# Reminiscence in Everyday Conversations: A Naturalistic Observation Study of Older Adults

Demiray, Burcu ; Mischler, Marianne ; Martin, Mike

DOI: https://doi.org/10.1093/geronb/gbx141

## Abstract

**Objectives**: We examined older adults' social reminiscence behavior in everyday life, and the relation between reminiscence functions and well-being.

**Method**: The sample included 2'164 sound snippets that included speech from 45 healthy older adults. We examined reminiscence in daily conversations using the Electronically Activated Recorder. Across four days, we collected a random sample of about 280 sound files (30-seconds long) per participant. Participants´ utterances were coded for whether they included reminiscence, for their functions and conversation partners. Participants completed mood and life satisfaction measures.

**Results**: Participants reminisced in 5% of their utterances (Range: 0% - 29%). They reminisced in 40% of cases with friends, 32.8% with their partner and 8% with their children/relatives. Three reminiscence functions were observed: identity, teaching/informing, and conversation. Participants´ reminiscence served the identity function while they were reminiscing with their partner and children. Participants reminisced to teach/inform while reminiscing with their children and strangers. Reminiscing for conversation occurred mainly with partner and friends. We found positive relations between life satisfaction and identity, teach/inform, and conversation functions. Mood had a negative relation with identity and teach/inform functions.

**Discussion**: This is the first study to take a naturalistic observation approach to reminiscence and to build up on self-report data.


*Keywords*: Electronically Activated Recorder (EAR), ambulatory assessment, life satisfaction, mood, social interactions.

## Introduction

Reminiscence is the naturally occurring act of thinking about or telling others about personally meaningful past experiences (Bluck & Levine, 1998). It may involve the recollection of specific events or more generic episodes, and may be private or shared with others (O´Rourke, King, & Cappeliez, 2017). Reminiscence is a central task of old age that is highly relevant for healthy aging (Erikson, 1959; Westerhof, Bohlmeijer, & Webster, 2010). A functional approach to reminiscence suggests that reminiscing serves to achieve essential functions in real life. Butler (1963), for instance, stated that older adults reorganize their sense of self with the help of reminiscence. Memories can serve to guide our actions, to help understand ourselves or to bond with others (Bluck, Alea, & Demiray, 2010).

The reminiscence literature is dominated by retrospective self-reports (e.g., O´Rourke, et al., 2017). There is only one study that has examined adults' natural reminiscence behavior in the normal course of their daily lives (Pasupathi & Carstensen, 2003). The current study is the first to examine reminiscence with a naturalistic observation method. We have used the Electronically Activated Recorder (EAR; Mehl, Pennebaker, Crow, Dabbs, & Price, 2001) to unobtrusively record random snippets of older adults´ everyday conversations across four days. The first goal of our study was to describe older adults´ social reminiscence behavior in everyday life. The second goal was to examine the relation between observed reminiscence functions and self-reported well-being.

### Reminiscence Functions

The most prominent model of reminiscence functions includes eight functions (Webster, 1993) that cluster into self-positive (identity, problem-solving, death preparation), self-negative (bitterness revival, boredom reduction, intimacy maintenance) and prosocial

functions (conversation, teaching/informing others; O'Rourke, Cappeliez, & Claxton, 2011; O'Rourke, Carmel, Chaudhury, Polchenko, & Bachner, 2013; O'Rourke, et al., 2017).

According to this tripartite model, self-positive functions involve recalling memories to make meaning through reflection on one´s life (Cappeliez & O´Rourke, 2006). The identity function is achieved when a sense of being the same person over time and a positive self-concept are maintained. Second, remembering the past can be used to handle the idea that life is coming to an end and to prepare for death. Problem-solving involves recalling memories to solve current challenges. Self-negative functions involve persistent rumination on the past with negative emotional valence (O'Rourke, et al., 2017). Reminiscence can be used to reduce boredom when one is under-stimulated. The intimacy maintenance function refers to feeling close to people who are no longer part of one´s life. Finally, reminiscence can be used for bitterness revival such as reliving difficult memories (Cappeliez & O´Rourke, 2006). The third construct is the prosocial functions: Reminiscence can be used to inform others, give advice and share life lessons. Finally, memories can be recalled as the starting point of a conversation to connect with others (Webster, 2003; Westerhof, et al., 2010).

**Reminiscence Functions and Well-being**

Research shows that self-reported self-positive functions are positively associated with physical health, psychological well-being and life satisfaction (Cappeliez & O´Rourke, 2006; Demiray & Freund, 2017; O'Rourke, et al., 2011). Self-reported self-negative functions have been found to be negatively associated with physical and mental health (Cappeliez & O´Rourke, 2006; O'Rourke, et al., 2011), and positively associated with psychological distress (Cappeliez & O'Rourke, 2002; Cappeliez, O'Rourke & Chaudhury, 2005) and unhappiness (Webster & McCall, 1999). Finally, self-reported prosocial functions have been found to be indirectly related to well-being via self-positive and self-negative functions

(O'Rourke et al., 2011). They involve active engagement with social environments and no focus on the re-evaluation of the past, which should enable opportunities to experience positive mood in interactions in the present (Cappeliez & O'Rourke, 2006; O'Rourke et al., 2011). In sum, there are robust findings on the relation between self-reported functions of reminiscence and well-being (Webster, et al., 2010).

**Social Interactions in Late Life**

As people grow older, their future time perspective becomes more limited (Demiray & Bluck, 2014). The goal of acquiring new information through social contact becomes less important, whereas the emotion regulation goal becomes more emphasized (Carstensen, 1992). The limited resources of an older person are used to stabilize well-being and positive social interactions get higher priority (Antonucci, Fiori, Birditt, & Jackey, 2010).

