

Telling Your Stories:
Designing an Online Email Based Storytelling Group for

Older Adults

by

Yuanyi Li

A Thesis Presented in Partial Fulfillment
of the Requirements for the Degree
Master of Science in Design

Approved April 2014 by the
Graduate Supervisory Committee:

Jacques Giard, Chair
Eric Margolis
Kyle Larkin

ARIZONA STATE UNIVERSITY

May 2014

ABSTRACT

The aim of this study is to test the feasibility of building a storytelling system for older adults to tell and share their life stories based on email. It is measured by the level of participation and people's acceptance of the system. The central goals were to empower people over 60 years old by providing a platform for them to share their wonderful life experience and perspectives on life and lead social services into the digital age by bridging traditional roundtable interaction and modern digital communication.

A prototype was built to test the level of participation of the system and follow-up interviews were conducted in order to deeply understand people's acceptance. Content analysis was used to analyze the stories to ascertain what common themes were present. Key design considerations and key factors that affect the feasibility of storytelling system were discussed. This research expands on current research and implementation of Internet-based storytelling system and shed light on the future of combining storytelling with older adults' existing Internet knowledge.

Key findings of this research are :(1) Frequency of reminiscence trigger and the number of active participants affect the level of participation collectively. Frequency is considered to be a key determinant. High frequency indicates high level of participation. (2) Categories of topics do not affect the level of participation significantly but serve as key attractions that enhance people's acceptance of the system. (3) Older adults highly accept and get involved in the new email storytelling system. This storytelling program helps them recall their memories and have a profound effect on their own introspection.

ACKNOWLEDGMENTS

I would like to express the deepest appreciation to my committee members for all their work. To my committee chair, Jacques Giard, for inspiring me to refine my research work over the two years of study in MSD program. To Eric Margolis for opening my eyes to the world of ethnography and storytelling. To Kyle Larkin for providing me valuable suggestions and support on my research.

I would like to thank all of my classmates and friends for encouraging me during my difficult time. I thank Jan, Carol and Josh for providing significant help in recruiting participants for my research and offering emotional support for my life in America.

Finally and most importantly, I would like to thank my parents for their love and support throughout my life, for their faith in me and for allowing me to be as ambitious as I wanted. They are the entire meaning of everything.

TABLE OF CONTENTS

CHAPTER	PAGE
LIST OF TABLES	vii
LIST OF FIGURES	viii
CHAPTER	1
1 INTRODUCTION	1
1.1 Purpose of study.....	1
1.2 Significance and Rational	2
1.3 Scope and limitations.....	3
1.4 Research Questions.....	5
1.5 Conceptual Framework.....	5
1.6 Definitions.....	8
2 LITERATURE REVIEW	9
2.1 Introduction.....	9
2.2 Storytelling, life review and reminiscence.....	9
2.2.1 Reminiscence	10
2.2.2 The difference between life review and reminiscence.....	11
2.2.3 Storytelling.....	12
2.3 Purpose of storytelling for older adults.....	13
2.3.1 Therapeutic purpose.....	14
2.3.2 Educational purpose.....	15
2.3.3 Personal expressive purpose	15

2.3.4 Negative effect of storytelling	16
2.4 Older adults and internet use.....	17
2.4.1 Computer-mediated communication.....	18
2.4.2 Text-based communication.....	19
2.4.3 Email and older adults	20
2.4.4 Other uses of email	21
2.5 Design digital storytelling for older adults	22
2.5.1 Support storytelling with high technology.....	22
2.5.2 Internet based storytelling.....	23
2.5.3 Reminiscence Triggering	24
2.5.4 Storytelling program in group settings	25
2.6 Conclusion.	27
3 METHODOLOGY	29
3.1 Introduction.....	29
3.2 Methods and methodology.....	29
3.2.1 Literature review	30
3.2.2 Sample strategy	30
3.2.3 Email storytelling system.....	30
3.2.3.1 Prototype design.....	31
3.2.3.2 Operational mechanism	32
3.2.3.3 Selection of topics to be posted in the trial	35
3.2.3.4 Date of sending emails.....	36

3.2.4 Follow up interview.....	37
3.2.5 Data analysis	37
3.3 Research questions and rationale	38
4 RESULT OF DATA ANALYSIS	41
4.1 Introduction.....	41
4.2 Level of participation.....	42
4.2.1 Group difference in the level of participation.....	42
4.2.2 Topics difference in the level of participation	47
4.3 People’s acceptance of system.....	51
4.3.1 Usability of the system.....	51
4.3.2 Perception of the system	52
4.3.3 User behavior	57
4.3.4 People’s involvement of the system	59
4.4 Content analysis of stories.....	62
4.4.1 Childhood related content analysis	63
4.4.2 Family related content analysis.....	66
4.4.3 Career related content analysis	69
4.4.4 Other content analysis.....	71
5 DISSCUSSION AND CONCLUSION	75
5.1 Introduction.....	75
5.2 Level of participation	75
5.2.1 Frequency and the level of participation.....	75

5.2.2 Topics and the level of participation.....	77
5.3 People’s acceptance of the system.....	77
5.3.1 Email and accessibility	78
5.3.2 Core value of the system.....	79
5.3.4 Building relationship with strangers.	80
5.3.5 Content of stories.	80
5.4 Design implications	81
5.5 Limitations and further research	83
5.6 Conclusion,	84
REFERENCES	85
APPENDIX.....	92
A INTERVIEW QUESTIONS	92
B SAMPLE INTERVIEW TRANSCRIPT	96
C CONSENT FORM	103
D SAMPLE STORIES.....	106
E QUESTION TO BE ASKED IN THE SYSTEM.....	114
F IRB CERTIFICATE	117

LIST OF TABLES

TABLE	PAGE
Table 3.1 Participants by age and gender	31
Table 3.2 Group difference in the frequency of sending emails.....	32
Table 3.3 Participants and their current use of email by groups.....	33
Table 3.4 Questions to be asked in the system.	35
Table 3.5 Date of sending emails by groups and topics	36
Table 4.1 Attractions score of the system. topics	53
Table 4.2 Length of replies by groups	63
Table 4.3 T1:How did you revel as s child	63
Table 4.4 T5:Did you have a nickname as a child and how did you feel about them ? ...	64
Table 4.5 T9:What were your favorite toys as a child	65
Table 4.6 T3:What was your mother like when you were child about them ?	66
Table 4.7 T7:Which family member do you wish you had kept in touch with better	66
Table 4.8 T12:What is your best relationship advice them ?.....	67
Table 4.9 T6 What is your first job and how did you get it.....	69
Table 4.10 T8:What was your worst boss like.....	69
Table 4.11 T10 What do you consider your greatest achievement.....	70
Table 4.12 T4:Has a friend saved you literally or figuratively did you feel about them ?	72
Table 4.13 T11 What life experience shaped who you are.....	72
Table 4.14 T2:Have you ever doubted your faith.....	73

LIST OF FIGURES

FIGURE	PAGE
Figure 1.0 Conceptual Framework.	7
Figure 3.1 Operational mechanism of storytelling system.	34
Figure 4.0 Number of replies by groups	42
Figure 4.1 Number of people who participate in discussion	44
Figure 4.2 Percentage of length of answers by groups	46
Figure 4.3 Percentage of length of answers by groups	47
Figure 4.4 Number of replies by categories.....	48
Figure 4.5 Length of replies by categories.....	50
Figure 4.6 Number of active participants by categories.	50
Figure 4.7 Difficulty Scale by participants.	52

CHAPTER ONE

INTRODUCTION

1.1 Purpose of study

Everyone has a story to tell, especially older adults. Storytelling or reminiscence are considered to be a beneficial way of facilitating the process of aging for older adults (Al Mahmud & Martens, 2013). But how can traditional storytelling programs adapt to the rapid development of Internet communication technology (ICT).

Data from Pew Research Center has exposed the truth that 53% of American adults aged 65 years or over use the Internet for communication in 2012, indicating that social interaction is a prevalent activity of this target population in online environments.

It is worth pointing out that electronic mail, most commonly referred to as email or e-mail, is becoming an essential tool for older adults to access the Internet and the entire online community. As stated in the Pew Research Center report, email use is the bedrock of all online activities for older adults, which takes up 86% of the Internet service seniors use every day (Zickuhr & Madden, 2012).

Consequently, can a better way of storytelling be developed utilizing the technology of email and the Internet to benefit more silver surfer?

This research is aimed at exploring the feasibility of Internet-based storytelling program for American older adults. To be more specific, the research attempts to look at how email – the most popular access to the Internet for older adults – can help to build a more effective online storytelling program in information age.

The research is focused on the design and short-term user evaluation of an email-based storytelling system built with the function of Google Groups. A prototype was used for a four-week long trial with three groups of eligible senior participants, followed by a follow-up interview on all older adults.

1.2 Significance and Rational

Reminiscence will help people confronted with late life depression to find meaning of life (Bohlmeijer, Westerhof, & Emmerik-de Jong, 2008). Positive effect has been found in group reminiscence that it helps to improve psychosocial wellbeing and quality of life of older adults (Gaggioli et al., 2013).

Although reminiscence programs are not new, the way they can be delivered can be made to be more accessible for seniors (Chonody & Wang, 2013). Recently, there has been interest within the human-computer interface community concerning combination of Internet and storytelling or reminiscence program for older adults. Several systems have been developed to trigger reminiscence content. By posting stories of older adults onto public online blogs to get feedback from younger generation, Chonody and Wang (2013) suggested a connection between older adults and technology to make use of internet and social network service for the purposes of reminiscence for older adults.

As mentioned above, data from the Pew Research center have shown that email is the most common Internet access for older adults. (Zickuhr & Madden, 2012). However, little is known about the process and feasibility of email storytelling system. Is it possible to combine reminiscence program with email in order to benefit older adults who are immobile? In addition, Gregor, Newell, and Zajicek (2002) also stated that older adults

usually had different attitudes and expectations towards technologies. He suggested engaging older adults early with the design process to ensure that it was meeting design requirements when designing Internet products for older adults.

This research is to test people's acceptance of the email storytelling system and explore what elements in the system affect the level of participation and activeness. Stories told by older adults in the email storytelling system will be analyzed in depth as well.

It is believed to be important to provide an innovative way of empowering Americans over 60 years old by developing a platform to share much of their life experience and philosophy of life without face-to-face communication. Instead of introducing new Internet technologies or multi-media service to older adults to help them reminiscence, which obviously increases the cognitive load for novice senior Internet users, the research proposes taking advantage of email service that most older adults are already familiar with. By building a prototype for trial, the target audience is engaged in an early design process and receives firsthand feedback. The prototype also offers a possible direction of transition of social services in the information age by connecting traditional storytelling program with Internet technology.

1.3 Scope and limitations

The research is a qualitative and quantitative study that was undertaken in Arizona. Participants are residents in the Phoenix area who are over 60 years old or older, including eight women and seven men. All 15 participants have a basic knowledge of

how to use email; many of them use email on a daily base. They check their mail box at least once a week.

The research includes a four-week trial utilizing an email storytelling prototype. A follow up interview with all participants was conducted after the trial. Data collection was conducted during the fall of 2013 and spring of 2014.

The email storytelling prototype in the research was built with the function of Google groups. Google groups is a free service from Google Inc. It offers online discussion groups for people who share primarily the same interests. Anyone with an email address can be invited to a group to start a discussion with other group members. It contains two kinds of discussion group. The first one is an online forum where group member can post and reply any topics if authorized by the founder of the group. It requires users to visit a specific forum page to communicate. The second one is done through emails process. Topics and discussion are sent to every email address assigned to the group and all the discussion can be conducted through email. In this research, only the email-based discussion was used in order to reduce older adults' cognition load of learning new Internet service and interface.

The result of the research is important in order to understand the initial user feedback toward this innovative way of storytelling as well as the design considerations for further development. However, interface issues is excluded, which means that font, color, size of buttons and page layout were not are because the interface of Gmail is not highly customized and there has been some research targeting the optimization of email interface for older adults (Arnott et al., 2004; Dickinson, Newell, Smith, & Hill, 2005). In

addition, stories in this research refer to older adults' past memories. There is no attempt to help older adults record their everyday life now.

Limitations of the research include the length of the storytelling. It is difficult to generalize the outcome and findings based on a four-week storytelling program with 15 participants. A longer trial, around one year in length, could help to develop a deeper understanding of how email storytelling system affects older adults' aging successfully.

1.4 Research Questions

The research looks at the feasibility of email storytelling system by evaluating the level of participation and people's acceptance of this system. In-depth rationale of the research questions can be found in Chapter 3 Methodology.

- 1 How are stories told in email storytelling system?
- 2 To what extent do older adults accept email storytelling system?
- 3 What elements of email storytelling system will affect the level of participation?

1.5 Conceptual Framework

The conceptual framework illustrates the relationship between different research field regarding storytelling and older adults (see figure 1.0). As shown in the figure, the research will evaluate the feasibility of the email-based storytelling system based on two main aspects.

The first aspect is people's acceptance of this system, which is a new service based on email and which participants have already used on a daily base. There is value in focusing on people's feedback after they use the system. The second aspect is the level

of participation because the research is trying to build a service, in-group settings. The interaction between group members and the interaction between participants and the system is one of the determinants of success.

At the same time, there are two main elements that will affect the level of participation of the system. First one is the frequency of reminiscence trigger. In this research, reminiscence trigger is the topic sent to older adults to help them with memory recall. Previous researches have revealed the fact that a trigger is necessary to entice reminiscence. But littler research has focused on how the frequency of trigger affects a storytelling program whether it is online or offline. Second one is the topic of storytelling. In previous research, topics are usually generated by the participants themselves. In this research, certain topics are provided as reminiscence trigger. That will help solve the problem of “have nothing to say” (Thiry & Rosson, 2012). The research attempts to test how different categories of topic affect the storytelling system separately.

