significant increases in positive affect following a purposefully recalled nostalgic event as well as higher scores on measures of social bonds (Wildschut et al., 2006). They suggested that experiences of nostalgia were precipitated by feelings of loneliness but increased feelings of perception of social support (Wildschut et al., 2006). The recent research findings suggests that nostalgia may act as a protective measure against negative affect and feelings of loneliness (Cox et al., 2015; Wildschut et al., 2006; Zhou et al., 2008). Although this research highlights that nostalgia can have an important social component, other research suggests that some of the most nostalgic aspects of our life include stimuli (*e.g.* music and toys) that are not inherently social (Batcho, 2005).

Consequently, nostalgia is considered by many researchers to be a positive, self-relevant emotion (Abeyta et al., 2015, Cox et al., 2015; Sedikides et al., 2008; Wildschut et al., 2006). However, other researchers suggest that nostalgia is a type of memory that is affectively charged with both positive and negative emotionality (Verplanken, 2012). Although some researchers believe nostalgia to be a type of emotion and others believe it to be a type of memory, nostalgia may be an experience which requires both memory and emotion components. Researchers studying the emotional content of nostalgia have found that the experience consists of more positive emotion than negative emotion (Cox et al., 2015; Abeyta et al., 2015), however these studies did not analyze the individual's affective change. Verplanken (2012) measured positive and negative state before and after the nostalgic experience, however, he did not include the same measure during the experience for nostalgia. His manipulation required willful conscious engagement in the creation of nostalgia, and this is problematic because nostalgia is likely not experienced purposefully in natural settings. Verplanken also found that habitual worriers experienced greater feelings of anxiety and depression even after a nostalgic experience briefly increased positive affect (Verplanken, 2012). This result suggests that nostalgia's negative component can overpower the positive component in some circumstances. Verplanken asserted that his findings may have been due to a discrepancy in the mood associated with the individual's habitual worry state (Verplanken, 2012). One possibility is that nostalgia functions as a self-reference system by means of emotional autobiographical recollections. My thesis will be the first to examine the emotional timeline experienced during nostalgia, and also, in a naturalistic setting.

The effect of nostalgia on the sense of self-identity has been neglected in past research, because much of the prior nostalgia research has focused on the social aspects of nostalgia.

Substantial research on nostalgia has considered the effects of nostalgia on health, emotion, and social bonds (Abeyta et al., 2015; Cox et al., 2015; Wildschut et al., 2006; Zhou, Sedikides, Wildschut, & Gao, 2008). However, Baldwin and Landau (2013) found evidence that experiencing nostalgia leads to higher reporting of growth-oriented self-perception, positive self-regard, and associated to meaning in life. Memory research suggests that our current emotional state can influence how and what we recall from memory (*e.g.* Wilson & Ross, 2003). Likewise, circumstances at the start of the nostalgic experience can affect the end state following a nostalgic experience (Verplanken, 2012; Wildschut et al., 2006). Even though Wildschut sees nostalgia primarily as an emotion, he proposes in his research that nostalgia can function as protection and enhancement of self-regard by affirming valued aspects of the self (Wildschut et al., 2006). This position is reminiscent of memories roles in life scripts and personal narratives. Life scripts are the general timeline series of events in a person's expected life trajectory and are heavily influenced by an individual's culture, while life narratives are recreations in the mind of a person's life as actually lived (Rubin & Berntsen, 2003). Wildschut seems to be suggesting that nostalgia sometimes works as a reference system between our past and current selves much like we use the autobiographical memories of our life narratives in relation to our cultures life script to inform us of where we are currently in life (Rubin & Berntsen, 2003). Memories are thought to be one of the most important aspects of what makes the self, and research has shown that many individuals who lose large portions of their memories also lose their sense of self (Prebble, Rose, Addis, & Tippett, 2013; Wilson & Ross, 2003). Nostalgic experiences could therefore play a significant role in the development and maintenance of one's self-concept. Participants in the current study will be required to rate the memories are that are recalled during nostalgic experiences on how important they are to their personal identity.