Although reminiscence is a major topic in aging research, partners during social reminiscence seems to be an unexplored area. We do not know how much and how older adults reminisce with people in their close social network and whether they reminisce with others as well. There is some work showing that people report to prefer to reminisce with those they feel close to (Alea & Bluck, 2003; Beike, Cole, & Merrick, 2017). Pasupathi and Carstensen (2003) found that partners for mutual reminiscence were rated as more familiar and better liked than partners in other social activities. Beike, Brandon and Cole (2016) showed that conversation partners who knew each other before the experiment were more likely to talk about specific autobiographical memories than general self-information. According to these studies, older adults should reminisce with their closest social partners in everyday life.

**Current Study: Research Goals and Hypotheses**

This study used ambulatory assessment to eliminate the limitations of retrospective self-report (e.g., memory errors, response biases; Scollon, Kim-Prieto, & Diener, 2003). Self-report might also favor reminiscence functions that people are aware of and underrepresent those that are not consciously thought about (O'Rourke et al., 2011). More importantly, a functional approach to reminiscence necessitates its investigation in the real world (Demiray, in press). Therefore, we used the EAR to collect sound snippets of conversations. The EAR has been used with good acceptance and compliance (Mehl, 2017) in all age groups with healthy and clinical populations (e.g., Robbins, López, Weihs, & Mehl, 2014).

The first goal of the study was to describe how and why older adults reminisce with others in daily life. We aimed to answer the following questions: (1) How much of older adults´ utterances are composed of reminiscence? Three experience-sampling studies guide us to make an estimate: Gardner and colleagues (2012) examined the frequency of autobiographical memories via random prompts throughout the day, which asked participants whether they were thinking about a memory at that moment or not. The probability of being caught while recalling a memory was 15% (10% in Garder and Ascoli, 2015). Pasupathi and Carstensen (2003) examined mutual remembering (both talking and listening to others) and found that people reported mutual remembering on 20% of social occasions. We expect our finding to be lower than these percentages (< 10%), as these studies focused on any autobiographical memory ("I ate a sandwich"), whereas we specifically examined reminiscence (recalling meaningful memories in a detailed way; Bluck & Levine, 1998).

(2) With whom do older adults reminisce? We expect them to favor close social partners, such as partner and close friends (e.g., Beike, et al., 2017; Hyman & Faries, 1992), and do not expect them to reminisce with strangers.

(3) Which functions does reminiscence serve in daily conversations? Does it serve all eight functions proposed by the tripartite model and as observed in self-report data? O'Rourke, et al. (2017) suggested that self-positive and self-negative functions should be inherently private and more likely to occur when people are thinking alone. Similarly, Kulkofsky, Wang and Hou (2010) emphasized that private versus social contexts should have different effects on the functions of autobiographical memory. They showed that private reminiscence favors directive functions (which guide current and future behavior), such as problem solving or death preparation (D'Argembeau, Renaud & Van der Linden, 2011), whereas social contexts are associated with memories that have higher social functions. If this assumption is correct, we should observe only the prosocial functions (i.e., teach/inform, conversation) in our study.

(4) Does reminiscence serve different functions with different social partners? It might (Pasupathi, Lucas & Coombs, 2002), which has never been examined before. We expect participants to reminisce for teaching purposes mostly with younger generations (e.g., their children). We expect them to reminisce for conversational purposes with their closest social partners who they spend most time with (e.g., partner, close friends).

The second study goal was to investigate the relation between reminiscence functions and well-being (i.e., life satisfaction, mood). Life satisfaction has been examined frequently (e.g., Cappeliez, et al., 2005), but mood has not been investigated before. Thus, we aimed to expand findings to an unexplored aspect of well-being and expected to find similar results for life satisfaction and mood. Based on research on the relation between reminiscence and well-being (Cappeliez, et al., 2005; O'Rourke et al., 2011), we hypothesized that older adults who report high levels of life satisfaction and positive mood are more likely to reminisce with the prosocial functions.

# Methods

## Participants

We collected 12,082 sound snippets from the real-life situations of older adults. Out of these, 312 (2.6%) were deleted due to non-compliance and technical problems. The remaining 11,770 snippets were used (Range: 198-299 per participant, $M = 261.56$, $SD = 19.80$). Data were collected from 48 participants (62 - 82 years of age).[1] Three participants had to be excluded due to missing data. The final sample included 45 adults: 22 men ($M = 70.4$, $SD = 4.62$) and 23 women ($M = 70.2$, $SD = 4.27$), all healthy and living independently with no record of neurological or psychiatric illness. Sixty percent were married, 22 % single, 11 % divorced, 4% widowed and 2% in a long-term relationship. Years of education ranged between seven and 25 ($M = 10.55$, $SD = 3.02$). An inclusion criterion was a minimum score of 27 on the Mini Mental State Examination (Folstein, Folstein & McHugh, 1975). Participants were compensated with 50 Swiss Francs.

## Procedure

**Introductory session.** Participants came to the Psychology Institute and completed well-being measures.[2] All measures were administered in a group setting except for MMSE. Participants received their assigned iPhone with a charging cable. They were asked to think of the iPhone as a "recorder", as it was set to "Airplane mode" and locked with only the iEAR application on. They were reminded to carry the iPhone as much as possible over the next four days. They were told that the EAR would record 30 seconds of sounds at a time, and that they would not be aware of when the EAR was recording, so that they could continue their normal lives.

**EAR data collection.** Data collection spanned two weekdays and one weekend (counterbalanced). Participants carried the iPhone either clipped to their waistline or in their pocket. They did not have to do anything with the iPhone other than carrying it and charging it every night. Participants also filled out a short diary each day, in which they reported their activities throughout the day and indicated when they were not carrying the iPhone and whether they preferred any files to be deleted due to privacy reasons. All study procedures have been approved by the local ethics committee.

