Stimulating people with dementia to reminisce using personal and generic photographs

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Abstract: Reminiscing is a positive pastime for people with dementia but little is known about selecting materials to prompt reminiscing, particularly whether personal items are more useful than generic ones. This paper reports two small studies, the first using personal stimuli (family photographs) and the second generic photographs of annual events to examine their relative effectiveness as reminiscence prompts for people with dementia. Story telling and the types of information people with dementia produced in response to the photographs are examined. In response to family photographs, people with dementia told very few stories and produced quite limited information. When shown generic photographs, people with dementia produced quite detailed and emotional stories of personal significance. The findings suggest that personal items perform as a memory test for labels and descriptions of family events whereas generic items spark off different recollections in different people, thereby encouraging the sharing of stories and social reminiscing.

Keywords: dementia; reminiscing; photographs.

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1 Introduction

Dementia is a progressive neurological condition that gradually undermines all aspects of a person’s functioning. Age is the greatest risk factor for developing dementia with the likelihood doubling every five years from age 65, reaching almost 50% by age 85 (Alzheimer’s Association, 2010). Alzheimer’s disease (AD) is the most common cause of dementia, accounting for an estimated 42% of cases, with vascular (VaD) and mixed AD and VaD accounting for a further 23.7% and 21.6%, respectively (Brunnström et al., 2009).
For many people, the first sign of dementia is a memory problem when carrying out everyday activities. For example, whilst shopping or cooking, people with dementia may forget where they have put things, what task they were doing or what items they have gone to the shop for. This memory problem can also make it difficult for people with dementia to hold conversations as they tend to repeat themselves or fail to respond to questions, leaving their conversation partner feeling that they are being ignored (Astell et al., 2004). However, many people with dementia retain very good memory for past events, especially from much earlier in their lives and can speak much more easily about these older memories than about recent events. Recalling and sharing these recollections with others can provide the basis of conversations for people with dementia that draw attention away from their everyday memory problems.

Sharing recollections, or reminiscing, is an important social activity for humans, which serves a variety of functions. For example, adults use reminiscing to reduce uncertainty in novel social situations and to re-establish old friendships (Parker, 1995). Sharing key life experiences with others contributes to the development of intimacy, allows us to maintain and project our own identities and to understand ourselves in relation to others (Parker, 1995). In dementia care, reminiscing is most often carried out as an activity in a group context. Typically, several people with a dementia diagnosis are prompted with old artefacts, photographs or other items provided by a member of staff who acts as group facilitator (Brooker and Duce, 2000). In this setting, reminiscing is primarily used to encourage spontaneous conversation between people with dementia and between them and care staff (Bender et al., 1998).

For people with a dementia diagnosis, the benefits of reminiscing can be seen to fall into three areas identified broadly as ‘social’, ‘skills’ and ‘self’.

1. **Social** refers to the primarily social aspects of reminiscing whereby the sharing of memories and stories from the past provides a focus for conversation (Bass and Greger, 1996). The group setting provides an environment in which people can share past achievements and disappointments (Brooker and Duce, 2000). Reminiscing is also socially and emotionally stimulating (Bender et al., 1998), and provides an opportunity for people to have their emotions and feelings associated with their recollections validated in the group (Brooker and Duce, 2000).

2. **Skills** refers to the opportunity that reminiscing provides for people with dementia to keep using a wide range of social and cognitive abilities (Bender et al., 1998). These include long-term memory, attention and concentration, speech production and comprehension, and of course conversational abilities (Orange and Purves, 1996). By emphasising retained skills, especially retrieval and discussion of remote memories, rather than focusing on current deficits, reminiscing empowers people with dementia to participate in social interactions (Astell et al., 2010).

3. **Self** refers to the presentation and evaluation of self that occurs when people participate in social situations. Typically, people with dementia experience repeated failure within social contexts, especially when asked direct questions to which they cannot recall the answers, leading to their withdrawal and isolation. Reminiscing provides the opportunity for people with dementia to participate in a conversation as equals (Astell et al., 2009), which has a positive impact on their identity (Mills, 1997) and facilitates adaptation to the changes they are experiencing as a consequence of their dementia (Kasl-Godley and Gatz, 2000).
Although reminiscing is widely used in dementia care there has been little systematic evaluation of what makes good reminiscence stimuli. Rodriguez (1990; cited in Haight and Webster, 1995) proposed that all themes and props used in reminiscing should be appropriate with regards to cohort, gender, geography and culture if they are to be successful but did not provide guidance on how to select such stimuli.

Namazi and Haynes (1994) examined the utility of commercially available 8” × 10” colour photographs accompanied by a sound associated with the depicted image (e.g., picture of a dog accompanied by the sound of barking). Using the mini mental state examination (MMSE: Folstein et al., 1975) as their outcome measure, Namazi and Haynes (1994) found small improvements in global cognitive function among nursing home residents who received these stimuli for reminiscing. However, it is unclear whether these minimal benefits accrued from the reminiscing or the multi-sensory stimuli used. Similarly, Bass and Greger (1996) explored the provision of multi-sensory stimuli and found that nursing home residents who participated in both single (conversation) and multi-sensory (visual and auditory stimuli) reminiscing sessions had lower depression scores than control participants who received no intervention (Bass and Greger, 1996).

These findings from studies using generic materials confirm that participating in activities involving reminiscing have benefits for people with dementia. However, it has been suggested that personally-relevant stimuli (e.g., family photographs) may be even better reminiscing prompts for people with dementia (Mizen, 2003), and increase the chances of creating a ‘failure-free’ experience for people with dementia. This is because autobiographical significance may make conceptual knowledge resistant to loss over time (Westmacott et al., 2003) as it has been found that people with dementia recall events of personal significance better than non-significant events (Snowden et al., 1994). This suggests that personal items may make better stimuli for prompting people with dementia to reminisce than generic items.