According to previous research, nostalgia occurs, for most people, multiple times in a week (Cox et al., 2015; Sedikides et al., 2008; Wildschut et al., 2006). Many of the studies analyzing nostalgia have utilized an in-lab willful elicitation of a nostalgic experience (Abeyta et al., 2015; Cox et al., 2015; Wildschut et al., 2006; Verplanken et al., 2012). However, past research has not attempted to capture nostalgic experiences in a natural setting. Given the random and sporadic nature of the experiences it is difficult to study this unpredictable phenomenon, and this would explain this scarcity of ecologically valid research. The present research utilizes a diary method pioneered by Berntsen in her examination of similar unpredictable memory phenomenon, that of involuntary memories (Berntsen, 1996; 1998). Involuntary memories also come to awareness without any premeditated, conscious attempt to retrieve them. The first study is a test of this methodology to record nostalgic experiences in real time in naturalistic settings.

### **Study 1**

Study 1 closely follows the method that Berntsen (1996) utilized for measuring involuntary memories with a few modifications to address their differences with nostalgic experiences. Unlike the Berntsen study which requires a specific number of involuntary memories to be recorded each day (minimum of one and a maximum of two), the current study allows participants to provide any number of nostalgic experiences that happen to them during a one week recording period. In addition, the current study also focuses questions about the emotional state of the participant at various times during the nostalgic experience (before, during, and after), rather than Berntsen's interest in just the emotional state of the participant during for the entirety of the memory recall. The current study will be the first research attempt to record nostalgic experiences as they happen (or as close to the time they happen) and to also

examine in more detail the memory and emotional aspects of these frequency but unpredictable experiences.

### *Method*

#### *Participants.*

Forty-one undergraduate students (28 female, 14 male; average age = 18.7) participated in this experiment for course credit. All participants provided informed consent prior to beginning the experiment.

#### *Nostalgia Diaries*

The first page of the diary contained the following instructions on how to complete the diary.

*"Nostalgia refers to a sentimental longing for the past. The goal of the current study is to examine nostalgia and especially the memories of the past associated with experiences of nostalgia. We would like you to record and experiences of nostalgia that happen to you in your daily life by asking you to record them in this diary. As you will see, we also have some questions and ratings scales to ask you about the memories and feelings associated with these nostalgic experiences. We hope you will be able to provide as many experiences of nostalgia as you can during the seven day recording period (starting tomorrow). You do not need to complete all of the questions associated with each experience of nostalgia at the time of their occurrence, because this may not be a convenient time to do so. However, we would like you to record this information as soon as possible after it has occurred. Feel free to censor any details of this experience you would rather not share with us. Once the recording period (7 days) has been completed or you have recorded 14 experiences of nostalgia, please return your diaries. We will then make sure you receive credit for your participation in this study."*

The rest of the diary consisted of 14 identical pages for recording each nostalgic experience. Participants recorded a brief description of their nostalgic experience. For example,

“I remembered my high school football games and how much fun they were, with everyone rowdy and on their feet, cheering loudly for our team.” Participants then recorded the nostalgia event’s cue or trigger (if one could be identified). For the above example the participant recorded reading the book ‘*Friday Night Lights*’. These cues were coded by the experimenters as internal if they related to a thought or feeling, or coded as external if they related to something perceived in the environment like a sound or a smell. If the participant recorded a memory during this nostalgic experience, the participant provided a brief description of the memory. If a memory was reported, the participant recorded when the memory came to mind (before, during, or after their feelings of nostalgia). The participants also rated their emotional state before, during, and after the recall of the memory using a scale from negative three (very negative) to positive three (very positive). The participant also rated the emotional content of the memory on a scale from negative three to positive three. The participant recorded who was involved in the memory (just themselves or others). The last question asked if the memory came to mind in the first person perspective (through their own eyes), or in the third person perspective (as if a part of a recording of the events). The full diary is provided in Appendix A.

### *Procedure*

Participants attended group information sessions to receive their diaries and provide their informed consents. The written instructions found in the diaries were read out aloud to the group. Any questions the participants had about the diaries were answered during this session, especially if they were not clear about what constitutes a nostalgic experience. The participants were instructed to return the diaries to the experimenters seven days later.

### *Results*

The mean number of nostalgic experiences recorded in a one week period was 3.07 ( $SD = 2.17$ ). Of these experiences, 8.2% were reported to have no cue, 16.3% were reported to have an internal cue, and 75.5% were reported to have an external cue. A total of 125 memories were recorded from all of the participants. Of these memories, 36.7% were specific memories, while 62.2% were general memories. The mean emotional content of the memories was 1.75 ( $SD = 1.72$ ), with only 16% of the memories being rated as negative overall. Of the 125 memories reported, 75.8% involved people other than the participant, and 63.6% were experienced from the first person perspective. A 1-way repeated measures analysis of variance (ANOVA) was conducted on the emotion ratings before, during, and after the memory. A significant time effect was obtained,  $F(2,194) = 2.85, p = .06$ , and a significant quadratic trend is highlighted in Figure 1. The trend shows a slight increase in positive emotion during the recall phase that decreases after recall of the memory.