**Final session.** After data collection, participants returned to the laboratory. The researcher collected the iPhones and the diaries, and administered the same well-being measures. Next, the researcher downloaded the sound files from the iPhone onto a lab computer and a CD so that participants could review their files in the lab or at home, and permanently delete any files they wished.[3]

## Measures

**EAR.** Each participant was provided with an iPhone 4S which had the iEAR application installed (version 2.3.0). The app recorded 72 30-second sound snippets that were randomly distributed throughout the day. The app was active for 18 hours per day with a blackout period between midnight and 6 AM. In total, 2.5 % of the participant´s day (36 minutes) was recorded (72 x 4 days = 288 recordings per participant = 144 minutes per participant).

**EAR-derived measures: Coding of sound files.** Each file was coded for (1) whether the participant was talking or not, (2) if talking, whether the participant was reminiscing or not, (3) if reminiscing, function(s) of reminiscence, and (4) participant´s conversation partners (i.e., partner/spouse, daughter/son, kids, other family members, friends/acquaintances,

strangers, pets). All coding categories were dichotomous (1 versus 0) indicating presence or absence of a behavior.

Reminiscence referred to talking about personally experienced past events: These could be specific events that happened at a particular place and time, repeated events (e.g., "I used to go every day"), extended events (e.g., "our 2-week vacation"), and long periods of life (e.g., "When I lived in the US"; Conway, Singer & Tagini, 2004). Reminiscence involved the detailed sharing of events that were meaningful to the participant (e.g., "As a child, I went to this glacier with my father, and I remember how long the walk was and how tired I felt").

Reminiscence functions were coded on the basis of Cappeliez and colleagues´ work (2005; 2006) as shown in Table 1. Reminiscence and its functions were double-coded by two independent coders. Inter-rater reliability for reminiscence was 95%, and for reminiscence functions was between 69% and 100%. All sound files that showed a disagreement between the two coders were re-listened to and re-coded through discussion.

**Well-being measures.** Life satisfaction was assessed using the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985; German translation from Schumacher, 2003). Participants rated five items on a scale from 1 (*do not agree at all*) to 7 (*fully agree*). Higher scores indicated higher life satisfaction. Cronbach's alpha was 0.87 for both measurement points.

We used the valence subscale ('good versus bad') from the Multidimensional Mood Questionnaire (Steyer, Schwenkmezger, Notz, & Eid, 1997) to measure mood states. It consists of 8 adjectives: Four adjectives were rated before the EAR data collection and the remaining four adjectives were rated after the EAR data collection. Participants were asked to indicate on a scale ranging from 1 (*not at all*) to 7 (*very much*) the extent to which their current state corresponded to the adjectives. Two of the adjectives in one measurement point

were positive and two were negative. High values indicate positive mood. Cronbach's alpha was 0.73 for the first and 0.83 for the second measurement point. Both well-being measures were administered twice, before and after the EAR data collection.

## Results

### Preliminary Analyses

Out of the final sample of 11,770 sound files, 2,495 included participant speech, ranging from 6 to 145 per participant ($M$ = 55.44, $SD$ = 31.91). That is, participants were talking in 21% of the sound files, in line with past EAR studies (M. Mehl, personal communication, April 21, 2017). Out of these 2,495 sound files, 331 were deleted because we were unable to code for whether the participant was talking about the past or not, leaving us with a total of 2,164 sound files for analyses.

A non-parametric Mann-Whitney U test showed that the reminiscence count for women ($M$ = 3.48) was significantly higher than the reminiscence count for men ($M$ = 1.36), $U$ = 150.5, $z$ = -2.376, $p$ = .017, $r$ = 0.35. Therefore, gender was added as a control variable in further analyses. Similarly, we checked for age effects in the count of reminiscence and its functions, but found no significant results, $U$s range 82.5 – 240.5, $z$s range -1.67 - -0.04, $p$s > .05. Therefore, age was not added in further analyses.

Life satisfaction scores were high and similar across the two measurement points (T1: $M$ = 5.10, $SD$ = 1.16 and T2: $M$ = 5.17, $SD$ = 1.06). A Wilcoxon test showed no significant difference between the two scores, $z$ = -0.79, $p$ = .43, $r$ = 0.12. Similarly, mood scores were high (T1: $M$ = 6.41, $SD$ = 0.60 and T2: $M$ = 6.24, $SD$ = 1.08) and similar, $z$ = -0.91, $p$ = .36, $r$ = 0.15. In order to obtain a more accurate assessment of life satisfaction and mood, we used the means of the two measurements. A Spearman's correlation showed a positive relation between life satisfaction and mood, $r$ = .34, $p$ = .029.

## Analytical Approach

All EAR data were treated as count data. For each participant, counts of reminiscence, reminiscence functions, and conversation partners were calculated. Count variables can be used as predictors in ordinary least square regressions, but if the variance is small, they will be unstable and might show a large standard error (Coxe, West, & Aiken, 2009). Therefore, we treated reminiscence and its functions as the dependent variables (count variables), and we entered life satisfaction and mood as predictors (continuous variables). This approach is in line with our aim of examining the *relation* between reminiscence and well-being, with no directional hypotheses or causal predictions.[4]

## Major Analyses

**Description of older adults' social reminiscence.** The first goal of the study was to describe how and why older adults reminisce with others in daily life. We had four sets of analyses in line with our questions: (1) How much of older adults´ utterances are composed of reminiscence? There were 2,164 sound files that included speech, ranging from 5 to 133 sound files ($M$ = 48.09, $SD$ = 30.49) per participant. Reminiscence was coded in 110 of these sound files (5% which is in line with our expectation of < 10%). Reminiscence count ranged from 0 to 14 per participant ($M$ = 2.44, $SD$ = 3.07). In our sample of 45 older adults, 13 participants never reminisced (28.8%). In summary, reminiscence represented 5% of all daily utterances, with a range of 0% - 29.4% per participant ($M$ = 4.24, $SD$ = 5.14).