This issue is addressed in the following two studies. In the first study, photographs selected from family albums are used as stimuli for prompting reminiscing by people with a dementia diagnosis and a family member. Six photographs from each family are used to explore how people respond to personal stimuli. This includes examination of story telling and the type of information provided both by people with a dementia diagnosis and their relatives who have selected the photographs as being personally-relevant. The selection of items by family members permits examination of the type of material family members consider to be personally-relevant for people with dementia. This allows for exploration of the retention of autobiographically-significant information by people with dementia and the potential benefits of personal materials for use in reminiscence as triggers for story-telling.

In the second study, generic photographs depicting annual events in the UK are used as stimuli to prompt reminiscing by people with dementia and age-matched controls. Aside from Namazi and Haynes (1994), few authors have described the size and shape of the photographic stimuli they used although Burnside (1994) noted that small black and white photographs were unsuccessful at eliciting memories, perhaps because some of the participants had a degree of visual impairment. As many commercially available reminiscence packages contain black and white photographs this study examines the effectiveness of colour versus black and white generic photographs in evoking people to reminisce. As in the first study, story telling and the types of information produced in response to the photographs are examined to provide insight into what happens when people are prompted to reminisce.
2 Study 1: Personal photographs

2.1 Introduction

The first aim of this study was to examine the types of photographs selected by family members to be prompts for reminiscing for their relatives with dementia. Caregivers were asked to select photographs they regarded as significant to the person with dementia. The second aim was to examine the response of people with dementia to the photographs in respect of the type of information produced, including telling stories, and to compare this with the way that family caregivers responded to the same items. Additionally, the length of participants’ responses was recorded both by number of conversational turns and number of words to provide a picture of the types of responses people give when reminiscing and illustrative examples of their verbatim responses are included in the results section. The use of turns and total words in this study was not intended to provide any measure of the speech production ability of the participants. Rather, the focus of this and the second study is on reminiscence stimuli and exploring reminiscing as it is used in dementia care settings, i.e., primarily as a tool for social interaction between people with dementia and people with dementia and caregivers.

2.2 Method

2.2.1 Participants

Five pairs of participants were recruited. These comprised five people with dementia (one male) who were recruited from a local day-care facility. They were approached through the care facility and provided with information about the study. Each participant was encouraged to discuss the study with his or her family before agreeing to take part. Participants ranged in age from 74 to 91 years (mean = 82.8). Four of the participants who wished to take part had been given a diagnosis of AD and one a diagnosis of multi-infarct dementia by an old age psychiatrist. The MMSE (Folstein et al., 1975) was used to provide a global picture of cognitive status and dementia severity and produced a range from 9 to 25 (mean = 20.4) where lower scores equate to greater dementia severity.

The main family caregivers (N = 5; 4 males) of the participants with dementia also consented to take part in the study. Four of the caregiver participants were spouses and one was the son of the participant with dementia. These participants ranged from 62 to 79 years of age (Mean = 72.2). Caregivers were also asked to complete the MMSE and their scores ranged from 26 to 30 (Mean = 28).

2.2.2 Materials

The family caregivers were asked to select six photographs from their family collections. They were asked to include three black and white and three colour photographs covering a diverse time span and incorporating significant places/events/family members/pets and friends.

A Sony Walkman Professional, WM-D6C and a Sony Mini DV Video camera were used to record the participants (Apple 15” G4 PowerBook).
2.2.3 Procedure
Each of the ten participants was seen individually. The MMSE was carried out first then each participant looked at his or her selection of personal photographs on the laptop presented one at a time by a member of the research team. The sessions were video and audio recorded for later transcription and there was no time limit on how long participants could speak about the photographs. The interviewer provided guidance if the participants became confused, asked for more information or indicated that they had forgotten what was being asked of them.

2.2.4 Coding
Format (colour or black and white), decade and contents were noted for each photograph. All conversations were transcribed verbatim and coded using a selection of strategies (Table 1). Coding comprised two elements. The first examined the amount of information produced in a number of ways to provide insight into the utility of personal photographs for stimulating reminiscing. The second element focused on the type of information elicited, including description and story telling, to further understanding of what reminiscing to family photographs looks like for people with dementia.

Table 1 Coding categories applied to the responses to personal photographs

<table>
<thead>
<tr>
<th>Coding Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turns</td>
<td>Total number of conversational turns per photographs</td>
</tr>
<tr>
<td>Word count</td>
<td>Total amount of words produced by each participant</td>
</tr>
<tr>
<td>Description</td>
<td>Response contains information about the events/people depicted in the image</td>
</tr>
<tr>
<td>Naming</td>
<td>Providing names of people in the photographs</td>
</tr>
<tr>
<td>Total information</td>
<td>Total units of information provided in response to each photograph</td>
</tr>
<tr>
<td>Stories</td>
<td>Story telling in response to photograph, classified as about the events depicted in the photograph or not</td>
</tr>
</tbody>
</table>

Two coders were trained to carry out the coding. The coding scheme was informed by our previous work coding transcripts and the training was accomplished by each rater blind coding the same transcript and comparing the results. This lead to a slight adjustment in the definitions of ‘description’ and ‘stories’ and the revised coding were applied to a new transcript. The two coders then both coded 100% of the transcripts on all strategies, examples of verbatim reminiscences produced by one person with dementia and one relative to one of their own family photographs is included in the following results section. This includes coding for turns to illustrate how these were calculated. Total number of turns and words refers to the total amount across all six photographs. Agreement on total words, number of turns, recognition of photograph, and lifetime period between the two coders was 100% with agreement on the other measures all above 90%.