By looking at these elements collectively, a better understanding of how people tell stories on this system and to what extent people accept it will be built.

Designing Online Email Based Storytelling Group for Older Adults

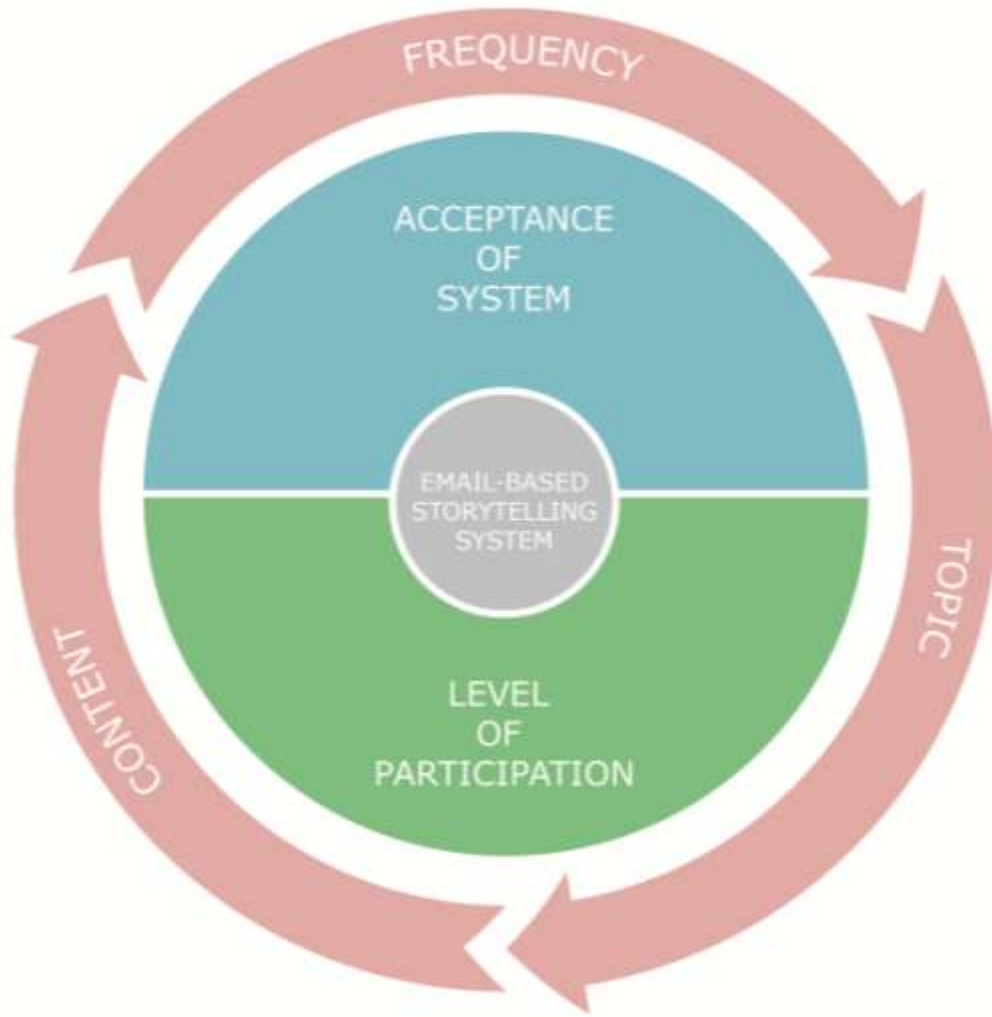


Figure 1.0 Conceptual Framework.

1.6 Definitions

Storytelling, Reminiscence and Life Review - Since storytelling, life review and reminiscence are three similar words that are often used interchangeably in the literature. It is necessary to clarify the slight difference among these three terms. Detail comparison of these three words can be found in Chapter 2 literature review. Storytelling is used throughout the research so that it becomes more understood and acceptable by older participants. But storytelling actually refers to one of the forms of reminiscence.

Reminiscence Trigger - Reminiscence is always triggered externally and not consciously (Cosley et al., 2009). A trigger is an artifact that entices people's reminiscence. It can be photos, diaries, mementoes, etc. (Frohlich, Kuchinsky, Pering, Don, & Ariss, 2002).

Group reminiscence - Group reminiscence indicates the reminiscence program conducted in group settings. A group of people sits together and share their stories with each other. A group can contain either strong ties like family members and close friends or weak ties like strangers on the Internet (Wright, 2000). Group reminiscence can be designed, controlled and guided to cater to the needs of older adults while individual reminiscence often happen by chance and are difficult to observe or study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This section will cover a critical review and comparison of different ideas, research, theory and implementations, as well as further design opportunities in the field of storytelling for older adults. It begins with clarity of similar definitions used in this field: storytelling, reminiscence and life review. These three terms are mentioned frequently in previous research. Nevertheless the difference and similarities among the three terms are still under discussion. Equivocal definitions of these three terms may result in imprecise research direction, hard retrieve of literature and it goes against the establishment of systematic theories in this specific research field. Different purposes of storytelling with older adults were also reviewed. Three purposes of storytelling were identified based on previous research. Additionally, literature and implementations of older adults' use of the Internet and email system were reviewed. The review also examined and compared different research and implementations of digital and web-based storytelling programs and devices designed for older adults as well as how group storytelling affected older adults more than individual storytelling. Last, the literature review addressed the importance of seeking for new ways of storytelling in digital age.

2.2 Storytelling, life review and reminiscence

Storytelling, reminiscence and life review are commonly used to describe similar activities in different literature. There has not been a common meaning among the three terms so that they are often used interchangeably in much literature throughout time. But

it is crucial to develop a clearer understanding of the slight difference in these three terms. This will help us differentiate and classify previous research in the preparation for defining the directions as well as the methodology in this research.

2.2.1 Reminiscence

Explicit definitions of these three terms have not been achieved based on previous study. However, some literature has indicates that there is agreement that reminiscence is a broad definition and practice that incorporate life review and storytelling.

The first landmark of reminiscence in this field can be found in 1963. Previously, reminiscence had only been considered as result of cognitive deterioration. Butler's (1963) research showed that life review, as a subset of reminiscence, positively affect old people's scale of acceptance of difficult time in the past. His research encouraged more researchers to study the development of reminiscence techniques and the relationship between life review and reminiscence. On the contrary, the correlation of age and reminiscence activities was later contradicted by Romaniuk and Romaniuk (1982), who figured out the same reminiscence activities on both older adults and young people. An inclusive definition of reminiscence was generated, which is

Reminiscence is the volitional or non-volitional act or process of recollecting memories of one's self in the past. It may involve the recall of particular or generic episodes that may or may not have been previously forgotten, and that are accompanied by the sense that the remembered episodes are veridical accounts of the original experiences.

This recollection from autobiographical memory may be private of shared with others (Bluck & Levine, 1998, p. 188).

2.2.2 The difference between life review and reminiscence

The first mention of life review dates back to 1959. Erikson (1953) clearly formulated the last stage of life as a period of life review. At this point, life review was depicted as an interpretation of reminiscence in the aged. It is a normal, further developed phenomenon enticed by the person's realization of upcoming death (Butler, 1963).

The difference between life review and reminiscence lies in format in early literature. Research conducted in 1984 indicates that life review is a personal and intense form of reminiscence (Molinari & Reichlin, 1984). It might be thought of as integrative form of reminiscence (Watt & Wong, 1991). Integrative reminiscence was defined as one type of reminiscence that refers to life review recognized in early literature (Westerhof, Bohlmeijer, & Webster, 2010). Then, life review was believed to be the "subset of reminiscing and it is a structured format of reminiscence to reviewing and looking for meaning in one's life. It was conducted at set times, and involves a guide through different or sequential aspects of a person's life". At the same time, reminiscence was defined as a way of talking about one's life (Buchanan et al., 2002). However, Haber (2006) argued that reminiscence is just the recall of memories. It is considered to be a "passive and spontaneous process that happened throughout our life." Research conducted in 1984 also showed that life review is an active recall of the past (Molinari & Reichlin, 1984).

Next, the difference between life review and reminiscence was identified in the purpose of these two practices. Therapeutic goals can be found in Buchanan's research. (Buchanan et al., 2002). Molinari and Reichlin (1984) described life review as an effective way to learn to accept the past experience and then survive. Support for this statement can be found in Haber's research. He described "Life review is also more likely than reminiscence to be an evaluative process, in that participants examine how their memories contribute to the meaning of their life." Moreover, reminiscence often concentrates on the detail of every life event (Haber, 2006). By remember and examining the past, life review helped resolve present conflicts and pressure and make more sense to current experience (Watt & Wong, 1991).

Another difference can be found in the skill set for life review and reminiscence. Reminiscence was considered as a spontaneous phenomenon that happened to everyone starting from ten years old (King, 1982). Life review required advanced and high levels of inner skills so that most older adults do not own (Coleman, 2005). But reminiscence can be experienced by everyone. It did not need any critical examination of past experiences. (Chonody & Wang, 2013).

2.2.3 Storytelling

Literature has been most often exclusively focused on the difference between life review and reminiscence but has ignored another frequently used term – storytelling. McMahon and Rhudick identified three types of reminiscence, namely storytelling reminiscence, life review, and defensive reminiscence, which included storytelling as reminiscence in life review (McMahon & Rhudick, 1964). At the same time, Gerfo (1980)

depicted three forms of reminiscence that were similar to the aforementioned definition, namely informative reminiscence, evaluative reminiscence, and obsessive reminiscence. Although Trentham (2007) argued that all these three terms shared the same or similar processes; however, life review and reminiscence were more indicative of therapeutic methods.

According to the literature reviewed above, one may identify a clearer relationship between reminiscence, life review, and storytelling. Reminiscence is a naturally occurring phenomenon that will happen throughout life, whether we share our memories with others or not, incorporating the recall and recollection of memories. It can be conducted both therapeutically and not. Life review is a constructed form of reminiscence, mainly used for therapeutic purpose through an evaluative process. Storytelling does not belong to either of the term but it is the concrete realization of life review and one of the concrete realizations of reminiscence. When telling a story, memories are reconstructed in relation to existing schemas.

In this research, storytelling is used throughout the thesis because it is more understandable but it actually refers to a concrete realization of reminiscence.

2.3 Purpose of storytelling for older adults.

Storytelling or reminiscence can be done by both younger and older generations. But what does storytelling specifically have to do with older adults? Three different purpose of storytelling for older adults can be identified through previous literature – therapeutic purpose, educational purpose, and personal expressive purpose.

A wide variety of reminiscences were found in both younger and older generations. But Webster used factor analysis to generate eight main and reliable outcomes of reminiscence as: identity, death preparation, problem solving, teach/inform, conversation, boredom reduction, bitterness revival, intimacy maintenance (Webster, 1997). In order to reduce the number of purposes for the ease of further research, these outcomes were grouped into three categories. Specifically, storytelling serves three main purposes according to former research: therapeutic purpose, educational purpose and personal expressive purpose.

2.3.1 Therapeutic purpose

Therapeutic purpose of storytelling can be found in a great deal of the literature. This literature indicated that storytelling was a way of dealing with late life depression of older adult and it helps to facilitate the process of aging successfully. Remembering the past can help older adults personally and socially. It provided unique opportunities for therapist to appreciate the successes and frustrations of growing and aging with patients (King, 1982). Significance in successful adaptation to old age was discovered in reminiscing (McMahon & Rhudick, 1964). Intrapersonal and interpersonal functions were found in helping older adults aging successfully. It could help “ maintain self-esteem, reinforce a sense of identity and integrity, work through personal losses and allay the anxieties about and stress in growing old.” (Pincus, 1970). People who reminisced frequently had higher consistency between past and present. By connecting their present to the past, reminiscers tend to the accept the difficulties of old age as an inevitable process try to alleviate the pain in late life depression (Magee, 1988) while non-

reminiscers complained about less earning power, a fear of crime, and the decreasing of recreational facilities due to age issue (Lewis, 1971).

Recent research has also shown that reminiscence interventions is beneficial to older adults in terms of dealing with depression and improving wellbeing (Lin, Dai, & Hwang, 2003) (Bohlmeijer et al., 2008). Strong relationship between mental health and reminiscence was found after that (Westerhof et al., 2010). Specifically, reminiscence was effective on the institutional care of people with dementia with evidence of the raise of self-esteem, self-integration and the improvement of life quality (Moos & Bjorn, 2006).

2.3.2 Educational purpose

Educational purpose of storytelling can also be found in the research conducted by Chonody and Wang (2013), which suggested that older adult's stories be used for passing wisdom down to the next generation and educating the community to get to know older adults without ageist and develop a clearer image of people's life in the past. Educational purpose was extended to be not only beneficial to pass on knowledge but also enhanced the understanding of old adults' own life (Haber, 2006). Harley and Fitzpatrick (2009b) found that successful storytelling process could educate and motivate their cohort to take part in storytelling activities. Positive educational effect were also found in tribal societies that reminiscence would help the transmission of the people's history, myths, legends and proverbs (Gutmann, 1977).

2.3.3 Personal expressive purpose

Little research mentioned the third aspect of storytelling for older adults – personal expressive purpose. Reminiscence is often treated as a foreground activity in

much of the study. The reason for the lack of literature in this field may lie in that focus from a psychological point of view on reminiscence as a potential therapy aimed at the relief of depressive symptoms of older adults (Bohlmeijer et al., 2008). Another cause of the ignorance of the purpose is due to the rapid development of Internet technology and the older adult's increasing awareness of the advantage of Internet. For instance, the case study of Geriatric1927 showcase another possibility that older adult are using storytelling as a tool to record their own life actively (Harley & Fitzpatrick, 2009b). Similarly, social network site MySpace is also considered as a way of storytelling for older adults (Pfeil, Arjan, & Zaphiris, 2009). When we move to information age, storytelling is seeking for a bigger role in older adults. They use storytelling to walk through their personal life and express their feelings and thought to the public instead of receiving help from nursing home storytelling program or other agency and programs only.