### *Discussion*

The results of this diary study support previous research on nostalgia that suggests most nostalgic experience involve positive memory content. However, the results of Study 1 also highlight that there is a non-linear change in the emotional effects of the memory with a rise in positive affect followed by a slight drop in positive after the memory is recalled that clearly illustrates the ‘bittersweet’ aspect of nostalgia.

Another finding that is consistent with previous research is that the majority of these experiences involved others. This supports the notion that nostalgia plays an important social function. Nostalgia may provide a reference to which individuals compare past and current relational status. This explanation would align with findings that nostalgia frequently involves

others as well as findings that nostalgia is important to self-concept (Baldwin, Biernat, & Landau, 2015).

Because results indicated that most nostalgic memories were cued, and not consciously brought into awareness, nostalgia may operate similarly to involuntary memory. Further, the majority of cues found in this study were external, which is consistent with research that most involuntary memories are externally cued (Ball, 2015; Berntsen, 1996).

A potential problem with the data collected in Study 1 can be explained by some participants having an unclear understanding of the instructions. Twenty percent of the nostalgic experiences recorded were viewed by participants to not involve a memory (and provided no memory ratings), but it was clear from coding of their nostalgia descriptions that most of these experiences did in fact involve general memories (i.e., not a specific time and place for the event). In addition, four participants reported not having any conscious nostalgic experiences during the 7 days of recording, although researchers suggest these are common experiences (Wildschut et al., 2006). In Study 2, we hope to overcome this problem by requiring participants to record involuntary memories and then determine if these memories were associated with feelings of nostalgia.

## **Study 2**

The diary methodology was utilized again in Study 2, but the participant recorded involuntary memories. It is our belief that nostalgic experiences are one form of involuntary memories and that this methodological change will result in a larger sample of nostalgic recordings per participants. In addition, this methodological approach allows us to compare nostalgic involuntary memories and non-nostalgic involuntary memories. Previous research

suggests that most involuntary memories involve specific events (Ball & Little, 2006). However, results from Study 1 suggest that many of the memories involved in nostalgic experiences are more often general.

### *Method*

#### *Participants.*

Forty undergraduate students (23 female, 17 male; average age = 18.7) participated in this experiment for course credit. All participants provided informed consent prior to participating in this experiment.

#### *Involuntary Memory Diaries*

The first page of the diary contained the following instructions on how to complete the diary.

*“Involuntary memories are past experiences that come to mind without a deliberate, premeditated plan to retrieve this information. For example, you could be doing homework and your high school graduation ceremony suddenly comes to mind. This memory phenomenon is a challenging one to research because of the unpredictability of involuntary memories. For that reason, most researchers have examined involuntary memories using diary studies. In a diary study, the participant records details of the involuntary memory in their diaries soon as it occurs, and completes the recording of this memory experience then or at least at before the end of the day. We would like you to record at least one involuntary memory (and no more than two involuntary memories) each day for seven days (starting tomorrow). Please provide a brief description of the memory and feel free to personally censor any details of this experience you would rather not share with us. For each involuntary memory, we will also ask you to provide some details about the memory and the retrieval context when the memory came to mind. Once the recording period (7 days) has been completed, please return your diary. We will then make sure you receive credit for your participation in this study.”*

The remainder of the diary consisted of 14 identical pages for recording each involuntary memory. Participants started each diary entry by recording a brief description of their involuntary memory. For example, “My ex and I sitting outside a movie theater next to a fountain.” The participants reported if the memory was of a specific event (*i.e.* happened in a specific place and time) or of a general event (*i.e.* a series of related events or an extended event over time). Participants then recorded their emotional state before, during, and after the recall of this memory on a scale from negative three (very negative) to positive three (very positive). Participants also rated the emotional content of the memory using the same scale. The participants then rated how often the memory was retrieved in the past on a scale from zero (rarely) to six (all the time), and also rated how often the memory was recalled involuntarily in the past on a scale from zero (never) to six (all the time). In addition, participants indicated how important this memory was to their personal identity, on a scale from zero (not at all) to six (very important). The participant recorded who was involved in the memory (just themselves or others). The memory was then rated on vividness and detail using a scale of zero (not at all) to six (very vivid). The final question for each involuntary memory asked whether the memory included a feeling of nostalgia as defined as a sentimental longing for the past. If the participant believed they had experienced nostalgia, they recorded why they thought the feeling came along. This could include missing people, places, time, or activity.