2.3 Results
The contents of the personal photographs were first examined to explore the type of contents that family members thought would be evocative prompts to encourage reminiscing by their relatives with dementia. All of the personal photographs contained
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people although caregivers had not been asked to do this. The 30 family photographs were broadly of three types: family members (18/30), weddings (6/30) and holidays (6/30). Photographs of family members included pictures of the person with a dementia diagnosis alone or with their spouse, their parents, offspring, siblings and grandchildren. All of the five family caregivers produced at least one wedding photograph and four produced one or more holiday photographs. In terms of era, the photographs spanned a broad time frame from the 1930s to the 2000s (Table 2). Of these 97\% of the photographs were more than ten years old and the majority (18/30) were colour.

<table>
<thead>
<tr>
<th>Decade</th>
<th>1930s</th>
<th>1940s</th>
<th>1950s</th>
<th>1960s</th>
<th>1970s</th>
<th>1980s</th>
<th>1990s</th>
<th>2000s</th>
</tr>
</thead>
<tbody>
<tr>
<td>N = 30</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>7</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>

Looking at the participants’ responses to the photographs the descriptive statistics indicate that the people with dementia and their relatives produced similar numbers of conversational turns (group means in Table 3). Indeed, in Family 3 and Family 5 the response of the person with dementia comprised a higher mean number of conversational turns than their relative without dementia. However, in all but one family (number 3 in Table 3) the total number of words produced by the person with dementia in response to their family photographs was lower than their relative without dementia. Closer examination of the types of information produced in response to the family photographs reveals that family caregivers typically described the people and places depicted in the photographs (Table 4). This primarily involved naming the people (26/30 photographs) although in 22/30 photographs some people were just described in terms of relationships, e.g., ‘that’s my brother-in-law’.

In comparison to their relatives, the participants with dementia failed to recognise almost one third of their personal photographs (Table 4). In terms of description, people with dementia produced fewer total pieces of information than their relatives as they provided fewer names (22/30) and less often described family relationships (17/30).

In addition to labelling and description of the photographs, the family caregivers produced a total of 14 stories in response to their 30 personal photographs (Table 4). The majority of these, 12/14, were directly related to the events and/or people depicted in the photographs. For example, the caregiver in Family 2 told a lively story about a holiday she and her husband took that lasted 23 turns and contained 397 words. The other two of the 14 stories were related to the people in the photographs at another time or place.

<table>
<thead>
<tr>
<th>Caregiver</th>
<th>Person with dementia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean turns</td>
<td>Total words</td>
</tr>
<tr>
<td>1</td>
<td>10.2 (3–25)</td>
</tr>
<tr>
<td>2</td>
<td>16.6 (9–23)</td>
</tr>
<tr>
<td>3</td>
<td>11.5 (5–23)</td>
</tr>
<tr>
<td>4</td>
<td>15.8 (9–31)</td>
</tr>
<tr>
<td>5</td>
<td>6.3 (4–10)</td>
</tr>
<tr>
<td>Mean (n = 5)</td>
<td>12.1</td>
</tr>
</tbody>
</table>
Table 4  Amount of description and stories told in response to personal photographs

<table>
<thead>
<tr>
<th>Response</th>
<th>Caregivers (n = 5)</th>
<th>People with dementia (n = 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Photograph not recognised</td>
<td>0/30</td>
<td>9/30</td>
</tr>
<tr>
<td>Description of photograph</td>
<td>30/30</td>
<td>21/30</td>
</tr>
<tr>
<td>Naming people in photograph</td>
<td>26/30</td>
<td>22/30</td>
</tr>
<tr>
<td>Total information units</td>
<td>118.4</td>
<td>64.4</td>
</tr>
<tr>
<td>Story about photograph</td>
<td>12/30</td>
<td>1/30</td>
</tr>
<tr>
<td>Story not about photograph</td>
<td>2/30</td>
<td>4/30</td>
</tr>
</tbody>
</table>

Although the participants with dementia produced a total of five stories in response to their 30 family photographs, none of these were the same as the ones produced by the relatives. For example, when looking at the same holiday photograph to which his wife had responded with a long, elaborate story (see above), the person with dementia in Family 2 responded with only 69 words, over five conversational turns, in which he identified himself and his wife in the photograph but provided no further information.

The one family photograph that elicited a related story by the person with dementia was of the lady’s wedding day. In this instance, she described how she and her husband had met and their courtship. Although this was not directly about the events depicted in the photograph it was judged to be directly related to the photograph in a way that none of the other four stories told by people with dementia were.

To further explore the way family caregivers and their relatives with dementia reacted to personal photographs, the responses of Family 4 to the same holiday photograph are compared. The photograph was taken on a trip to a zoo and contains family members, a boy, ‘P’ from the family whose house they were staying at, and an elephant. The Family 4 caregiver produced a detailed story of 452 words over 31 conversational turns, whereas her husband with dementia responded with only 21 words over four turns. The caregiver’s response commenced with:

Caregiver 4: “That was a good holiday, that.”  
Interviewer: “Good.”  
CG4: “Oh, that’s at the Dublin Zoo.”  
I: “Mhmm.”  
CG4: “That’s P.”  
I” “Mhmm.”  
CG4: “He, he was the wee laddie that’s mum we went to.”  

These first four turns convey the caregiver’s feeling about the events depicted in the photograph (Turn 1), provide the location (Turn 2), describe a person in the photograph (Turn 3) and explain the relationship between the people in the photograph (Turn 4). In Turn 5, the caregiver explains how they got to know ‘P’ before returning to speak about the photograph in Turns 6 to 9. In response to a question from the interviewer, caregiver 4 then names the other people in the photograph (Turns 10 and 11) and provides some additional information about them (Turns 12–14). In Turn 15, the caregiver returns to speaking about ‘P’:
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CG4: “But that wee lad was marvellous. He actually made our holiday.”
I: “Mhhm.
CG4: “Cause we took him with us every place.”
I: “Right.”
CG4: “And he showed us where to go.”
I: “Ah.”
CG4: “Where to get buses and, and trains.”