2.3.4 Negative effect of storytelling

Positive effects of storytelling have been shown in much of literature. However, a little literature argues that negative aspect of reminiscence regarding loss and bitterness could probably lead to an increasing feeling of self-doubt and recrimination. Negative fashion of reminiscence was found to make older adults experience heightened emotional distress and anxiety (Butler, 1963). Through reminiscence, the elderly may engage in facing his or her failures, painfulness, losses, anxiety and stress may be elicited to react defensively (Molinari & Reichlin, 1984). When older adults frequently use negative functions of reminiscence including bitterness revival and death preparation, they are more vulnerable to psychological distress. However, research above only described the

effect of negative reminiscence on older adults emotionally, psychologically. Cully, LaVoie, and Gfeller (2001) argued that this influence works in both directions. “When psychological distress increase, older adults may be more likely to recall bitter memories and reminisce in order to alleviate feeling of boredom.”

2.4 Older adults and Internet use

Older adults are more likely to now live without their family and friends, making social isolation more prevalent than before (McCarthy & Thomas, 2004). Older adults’ networks of family and friends are increasingly widely spread (Grundy, 1996), which increases the opportunity for them to ask for online support. When older adults are not receiving enough support or companionship from their un-Internet family members or friends due to widowhood, physical immobility or loneliness, they are willing to seek for help online. Sharing of intimate problems and emotions with other Internet users help them find “surrogate family” online (Wright, 2000).

Studies have examined the impact of the Internet on the well-being of older Chinese, suggesting that the increasing use of the Internet of older adults is positively associated with their perceived quality of life and help improves self-evaluations and other people’s views (Xie, 2007). The use of Internet by older citizens can improve their quality of life by engaging them in more youthful online activities such as “surfing the net,” reducing loneliness through on-line chatting, and satisfying their needs by visiting information-rich websites (McMellon & Schiffman, 2002). Wright further analyzed and classified older adults’ online activities by stating that when older adults seek help online,

they were mainly seeking for two types of social support: informational support and emotional support, which were linked to positive health outcomes (Wright, 2000).

However, current information technology is obviously not appropriate for older adults who are over 60 years old. Research has shown that older adults feel no confidence when facing Internet technology because of a lack of experience and support (Marqui é Jourdan-Boddaert, & Huet, 2002). Although information technology will significantly affect older adults' life, lack of experience and support make it more likely that older adults will have a negative computer experiences and cause computer anxiety (Todman & Drysdale, 2004). Computer-based Internet service is only beneficial and supportive to older adults when it is easy to use and access (Czaja, Guerrier, Nair, & Landauer, 1993).

2.4.1 Computer-mediated communication

Over the last decade, a great deal of effort has been devoted to the study of computer-mediated communication (CMC). Compared to traditional face-to-face interaction, CMC can affect conversation in many ways due to the changes in social, physical and temporal cues (Harley & Fitzpatrick, 2009b).

There are three main forms of CMC – text, audio and video. The media-richness theory of Daft and Lengel (1986) indicates that video is a rich media compared to text and audio; therefore, it is more effective for remote communication. The case study conducted by Harley and Fitzpatrick (2009b) suggests that YouTube is a new medium for intergenerational communication. But a key limitation of this research is that it studied only one case on YouTube. It did not take into account the inaccessibility of video

technology for a majority of older adults. More importantly, it did not realize the gradual decline of the intergenerational connection over time.

Apart from this, CMC lacks a social presence, thereby labeled as impersonal and hostile. That said, this statement has been challenged repeatedly over time because people have argued that the feeling of uncertainty in online virtual communication can be reduced by developing a more satisfying relationship through spending more time on the message (Parks & Floyd, 1996).

2.4.2 Text-based communication

Unlike video-based communication, text-based forms of communication was believed to have least number of paralinguistic and visual cues (Harley & Fitzpatrick, 2009a). Examples of text-based communication are email, blog, chat rooms, etc. Generally, they share the same features. Text-based communication is asynchronous so that there is no question of pressure for an immediate response (Tyler & Tang, 2003).

However, text-based communication is often beneficial for older adults' storytelling because ethnographic research conducted in Japan reveals the fact that text-based communication offers an opportunity for older adults to think about what they want to write more thoroughly and then construct social connections regardless of the inaccessibility of rich media (Kanayama, 2003). Furthermore, text-based communication can be easily stored and edited by the authorized user for future use (Garton & Wellman, 1993).

2.4.3 Email and older adults

Considerable evidence can be found to indicate that an increasing number of older adults are using email. A survey of web use conducted by Morrell, Mayhorn, and Bennett (2000) revealed the fact that middle-aged and older adults primarily use email in online environments. Recent data collected by the Pew Research Center also showed that 86% of silver surfers use email and 48% of them write and receive email on a daily basis. Emails serve as the bedrock of online communications for seniors (Zickuhr & Madden, 2012). Similar trends can also be found in non-users. Email is considered to be the most attractive Internet service for older adults to learn in order to access health and traveling information (Morrell et al., 2000). One reason that older adults choose email instead of other website or Internet service lies in research that older adults feel email to be a manageable and controllable tool in a context where there is anxiety about missing important notices or posting content that jeopardizes their privacy (Thiry & Rosson, 2012).

To better support older adults, several simplified email interfaces have been developed because inappropriate interface design is considered to be a fundamental cause of a so-called digital divide (Chadwick-Dias, McNulty, & Tullis, 2003). Czaja et al. (1993) reported the feasibility of developing a specialized and simplified email system for older adults with minimal difficulty. The email system emphasized the importance of reduced-functionality when designing for older adults.

Likewise and by way of interviews and consultation with senior computer users in order to better understand the needs of older adults, Arnott et al developed a new email

interface for older people that emphasizes the simplicity of interface and reduction of function (Arnott et al., 2004). In addition, Hawthorn's SeniorMail attempted to redesign the Microsoft Outlook interface to make email more accessible to older adults (Hawthorn, 2002). However, this redesign is an adaptation of an existing system rather than a system specifically designed for older adults. Later, a new email system for older novice computer users over 60 years old was developed to help attract non-users and introduce them to the Internet (Dickinson et al., 2005). Recent research also pointed out that through reducing the function and providing necessary language support, new email system designed for older adults with Aphasia could help them to communicate better with their partners and therapist (Al Mahmud & Martens, 2013).

2.4.4 Other uses of email

Most research regarding older adults and email use primarily focused on the simplification of the interface or function of email system to make it more accessible for seniors. Minimal research has focused on what email can do more than mere communication. Atherton suggested the possibility of doing medical consultation in general practice through email based on semi-instructed interviews of patients and experts (Atherton, Pappas, Heneghan, & Murray, 2013). Similarly, email can be a useful tool in the practice of medicine to facilitate communication within a patient-physician relationship (Association, 2013). In addition, email has been recognized as a cost-effective way of Internet marketing. Because of email marketing's high response rate, more than a half of American companies use email as a marketing tool on a daily basis (Rettie, 2002).

Gill conducted an investigation in 2012 of 2600 workers around the world in order to discover the variety of uses of email. It was discovered that the primary reason people use email has evolved. Previously, exchanging documents had been the main purpose of using email (Gill, 2013).

However, research has not focused much attention on how the evolution of email affects older adults. Besides communicating with friends and family member, it is not known what else older adults do with email to benefit their late life. This area of research deserves more attention and further investigation.

2.5 Design digital storytelling for older adults

In the following part, two areas of research concerning digital storytelling are examined. Design considerations of storytelling program that support older adults to reminisce are reviewed based on previous research and implementations.

2.5.1 Support storytelling with high technology

The first area of research is the use of high technology to support storytelling. A number of technologies exist to organize content derived from memories and to enable older adults to record their life actively.

Digital storytelling photo frame was developed to ease intergenerational communication through the conveying of relevant information about one's life (Mynatt & Rowan, 2000). Similarly, Electronic Family Newspaper, designed for older adults to help remote family members to communicate easily, was perceived as a richer, more natural form of communication. It facilitates the integration of documents into a current network that other family member have already built online (Rodríguez, Gonzalez, Favela, &

Santana, 2009). Sensecam is a wearable camera designed for older adults to help them remember and record what they do daily by automatically taking pictures during the day (Sellen et al., 2007).

These high-tech design concepts still need improvement and time before they are placed on the market. Furthermore, not all have fully considered the level of acceptance of technology by older adults because most of them utilize video and picture taking technology, which on one hand, enrich the content and enhance the holistic user experience, but which, on the other hand, increase the difficulties of use and management of data for older adults.

More importantly, these technologies and implementations focus on how to record their everyday life. These design concepts do not allow people to recall past memory. Similarly, Cosley et al. (2009) stated that the explicit decision to manipulate captured memories goes against the spontaneous nature of reminiscing and can lead to an information overload.

2.5.2 Internet-based storytelling

The second aspect of research in this field concentrates on helping older adults tell and share their life stories. These stories are not always shared because of social isolation, inaccessibility to the Internet. In the context of high technology, the difference between the support of storytelling with high technology as discussed in 2.5.1 and Internet-based storytelling is that the research is not concentrated on the capture of everyday life but on the sharing of experience during one's lifetime. It is not about the present but about the past.

Recent research of Internet-based storytelling was conducted by Chonody and Wang (2013). They assisted older adults to post their stories online. They also received feedback from the public in order to understand the feasibility of building intergenerational relationship through multi-media. However, stories in this research were generated by older adults and collected by researchers offline, which means when the research is concluded, no one will help older adults post their stories online so that no continuous and long-term benefit can be brought to them. Older adult cannot benefit from storytelling programs without the help of researchers. Storytelling programs like this require a specific time and location of which people or an organization must manage. If this service were not made available, older adults would then not be able to continue.

2.5.3 Reminiscence Triggering

Based on previous research, triggering and group process are two main determinant factors when designing a storytelling program.

Triggering is an important element in reminiscence program. Without triggering, reminiscence programs cannot begin. A good triggering can help remove older adults' concern of having nothing to say (Thiry & Rosson, 2012). Evidence is also found in Cosley et al's research. They were of the opinion that reminiscence is usually triggered externally and often not consciously attended to (Cosley et al., 2009). A variety of media can serve as a reminiscence trigger. The most notable trigger is a photograph or image. Photographs and images can be used to not only record memory but to also share memories more easily with others (Frohlich et al., 2002). Such mementoes can serve as strong reminiscence triggers. It does not have to be pictorial representations because

mementos are ubiquitous. Any artifact can be a memento as long as people give it a meaning (Petrelli, Whittaker, & Brockmeier, 2008). In addition to these intentional triggers, research also confirmed the existence of non-physical trigger such as smell, music, people, newspapers, etc. (Cosley et al., 2009).

Although we have various triggers to help people reminisce, these triggers may not be accessible with digital technology. When everything we experience and every story we tell goes online, triggers like smell or memento may not work as well anymore, especially for older adults. Cosley et al. (2009) reported on a system utilizing information already captured on social network as trigger reminiscence. Because most older adults do not have any content on a social network site this type of trigger does not work for them (Thiry & Rosson, 2012).

Topics and questions about life stories are considered as an effective reminiscence trigger in the information age. In order to reach a wider range of people, trigger topics that relate to potentially embarrassing or offensive memories need to be avoided (Cosley et al., 2009). The main weakness of this study was that it separated trigger email and the actual story interface, which means that topics in the trigger mail only serve as a prompt. Older adults still needed to visit another page in order to post their stories that correspondent with the topics.

2.5.4 Storytelling program in group settings

Peesapati et al. (2010) stated that reminiscence is a private and intimate activity; therefore, privacy of information is extremely important when designing a storytelling program . However, it is difficult to make reminiscence fully private because of the

potential social aspects of reminiscing in which people often reminisce about other people (Cosley et al., 2009). Consequently and in order to solve this problem, many researchers have proposed various methods of group reminiscence by making information only available within group of people. The information is not available to the public like it is in social network websites where it can cause emotional harm to older adults (Peesapati et al., 2010). Several studies have shown the efficacy of group reminiscence in improving wellbeing in older adults. Through assigning older and younger participants into one storytelling group and sharing their stories, group reminiscence is believed to be a potentially effective activity to build intergenerational relationship and help to enhance older adults' quality of life (Gaggioli et al., 2013). The importance of group reminiscence among peers has also been examined. It has shown therapeutic benefits for older elders. It also helps facilitate the process of aging. By communicating with group members, older adults are able to find people who share the same feeling and experience with them thereby feeling less alone (Feinberg, 1996).

Since the Internet has been an open platform for the exchange of information, it makes it a great deal easier for older adults to communicate with their peers than it did before. As a result, online group reminiscence among peers drew some attention. Undoubtedly, online and offline group reminiscence are equally successful in improving psychosocial wellbeing. Strong evidence can be found in research conducted by Xie (2007). By investigating 33 older adults who were current or former students of a computer class in China, Xie found that learning and using the Internet within peer groups makes life more meaningful after retirement.

By sharing experiences with like-minded individuals and people of their own age, older adults find support for such catastrophic life events as loss or divorce (McMellon & Schiffman, 2002). Such reaction indicates the importance of both receiving and giving information for older adults in an online environment. Chonody and Wang (2013) found that group process in storytelling programs has more influence on the quality of storytelling program than did stories alone.