(2) With whom do older adults reminisce? First, we were unable to code for social partner in only 2.5% of the files. In 40.2% of recorded cases, participants reminisced with their friends and in 32.8% with their partner. Their children and relatives were also partners for reminiscence, each representing 8.2% of cases. Participants, surprisingly, reminisced with

strangers 5.6% of the time. Finally, they reminisced with children (e.g., grandchildren) 2.5% of the time.

Next, we examined which social partners were significantly related to reminiscence count. Thus, we tested the assumption of a Poisson distribution for reminiscence count. A Kolmogorov-Smirnov test showed a significant difference from a Poisson distribution, $z$ = 1.42, $p$ = .03. Therefore, a negative binominal regression was conducted with social partners as the predictor and reminiscence count as the dependent variable. Results showed that for every additional count of talking with friends, reminiscence frequency increased 1.03 times, $p$ = .048. There was a marginally significant result for partner: For every additional count of talking with one's partner, reminiscence frequency increased 1.02 times, $p$ = .059. The remaining social partners did not show a significant relation with reminiscence count, $B$s range between 1.01 and 1.12, all $p$s > .05.

(3) We explored which functions reminiscence served in conversations. For the 110 sound files in which participants reminisced, a total of 139 functions were coded. Out of these, 76 cases of reminiscence served the conversation function (54.7%) and 30 cases (21.6%) served the teach/inform function. That is, as expected, both prosocial functions were observed. In opposition to O'Rourke and colleagues' assumption (2017), social reminiscence also served the identity function (33 cases: 23.7%). The remaining five functions had a count of zero and were not included in further analyses.

(4) We examined whether reminiscence served different functions with different social partners. For these analyses, the 32 participants who reminisced were used. Kolmogorov-Smirnov tests showed no significant difference from a Poisson distribution for the three functions; identity ($z$ = 0.36, $p$ = 1.00), teach/inform ($z$ = 0.21, $p$ = 1.00) and conversation ($z$ =

1.01, $p = .19$). Therefore, we conducted three Poisson regressions with the functions as dependent variables, social partner as the independent variable and gender as the control variable.

As shown in Table 2, with every additional count of reminiscing with one´s partner, reminiscence served the identity function 1.42 times more often and the conversation function 1.31 times more often. For every additional count of reminiscing with one´s children (Line 2), reminiscence served the identity function 1.27 times more often and the teach/inform function 1.39 times more often. Reminiscing with friends was associated with only the conversation function: With every additional count of reminiscing with friends, conversation function frequency increased 1.30 times (Line 5). Finally, reminiscing with strangers was associated with the teach/inform function (Line 6): With every additional count of reminiscing with strangers, the teach/inform function frequency increased 1.91 times.

**Relation between reminiscence functions and well-being**. The second goal of the study was to investigate the relation of reminiscence functions to life satisfaction and mood. We examined whether older adults who reported higher levels of life satisfaction and positive mood were more likely to reminisce with identity, teach/inform and conversation functions. Poisson regressions were run for the identity and teach/inform functions (Table 3), whereas a negative binominal regression was run for the conversation function due to the problem of overdispersion. As shown in Table 3, two Poisson regressions were run with identity and teach/inform functions as the dependent variable, mood and life satisfaction as the predictors, and gender as the control variable. Results showed no main effect of gender for identity ($p = .99$) and teach/inform functions ($p = .62$). Mood was a significant predictor of both identity and teach/inform functions (Line 1): With every one point increase on the mood scale, the identity function count decreased 0.25 times and the teach/inform function count decreased

0.20 times (B < 1 indicates decrease). In contrast, life satisfaction showed the opposite pattern for both identity and teach/inform functions (Line 2). With every one point increase on the life satisfaction scale, the identity function count increased 1.72 times and the teach/inform function count increased 2.40 times. Thus, our hypothesis was supported with life satisfaction, but not with mood.

The Poisson regression on the relation between the conversation function and the two aspects of well-being showed an overdispersion ($X^2/df = 2.395$). Therefore, a negative binominal regression was run. Results showed that gender was non-significant, $p = .47$, 95% CI for B [0.261, 1.849]. Mood did not have a significant relation with the conversation function, $p = .27$, 95% CI for B [0.168, 1.656]. Life satisfaction showed a marginally significant relation with the conversation function count, $p = .08$, 95% CI for B [0.932, 3.283]. Thus, our hypothesis regarding the conversation function was supported with life satisfaction, but not with mood.

## Discussion

This study is the first to examine social reminiscence with a naturalistic observation method. Our first goal was to describe how and why older adults reminisce in everyday conversations. The second goal was to replicate findings from self-report studies by showing a relation between reminiscence functions and life satisfaction, as well as exploring the relation between reminiscence functions and mood.

**Description of older adults' social reminiscence.** We found that 5% of older adults´ utterances included reminiscence. This is in line with our expectations based on previous work on the natural frequency of autobiographical memory (Gardner & Ascoli, 2015; Gardner, et al., 2012): These experience-sampling studies had examined both thinking and talking about any type of autobiographical memory, therefore their percentages are higher

than what we found. We should also note that 5% is for the whole sample of sound snippets, but when we examined participants individually, reminiscence ranged from 0% to 29% of utterances. This shows that there is large variability in the frequency of reminiscence across individuals. Future research should focus on individual differences in reminiscence and examine why some contexts lead to "reminiscers" and others not (Webster & Ma, 2013), and why this might matter for well-being. Furthermore, future studies should examine within-person change or stability in reminiscence depending on different contexts.

In line with our expectations, older adults reminisced mostly with their friends and partner. According to the socioemotional selectivity theory, older adults focus more on emotion-oriented goals and use social interactions for emotion regulation and maintenance of well-being (Carstensen, 1992). Therefore, it is in line that older people spent more time reminiscing with their partner and close friends than with strangers. Partner and friends are part of older adults' convoy of social support (Antonucci & Akiyama, 1991). Other family members are part of this convoy as well, but they did not predict reminiscence behavior. Looking at the mean counts for different social partners, we observed that the occasions of talking with the daughter/son ($M$ = 4.07) and other relatives ($M$ = 3.53) were much fewer than talking with partner ($M$ = 20.98) and friends ($M$ = 14.71). Possible explanations are that middle-aged children may be busy with the multiple roles and responsibilities of midlife (Freund & Ritter, 2009), or that they, as well as other relatives might not live close by.