The next nine turns (19–27) contain further reminiscing about ’P’ and his family, with the response to the photograph concluding as follows:

CG4: “But I mean it was great.”
I: “Mhhm”
CG4: “I thoroughly enjoyed it.”
I: “Good holiday.”
CG4: “Yeah. That was a good holiday.”
I: “OK. Do you want to see another one?”
CG4: “Yeah.”

In contrast to this lengthy and detailed response, the person with dementia in Family 4 responded as follows to the same photograph:

Interviewer: “OK. Can you tell me who’s in that picture?
Person with Dementia 4: “That’s me, my daughter…”
I: “Mhhm”
PwD4: “My wife, and I think that was my grandson”
I: “Your grandson?” OK. Does that picture bring back any happy memories to you? The elephant?”
PwD4: “No. I don’t know. I don’t think so.”
I: “OK. Want to see another one?”
PwD4: “Yeah”

In this instance, the person with dementia did not recognise all of the people in the photograph and wondered whether the boy ’P’ was his grandson. In addition, the photograph did not elicit any signs of recognition of the time and place it was taken.

2.4 Discussion

The two aims of this study were:

1 to identify the types of photographs family members selected as being personally-relevant for people with dementia
to look at how people reminisce when presented with these photographs.

It should be noted that it had been intended to conduct the study with a larger sample of people with dementia and family members. However, data collection was stopped when it became clear that failure to recognise people and events in their family photographs was distressing for people with dementia. The findings must therefore be seen within the context of the small number of participants.

In terms of selecting personally-relevant photographs from their family albums the relatives of people with dementia picked items containing people, usually family members. This was in spite of the suggestion that the photographs might contain significant places/events/pets and friends as well as family members. The photographs were mostly more than ten years old and most were colour as opposed to black and white.

When asked to reminisce in response to these family photographs, the relatives of people with dementia tended towards labelling the contents of the photographs, primarily by naming the people in them, stating something about family relationships and in some instances providing an update on what had happened since the photograph was taken. For example, speaking about people in a wedding photograph and commenting if they had children or were now divorced. There was individual variation in how much information people provided with some participants providing quite lengthy responses and others tending towards a few short pieces of information.

Relatives of people with dementia told stories, which might be more typically associated with reminiscing (Bass and Greger, 1996) in response to 14 of their 30 family photographs. Twelve of these stories were directly related to the photographs with a further two unrelated. Given that the photographs were selected to be evocative prompts for reminiscing it is interesting that fewer than half of these personally-relevant photographs stimulated the telling of personal stories from the relatives of people with dementia. Whilst some of these stories were complex and elaborate, as in the example above about the trip to Dublin Zoo, it was not the case that each personal photograph prompted rich and detailed recollections by family caregivers. Thus, the bulk of their reminiscing activity comprised description and labelling as opposed to story telling.

When shown to the people with dementia the family photographs in this study prompted them to recall even fewer stories and personal recollections. The people with dementia told only five stories in response to their 30-personal photographs, and of these only one was judged to be directly related to the photograph. Interestingly, none of the five stories told by people with dementia were the same as the ones told by their relatives. Indeed the people with dementia were not always able to recognise the people in the photographs, mislabelling and confusing family members, although they mostly knew the photographs were of members of their own family.

As a group the responses of the people with dementia were shorter on average than those of their relatives without dementia. Examination of their verbatim responses indicated that they produced fewer descriptions and pieces of information about the people and events depicted in the photographs from their family albums than did the older adults without dementia. Their reminiscences were short in terms of total number of words produced and primarily descriptive, with the responses tending to focus on identifying the people in the photographs.

It is possible that the tendency of the people with dementia to produce shorter reminiscences to their family photographs is a consequence of their illness. This may result from their undoubted difficulties with memory but also speech production
difficulties, which may reduce their verbal output (Astell and Harley, 2002). With a larger sample size it would have been possible to calculate the rate of speech production, which has been shown to provide a more accurate measure of the impact of dementia on speech production. This is important for informing understanding of the value and role of reminiscing as a social activity in dementia care settings, such that caregivers are aware that the ability of people with dementia to speak about their memories may be compromised. Based on the information collected in the present study it is not possible to distinguish between the possible contributions of memory problems and speech production difficulties to the output produced by the participants with dementia. However, it is apparent that the people with dementia who participated in this study produced fewer pieces of information, including names, about their family photographs, than their relatives who also took part.

Taken together these findings suggest that the personal photographs selected by family members of people with dementia in this study to stimulate reminiscing primarily encouraged labelling and description as opposed to story telling. Each photograph had a particular set of information attached to it – i.e., names of the people in the photograph, date and location – and the primary reaction of both people with dementia and their relatives was to try to provide this information. This suggests that when people are presented with personal photographs to which people have a direct emotional connection, they tend to provide factual information. In this study, these personally-relevant photographs did not encourage people, either with or without dementia, to recollect large amounts of autobiographically-significant events (Westmacott et al., 2003).

Not everyone has access to a set of personal family photographs about which to reminisce. Additionally, commercially available reminiscence stimuli for dementia care settings are generic by their very nature. Given the low amount of personal stories and information recalled by people with dementia in response to personal photographs, this raises the question of how useful generic items, to which people have no personal connection, are at stimulating reminiscence. This is explored in the second study.

3 Study 2 – generic photographs

3.1 Introduction

To explore the utility of generic photographs as prompts to reminiscing by people with dementia, this study examined the reaction of participants to a selection of generic photographs depicting annual events in the UK. These were selected as contents that would be familiar to a broad range of older people to permit examination of how people responded to the photographs when presented with them as stimuli to prompt reminiscing. As in Study 1, the examination of participants’ responses included the type and quantity of information they produced and whether they told stories in response to the photographs. The focus of the analysis is again on the stimuli as opposed to the speech production abilities of the participants. As such total amount of words and stories are used here to provide a descriptive summary of the way the participants responded to the generic photographs and a picture of reminiscing activity in response to the photographs as they might be used in a dementia care setting.
3.2 Method

3.2.1 Participants

Two groups of participants were recruited. Five people with a dementia diagnosis, two men and three women, were recruited from a day care centre and a social work department care home. They were approached through the care facility and provided with information about the study, which was also sent to their relatives. Each participant was encouraged to discuss the study with his or her family before agreeing to take part.