Study have also shown that it is beneficial to older adults that interacting with people they are not familiar with. These “weak ties” provide the opportunity to discuss life experience without being judged more harshly by a member of a close network (Wright, 2000)

2.6 Conclusion.

The literature shows that Internet-based storytelling system is highly recommended as a process to facilitate storytelling when utilizing multi-media and social network sites. However, most of research only considers older adults who are already experienced Internet users. These older adults already have a good knowledge of how to create a blog, and how to use YouTube and Facebook to express their feeling and share their life stories. Stories generated from these platforms were analyzed to better understand the content and behavior. However, research in this field has largely ignored a large amount of novice users who only use email on a daily base and never have an opportunity to be introduced to other Internet services or reminiscence programs. Consequently, this means that they can find no solution to their emotional and informational needs.

Previous studies have not focused much attention on developing Internet-based storytelling program based on older adult's existing experience such as email. The proposed research is meant to fill the gap of email storytelling system in order to explore the new forms of Internet-based reminiscence program for older adults.

In addition, numerous studies have argued that sustainable effects for participants were hard to identify after the completion of reminiscence programs. One problem was that reminiscence programs reported in most studies were undertaken over a certain period of time and space or participants were introduced to a special service and location in order to conduct the research. Storytelling programs as designed for older adults would conclude after a group meeting or get together were held. If this service were not made available, older adults would then not be able to continue.

As a consequence, a storytelling program built with basic knowledge of Internet is strongly needed to benefit older adults on a larger scale.

CHAPTER THREE

METHODOLOGY

3.1 Introduction

This chapter introduces the methods and methodology used in the proposed research. Since an email-based storytelling system was built as part of the research, the design process and operational mechanism are introduced in detail. The design of the system is inspired by the current offline storytelling program built for older adults. This is followed by the selection of possible topics to be sent to participants. These topics are selected based on previous research on reminiscence content generated by different storytelling programs. Next, basic information about participant and their use of email service are introduced. These participants are recruited based on their current knowledge of the Internet. Because of the type of email service used in the trial, only participants who have a basic use of email are eligible in this research. The process and methods of data collection are then introduced followed lastly by the research questions.

3.2 Methods and methodology

Due to the fact that the research topic revolves around an innovative system for older adults, a combination of qualitative and quantitative research methods are best suited for this study. In this case, the methods are a control test, semi-structured interviews, and data coding, which lend well to both the qualitative data of stories and people's acceptance and the quantitative data of level of participation.

3.2.1 Literature review

Before methods were chosen, a literature review was conducted in order to thoroughly understand the previous research regarding storytelling and older adults in this field. A clarification of the definition of three frequently used words helped to target this research. Effective research methods in previous research provided a broader view of the selection of methods in this research.

Through a comprehensive review of the literature, a clear understanding with respect to the existing knowledge of storytelling and older adults and the potential research issues was formed.

3.2.2 Sample strategy

A total number of 15 older adults living around Phoenix area (see table 3.1) were selected. They were recruited through snowball sampling ($M = 67.1$ $SD = 4.65$). They all have a basic knowledge of how to use email. They may use email on a daily basis or at least check their email box once a week. Email addresses were not just limited to Gmail; a mailbox from any email server in America was also considered valid and accepted.

3.2.3 Email storytelling system

In order to test the possibility of email storytelling system for older adults, a prototype was designed and built. This prototype enabled a group of people to discuss life topics sent by the system every week through email. In the part that follows, the design and rationale of this prototype is introduced. Then the sampling strategy and the operational mechanism are discussed in detail.

Table 3.1

Participants by age and gender

Age	Female	Male	All
60-64	4	1	5
65-69	1	4	5
70-75	3	2	5
All	8	7	15

3.2.3.1 Prototype design.

The central goals of this prototype were to empower people over 60 years old by providing a platform for them to share their life stories and perspectives on life in order to lead social services into the digital age by bridging traditional roundtable interaction and modern digital communication.

As a result, a storytelling prototype to serve this function was designed and built using the function of Google Groups. In order to discover the possible influential elements of the research, 15 older adults were divided into three groups namely Storytelling Group A, Storytelling Group B, and Storytelling Group C. Groups were created because of the positive effect of group process in the implementation of reminiscence program as compared to individual storytelling (Feinberg, 1996). In addition, participants who knew each other were not assigned to the same group because communicating with strangers is claimed to provide better quality of stories that would not be shared within their family and friends (Wright, 2000).

For the reliability of data collection, all the three groups used the same topics and started and ended at the same time. The only variable among three groups was the

frequency of sending emails because the frequency of storytelling groups was believed to have a significant effect on the level of participation and the quality of stories.

Participants were assigned to one of the groups according to their frequency of checking their email. The difference in the frequency of sending emails in Group A, B and C is listed below (see table 3.2). Table 3.3 displays the basic information of participants and their use of email as well as the group they are assigned to. (See table 3.3)

3.2.3.2 Operational mechanism

An invitation to participate in the research was first sent to the email address provided by each participant. A reply from each participant indicated the formal acceptance of the invitation.

The trial started after all invitations were accepted in all three groups. Three topics regarding various life topics were sent to each group by the researcher every week. A total of 12 topics were sent over four weeks. Researcher himself was assigned to all three groups for the convenience of data collection and monitoring. However, researcher was not allowed to post any reply or respond to any group members because that would destroyed group settings.

Table 3.2

Group difference in the frequency of sending emails

Group	Frequency	Number of emails each time	Day of week	Total
A	3 per week	1	M/Th/Sa	12
B	2 per week	1 or 2	M/F	12
C	1 per week	3	M	12

Note: Frequency indicates the frequency of send emails every week. Number of emails each time is the number of emails sent each time. For Group C, we send three emails on

time. For Group B, we send two emails one day and send one more emails another day. Day of the week indicated the actual sent out day during the week that is consistent throughout the trail. The total number of emails in three groups is the same.

When participants received the topics for any given week, they can reply directly to the topic with their answers. All the replies during the trial were sent to the entire group so that each one in the group had access to all of the stories and took part in the discussion. All responses were voluntary. Participants had the right to ignore any of the topics or replies from other group members if they were not interested (see figure 3.1).

Table 3.3

Participants and their current use of email by groups.

Name	Age	Gender	Email use	Email service
A1	62	F	Use email every day. Primarily for work.	Google
A2	65	M	Use email every day for work. Receive more than 100 mails per day. Reply emails on computer	Google
A3	60	F	Check email every two days.	Google
A4	64	F	Using smart phone to check and reply emails immediately after receiving an email	Google
A5	72	F	Check emails every three days. Primarily use email to communicate with friends and family.	AOL
B1	73	F	Use Gmail every day.	Google
B2	69	F	Go to senior center three times a week and use their computer to check emails.	Google
B3	66	M	Check emails irregularly.	Google
B4	70	F	Check emails at least once a week.	AOL
B5	72	M	Check emails everyday	Google
C1	75	M	Check emails on weekends. Don't use it often.	AOL

C2	68	M	Check emails on Monday. Don't use email often but will reply if receive one.	Google
C3	68	M	Check emails on weekends	Centurylink.
C4	61	M	Using smart phones. Reply immediately when receiving emails.	COX
C5	61	F	Use email everyday for work	Gmail

Note: The first column indicates the name code of participants. Their real names are concealed based on consent form signed before the research. For example, A1 mean the first participant in group A.

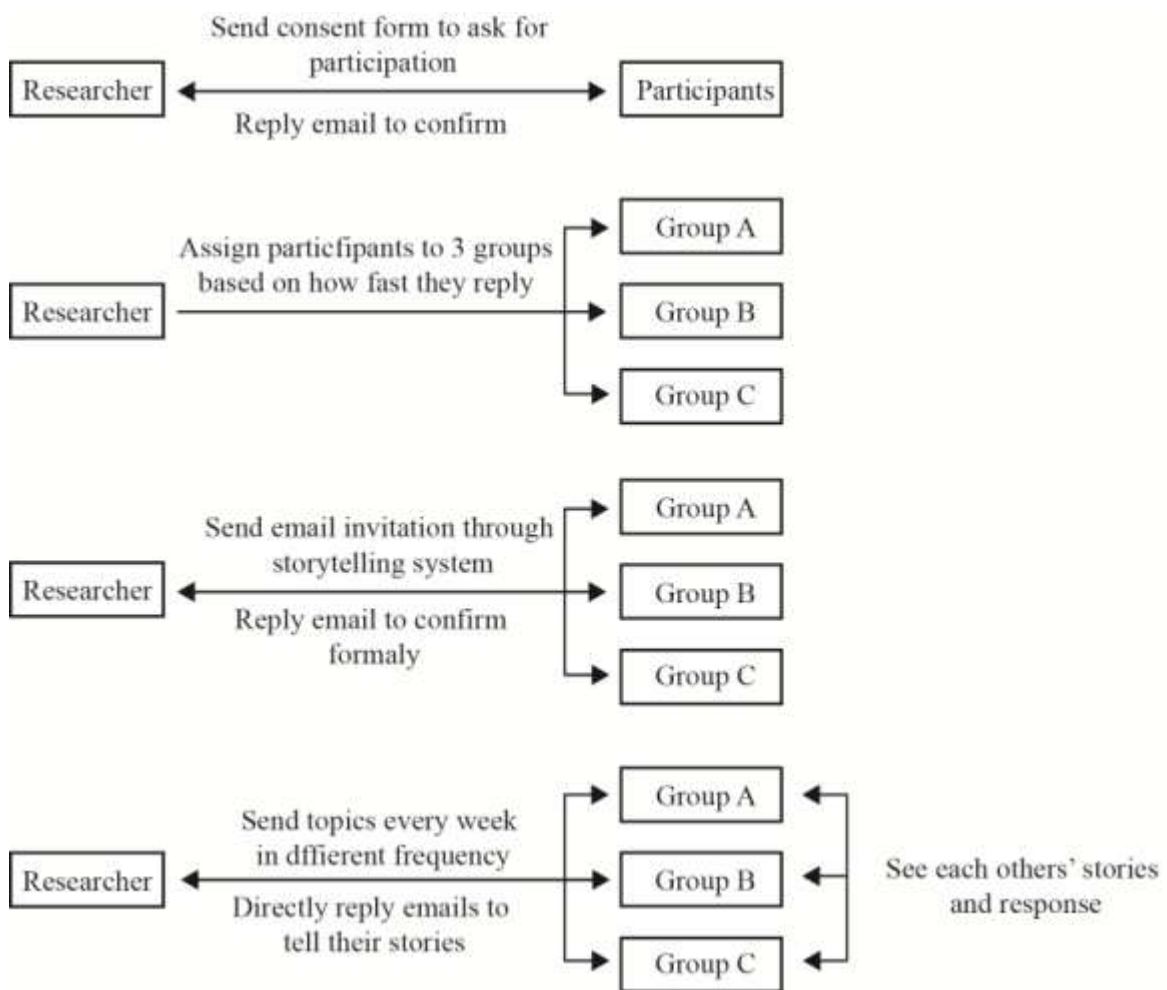


Figure 3.1 Operational mechanism of storytelling system.

3.2.3.3 Selection of topics to be posted in the trial

Literature of the topics and operation of life review or reminiscence is inadequate. Several reminiscence programs have been designed for older adult to identify the most effective topics that benefit older adults and facilitate the process of reminiscence. There were three main topics in the operation of reminiscence identified in previous research – a developmental time period, reflections on the present, and other reflections on the past (Chonody & Wang, 2013).

Consequently, 12 topics regarding four different life topics across the life span were generated (see Table 3.4). These topics are childhood, family, career and other life topics. Topics were classified into four categories in order to test which categories of topics may affect people's level of participation.

Table 3.4

Questions to be asked in the system.

Topics	Categories	Content
T1	Childhood	How did you rebel as a child?
T2	Others	Have you ever doubted your faith?
T3	Family	What was your mother like when you were a child?
T4	Others	Has a friend saved you literally or figuratively?
T5	Childhood	Did you have any nicknames as a child? How did you feel about them?
T6	Career	What is your first job and how did you get it?
T7	Family	Which family members do you wish you had kept in touch with better?
T8	Career	What was your worst boss like?
T9	Childhood	What were your favorite toys as a child?
T10	Career	What do you consider your greatest achievement?

T11	Others	What life experiences shaped who you are?
T12	Family	What is your best relationship advice?

Note: T1-T12 represent 12 topics. They are listed in chronological order.

3.2.3.4 Date of sending emails

Since the frequency of sending emails in different group is different (see Table 3.2), the same topics may not be sent on the same date. The actual dates of sending emails in all three groups are detailed in Table 3.4 (see table 3.5). The trial was conducted in December 2013 and lasted one month. All groups started at the same time. The first question was sent on December 02. Since the frequency of sending emails in these three groups was different, the last questions sent to them were different.

Table 3.5

Date of sending emails by groups and topics.

Topics	Group A	Group B	Group C
T1	12/02	12/02	12/02
T2	12/05	12/02	12/02
T3	12/07	12/06	12/02
T4	12/09	12/09	12/09
T5	12/12	12/09	12/09
T6	12/14	12/13	12/09
T7	12/17	12/17	12/17
T8	12/19	12/17	12/17
T9	12/21	12/20	12/17
T10	12/24	12/24	12/24
T11	12/26	12/24	12/24
T12	12/28	12/27	12/24

3.2.4 Follow up interviews

A follow-up interview with all the participants in the research was conducted in order to get a sense of the feedback from participants once they had used the system. Most interviews were conducted face-to-face with a recorder in order to archive the conversations.

A semi-structured interview method was used because it is believed to be a good way of generating rich data. The language used during interviews is considered essential in gaining more insight into the participants' perceptions and values (Longhurst, 2010). Interview questions contained their initial feedback toward the use of the system. Both open questions and selected questions were included in the interview. Interviews were conducted in January 2014.

3.2.5 Data analysis

Based on the method chosen in the previous sections, there were two types of data collected from the system.