**Which functions does social reminiscence serve?** As expected, social reminiscence served both prosocial functions during conversations (O'Rourke, et al., 2017). Participants reminisced mostly for conversational purposes (45.5%). This is not surprising, as social contexts appear to favor social functions of recalling the personal past (Kulkofsky, Wang, & Hou, 2010). Reminiscing for conversational purposes helps to maintain emotional bonds and

to connect or reconnect with people (Alea, & Bluck, 2003; Webster, 2003). The teach/inform function was also frequent: 24.2%. Reminiscing to teach and inform others can be interpreted as a way of establishing generativity. Generativity manifests in adult life and encompasses dimensions such as inner desire for symbolic immortality and the need to be needed (McAdams, & de St. Aubin, 1992).

Self-positive functions have been suggested to be served while thinking privately (O'Rourke, et al., 2017), but the identity function was observed in the current data: Social reminiscence served the identity function in 29.5% of the cases. This shows that people recall their past for identity purposes while both thinking privately and while talking to others. The identity function helps to maintain a sense of identity and self-continuity, and to make important aspects of our life salient (Webster, & Cappeliez, 1993; Westerhof, et al., 2010). Based on the assumption that older people engage in meaningful social interactions and pursue goals that enhance current well-being (Pasupathi, & Carstensen, 2003), this finding is meaningful.

As expected, the remaining self-positive and self-negative functions were not detected in the current data. These functions are assumed to occur in private reminiscence (O'Rourke, et al., 2017). For example, an older adult who is in conflict with their grown-up child might think about a similar situation that occurred in the past and draw on that experience to resolve the current conflict (problem-solving). Reminiscence with such a directive function is more likely to have a solitary nature (Kulkofsky, et al., 2010). This study is the first to show that this is indeed true and that these functions do not appear in conversations. Another explanation for the absence of self-negative functions might be the sample's high levels of life satisfaction and mood.

Finally, methodological reasons could explain the absence of these five functions. In previous studies, functions were self-reported: Participants could reflect on what functions they believed reminiscence served (Kulkofsky, et al., 2010). In this study, functions were coded by objective coders, who had to rely on participants´ utterances and did not have any knowledge about their mental state. For example, coders could not tell whether a participant was feeling bored and whether reminiscing at that moment actually served the boredom reduction function. Future research should use a multi-method approach that can assess reminiscence both objectively and via self-report. An ideal design would merge the EAR method with experience-sampling to capture verbal reminiscence and to obtain momentary self-reports on functions.

**Does reminiscence serve different functions with different social partners?** How memories are retold is dependent on the speaker and the listener (Pasupathi & Hoyt, 2009), and our results showed that reminiscence served different functions with different listeners. First, we found a relation between reminiscing with one's partner and child, and the identity function: Older adults' reminiscence served the identity function more often, when they reminisced with their partner and children. Talking to a familiar person to maintain self-continuity should be easier than reminiscing with a stranger to explain yourself. Reminiscing that serves the identity function relies on a well-known listener who responds and encourages elaboration (Pasupathi, & Hoyt, 2009).

Reminiscence served the teach/inform function more often while participants reminisced with their children and strangers. This can be interpreted as generativity and as fulfilling the need to be needed (McAdams, & de St. Aubin, 1992). Older adults talked about past experiences when they wanted to give advice or pass on knowledge to the younger generation and to new people who did not know their past.

As expected, the conversation function frequency was related to how often older adults reminisced with their partner and friends. Past studies showed that self-reported reasons for recalling memories are to provide material for conversation (Pasupathi, et al., 2002), to update others about what is ongoing in one's life (Webster, 2003), and to nurture social relationships (Hyman & Faries, 1992). Alea and Bluck (2007) examined whether retrieving positive memories about one's spouse, compared to hearing a story of a fictional happy couple, differentially affected feelings of intimacy towards one's spouse. Participants' intimacy increased only after thinking about memories of their partners. Thus, older adults reminisce mostly with their closest social partners for conversation, which should enhance their relationships.

**Relation between reminiscence functions and well-being.** The second study goal was to investigate the relation between reminiscence functions and well-being. We expected a relation between high levels of life satisfaction and mood and high counts of reminiscence serving the identity, teach/inform and conversation functions.

Life satisfaction, as expected, was positively related to the identity function. This replicated earlier findings (Cappeliez, et al., 2005; O'Rourke et al., 2011) showing that higher life satisfaction is related to increased frequency of reminiscence serving the identity function. Results on mood showed that the better people felt, the less often reminiscence served the identity function. This was contradictory to our expectations. According to Erikson (1959), the developmental crisis older people face is based on the conflict between personal integrity and desperation. Older people who cannot look back on their life with a feeling of wholeness might have unfulfilled desires and a sense of desperation (Gerrig, & Zimbardo, 2008). Erikson describes a link between feeling low and having an unsatisfied identity. Therefore, negative mood may trigger the need to improve one's sense of identity, which could explain

why low levels of mood are associated with the identity function. This is supported by a study showing that individuals with low depression scores remembered more positive memories after induced negative mood, than when mood was not manipulated (Josephson et al., 1996). This finding supports the idea that mood serves as a *repair process* in memory. If a person in bad mood remembers a positive memory, mood can be actively enhanced (Josephson et al., 1999).