The participants with a dementia diagnosis ranged in age from 72–94 years of age (mean = 85.6). Participants’ MMSE scores ranged from 12–24 out of 30 (mean = 16.8) where lower scores signify greater dementia severity. Each had been given a diagnosis of probable AD by an old age psychiatrist. These participants were approximately matched to the mean age (82.8 years) and MMSE (20.4) scores of the people with dementia who took part in Study 1.

Five older people, two men and three women, without dementia were also recruited from a local community group to take part. They ranged in age from 63–81 years (mean age 72) with MMSE scores between 27 and 30 (mean 28.6). These participants were approximately matched to the mean age (72.2 years) and MMSE (28) scores of the family caregivers who took part in Study 1.

As it was not possible to recruit the same participants for this study as participated in study 1, an attempt was made to match the two groups of participants in the present study with those in Study 1 as far as possible. This was to enable some very basic comparisons to be made at a descriptive level between the way people reminisced when presented with family photographs in Study 1 and the way people in the present study reminisced when presented with generic photographs. It is acknowledged that the small sample size means any conclusions can only be tentative.

3.2.2 Materials

3.2.2.1 Photographs

Six sets of 6” × 8” photographs were assembled each comprising one photograph of each of six different events selected for their relevance to the age, culture and geographical location of the participants of this study: ‘Christmas’, ‘Easter’, ‘Burns’ Night’, ‘New Year’, ‘Birthdays’ and ‘Holidays’ Each event was depicted in three forms – ‘scenes’, ‘food’ or ‘people’. For example, the Christmas ‘scene’ was a decorated Christmas tree; Christmas ‘people’ showed a family opening presents and the same event represented as ‘food’ showed a Christmas pudding. Each image was presented in either black and white or colour formats. Therefore, the total set of 36 photographs comprised 18 black and white and 18 colours.

Each set of six photographs comprised one depiction of each annual event. Half of these were in colour and half were black and white. This design was used to examine the impact of content type (scene, people, food) and colour format (black and white and colour on stimulating reminiscing.

Each session was recorded using a Sony Walkman Professional, WM-D6C and a Sony Mini DV Video camera (Apple 15” G4 PowerBook).
3.2.3 Procedure

Each participant was seen individually. The MMSE (Folstein et al., 1975) was carried out first then each participant was shown a series of six photographs on the laptop, each representing a different annual event in the form of ‘food’, ‘scene’ or ‘people’. The participants were shown black and white and colour photographs alternately. Each participant saw each of the three types of representation – i.e., ‘food’, ‘people’ and ‘scene’ – twice during the session. The participants were encouraged to discuss their memories of each event and were allowed to talk for as long as they wanted or until their discourse came to a natural end. The interviewer provided guidance if the participants became confused, asked for more information or indicated that they had forgotten what was being asked of them.

3.2.4 Coding responses

All conversations were transcribed verbatim and were coded using a selection of strategies (Table 5). Coding comprised two elements. The first examined the amount of information produced in a number of ways to provide insight into the utility of the different photographs as prompts for stimulating reminiscing. The second element focused on the type of information elicited, including lifetime period and story telling to further understanding of the how people with dementia reminisce.

<table>
<thead>
<tr>
<th>Table 5</th>
<th>Coding strategies applied to the responses to generic photographs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turns</td>
<td>Total number of conversational turns per photograph</td>
</tr>
<tr>
<td>Word count</td>
<td>Total amount of words produced by each participant</td>
</tr>
<tr>
<td>Lifetime period</td>
<td>Childhood, adulthood, recent (last ten years)</td>
</tr>
<tr>
<td>Description</td>
<td>Response contains information about the events/people depicted in the image</td>
</tr>
<tr>
<td>Stories</td>
<td>Story telling in response to photograph, classified as about the events depicted in the photograph or not</td>
</tr>
</tbody>
</table>

The same two coders were trained to carry out the coding. The coding scheme was informed by that used for Study 1, with the addition of strategies dealing with lifetime periods. Four additional coders have also used the coding strategies in a larger, (as yet unpublished) study using the same generic photographs. As before the training consisted of each coder blind coding the same transcript and comparing the results. The two coders then both coded 100% of the transcripts on all strategies, agreement on total words, number of turns, and number of stories between the two coders was 100% with agreement on the other measures all above 88%.

3.3 Results

In respect of format, all six annual events, in all image types (food, people, and scene) presented in both black and white and colour successfully elicited recollections by the participants. That is all of the participants produced a response to each photograph and these were examined for length and type of information provided. As in Study 1, the number of turns and words produced by the two groups of participants in response to the six photographs were examined. It can be seen that the people with dementia produced a
higher total number of words than the older adults without dementia (Table 6). Holiday photographs appeared to be most evocative for people with dementia, eliciting the most words and turns of the six annual events, whereas New Year photographs produced the lowest responses. A different pattern was seen in the responses of the family caregivers who produced greatest response to Burns Night photographs and least to Easter.