The first type of data was the story collected from the four-week trial. Both qualitative and quantitative data was generated in this stage. Quantitative data included the total numbers of replies in three groups, the total number of words of replies in three groups, and the total number of replies in all twelve topics etc. The analysis of these data helped reveal the level of participation. The number of words was also included because short and poor answers were not considered to be a successful story. Qualitative data was derived from data coding of the stories. Content analysis was undertaken to analyze the

stories to ascertain what common themes were present. Getting a sense of how people tell their stories online and what is important in their life experience to participants is important information. To analyze the content, all stories and replies offered by the participants were first read as a whole in order to develop an overview of the content. Coded concepts were iteratively reviewed and related concepts were combined. These data helped gain a deeper insight of how people tell their stories in the system and how deep these stories were. The depth of stories can be another indicator of the feasibility of the system.

The second type of data was derived from follow-up interview on all participants after the trial. In this stage, qualitative data were collected from several open questions asked during interview. Quantitative data was collected from selected questions concerning the initial feedback of the operations of the system. All data collected in this stage helped discover people's acceptance of this new system and provide insight on the practical value of the system.

3.3 Research questions and rationale

Q1: How are stories told in an email storytelling system?

Since email-based storytelling system has never been discussed in most previous research (Chonody & Wang, 2013) the topics of stories in previous research were often generated by participants themselves. This research is different. It is trying to use certain topics to entice people to tell their stories. Consequently, it is important to know how stories are told in the system and which topics attract more participants or generate more replies.

Q2: To what extent do older adults accept email storytelling system?

This question is important to answer because this research must be an experiment with practical value. Some storytelling as part of previous research ended immediately after the research was completed. Such research did not have long-term benefits for older adults. This is usually due to older adults' immobility or inaccessibility of new technology (Debrew, 2009). On the contrary, this research is trying to look at the combination of email and storytelling, which helps remove the obstacle of technology and location for older adults. By interviewing older adults after they use this storytelling system and analyzing the content of the stories told during the process, more becomes known about how much older adults accept the new system and feasibility of building a continuous and long-term storytelling service. A high level of people's acceptance of the system indicates the higher feasibility of implementation.

Q3: What elements of email storytelling system will affect the level of participation and the quality of stories?

The rationale for this question is that email storytelling system is a new platform for storytelling. Previous research that focused on multi-media storytelling program examined how people use the system they built or how people use their current tool to tell their stories (Pfeil et al., 2009). But little is known about the important considerations when designing a storytelling system. However, design considerations are extremely important because it helps bridge the relationship between theory and practice. By considering this question, we begin to shed light on the basic design considerations of

online storytelling system that can be applied to future storytelling design project for older adults.

CHAPTER FOUR

RESULT OF DATA ANALYSIS

4.1 Introduction

A critical quantitative measure of success in terms of the feasibility of the system was the quantitative data collected in each group and for each topic. This chapter reviews three main results. It starts with a discussion on the result of data collection in the trial stage. These data help to develop a deeper understand of how this system works among older adults. A high level of participation indicates a high level of feasibility of building actual storytelling service to benefit older adults.

Next, data collected from follow-up interview are discussed in detail. These data consist of the initial feedback of participants after they used the system for four weeks. It includes both quantitative and qualitative data revealing people's acceptance of this new system. A high level of acceptance suggests the high feasibility of designing internet-based storytelling system.

At the same time, content analysis of stories told by older adults is conducted. Data coding was used to find patterns in their stories. This approach helps us better understand how people tell their stories online and how deep these stories are. It is also beneficial to designers or social workers who are going to develop an online-based storytelling system for older adults because these patterns help us get a good knowledge their habits.

4.2 Level of participation.

The first set of data referred to the level of participation of older adults. It can be measured by the total number of replies, total number of words, and the number of people who participate in discussion. What follows is a discussion of the evaluative criteria in detail. It begins with the differences by groups in the level of participation. This is achieved by the analysis of the quantitative data collected from the system on a group-by-group basis and by the level of participation result from different frequency of sending emails. These two factors are compared in detail. This is followed by an analysis of the differences between the twelve topics.

4.2.1 Group difference in the level of participation

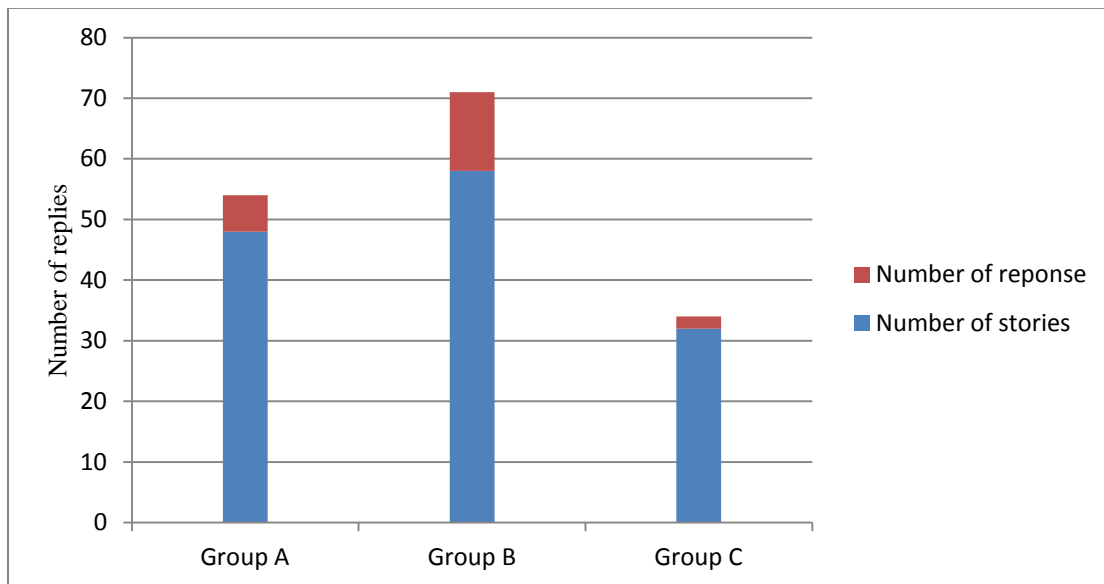


Figure 4.0 Number of replies by groups

The analysis begins by looking at the total number of replies in the three groups. Each group has five participants and twelve topics in total; therefore, the expected number of replies (every participant replies to each topic) is 60. The total number of

replies showcases the level of participation of each participant in the system (see figure 4.0). As shown in the figure, Group B has the most replies, which is greater than the expected number of replies of 60. Among the three groups, Group C has the least number of replies, which is almost half of Group B. Group A and Group C have a number lower than the expected 60 replies, which means there are topics that were not answered by every group member.

In addition, the number of replies includes the stories that were posted to each topic as well as the interaction between group members. As shown in the figure, both stories and mutual response in Group B are higher than the other two groups. Moreover, the percentage of interactions between group members in Group B is higher than the other two groups.

As mentioned in Chapter 3, the only variable in three groups is the frequency of sending topics. Group A were sent topics three times a week while Group C were sent only once a week. The data in figure 4.0 does not show a continued decline or rise in the number of replies along with the frequency. Frequency seems not to be the only one determinant in the high value of Group B, but a low frequency in Group C leads to the lowest number of replies. Topics are only sent to Group C once a week so that perhaps participants in Group C do not have a great feeling of involvement.

As mentioned above, not everyone answered every topic. Since all the answers are voluntary, if participant do not think they have much to say about one topic or they feel like the topic is too private and offensive, they are allowed to skip the topics they

choose. As a result, the number of active participants who participate in every topic will also affect the level of participation (see figure 4.1).

Five people were first assigned to each group. Only Group B maintained five participants throughout the process. Although the number dropped to four in the middle part of the trial as well as the last part, the group maintained five active people in nine of the 12 topics. As a result, all participants were involved in discussions for almost every topic.

For Group A and Group C, the total number of people taking part in discussions never reached five except Group A in T2. Group A retained four active participants for the most part of the research; Group C saw a greater reduction, from four at the beginning to only one active participant at the end.

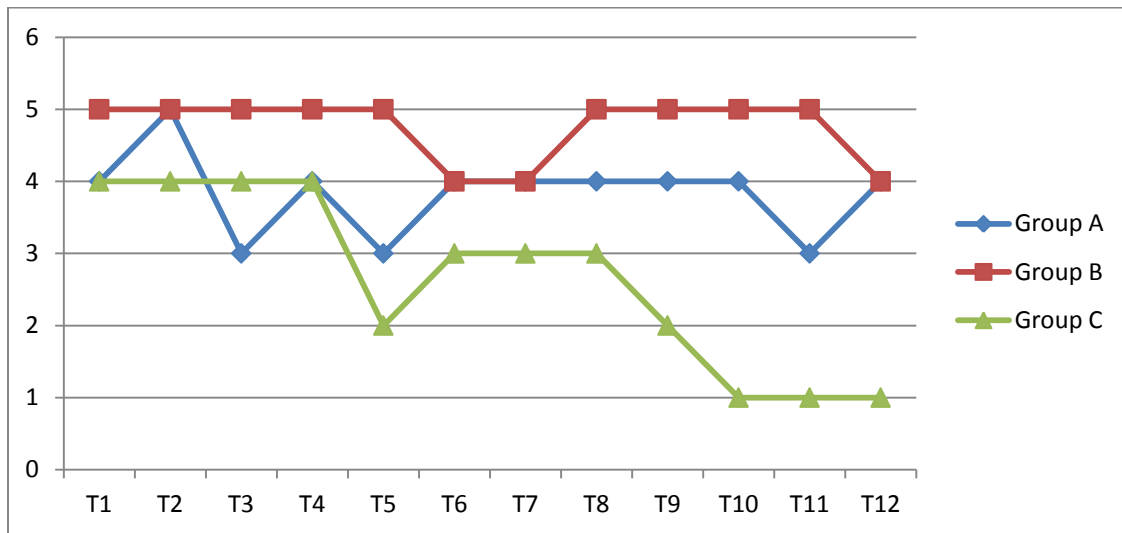


Figure 4.1 Number of people who participate in discussion

The different number of active participants in the three groups may help explain the reason why Group B had the most replies. For a group of five people, the absence of one participant can have a measurable impact. Each participant was sent a consent form

before the research began so that all of them knew that five people were part of each group and that at least five stories would be posted for each topic. When fewer stories were received as was imagined, they felt that the system did not work as expected. Their incentive to participate was not strong enough to keep them interested in using the system. Since Group B maintained five participants most of the time, members in Group B kept a higher level of participation.

In addition, more active participants provided them with a greater opportunity to find a person with which to communicate. When there were only two or three active participants in Group C, members of the group felt no obligation to keep a conversation going. But when all participants took part in the discussion like Group A, all of them had more choices to listen to other people's stories and they were more likely to find a person to interact with.

The total numbers of replies alone does not reveal the level of participation because some answers may be too short to make sense. Short answer may reflect people's unwillingness to participate. Consequently, an analysis of the data based on the length of replies was undertaken (see figure 4.2). The results are shown in the figure. Longer answers usually indicate thoughtful and intensive recall of memories. It is apparent in the figure that the quality of replies experiences a steady decline along with the drop in frequency.

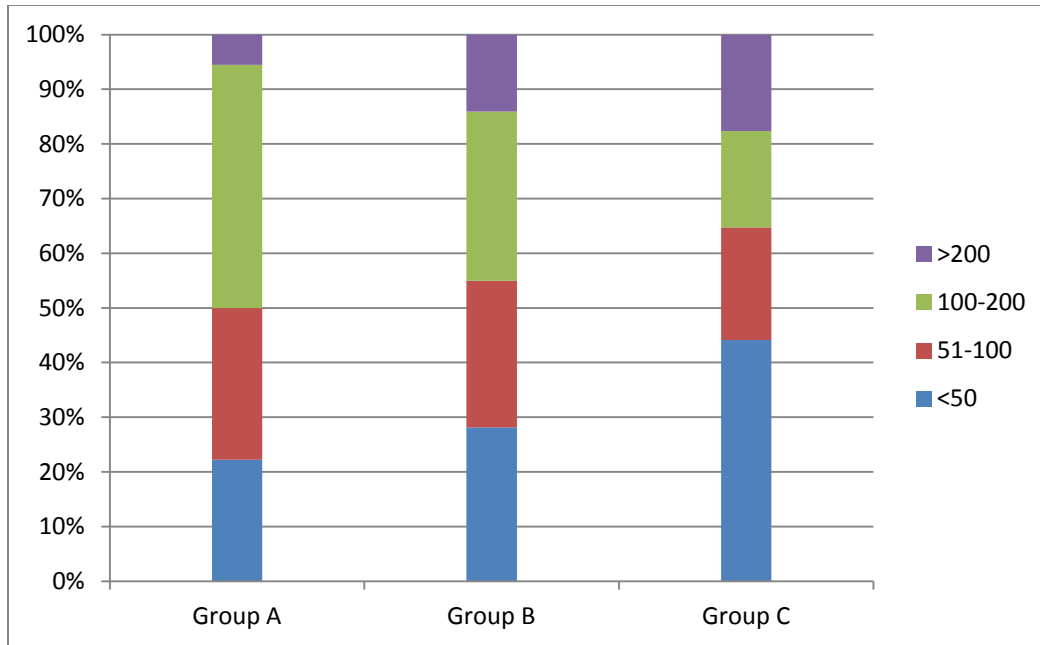


Figure 4.2 Percentage of length of answers by groups

Group A had more answers of high quality than the other two groups. Although Group C had more long answer (more than 300 words), it had almost half of the short answers (fewer than 50 words). Short answers usually contain simple greeting messages or thank-you notes, which cannot fully reflect a high-level of participation.

It is also worth pointing out that although Group B had the most replies according to figure 4.0, the quality of stories in this group is not as good as it is with Group A. That is to say, a high frequency will make participants feel that they are fully involved in the trial and that they are supposed to post their answers. Although the low frequency in Group C allows participant to have enough time to generate longer answers, it still caused the production of a large amount of short and invaluable replies.