### *Procedure*

Participants attended group information sessions to receive their diaries and provide their informed consent. The written instructions found in the diaries were read out aloud to the group. Any questions the participants had about the diaries were answered during this session. The participants were instructed to return the diaries after the seven day recording period.

### *Results*

Participants recorded 7.38 ( $SD = 1.96$ ) involuntary memory experiences on average during the one week period. The mean number of nostalgic experiences associated with these involuntary memories was 3.83 ( $SD = 2.07$ ) and that corresponds to 51.60% ( $SD = 22.89\%$ ) of the memories recorded. Thirty-two participants recorded at least two involuntary memories associated with nostalgia and at least two involuntary memories that did not have nostalgia associated with them. The following data analyses tests for differences between these different types of involuntary memory experiences in these 32 participants. The affective state of the participants before, during, and after the memory recall for the different types of involuntary memories (nostalgic vs non-nostalgic control) was compared in a 2-way analysis of variance. There was no main effect of Time  $F(2, 62) = 1.41, p > .05$ , but there was a significant main effect of Memory Type  $F(1, 31) = 11.54, p = .002$ , and a significant interaction of Time  $\times$  Memory Type  $F(2, 62) = 7.06, p = .002$ . This interaction is illustrated in Figure 2. Post hoc simple effects analysis was conducted for each type of involuntary memory. No significant Time effect was found for non-nostalgic involuntary memories  $F(2, 62) = .13, p > .05$ . However, a significant Time effect was found for nostalgic involuntary memories  $F(2, 62) = 6.23, p = .003$ . Further post hoc analysis revealed that affective state during recall was more positive than before recall, but that there was no difference in affective state for the other time comparison, although a similar quadratic trend as observed in Study 1 was evident to some degree in the findings of Study 2 (refer to Figure 2).

Non-nostalgic memories were also compared with nostalgic involuntary memories on a number of memory aspects. Memory specificity did not differ between the two types of memory,  $t(31) = -1.37, p > .05$ . The two different types of memories did not differ in their vividness  $t(31)$



= -1.38,  $p > .05$ . The emotional content of the memories was more positive in the nostalgic memories ( $M = 1.99$ ;  $SD = .97$ ) than in the non-nostalgic memories ( $M = .17$ ;  $SD = 1.26$ );  $t(31) = -7.12$ ,  $p < .001$ . Nostalgic memories were also recalled more frequently in the past ( $M = 2.60$ ;  $SD = 1.07$ ) than non-nostalgic memories ( $M = 1.72$ ;  $SD = .90$ );  $t(31) = -4.56$ ,  $p < .001$ . In addition, nostalgic memories were more important to self-identity ( $M = 2.33$ ;  $SD = 1.24$ ) than non-nostalgic memories ( $M = 1.22$ ;  $SD = 1.08$ );  $t(31) = -4.17$ ,  $p < .001$ . Nostalgic involuntary memories also involved others more frequently ( $M = .90$ ;  $SD = .16$ ) than non-nostalgic involuntary memories ( $M = .72$ ;  $SD = .27$ );  $t(31) = -3.14$ ,  $p < .004$ . A 1-way analysis of variance was conducted just with nostalgic involuntary memories to determine which source of longing (time period, people, places, or activities) was reported more frequently. A significant differences in source reporting was found,  $F(3, 93) = 16.59$ ,  $p < .001$ , with participants reporting that they missed people the most (refer to Figure 3), although all sources were commonly reported.

### *Discussion*

This study's most important implication is that nostalgia can be researched through the recording of involuntary memories. Recent research on involuntary memories (in the field and in the lab) has informed us quite a lot about these random memory experiences (refer to Berntsen, 2013) and about what functions they may play. Likewise similar questions can now be examined for involuntary nostalgic experiences.

The results of Study 2 also replicate the emotional content and timeline that was found in the first experiment, especially the emotional timeline of nostalgic experiences. Results of Study 2 replicate the importance of others found in Study 1. Study 2 provides further support that nostalgia plays an important role in self-identity because participants rated the nostalgic

involuntary memories as feeling subjectively more important to their sense of self. Another result which may support this claim is the finding that the nostalgic involuntary memories were reported as being recalled more frequently than non-nostalgic involuntary memories. This suggests that these types of memories can be referenced repeatedly.