We also expected that older adults with high levels of life satisfaction and mood are more likely to reminisce with the prosocial functions. Contrary to our prediction, mood was unrelated to the conversation function and was negatively related to the teach/inform function. The better older adults felt, the less they reminisced to teach/inform others. This might be because instances of teaching/advising may not be pleasant moments and may include negativity. Past work shows that recalling directive memories is dominated by negative emotion and that negative memories serve a higher directive function than positive memories (Rasmussen & Berntsen, 2009). In contrast, participants reporting high levels of life satisfaction reminisced more often to pass on knowledge and for conversational purposes than those reporting lower levels of life satisfaction. This was expected and replicated findings by Cappeliez and colleagues (2005) showing a positive relation between life satisfaction and prosocial functions.

Life satisfaction and mood were positively correlated. Nevertheless, they showed opposing relations with reminiscence functions. Positive relations between the self-positive functions, the prosocial functions and well-being shown in past work (Cappeliez et al., 2005; O'Rourke et al., 2011) are based on well-being being assessed with measures of life satisfaction, depression and anxiety, but not mood. We replicated the positive relation between life satisfaction and reminiscence was replicated. However, mood was found to have

an opposite pattern. The reason might be that life satisfaction is a more stable, trait-like dimension, which is a judgmental process comparing current life with a standard (Diener et al., 1985). Mood, on the other hand, is an emotional-affective dimension of well-being (Diener, 1984) that is more state-like and variable. This difference might have led to the opposite findings, and future research should investigate this issue.

**Limitations**

The sample was relatively small, which might limit the generalization of results. Although participants' responses to the well-being scales ranged from minimum to maximum scores, they were highly satisfied with their life with positive mood. However, the strength of our study is its attempt to increase ecological validity through sampling from a range of natural situations (N = 11,770).

Ideally, mood should have been measured momentarily throughout the day across the four days. Assessing momentary mood within a micro-longitudinal study would allow for the examination of intra-individual effects in the relation between reminiscence and mood. Merging the EAR method with experience-sampling would result in an ideal multi-method approach (Demiray, in press).

Finally, the Balanced Time Perspective Scale (Webster & Ma, 2013) could have been administered to identify "reminiscers" and examine whether they really reminisce more than others in real life. The Reminiscence Functions Scale (Webster, 1993) could have been used to further validate the coding of functions.

## Conclusions

We took an objective approach of assessing reminiscence by coding older adults' utterances in a standardized way. We found that older adults do not live in the past as expected by aging stereotypes. We showed that there are individual differences in how much

older adults reminisce with others. We observed only three of the reminiscence functions that have been demonstrated with self-report data, and found that different functions are served with different social partners. The positive relation between life satisfaction and reminiscence functions validated previous findings on self-reported functions. The unexpected negative relation between mood and reminiscence functions necessitates further investigation. In conclusion, this study contributed to the literature with its focus on social reminiscence and its functions in everyday life.

## References

Alea, N., & Bluck, S. (2003). Why are you telling me that? A conceptual model of the social function of autobiographical memory. *Memory, 11*(2), 165-178. doi:10.1080/741938207

Alea, N., & Bluck, S. (2007). I´ll keep you in mind: The intimacy function of autobiographical memory. *Applied Cognitive Psychology, 21*(8), 1091-1111. doi:10.1002/acp.1316

Antonucci, T. C., & Akiyama, H. (1991). Convoys of social support. *Marriage & Family Review, 16*(1), 103-124. doi:10.1300/J002v16n01_06

Antonucci, T. C., Fiori, K. L., Birditt, K., & Jackey, L. M. (2010). Convoys of Social Relations: Integrating Life-Span and Life-Course Perspectives. *The Handbook of Life-Span Development: Part II. Social and Emotional Development*. John Wiley & Sons, Inc. pp. 434-473.

Beike, D. R., Brandon, N. R., & Cole, H. E. (2016). Is sharing specific autobiographical memories a distinct form of self-disclosure? *Journal of Experimental Psychology: General, 145*(4), 434-450. doi:10.1037/xge0000143

Beike, D. R., Cole, H. E. C, & Merrick, C. R. (2017). Sharing specific "we" autobiographical memories in close relationships: The role of contact frequency. *Memory.* 1-10. doi:10.1080/09658211.2017.1313990

Bluck, S., & Levine, L. J., (1998). Reminiscence as autobiographical memory: A catalyst for reminiscence theory development. *Aging and Society, 18*, 185-208.

Bluck, S., Alea, N., & Demiray, B. (2010). You get what you need: the psychosocial functions of remembering. In J. Mace (Ed.), *The act of remembering: Toward an understanding of how we recall the past.* (pp. 284–307). UK: Blackwell Publishing Ltd.

Butler, R. N. (1963). The life review: An interpretation of reminiscence in the aged. *Psychiatry, 26*(1), 65-76.

Cappeliez, P., & O'Rourke, N. O. (2002). Personality traits and existential concerns as predictors of the functions of reminiscence in older adults. *Journal of Gerontology, 57B* (2), 116-123. doi:10.1093/gernb/57.2.p116

Cappeliez, P., & O'Rourke, N. (2006). Empirical validation of a model of reminiscence and in later life. *Journal of Gerontology, 61*(4), 237-244. doi:10.1093/geronb/61.4.P237

Cappeliez, P., O'Rourke, N., & Chaudhury, H. (2005). Functions of reminiscence and mental health in later life. *Aging & Mental Health, 9*(4), 295-301. doi:10.1080/13607860500131427

Carstensen, L. L. (1992). Social and emotional patterns in adulthood: Support for socioemotional selectivity theory. *Psychology and Aging, 7*(3), 331-338.

Conway, M. A., Singer, J. A., & Tagini, A. (2004). The self and autobiographical memory: Correspondence and coherence. *Autobiographical memory: Theoretical Applications, 22*(5), 491-529. doi:10.1521/soco.22.5.491.50768

Coxe, S., West, S. G., & Aiken, L. S. (2009). The analysis of count data: A gentle introduction to poisson regression and its alternatives. *Journal of Personality Assessment, 91*(2), 121-136. doi:10.1080/00223890802634175

Demiray, B. (in press). Otobiyografik Bellek Araştırmalarında Kullanılan Yöntemler. In S. Gülgöz, B. Ece, & S. Öner (Eds.), *Hayatı hatırlamak: Otobiyografik Belleğin Psikolojisi*. Koc University Publishing.