It is possible that some participants only created long answers and some participants only created short answers. Consequently, it is worth tracking the behavior of

each user during the research to see if their personality affects the results (see Figure 4.3).

As shown in figure 4.3, there was no participant who always wrote long answers.

Participants in every group produce both long and short answers. For participants A2, A4, A5, B4, B5, C2 and C3, the number of short and long answers is nearly the same, which means no unique pattern about the relationship between participants and length of answers can be identified.

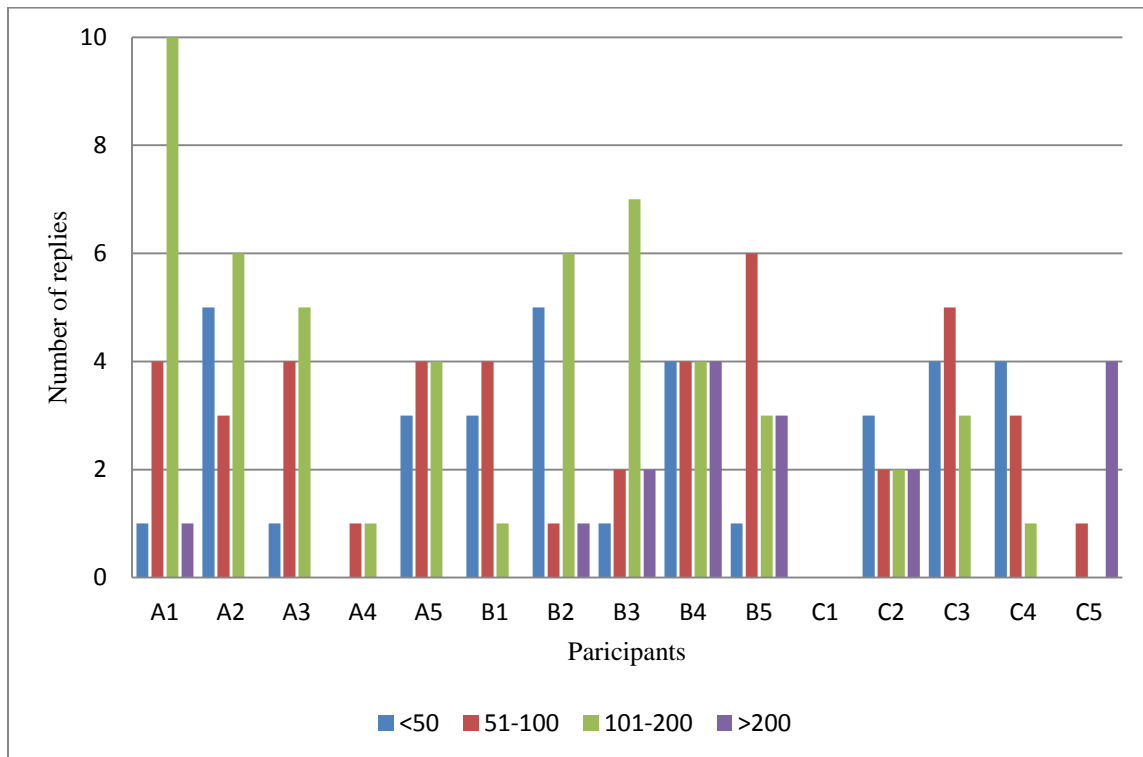


Figure 4.3 Percentage of length of answers by groups

4.2.2 Topics difference in the level of participation

Twelve topics regarding different life experience were sent out to participants during the trial. It is important to understand how different topics affect people's level of participation. Topics that generated better answers could be used for the design of future systems. To avoid any significant effect of frequency on length of replies, number of

replies, number of active participant, and data analysis in this section, we only need to look at the level of participation by topic. It is not important to look at topics individually because the data of one topic does not reflect the general situation. Moreover, the data from the topics are strongly affected by active participants, as discussed in the previous section.

Another reason for analyzing data by categories instead of single topics is that topics from the same categories are not listed in chronological order. Therefore, any time-based trend will not affect the reliability of data in this section.

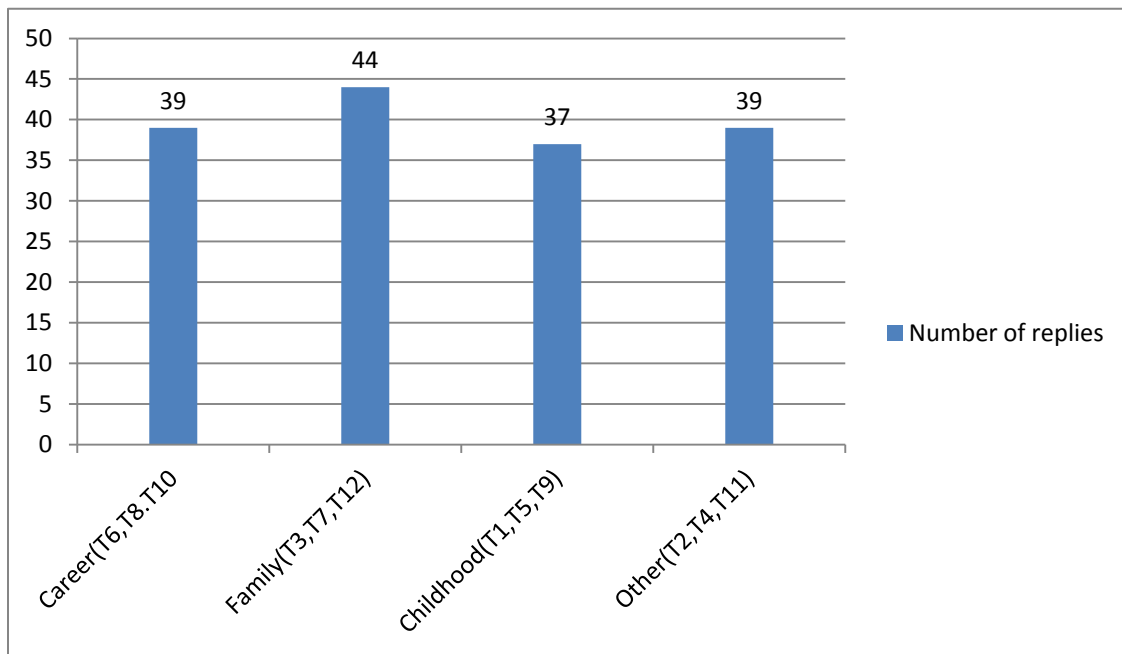


Figure 4.4 Number of replies by categories

Figure 4.4 shows the number of replies by categories. As shown in the figure, topics concerning family relationship have the most replies. These topics are T3: What was your Mother like when you were a child? T7: Which family members do you wish you had kept in touch with better? T12: What is your best relationship advice? Because

the age range of older adults in this research is from 60 to 75 years old, that most of them live with their spouses only, and that many of them have retired, they have more to say about family relationship because that is what they desire most.

Although this figure indicates the possible relationship between topics and level of participation, the difference between topics is relatively small. ($M = 39.75$; $SD = 2.98$). There was no evidence for any significant difference between different topics.

Similarly and because the number of replies alone cannot indicate the level of participation, the length of replies was also examined (see figure 4.5). The length of replies in career, family and others are almost the same. This result confirms that there is no significant difference in the topics (Figure 4.4).

In terms of number of active participants, Figure 4.6 shows that there is no significant difference among the four categories ($M = 33.75$; $SD = 1.70$). The number of active participants who discussed these topics is almost the same. This result means that topics are not a key factor that affects the level of participation (see Figure 4.6).

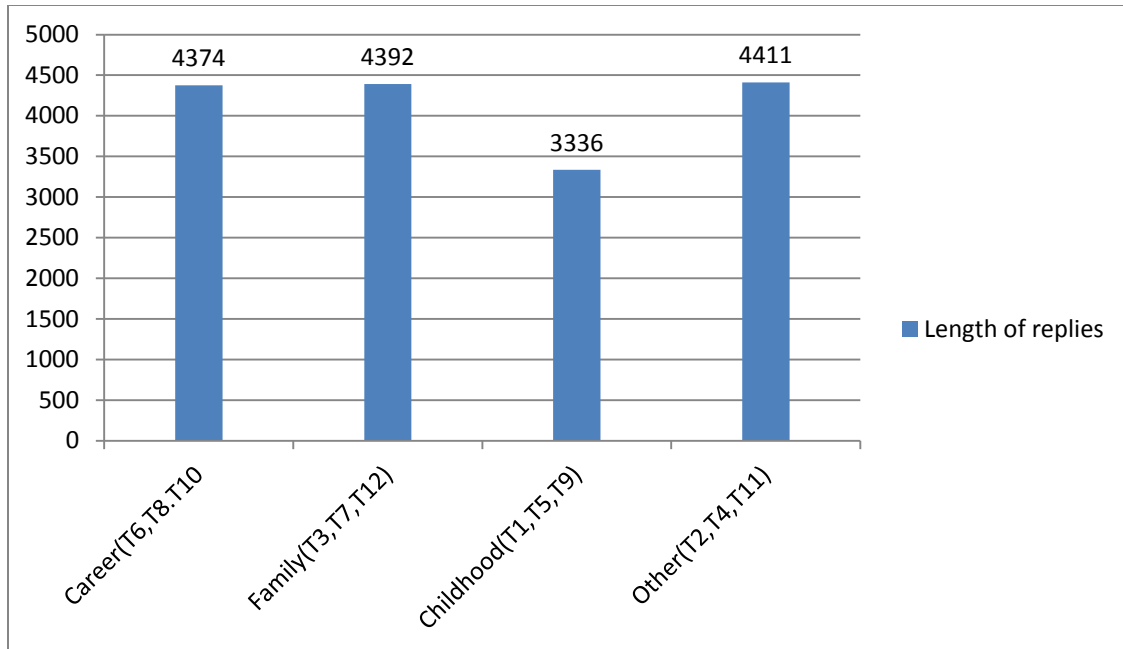


Figure 4.5 Length of replies by categories

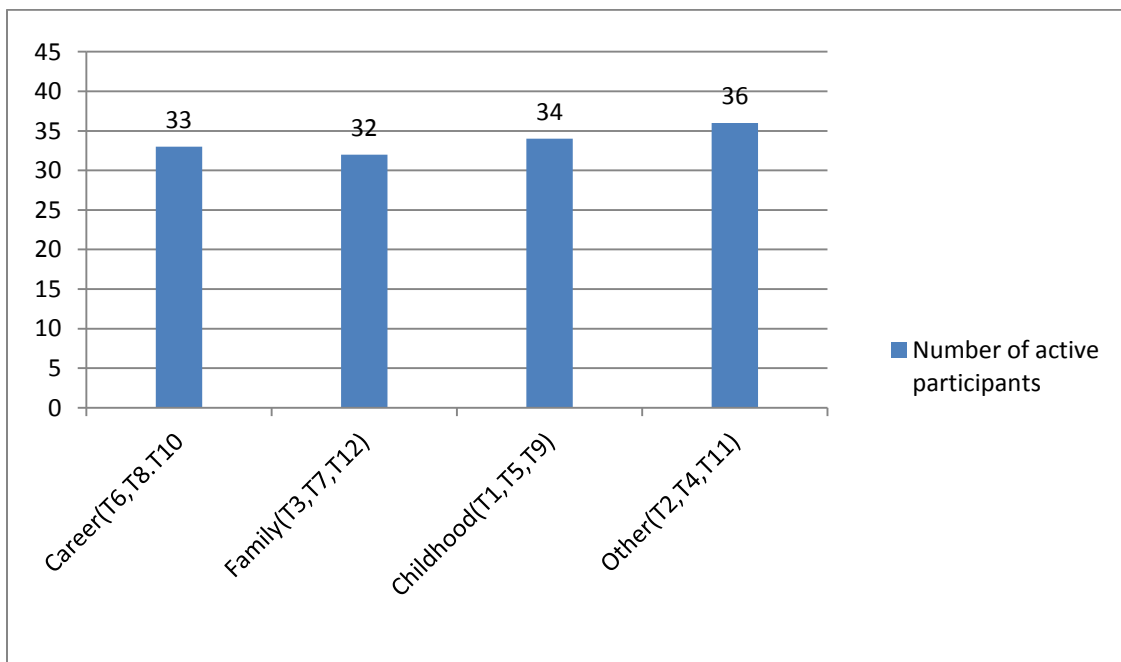


Figure 4.6 Number of active participants by categories.

4.3 People's acceptance of system

In this section, data collected from interviews are examined. These results help us develop an understanding of people's acceptance of the system as well as their feedback about using the storytelling system. The level of acceptance consists of four parts:

1. The usability of the system was examined based on how easily participant use the system.
2. Their perception of the system was discussed – How people understand the system and how they perceive the operational mechanism of it.
3. User's behavior regarding how people use this system when they receive topics was explored.
4. Their level of engagement of the system was analyzed. The level of involvement indicates how much people care about the system and how well they interact with the system and other group members.

These four parts collectively determine older adults' acceptance of the email storytelling system.

4.3.1 Usability of the system

Participants were asked to score how easy this system is to use on a scale from very easy to very difficult (Very Easy = 0; Very Difficult = 5). As shown in the difficulty rating scale in Figure 4.7, most participants reported that the email storytelling system was very easy to use. Since participants were selected based on their basic knowledge of computer and emails, they did not feel that there was a big difference between the use of email in this situation and in their personal life. The system was designed based on the

functions of Google groups, which enables online discussion and group emails without visiting external page. Everything can be done in regular emails interface; all that is needed is to click *reply*.