### **General Discussion**

The results of both diary studies support much of the literature on nostalgia which finds that nostalgia is predominantly a bittersweet positive experience that involves memories of others (Wildschut et al., 2006). However, the current studies also shed new light on important implications. Much of the previous research has concluded that nostalgia leads to positive affective states (Cox et al., 2015) The current findings suggest that the affective state after experiencing nostalgia is no more positive than before experiencing nostalgia, and that the increase in affective state during the experience of nostalgia is what has been reported. Similarly the current studies found that nostalgia does prominently feature the self, and highlights the important function that nostalgic experiences play in the development and maintenance of one's self identity.

Some researchers suggest that nostalgia heightens social connectedness (Abeyta et al., 2015), but this function was not examined in the current study as we focuses on its function with respect to self-identity. Adding diary questions about feelings of social connectedness, before and after the experience of nostalgia could provide naturalistic support for this proposition.

Memory researchers have found that emotional memories are more often experienced in first person rather than in third person (Talarico, 2004) Additionally, research suggests that first person experiences are more likely when the memories are consistent with our self-view (Wilson

& Ross, 2003). Because the nostalgic experiences reported in the current research were most often experienced in the first person perspective and were more emotionally charged, it may be some support that nostalgia may act as a mediating factor involved in self-identity. Research by Baldwin and colleagues illustrate that nostalgia is important in self-concept, the current studies may display how (Baldwin, Biernat, & Landau, 2015).

Unlike most past research on nostalgia, the current studies utilized a naturalistic method for analyzing nostalgic content. The finding that nostalgia can be studied using a method that has been developed to record involuntary memory suggests that nostalgia can be studied using similar methodology which can be applied in the lab setting while maintaining a level of ecological validity. The continuous word association task has been used to successfully elicit and analyze involuntary memories in the lab (Brewin & Soni, 2010). This task could be adapted by manipulation of word choice in order to trigger a nostalgic experience in participants in a controlled predictable environment. This task could also be used to try and trigger desired types of nostalgia (*e.g.* ones whose subjects are not other people) in order to study them more despite their relative rarity.

One potential limitation of the current research is the population used. When asked to report their most important events, people reported that they occurred between the ages of 15 and 28 (Janssen, 2015). Because our participant population is at the beginning of this time frame, it is possible that the reporting of nostalgic experiences would be greater in the rest of the population than what was found in these studies. Future research could use older adult populations which may not only report more nostalgic experiences, but may also report longing for subjects other than people. Some memory research suggest that emotional strength fades with time and positive memories last longer (Walker, 1997). Using older populations may show an even greater

percentage of positive content in the nostalgic experiences. Further study could also be done by asking participants to approximate for what time period these nostalgic events are for which could provide further support of nostalgia's similarity to memory if the results are similar to what has been found in memory research.

These studies have paved the way for studying nostalgia using several methodologies which are more similar to nostalgia's natural occurrence. Additionally, these studies have provided questions for further study including the ramifications of modifying the population of interest as well as a potential for more pertinent self-identity measures. With the growing interest in nostalgia, these studies add insight and understanding into the expanding literature on the bittersweet experience of nostalgia.

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## Appendix A

### Diary pages used in Study 1

**Day, time, date:**

**Nostalgia experience**

*Brief description of experience:*

*Was there a specific cue or trigger that brought on this feeling of nostalgia? If yes, please describe the cue and why it triggered this feeling.*

*Was there a memory that was associated with this feeling of nostalgia? If yes, please describe the memory that came to mind.*

*If a memory came to mind during this time when you felt nostalgic:*

- (a) Did the memory come to mind before, during, or after feeling nostalgic?*
- (b) What was your emotional state at the time of memory retrieval (-3 = very negative to + 3 = very positive)?*
- (c) What was your emotional state during the recall of this memory (-3 = very negative to + 3 = very positive)?*
- (d) What was your emotional state after recalling this memory (-3 = very negative to + 3 = very positive)?*
- (e) How would you rate the emotional content of this memory (-3 = very negative to + 3 = very positive)?*
- (f) Did this memory involve other people than just yourself Yes/No)?*
- (g) When the memory came to mind, did you view this experience as if you were viewing it through your own eyes again (first perspective) or as if you were viewing a recording of yourself (third perspective)?*