Demiray, B., & Bluck, S. (2014). Time since birth and time left to life: opposing forces in constructing psychological wellbeing. *Aging & Society, 34*(7), 1193-1218. doi:10.1017/S0144686X13000032

Demiray, B., & Freund, A. M. (2017). The psychological distance of memories: Examining causal relations with mood and self-esteem in young, middle-aged and older adults. *Consciousness and Cognition, 49*, 117-131. doi:10.1016/j.concog.2017.01.004

Diener, E. (1984). Subjective well-being. *Psychological Bulletin, 95*(3), 542-575.

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment, 49*(1), 71-75. doi:10.1207/s15327752jpa4901_13

Erikson, E. H. (1959). Identity and the life cycle. *Psychological Issues, 1*, 1-171.

Folstein, M. F., Folstein, S. E., & McHugh, P. R. (1975). Mini-mental-state, a practical method for grading the cognitive state of patients for the clinician. *Journal of Psychiatric Research, 12,* 189-198.

Freund, A. M., & Ritter, J. O. (2009). Midlife crisis: A debate. *Gerontology*, *55*(5), 582-591. doi: 10.1159/000227322

Gerrig, R., & Zimbardo, P. G. (2008). Entwicklung. In Graf, R., Mallett, D., Nagler, M., & Ricker, B. (Eds.), *Psychologie* (pp 361-411). Wemding, Germany: Fimengruppe APPL, aprinta druck.

Hyman, I. E., & Faries, J. M. (1992). The functions of autobiographical memory. *Theoretical Perspectives on Autobiographical Memory, 65,* 207-221.

Josephson, B. R., Jefferson, Rose, R. D., & Singer, J. A. (1999). Thought sampling after mood induction in depressed vs. non-depressed college students. *Imagination, Cognition and Personality, 19*(1), 27-37. doi:10.2190/UWA1-HF64-B26N-8L8P

Kulkofsky, S., Wang, Q., & Hou, Y. (2010). Why I remember that: The influence of contextual factors on beliefs about everyday memory. *Memory & Cognition*, *38*(4), 461-473. doi:10.3758/MC.38.4.461

McAdams, D. P., & de St. Aubin, E. (1992). A theory of generativity and its assessment through self-report, behavioral acts, and narrative themes in autobiography. *Journal of Personality and Social Psychology, 6,* 1003-1015.

Mehl, M. R. (2017). The Electronically Activated Recorder or EAR: A method for the naturalistic observation of daily social behavior. *Current Directions in Psychological Science*, *26* (2), 184-190. doi: 10.1177/0963721416680611

Mehl, M. R., Pennebaker, J. W., Crow, D. M., Dabbs, J., & Price, J. H. (2001). The Electronically Activated Recorder (EAR): A device for sampling naturalistic daily activities and conversations. *Behavior Research Methods, Instruments, & Computers*, *33*, 517–523. doi:10.3758/BF03195410

O'Rourke, N., Cappeliez, P., & Claxton, A. (2011). Functions of reminiscence and psychological well-being of young-old and older adults over time. *Aging & Mental Health, 15*(2), 272-281. doi:10.1080/13607861003713281

O'Rourke, N. O., Carmel, S., Chaudhury, H., Polchenko, N., & Bachner, Y.G. (2013). A cross-national comparison of reminiscence functions between Canadian and Israeli older adults. *Journal of Gerontology, Series B: Psychological Sciences and Social Sciences, 68*(2), 184-192. doi:10.1093/greonb/gbs058.

O'Rourke, N., King, D. B., & Cappeliez, P. (2017). Reminiscence functions over time: Consistency of self functions and variation of prosocial functions. *Memory, 25*(3), 403-411. doi:10.1080/0968211.2016.1179331

Pasupathi, M., & Carstensen, L. L. (2003). Age and emotional experience during mutual reminiscing. *Psychology and Aging, 18*(3), 430-442. doi:10.1037/0882-7974.18.3.430

Pasupathi, M., & Hoyt, T. (2009). The development of narrative identity in late adolescence and emergent adulthood: The continued importance of listeners. *Developmental Psychology, 45*(2), 558-574. doi:10.1037/a0014431

Pasupathi, M., Lucas, S., & Coombs, A. (2002). Conversational functions of autobiographical remembering: Long-married couples talk about conflicts and pleasant topics. *Discourse Processes, 34*(2), 163-192. doi:10.1207/S15326950DP3402_3

Rasmussen, A. S., & Berntsen, D. (2009). Emotional valence and the functions. *Memory & Cognition, 37*(4), 477-492. doi:10.3758/MC.37.4.477

Robbins, M. L., López, A. M., Weihs, K. L., & Mehl, M. R. (2014). Cancer conversations in context: Naturalistic observation of couples coping with breast cancer. *Journal of Family Psychology*, *28*(3), 380. doi: 10.1037/a0036458

Scollon, C. N., Kim-Prieto, C. & Diener, E. (2003). Experience-sampling: Promises and pitfalls, strengths and weaknesses. *Journal of Happiness Studies, 4*, 5-34.

Steyer, R., Schwenkmezger, P., Notz, P., & Eid, M. (1997). *Mehrdimensionaler Befindlichkeitsfragebogen (MDBF)*. Goettingen: Hogrefe.

Webster, J. D. (1993). Construction and validation of the reminiscence functions scale. *Journal of Gerontology: Psychological Sciences, 48*(5), 256-262.

Webster, J. D. (2003). The reminiscence circumplex and autobiographical memory functions. *Memory, 11*(2), 203-215. doi:10.1080/741938202

Webster, J. D., Bohlmeijer, E. T., & Westerhof, G. J. (2010). Mapping the future of reminiscence: A conceptual guide for research and practice. *Research on Aging, 32*(4), 527-564. doi:10.1177/0164027510364144

Webster, J. D., & Cappeliez, P. (1993). Reminiscence and autobiographical memory: Complementary contexts for cognitive ageing research. *Developmental Review, 13,*54-91.