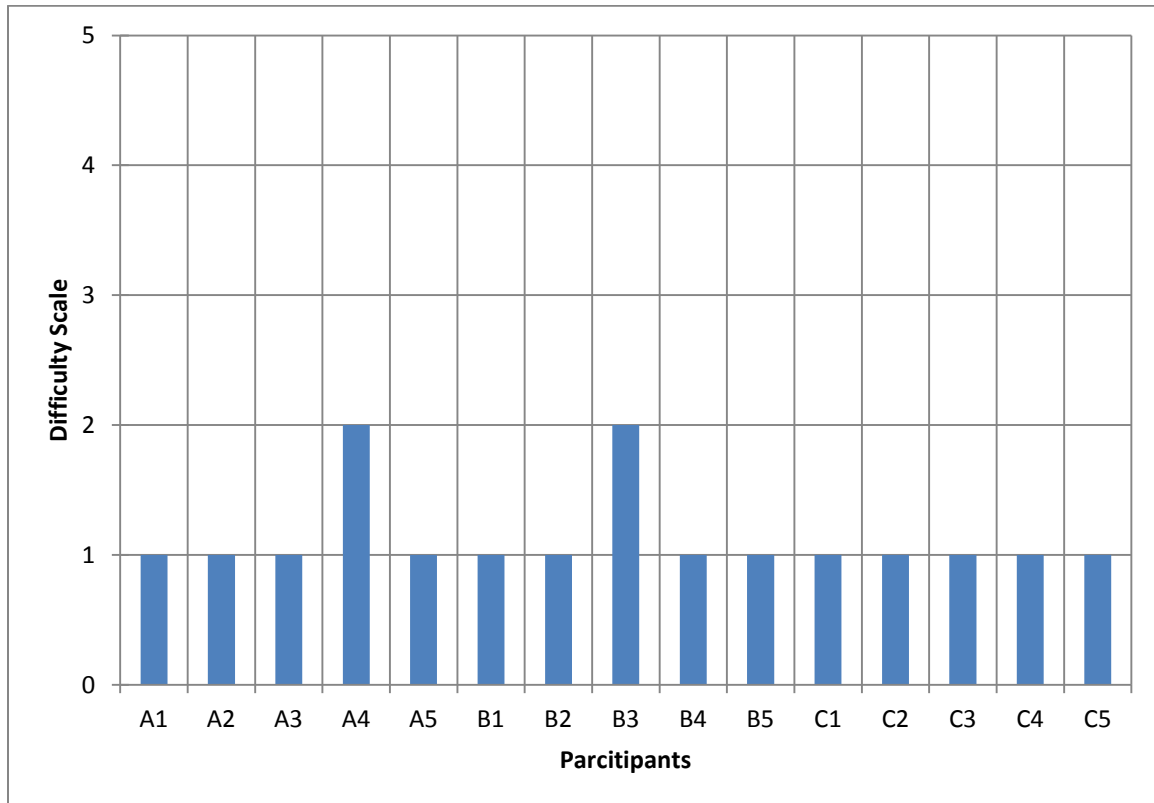


Figure 4.7 Difficulty Scale by participants.

Although the system was a new way of using emails, it did not appear to increase the cognitive load for older adults. Result in Figure 4.7 supported the fact the storytelling system based on email service enhanced older adults' opportunity to access the system and also raised their acceptance of this potential new service.

4.3.2 Perception of the system

First, people's thought on how this system attracts them and how these attractions affect them were discussed. Four key elements that may affect their acceptance were

listed in advance during the interview (see table 4.1). As shown in Table 4.1 topics that recall past memory were the most interesting part for most participants. Having someone to talk to was the least important. That is probably because of the fact that most older adults in this research were not experiencing social isolation. They have people to talk to; therefore, they have many opportunities to tell or share their stories with their friends.

Table 4.1

Attractions score of the system

	Interesting topics that recall past memory	Reading other people's stories	The feeling of sharing	Having someone to talk to
A1	4	3	2	1
A2	4	1	2	3
A3	4	2	3	1
A4	4	3	2	1
A5	4	3	2	1
B1	4	3	2	1
B2	4	2	3	1
B3	4	2	3	1
B4	3	4	2	1
B5	4	2	3	1
C1	4	3	2	1
C2	3	4	1	2
C3	3	4	2	1
C4	4	3	2	1
C5	4	2	3	1

Total	57	41	34	18
Percentage	38%	27%	23%	12%

Topics played a very important role (38%) in attracting the participants and in keeping them thinking about their life events over time. As mentioned by one participant, I didn't expect the questions to be so specific. I didn't really know what to expect because I like telling stories and I like talking a lot. I like telling people what I know and hearing people what they know (interview # B2).

As mentioned in section 4.2.2. The selection of topics does not significantly affect people's level of participation. In terms of people's acceptance of the system, topics become a key factor to affect the whole experience. However, it is not the topic itself but the feeling of thinking about the topic and the feeling of recalling memories that really attract people. One participant said,

The questions were very good, and it gave me an opportunity to maybe think about some things that you haven't thought about before. Maybe put some things and perspective on what is happen to you and your life and that type of things. I mean, that is the way I looked at it (interview # B4).

Similar explanation can also be found in another participants, "It's interesting to have a topic that maybe I had never thought about come to me and make me think in a new way or something."

These explanations confirmed the fact the topic itself is not that important in designing a storytelling system for older adults. People treasure the process of recalling and making them think about their life more than topics only.

Currently, all the topics were sent to the participants by the researcher. The selection of topics was also made by the researcher. Participants were asked about how they felt about posting topics themselves instead of by the researchers. It is more acceptable to receive a topic from a mediator and answer it than it is to think about a topic, perhaps being fearful that others will have nothing to say about it. Topics submitted by the researcher may help the participants to think of life topics that they have never thought about. In that way one stated that,

I think we all have great experiences just want to talk about this, so you just want to talk about that so when you have a outside mediator like yourself, then everybody has to think a little differently and uniformly. I think it is more creative that way (interview # A3).

Being able to post topics by themselves may also put participant under the risk of being offended. As one of the older adults said,

We can send you suggestions of topics and then you would see whether you would like those topics, but I would want you to be the one that filters around the topics in case that there is something a little bit not cautious. They might take offense or they might be too controversial. I wouldn't want to offend anybody (interview # B2).

The willingness of receiving topics passively as mentioned in the interview above indicates the importance of a level of control in the freedom of interaction.

When examining the differences between online storytelling and offline storytelling, people do not feel the pressure to have to answer a question and have to take

part in discussion like they do with face-to-face storytelling. One participant mentioned the face-to-face storytelling group she joined and stated that email storytelling is a lot more pleasant because you are not being judged by what you said. As a participant stated,

I think if you are doing it online, you are probably more open than if you are talking face to face. I think that would be true of me. You feel more free to get in details than if you just talking person to person (interview # B4).

At the same time, online storytelling give them more freedom to talk about their life without any concern. This was explained by one of the participants,

It's like meeting someone on the airplane and you don't think you will really see, you sometimes tend to be more open and honest may be not the best words, but you are open telling thing that you might not tell anybody else if you feel uncomfortable of they knew too much. If you are telling stories to someone you basically will never meet, you might be more revealing (interview # C5).

Being able to reply to stories online provides more time to think about the topic and to edit the content before sending. More thoughtful and deeper answers can be created through online storytelling compared to face-to-face storytelling. One participant stated,

I think being online gave me some time to kind of think about my response before I responded and I could edit it. So as I was typing, if something else came to my mind, or I decided to change direction of what I say, I can just delete and changed a little bit. But If I am in a group, it could be something just come out of my mind. (interview # B5)

Another element that older adults mentioned often was the dynamic of participants in one group. When participants were asked to describe this system to their friends, they usually mentioned the dynamic of the group first. There appeared to be fascination with how other people live their lives such as those people who experienced World War II and those who have traveled around the world. One participant described the system like this,

It was a variety of people, completely different backgrounds, we would never ever have known each other. If someone need to express some of your life experience, it would be good to be a part of it. I guess the people who were older have more to say but people who were younger really didn't have that much experience but it is interesting to exchange our life experience with totally different people (interview # B2).

4.3.3 User behavior

Participants were totally free to answer or skip any topic sent to them. They were also free to read other people's responses. But based on the data collected from the interviews, all participants read all the stories during the four-week trial. Although they might have replied to the topic earlier than anyone in the group, they would still check the stories that followed and that were posted by other participants. They enjoyed reading those stories and did not want to miss any of them. One participant described her way of using the system,

At first I responded directly to your question because I get up so early in the morning that some people hadn't respond yet. And then later on when I get a little

bit time, then I started reading people's stories. If I didn't have a chance to do that in the morning then other people have replied during the day then I started reading their emails. My situation would have been fifty fifty. I did it at the beginning, or I did it after I receive people emails (interview # A1).

In addition, reading other people's stories first also helped participants develop a better understanding of how these questions were answered and how they were going to answer these questions themselves. That is explained by one of the participants,

I don't check my email every day, so I think there were people who answered very quickly and so I did go see what they wrote just to get a feel of oh you know, how did they respond to this and what they might have similar to me. But I think I still effectively truthfully answered the question not based on what they said but my true feelings (interview # C2).

When the answer required much time to think over, participants did not reply to the topic immediately. They were pleased to read other people's stories first.

There are a few questions I answer immediately as soon as I read the questions, some of them like the questions about the important experience in my life. I want to think deeply about them so I waited to respond and then read everybody else's responses and then replied to them (interview # B3).

As mentioned in Figure 4.0 and although Group B had the most replies including both number of stories and number of response between team members, the interaction between participants only occupy a small part of all the replies. However, based on the interview answers about behavior, people were pleased to read the stories from each

group member. They regarded other people's stories as an inspiration for them and to think about their own life experience and how they dealt with the same situation. This kind of comparison helped them examine their past life experience and realize how wonderful their life have been.

4.3.4 People's involvement with the system

The first facet of people's involvement with the email storytelling system is privacy of information. The design of the email system uses the Internet. Consequently, participants do not know each other. Therefore, it is important to build rapport quickly. At the very beginning of the research, people felt somewhat apprehensive because they were sharing their life experiences with strangers. But trust was quickly established because of the type and depth of the stories. As mentioned by one participants,

At first it's kind of weird not knowing each other, but I think because questions and the way they were ordered maybe. They started off with easy questions but then they went very deep. And then later we got quite deeper questions and by that time, even though we hadn't seen each other, we all felt like we kind of safe (interview # B3).

Although this system is based on the Internet, it is only available for groups. Only group members and researchers have access to all the data. Participants agreed to keep the information private. In the interview, the privacy of information was discussed as was the idea of posting information on the Internet. Participants were afraid of information overload if everything was exposed to public. One of them said,

I don't belong to Facebook because I am very concerned about all the horrible stories I hear about people picking things out from that and I like the privacy of this. I don't like being that exposed so I would probably want it to be. It can get too big. You will get too many opinion and two many stories (interview # A1).

Another concern about making the storytelling group public was the loss of the feeling of interaction if stories are posted on a blog or a social network website.

Storytelling in group settings builds a private and comfortable environment in which to share life experiences. Too much exposed to public will reduce the level of participation of older adults. One participant said,

That gets less comfortable to me, because at least in the smaller group you feel like you are interacting but if you just put them out kind of like Facebook I am not. I don't like putting lot general stories out there. I do have concern about this (interview # C5).

The second part of people's involvement of the email storytelling system the relationship built between group members. People enjoyed communicating with their group members and reading their life stories. Although they did not know each other, a virtual relationship between team members was built. One participant said,

I would love to keep in touch with one person in my group. I really enjoy the way he wrote and describe his life and I actually responded to something to him and he responded back and he said That really made me laugh I really need that. I feel like I almost knew him just because the way he spoke and the tenderness he has in the storytelling (interview # A1).

However, the relationship built online is still a “weak tie”; none of the participants wanted to develop the relationship further. Since the relationship was built online, it made them feel more comfortable to keep this relationship online. Participants did not have a strong desire to change the online relationship into a face-to-face relationship in person. As one participant said,

That’s always fun to meet someone eventually. My job is talking to people all over the United States. A lot of them I never met so I have the relationship with all these people just through phone contact. And it’s fun to meet somebody. That doesn’t necessarily always happen. So I would be happy just keeping an email communication going with him (interview # A1).

At the same time, people enjoyed sharing their stories with strangers more than with their close friends and family members. To some degree, this was because some it was not considered appropriate to have private stories or life experience known by people of intimate relationship. More details were shared with strangers because they had never met each other. One participant said,

It was fine; it was much better than somebody that I know because the people I know, I already know most of the things about them. So it’s fun to be in a group of strangers to learn about other people. And that you might hold back a little bit if it was friends or people you already know. If it’s strangers, you figure oh I’m not going to see them again, so I will just share everything you know. But I can see where a person may have some reservation about sharing some details; you may not be that open (interview # B4).

A similar statement was also made by another participants,

I figure that because it was a little bit anonymous, maybe we feel like we can share things that were personal maybe we won't share with friends. Because we will never meet those people and they don't know who I am (interview # B3).

Based on the analysis above, people preferred to be involved with strangers in the storytelling program instead of close friends because they believed that an online environment made them open to tell details of their life without being judged. The email storytelling system enabled them to let down their guard and to talk more actively and freely.

4.4 Content analysis of stories

In this section, the content of the stories and the responses collected from the system are examined. A total number of 159 stories were collected during the four-week trial. Short answers of less than 50 words were not considered in the data analysis because most of them were simple thank-you notes in response to other participants' replies. Content analysis was used to analyze the narratives of 112 stories including 41 stories from 51 to 100 words, 52 stories from 101 to 200 words, and 19 stories of more than 200 words (see table 4.2).

As shown in table 3.4, all 12 topics belong to four categories: childhood; family; career; and others. The dynamic of the topics and the content creates a challenge when collectively examining the stories and coding the data. As a result, themes and subthemes generated from stories by categories were examined. In the following section, childhood

related stories, family related stories, career related stories, and other stories were analyzed separately. Different themes and subthemes were identified accordingly.

Table 4.2

Length of replies by groups.