## Appendix B

### Diary pages used in Study 2

**Date:**

**Involuntary memory #1**

*Brief description of memory:*

*Was this memory of a specific event (i.e., specific place and time) or a general memory (extended event or related events)?*

*What was your emotional state at the time of the memory retrieval (-3 = very negative to + 3 = very positive)?*

*What was your emotional state during the recall of this memory (-3 = very negative to + 3 = very positive)?*

*What was your emotional state after recalling this memory (-3 = very negative to + 3 = very positive)?*

*How would you rate the emotional content of this memory (-3 = very negative to + 3 = very positive)?*

*How often have you retrieved this memory in the past (0 = rarely to 6 = all the time)?*

*How often have you recalled this memory involuntarily in the past (0 = never to 6 = all the time)?*

*How important is this memory to your personal identity (0 = not at all to 6 = very important)?*

*Did this memory involve other people than just yourself (0 = just me; 1 = me and others)?*

*How vivid and detailed was the memory that came to mind (0 = not at all to 6 = very vivid)?*

*Did you experience any feeling of nostalgia (i.e., a sentimental longing for the past) (Yes/No)?  
And if you did, what was it that you were missing at the time (e.g., time period, place, people, activity, etc.) and why do you think that happened?*

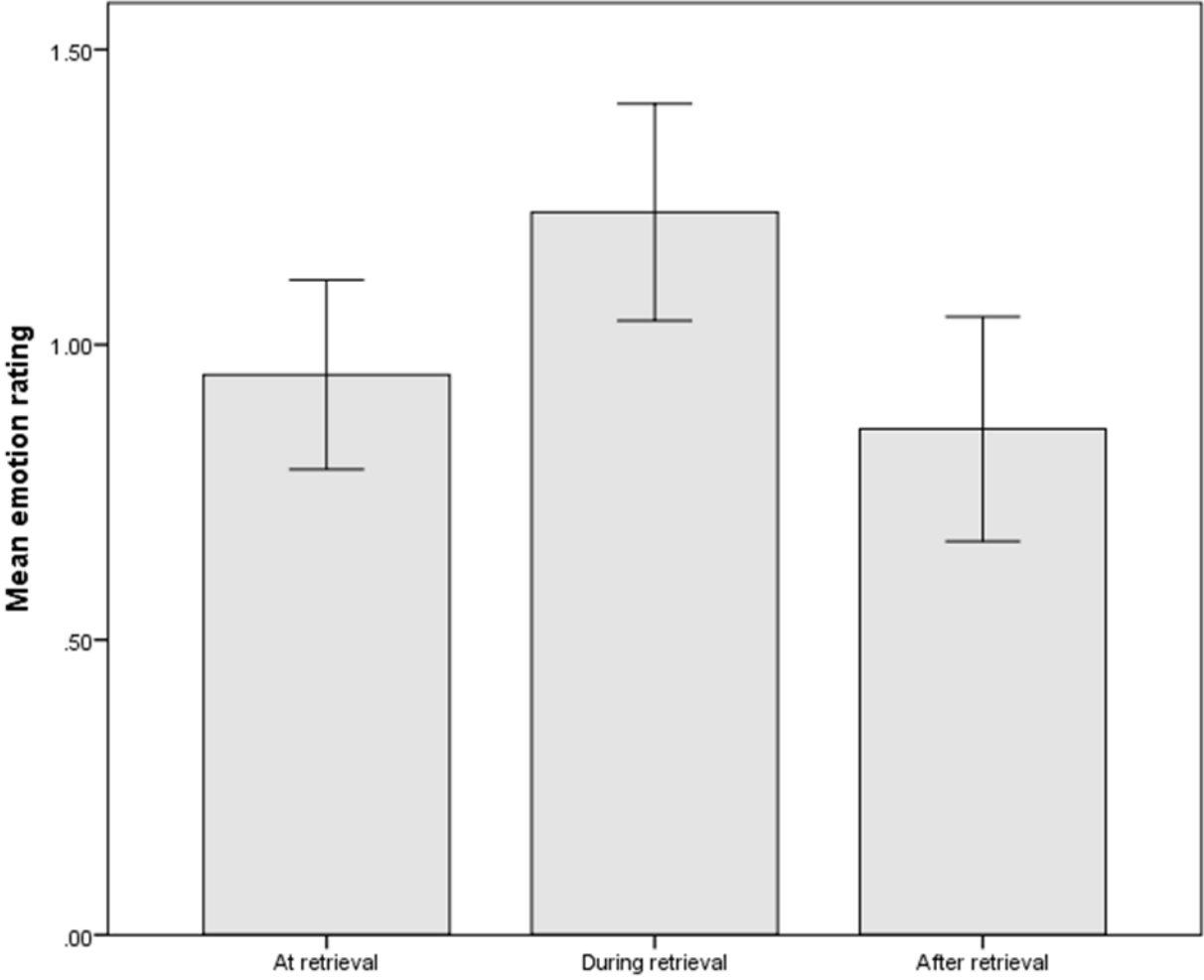
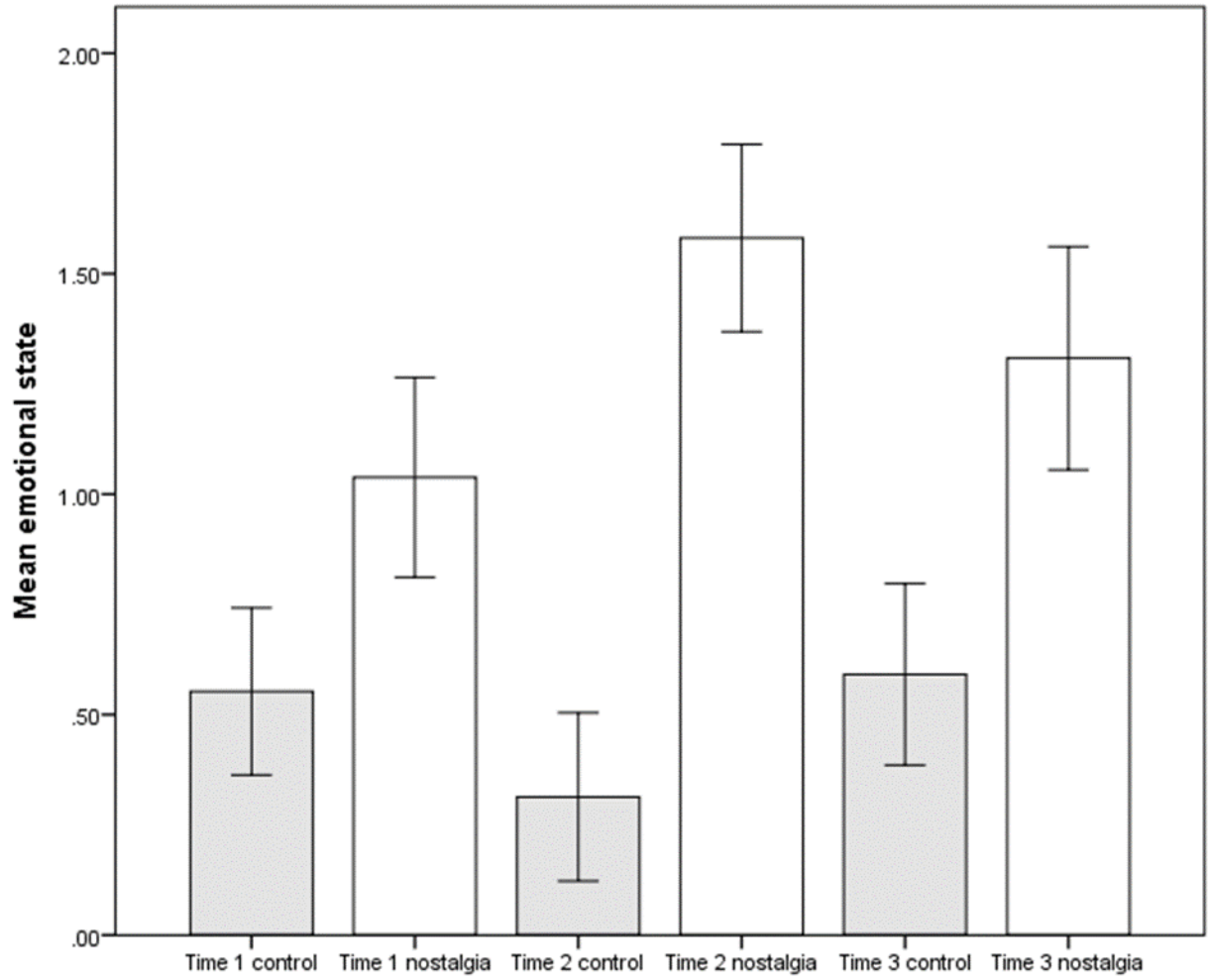


Figure 1: Average emotion ratings before, during, and after memory retrieval for Study 1.