Webster, J. D., & Ma, X. (2013). A balanced time perspective in adulthood: Well-being and developmental effects. *Canadian Journal on Aging/La Revue canadienne du vieillissement*, *32*(4), 433-442. doi:10.1017/S0714980813000500

Webster, J. D., & McCall, M. E. (1999). Reminiscence functions across adulthood: A replication and extension. *Journal of Adult Development, 6*(1), 73-85.

Westerhof, G. J., Bohlmeijer, E. T., & Webster, J. D. (2010). Reminiscence and mental health: A review of recent progress in theory, research and interventions. *Aging and Society, 30*, 697-721. doi:10.1017/SO14486X09990328

## Footnotes

[1] Participants were recruited through the participant pool of the Psychology Institute (University of Zürich), via flyers handed out at the *Seniors University* (University of Zürich), via advertisements on their website and a local newspaper, and through snowball sampling.

[2] Six participants were visited at home for their convenience.

[3] Only five participants requested the deletion of some of their sound files, and the number of deleted files was very low, ranging from 1 to 14 per participant ($M = 7.2$, $SD = 5.63$).

[4] Using count data as dependent variable in an ordinary least square regression might result in biased standard errors and significant tests (Coxe, et al., 2009). Therefore, the use of a generalized linear model, such as Poisson regression is recommended (Coxe et al., 2009). Poisson regression is needed for outcome variables with low count, which is the case in the current study with reminiscence and function counts. Furthermore, Poisson regression expects mean and variance to be the same, which makes it suitable for count data, in which an increasing variance is typically observed with an increasing mean. When the variance is larger than the mean, it is defined as a case of *overdispersion* (O'Hara, & Kotze, 2010). Overdispersion can occur when individual differences are not accounted for by the regression model (Coxe et al., 2009). In case of overdispersion, a negative binominal regression is recommended (Coxe et al., 2009).

Table 1

*Coding guidelines for the eight reminiscence functions with examples*

| Function | Coding | Example |
|---|---|---|
| Problem-solving | when utterances were about previous coping strategies to solve a current problem | "Last year, I got the ticket at the counter which worked well, so I will go to the counter" |
| Death preparation | when utterances referred to one´s past with the intention of reducing fear of death | "I have enjoyed my time with my family, and I feel I have no regrets" |
| Identity | when utterances described who they are and gave meaning and continuity to their life | "In my twenties, I worked as a teacher at a Swiss school in Singapore. This experience has always influenced my teaching style, until retirement" |
| Bitterness revival | utterances in which one expresses annoyance and anger about injustice and negative experiences | "You know what he did? He just slammed the door in my face!" |

| | | |
|---|---|---|
| Boredom reduction | utterances about the past to entertain oneself or to compensate for the lack of stimuli | “Do you remember the time when he fell off the bike? It was so funny!” |
| Intimacy maintenance | utterances about a person that is no longer part of one’s life | “I miss my sister. I often remember our meetings in this room and imagine that she is right here” |
| Teach/inform | when one aimed to teach something or gave advice based on one´s past experiences | “When I went through divorce, I experienced similar challenges and used defense mechanisms, such as...” |
| Conversation | when one wanted to connect with others through conversation and to entertain others | “We had a great time together in Disneyland last summer” |

*Note*. Categories are not mutually exclusive.

Table 2

*Poisson regressions predicting identity, teach/inform and conversation functions*

| | Identity | | | | Teach/Inform | | | | Conversation | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 95% CI | | | | 95% CI | | | | 95% CI | |
| | *p* | Exp(B) | Lower | Upper | *p* | Exp(B) | Lower | Upper | *p* | Exp(B) | Lower | Upper |
| 1. Partner | .011 | 1.420 | 1.082 | 1.865 | .629 | 1.073 | 0.807 | 1.426 | .001 | 1.312 | 1.112 | 1.549 |
| 2. Children | .011 | 1.271 | 1.056 | 1.529 | .002 | 1.388 | 1.132 | 1.703 | .726 | 0.973 | 0.834 | 1.135 |
| 3. Kids | .964 | 0.969 | 0.252 | 3.730 | .737 | 1.363 | 0.224 | 8.307 | .573 | 1.328 | 0.495 | 3.561 |
| 4. Relatives | .489 | 0.837 | 0.505 | 1.386 | .489 | 1.178 | 0.734 | 1.891 | .622 | 1.079 | 0.797 | 1.462 |
| 5. Friends | .439 | 1.076 | 0.894 | 1.294 | .270 | 1.127 | 0.911 | 1.392 | <.001 | 1.303 | 1.135 | 1.496 |
| 6. Stranger | .681 | 1.251 | 0.519 | 3.015 | .051 | 1.907 | 0.997 | 3.647 | .270 | 1.304 | 0.814 | 2.090 |

*Note*. N = 32. Values below 1 for B indicate a negative relation, whereas values above 1 represent a positive relation. Gender was unrelated to the three functions, all *p*s > .05.

Table 3

*Poisson regressions predicting identity and teach/inform functions*

| | Identity | | | | Teach/Inform | | | |
|---|---|---|---|---|---|---|---|---|
| | | | 95% CI | | | | 95% CI | |
| | *p* | Exp(B) | Lower | Upper | *p* | Exp(B) | Lower | Upper |
| Mood | .002 | 0.253 | 0.108 | 0.591 | <.001 | 0.203 | 0.085 | 0.486 |
| Life Satis. | .042 | 1.724 | 1.021 | 2.913 | .004 | 2.395 | 1.315 | 4.361 |

*Note*. N = 32. Values below 1 for B indicate a negative relation, whereas values above 1 represent a positive relation.