**Table 6** Mean (range) number of turns and total (range) words produced in response to generic photographs

<table>
<thead>
<tr>
<th>Theme</th>
<th>Older adults (n = 5)</th>
<th>People with dementia (n = 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean turns</td>
<td>Total words</td>
</tr>
<tr>
<td>Christmas</td>
<td>9.2 (3–20)</td>
<td>76 (28–412)</td>
</tr>
<tr>
<td>Easter</td>
<td>5.2 (3–7)</td>
<td>459 (62–143)</td>
</tr>
<tr>
<td>New Year</td>
<td>6.8 (2–13)</td>
<td>806 (15–379)</td>
</tr>
<tr>
<td>Burns Night</td>
<td>8.4 (2–13)</td>
<td>830 (48–261)</td>
</tr>
<tr>
<td>Holiday</td>
<td>8.2 (5–13)</td>
<td>705 (86–217)</td>
</tr>
<tr>
<td>Mean per set (n = 5)</td>
<td>7.8</td>
<td>727</td>
</tr>
</tbody>
</table>

To explore the efficacy of the generic photographs as prompts for reminiscing the mean number of turns and words produced by both groups of participants was examined alongside the equivalent scores from Study 1 (Table 7). This revealed that the older people without dementia produced similar amounts of turns and words in response to both personal and generic photographs. However, while the number of turns was very similar in response to both types of photographs, the number of words produced by people with dementia in this study was almost twice as high as the number produced by the participants with dementia in Study 1 who looked at personal photographs. This suggests that the participants with dementia had more to say in response to the generic photographs than those who saw family photographs.

**Table 7** Mean number of turns and words produced by the participants in response to personal and generic photographs

<table>
<thead>
<tr>
<th>Type of photograph</th>
<th>Turns</th>
<th></th>
<th>Words</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Older adults (n = 5)</td>
<td>People with dementia (n = 5)</td>
<td>Older adults (n = 5)</td>
<td>People with dementia (n = 5)</td>
</tr>
<tr>
<td>Personal (Study 1; n = 6)</td>
<td>12.1</td>
<td>11.9</td>
<td>840.8</td>
<td>537.6</td>
</tr>
<tr>
<td>Generic (Study 2; n = 6)</td>
<td>9.3</td>
<td>12.2</td>
<td>872.4</td>
<td>1154.8</td>
</tr>
</tbody>
</table>

As in Study 1 the participants’ responses were also examined for descriptions of the photographs and story telling (Table 8). Additionally, the responses were examined to see if participants referred to particular lifetime periods in their recollections. Six of the 30 responses produced by the older adults with dementia were descriptions of the photographs without any memory recollections, whereas the older adults without dementia never produced just descriptions of the photographs. In respect of the 18 stories told by people with dementia and the 18 told by the older adults without dementia, nine
were in response to black and white photographs and nine to colour, suggesting that both formats were equally effective at prompting people to tell stories.

Table 8  Total number of generic photographs (n = 30) eliciting stories and descriptions and the lifetime periods referred to in the participants’ responses

<table>
<thead>
<tr>
<th></th>
<th>Older adults (n = 5)</th>
<th>People with dementia (n = 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stories/30</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>Description no reminiscing</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>Childhood</td>
<td>7</td>
<td>16</td>
</tr>
<tr>
<td>Youth</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>Adulthood</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>Recent</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>Childhood then recent</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Recent then childhood</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Time not known</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

To further examine the type of information elicited by the generic photographs the responses of two participants to photographs of the same annual event are compared. The first is the response of one of the older adults without dementia to a photograph of a holiday scene. The total response lasts for nine turns and contains 121 words.

Interviewer:  “Here’s a picture of a holiday scene.”
Older Adult 1:  “Oh, that’s lovely!”

I:  “What are our memories of holidays?”
OA1:  “Mostly South Africa because that’s where my son is.”

I:  “Hmmm?”
OA1:  “And we’ve been out there twelve times, so it’s been wonderful.”

I:  “Oh!”
OA1:  “Unfortunately, we can’t go now because of [husband’s name]. But ehm, and I love flying.”

In the first four turns, the participant comments on the photograph (Turn 1), provides information about where they liked to go on holiday (Turn 2), explains why (Turn 3) and remarks that sadly they are no longer able to do so due to their spouse’s illness (Turn 4). In the next phase (Turns 5–8), the participant moves on to a recent trip:

OA1:  “Actually, I took him [husband] a day to Prague last year.”

I:  “Oh!”

OA1:  “Because we can’t have over night stays now.”

I:  “Hmmm.”

OA1:  “And I was just in the mood. I thought, I must get away somewhere. And I saw this for a day to Prague. So we took this day to Prague and it was wonderful.”
The response ends with the participant commenting on how they really enjoy flying and taking holidays.

OA1: “But I love flying. I love it. And I love holidays. It’s just nice getting everything done for you. That’s what it is.” (both laugh) Turn 9

The participant’s response contains factual information as well as conveying two emotions: happiness in respect of taking holidays (Turn 4 and 9) and regret that the sort of long-haul trips the participant has previously enjoyed is no longer possible (Turn 4 and 6). The information relates to quite recent events such as visiting their adult son and a trip taken just the previous year.

In comparison, the response of a participant with dementia to the ‘holiday people’ photograph is primarily concerned with events from much earlier in the participant’s life. The participant’s initial turn clarifies that this is not a personal photograph before going on to relate a very long story of 924 words over 36 conversational turns. The numbers in parentheses indicate the number of unfilled pauses in seconds in the participant’s response:

Interviewer: “Here’s a picture of people on holiday. What are your memories of holidays?”

Person with Dementia 2: “(3) Two persons on holiday. They’re not connected to me at all. (2) What is it you want me to tell you?” Turn 1

I: “What are your memories of holidays?”

PwD2: “(4) I had some great holidays.” Turn 2

I: “Hmmm.”

PwD2: “Camping.” Turn 3

The first part of the response sees the participant identifying the contents of the photograph and informing the interviewer that he is not related to the people in any way (Turn 1). In other words, the participant is confirming that this is not a family photograph. The participant then asks the interviewer what she would like him to tell her (Turn 1). Once the interviewer has repeated the question, the participant then continues with his response informing her that he had experienced “some great holidays (Turn 2)… camping” (Turn 3). This response was clearly directly related to the specific stimuli in the photograph, which was maintained throughout the entire response as illustrated by the following excerpt describing meeting girls at the dance and what happened when the girls’ faces were sunburnt:

PwD2: “And er, (3) we used to have a sing-song.” Turn 19

I: “Hmmm.”