*Figure 2: Emotion ratings of Non-nostalgic IM's (control) and Nostalgic IM's before, during, and after the experience during Study 2.*

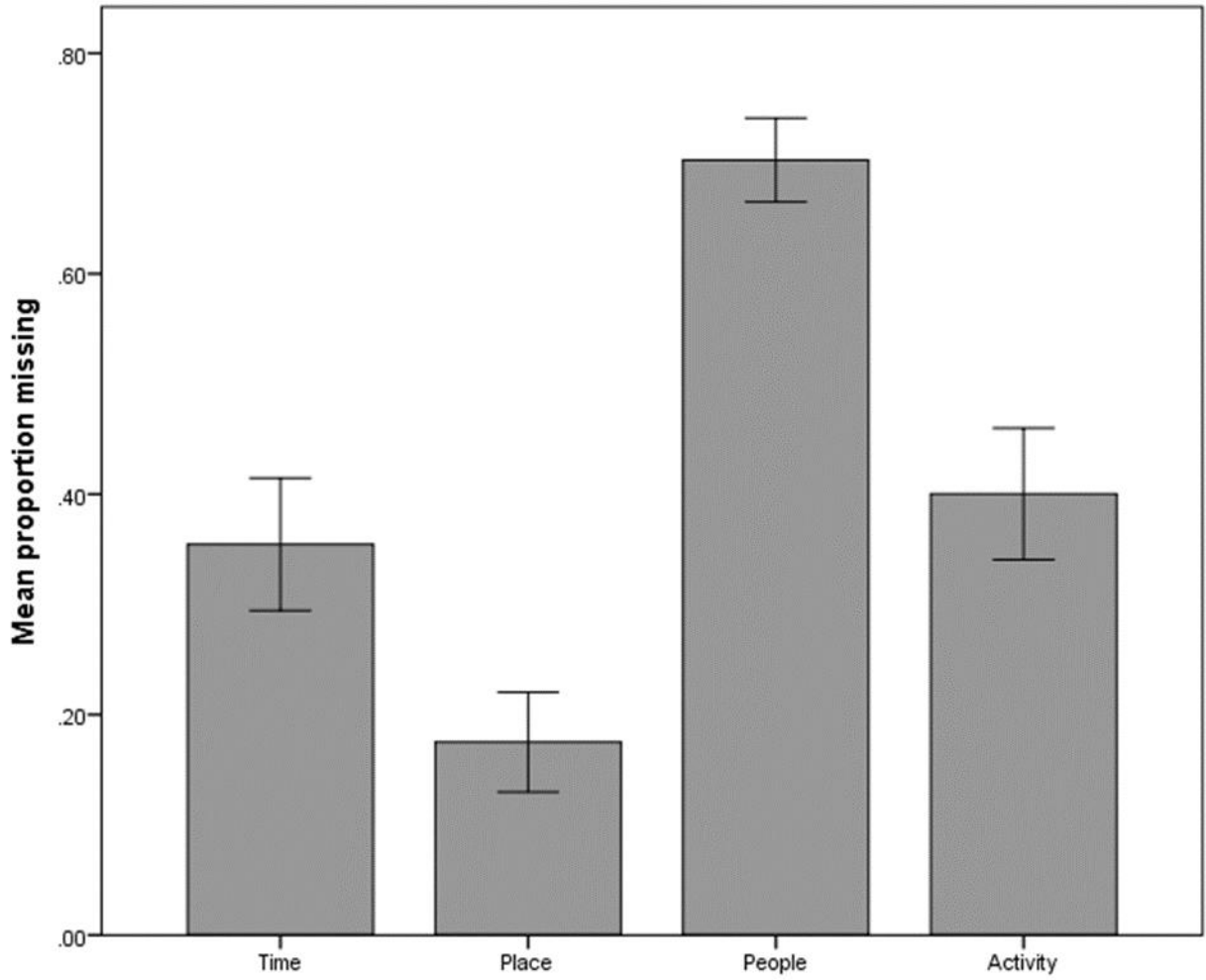


Figure 3: Proportion of missed subjects in nostalgic experiences in Study 2.