PwD2: “And cars coming down used to join in. (2) And we had a great time. (6) And then, (5) we used to invite the girls that
we had picked up in the dancing.”

I: “Hmmm.”

PwD2: “To come and get a meal. And they came. And we gave them a good meal. And then er, we sat and blethered. About everything and a’thing. (4) And there was a camp of lassies in the next tent to us. (3) And you’ve never seen a mess of faces in all your life. They let the sun get at their face.”

I: “Hmmm.”

PwD2: “Oh, and the smell! (2) Oh, a boy came in and he came flying out. I says what’s to dae [do] with you? He says, go in and see. I says no, there’s something there, in there that you don’t (3) he says you’re faird [afraid] to go in. I says, I’m no’ faird. I went away in and I’ve never done a dafter thing (both laugh). The smell off their faces, ken [do you understand]? (Both laugh) (3) Oh, we had some wonderful times. Twelve of us.”

The participant describes his camping holidays very evocatively. For example, his description of the boy ‘flying out’ of the girls’ tent in response to the smell in there (Turn 22) conjures up a clear picture to the listener of events that took place at the campsite.

The participant also describes a conversational exchange that took place: “…he says, go in and see”… and I says “no, there’s something there, in there that you don’t”… he says “you’re faird to go in.” I says “I’m no faird.” His description of what happened next contains a self-deprecating comment as well as eliciting an emotional reverie about the holidays of his youth (Turn 22).

Towards the end of his response to this photograph the participant tells another specific story:

PwD2: “(5) And we were playing at football, as usual. And the ball came down, oh, what we cried, you get a good kick at it.”

I: “Hmmm.”

PwD2: “It came down and I ran and caught it. And instead of going up the way, it went across the way. And she was carrying water down, there was (6) now wait ’til I see now. (8) I think it was three girls and two chaps. Yeah, I think that’s the way and there was twa, twa [two] of them were going together.”

I: “Hmmm.”

PwD2: “Another lassie was spare. So when she was coming down, I didn’t, didn’t do it intentionally. Oh what we cry, you get a right kick. Came down. And I ran and kicked it. And it went right across and the bucket and her went right in the air. (Both laugh). And I went over and oh, I apologised as much as I could. But she was hurt. But she laughed.”

I: “That’s the main thing.”

PwD2: “And she asked me would I come up and, she was going to be on her own that night. The other two were away with their lads. Would I come up and I didn’t want to go. ’Cause we arranged to go to the dancing.”

I: “Hmmm.”
At the time of this interview, the participant was 94 years old and was referring to events from approximately 75 years earlier. He lived in a nursing home and his dementia was approaching the severe level as indicated by his MMSE score of 12. As such it might seem surprising that he could produce such a large, connected narrative. Examination of the narrative suggests that he recalled a series of separate incidents from his camping holidays and was able to produce these in a sequence. Interestingly, when recruitment was taking place for this study, the care home staff felt that this gentleman would not be suitable as in their view he was not able to have a conversation. In examining his verbal output, it was apparent that his speech contained long unfilled pauses, which may have lead the caregivers to believe that he was not able to produce responses in conversation, whereas these may actually have been indicative of planning time (Butterworth, 1980).

3.4 Discussion

The two aims of this study were to:

1. examine how people reminisce to generic photographs
2. explore their responses in relation to how people in Study 1 responded to personal photographs.

The first point to note is that in this study the generic photographs successfully prompted people with and without dementia to recollect personal memories, i.e., to reminisce. The generic stimuli contained images of annual events such as birthday celebrations and holiday scenes selected to be familiar to a wide range of people. These acted as prompts for people with dementia to recall personally significant memories that could form the basis of conversations, as indicated by turn-taking and production of sequences of connected narratives.

When compared with the responses produced by the people with dementia in Study 1 to personal photographs, the responses generated by the people with dementia in response to generic photographs were longer in terms of total number of words. In addition, the overall amount of words produced by the people with dementia was higher than that produced by the older people without dementia in both studies.

Each person with dementia produced between 2 and 5 stories in response to the six generic photographs, resulting in a total of 18 stories in response to the 30 generic photographs seen by the group of five participants collectively. This compares with a total of five stories told by people with dementia collectively in Study 1 in response to their 30 personal photographs.

Interestingly the people without dementia also told 18 stories in response to the 30 generic photographs they saw collectively, slightly higher than the 14 produced by participants without dementia in response to their personal photographs in Study 1.

These findings tentatively suggest two things: first, that the personal photographs are not more evocative for people without dementia as the two groups of participants without dementia produced very similar responses to both types of photographs. If family photographs were more stimulating due to personal relatedness to the photographs it might be reasonable to expect people to produce longer responses and/or more...
Stimulating people with dementia to reminisce

autobiographical stories when reminiscing with their personal photographs, as these are more autobiographically-significant (Westmacott et al., 2003).

The second point is that the generic photographs did appear to be particularly evocative for the people with dementia. This is based on the finding that the group of people with dementia who were presented with generic photographs to reminisce with produced longer responses than the group of people with dementia in Study 1 who were given family photographs as stimuli for reminiscing. The findings in Study 1 suggested that the people with dementia might have lost knowledge and information as they produced shorter responses compared to their relatives who saw the same photographs. However, in Study 2 the group of people with similar levels of dementia severity not only produced longer responses than the participants with dementia in Study 1; they also produced longer responses than either of the two groups of participants without dementia.

4 Discussion of studies 1 and 2

The two studies presented here set out to examine the use of stimuli used to prompt reminiscing by people with dementia. In trying to understand these findings, it is important to keep in mind that reminiscing is commonly viewed in dementia care as a positive activity for people with dementia to participate in as they can usually recall events from the past better than they can recall recent events. Sharing their recollections and stories from their lives can form the basis of positive social interactions with family members, care staff and other people with dementia (Bender et al., 1998).

The findings of the first study reveal that on the whole people with dementia can recognise when photographs are from their family albums. In response to these photographs they can identify some of the people in the photographs but not all. However, they appear to have difficulty labelling the photographs and providing descriptive information about the people and events. Their relatives without dementia also tend to provide factual information about family photographs, which primarily consists of labelling the people and relationships within them. They tell few stories and their responses suggest that personal photographs do not elicit reminiscing as much as information retrieval. Typically, the family members of people with dementia provide up to date information about the people in the photographs, which their relatives with dementia do not tend to do.

In response to generic photographs people with dementia are as likely to produce stories as are older adults without dementia. Indeed, they can produce rich reminiscences, full of engaging descriptions that can form the basis of conversations. This concurs with the finding that people with dementia recall events of personal significance better than non-significant events (Snowden et al., 1994) as their recollections were of personal stories from their own lives, which had apparently made them resistant to loss (Westmacott et al., 2003). Additionally, these recollections can be lengthy, comprising many conversational turns, signaling the preservation of a number of fundamentals of conversation (Orange and Purves, 1996).

In relation to the three functions of reminiscing for people with dementia proposed in the introduction, it appears that the two types of stimuli (personal and generic) have a different impact. **Social** – the social benefit of reminiscing derives from the telling and sharing of memories with other people, whether one-to-one or in a group (Brooker and
Duce, 2000). Personal photographs do not appear to be very good prompts for triggering people with dementia to reminisce, reducing their opportunity for shared social interaction and the validation that accompanies this. In contrast, generic photographs, which can be used with a wide range of people, seem to provide good prompts for stimulating the recollection of personal stories, including ones that are complex and highly detailed (Bender et al., 1998).

Skills – the benefit of reminiscing in terms of skill maintenance is undermined by failure to recognise and remember people and events in family photographs. This is both distressing and disabling for people with dementia who recognise that photographs are from their family album but cannot successfully provide accurate information about them. In doing so, they fail to meet the expectations of families who select the items, believing that they will provide evocative reminiscing prompts. Generic photographs have the advantage of not being tied to a ‘right’ answer, i.e., a particular event that took place at a particular date and time involving certain people. This reduces the chances of ‘failing’ for people with dementia, allowing them to exploit their retained turn-taking and story-telling abilities (Astell et al., 2009).

Self – reminiscing can provide an opportunity for people with dementia to experience positive interactions and engagement with others, whether family members, professional caregivers or other people with dementia (Gibson, 2004). Failure to recognise people and events in family photographs can undermine a person with dementia’s self-confidence and comfort at participating in social interactions. By contrast, generic photographs can facilitate the presentation of self and preservation of identity by people with dementia through triggering the recollection and sharing of stories (Mills, 1997).

The use of generic photographs and examination of the responses they elicit raises a question about the nature of reminiscing when used as an activity in dementia care. Specifically, does it matter if the response a person makes is directly related to the photograph or is it the stimulation of conversation that is more important? Although generic photographs have no right answer as defined above, there is clearly information that goes along with whatever is depicted in the photograph, e.g., a beach or people at a birthday party. If a person with dementia tells a story that is not apparently connected to the immediate stimulus, is this wrong? Should they be discouraged from continuing the story? Or should their recollection be validated and treated as an acceptable response? To ensure that reminiscing remains a positive social activity for people with dementia, we would argue that the latter view is more useful. This ensures that the focus of reminiscing is on the social aspects rather than being a memory test, where the person with dementia is likely to fail.

In addition to apparently acting as more effective prompts to reminiscing, generic stimuli appear to have a number of benefits over personal photographs. First, they are accessible to a wide range of people. Second, they may not suffer through repeated use in that they may stimulate the recollection of different stories on different occasions. Third, they are easier to obtain than personal photographs which rely on the availability of family albums and indeed family members to select and label them. This is a time consuming activity (Damianakis et al., 2010), which not everyone may be prepared to undertake. Fourth, in contrast to personal photographs, generic ones can provide a ‘failure-free’ experience for people with dementia. This is because there is no single set of information that people are expected to produce in response to a photograph as there is with a family photograph which memorialises an event on a particular date in a particular place and contain a certain set of people.
Finally, the studies presented here, though small, provide some preliminary information about how people reminisce. Specifically, these findings provide information about the sort of amount and types of information people give in response to photographs. In both studies, the amount of words and number of conversational turns were totalled. This was to provide some idea of what people’s responses look like when they are asked to reminisce as the focus of the studies was to explore the relative merits of personal and generic photographs as stimuli for reminiscing. There was no intention in either study to conduct a detailed exploration of the speech production element of reminiscing due to the small sample sizes and the heterogeneity of the participants. With larger samples it would be possible to undertake more detailed analyses of the output of the participants in terms not only of their contents, but also the syntactic, semantic, phonological and rate of production elements.

In conclusion, the findings of these two studies suggest that generic materials have advantages over personal ones for prompting people with dementia to reminisce. It appears that the specific details and narratives that accompany items selected from family albums (date, place, event, etc.) have the effect of limiting the type of information people with dementia and indeed their relatives produce. In addition, personal items do not elicit the type of detailed narratives that the generic photographs in this study elicited. The findings of these two small studies suggest that generic items can successfully trigger personal memories that are not bound to any place or era, thereby providing the basis for enjoyable, shared, positive social interactions where people with dementia can have their emotions and feelings validated (Brooker and Duce, 2000).

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References


Rodriguez A. (1990) ‘A descriptive study of selected props used to elicit memories in elders’, Master’s thesis, School of Nursing, University of Texas at Austin, Austin, Texas.