	Group A	Group B	Group C	Total
<50	12	20	15	47
51-100	15	19	7	41
101-200	24	22	6	52
>200	3	10	6	19
Total	54	71	34	159

4.3.1 Childhood related content analysis

There were three topics related to their life experience when they were children. The following tables provide the themes, subthemes and selected quote for each question. Topic 1: How did you rebel as a child (see table 4.3); T5: Did you have a nickname as a child and how did you feel about them (see table 4.4); and T9: What were your favorite toys as a child (see table 4.5).

Table 4.3

T1 How did you rebel as a child.

Themes	Subthemes	Quote
Family environment	Parental education	I grew up with parents that were 40 years older than me, and in the 50's, we were taught to respect our elders.

	Family Composition	I wasn't much of a rebel as a child, I am from a large family and was 4 th from the youngest of 11 children.
Neighborhood	Innocent and safe area	Growing up in a suburban, gated community on the beach, it was very safe and I could ride my bike around the neighborhood.
Avoid rebel	Please my family	I was in fear of hurting my parents (People I pleased)
	Internalize	I just internalized any anger or disagreement I might have with my parents or others.
Rebel as a child	Conceal the fact	I used to rebel by hiding my bad homework assignments under furniture and shredding it before flushing it down the toilet.
	Theft	The one I recall is stealing my parent's cigarettes and crawling under the house

Note: Names of all individuals have been changed to protect the anonymity of the participants.

Table 4.4

T5 Did you have a nickname as a child and how did you feel about them

Themes	Subthemes	Quote
Privacy of nickname	Known by intimate relationship	Whenever I hear Bun, I know it is family or family friends.
Divers source of nicknames	Endearment by family	My mother still calls me by my nickname "Pudgy." She says it with love.
	By accidents	She had a Canadian accent that made the

Insult

word sound like “tor”

I have the nickname my brother gave to me. It was “Fats” or “Fatso”. I wasn’t even fat!

Note: Names of all individuals have been changed to protect the anonymity of the participants.

Table 4.5

T9 What were your favorite toys as a child

Themes	Subthemes	Quote
Be eager for freedom	Play outside	Growing up in Iowa the kids played all sports outside
	Transportation toys.	My most favorite toy was a Lionel Train set that took up a whole Ping Pong table in our basement.
Pretend to be grown up	Dress and act as an adult	My favorite playing activity was to dress up in my mother and older sister’s clothes and shoes along with two sisters and two cousins who lived nearby.

Note: Names of all individuals, have been changed to protect the anonymity of the participants

Most older adults did not rebel at all. The reason for most of them was that they were taught to please parents and no one would like to break the rules. And they felt grateful for this “They were mindful and obedient and I wanted to please my family.” In terms of their nicknames, some of them blamed their friends for giving them an insulting nicknames but the way they told the stories is peaceful and illustrated a wealth of emotion. “I have always loved my mother’s knack for weird nicknames though.” When

they talked about toys, they were more likely to describe the environment of playing with toys. Some of them described in great details “My doll came dressed in a pretty frilly dress with white strap-on shoes.”

4.3.2 Family related content analysis

Three topics related to their family were sent to participants. The following tables provide the themes, subthemes and selected quotes for each question. T3: What was your mother like when you were a child (see table 4.6); T7: Which family member do you wish you had kept in touch with better (see table 4.7); and T12: What is your best relationship advice (see table 4.8).

Table 4.6

T3 What was your mother like when you were a child?

Themes	Subthemes	Quote
Being grateful	Dedication	By the time I was up and functioning in the morning, she had already left for work. She gave up everything for me.
	Impact on me	She was brave, smart and honest. She prepared me well for life.
Being regretful	Miss	I had the chance to take care of her for the last two years of her life. She passed in March 2013 at the age of 91. Boy! Do I miss you, ma!

Note: Names of all individuals have been changed to protect the anonymity of the participants.

Table 4.7

T7 Which family member do you wish you had kept in touch with better.

Themes	Subthemes	Quote
Hope to learn more	Life stories	They all grew up in such a different time and have great stories about childhood and what relationship and our country was like then.
	Personality	I want to be like her and if I kept in better touch maybe I could have learned more about how to go through life with joy and faith even in difficult times.
Effort to maintain relationship	Maintain long distance relationship	My mother and I started sending “living” letters – i.e. 60-minute tapes.
Impact on the present	Treasure relationship	These days, now that I am semi-retired, I try to keep in better touch with those who are still living.
	Tell stories now	The real answer is that we all should write down – an ethical will – in which we talk about our lives, how we became the person we are and what influenced us.

Note: Names of all individuals have been changed to protect the anonymity of the participants.

Table 4.8

T12 What is your best relationship advice

Themes	Subthemes	Quote
Avoid bad relationship	Share the same lifestyle	It is important to hope that you have areas in common, you think the same way in handling bills, finances, travel and other forms of enjoyment.
Build strong	Listen	So often, we don’t open our minds to

relationship

listen to others.

No considerations of
gain and loss

Don't complicate things by thinking
someone owes you something; you owe
them something.

Note: Names of all individuals have been changed to protect the anonymity of the participants.

When participants talked about their mother, a majority of them mentioned how grateful they were for their mother. Detailed description of how their mother brought them up can be found in most stories. Although most of their mothers have passed away, participants expressed how much they missed their mothers in a more peaceful way with no depression and agony.

The person whom they wanted to be more in touch with varied: from siblings, parents and cousins. In most cases, the reason for not being in touch is distance. But some participants attempted to maintain or rebuild relationships because of distance. In addition, the regrets they had helped them treasure their current relationships even more from which they learned how to tell their stories in their way. One stated that "I am beginning to write down thing for my son and his three children about my family so they have more of their ancestry on record."

A majority of participants focused on relationship advice between husband and wife. Their answers tended to be short with a few bullet points. Some of them experienced divorce or betrayal. Nevertheless, they had a clear vision of what happened and were willing to share their failures with other participants.

4.3.3 Career related content analysis

There were three topics related to career. The following tables provide the themes, subthemes and selected quotes for each question. T6: What is your first job and how did you get it? (see table 4.9); and T8: What was your worst boss like? (see table 4.10); T10: What do you consider your greatest achievement? (see table 4.11).

Table 4.9

T6 What is your first job and how did you get it

Themes	Subthemes	Quote
Get job easily	Neighborhood	It was really more of a family compound than a working farm and several of my relatives and their children also lived there.
	Inherit from family	I actually inherited this job. My older sister had the job, then my older sister, then me.
Treasure the opportunity	Being obedient	At 14, I was asked to wake up at 4:30 to pick up papers and run our route by 7am. Rain, snow, ice – it didn't matter.
	Impact on the future	I gained some wonderful work experience that served me well in my long career in the business world.

Note: Names of all individuals have been changed to protect the anonymity of the participants.

Table 4.10

T8 What was your worst boss like?

Themes	Subthemes	Quote
--------	-----------	-------

Complaints about boss	Controllor	My worst boss was a total controllor and would not allow me to do the job my way.
	Lack of work ethic	The reason he was so good at his job was he lied to clients about the product they were purchasing and he's a very smooth talker.
Dealing with the issue	Get used to it	I formed the habit of having a piece of paper on my desk with writing on it, and a pencil or pen in my hand.
	Being Critical	While his instability and lack of work ethic bother me, I know it is really not much to complain about.
	Resign	I picked up my purse and told him I would be leaving because no one deserves to be spoken to that harshly.

Note: Names of all individuals have been changed to protect the anonymity of the participants.

Table 4.11

T10 What do you consider your greatest achievement.

Themes	Subthemes	Quote
Self-pursuit	Career	Having a job in the golf industry and I loved, and still do love the game was a great achievement.
	Academic	Going back to school in one's 60's is the best thing that you can do to expand your life's achievements.
Take the responsibility	Raise children	I know it sounds cliché but raising my one and only child to be a good man is my

	greatest achievement.
Care for people	I have been able to support and encourage students from all over the world.

Note: Names of all individuals have been changed to protect the anonymity of the participants.

In terms of their first job, no one obtained it by way of a formal process. Most were recommended by their family or friends. Moreover and for most of them, income was quite important in their first job. Many of them still remember their salary clearly.

When people talked about their worst boss they did not only center on the complaints about their profession; some of them also devoted a large number of words writing about their poor fashion sense or bad living habits. They clearly remembered details such as what they usually wore or how they reacted. One talked about her decision to leave the company “It was really the fact that her black feather plumed hat had become stuck to the wall that was covered in glue diggings.”

All answers of their greatest achievement were related to love and passion. Greatest achievements are things that they love and care for in their lifetime. Many of the achievements began with a simple decision they had made. The personality that enables them to make decisions helps them continue their pursuit until today.

4.3.4 Other content analysis

There were three topics sent to participants that related to other aspects of life stories. The following tables provide the themes, subthemes and selected quotes for each question. T4: Has a friend saved you literally or figuratively? (see table 4.12); T11: What life experience shaped who you are? (see table 4.13); and T2: Have you ever doubt your faith? (see table 4.14).

Table 4.12

T4 Has a friend saved you literally or figuratively?

Themes	Subthemes	Quote
Emotionally Support	Deep depression	I had been spiritually dead after my mother died of cancer.
	Courage in tough time	My friends patiently listened to me and encouraged me through this time.
Religious support	Meeting God	It was God who brought me out of that time.
Literally save	Death	A friend of mine saved me from food poisoning in 1997 over the phone.
Continued effect	Benefit whole life	I have used this powerful directive many times throughout my life in facing difficult situations.

Note: Names of all individuals have been changed to protect the anonymity of the participants.

Table 4.13

T11 What life experience shaped who you are

Themes	Subthemes	Quote
Belief	Meet God	I learned about God and Jesus and how Jesus would forgive and rescue me from the punishment I deserved for not loving God and others as such as I loved myself.
Change of environment	Move	When I moved to the USA from England life was very difficult with my two children.
	Travelling	My first experience travelling overseas

Family influence	Divorce	opened my eyes to new experiences, the adventure of travelling, and taught me so much about people and myself.
	Parental	My parents got a divorce when I was 10, and it was pretty damaging to lots of people from both sides of my parents' family, certainly to my sister and myself. I know my family was a big part of shaping me into who I am

Note: Names of all individuals have been changed to protect the anonymity of the participants.

Table 4.14

T2 Have you ever doubted your faith

Themes	Subthemes	Quote
Loyalty	Family education	I was raised in a strict Catholic home and I didn't question the authority or correctness of my faith.
Struggle with doubt	Internalize	I drew an imaginary line and proclaimed, "There is the end of space," And Then I cried. "What's on the other side?" I no longer challenge this faith

Note: Names of all individuals have been changed to protect the anonymity of the participants.

When participants talked about their friends who saved them, a majority focused on figurative support including encouraging them during difficult times and aiding them during their depression. What they learned from these difficult situations became their philosophy of life eventually.

Answers about the life experience that shaped who they are tended to focus the life events that influence them continuously. These influencing factors determined their personality, their vision, and the way of doing things. One participant said “Before this I was a very shy kid but being out on my own forced me to break out of that shell very very quickly.”

Most people did not have any experience of doubting their faith because they grew up in a Christian family. A few people challenged their faith at some point in their life but they were proven wrong.

CHAPTER FIVE

DISCUSSION AND CONCLUSION

5.1 Introduction

This section discusses the results of the data analysis and the explanations of the research questions. It first identifies the key elements that may significantly influence the level of participation of storytelling system. Both object and subject factors are examined according to the result of data analysis. The evaluation of how much people accept and become involved with the innovative way of storytelling is explained next. It is believed that people's acceptance of the system may affect the feasibility of developing a real email based storytelling service. This is followed by the design considerations of the development of email storytelling system for older adults. Last, potential research topics for further exploration and the limitations of this research are introduced.

5.2 Level of participation

In this research, the level of participation was measured using primarily three elements: the number of replies, the length of answers, and the number of active participants. Two key factors are believed to affect the level of participation – frequency of reminiscence trigger and the number of active participants.

5.2.1 Frequency and the level of participation

Overall, frequency of reminiscence trigger has a profound effect on the level of participation. According to the result of the data analysis, a higher frequency of reminiscence will lead to a higher level of participation. The least frequent reminiscence trigger in Group C, which was once a week, made participants feel that they were not

involved in the program because topics were sent once altogether with no other emails from researcher sent after that. At the same time, Group A and Group C, which had more frequent reminiscence triggers, produced more stories and responses of good quality. The number of people who continued participating in the discussion until the end of the trial in Groups A and B was higher than Group C.

However, the level of participation did not decline along with the decrease of frequency. The unexpected result of the highest number of replies in Group B implied that frequency was not the only determinant of the level of participation. One explanation of this is that the number of active participants also influences the level of participation but on a smaller scale. As we can see in the result of data analysis, Group B is the only group that has all participants joining the discussion over the duration of the trial. This increased the chances for other group members to find interesting people and stories they were willing to interact with. Since this research was conducted in a group of five, any change in the number of participants mattered greatly. Every participant knew that at least five stories about the same topics were expected. If the stories they received were not the same as they expected, which means there were people who didn't provide answers every time, their initiative to post their answers declined. However, the number of active participants is not the strongest factor that can affect the level of participation compared with the frequency of reminiscence trigger.

It is also worth noting the correlation between the length of answers and frequency. Although Group B had the most replies and active participants, the percentage of answers of good quality (i.e. length of answers is more than 100 words) in Group A is

greater than Group B and C. It actually followed the trend of the decline of frequency. When reminiscence triggers were sent more frequently, they would provide better answers. However, as shown in the data analysis, Group C not only has short and poor answers but it also has very long answers. Less frequent reminiscence trigger allowed older adults to create longer answers but the negative effects that low frequent reminiscence has on the number of active participants is much stronger than it is for the length of answers. Although the percentage of long answers in Group C is high, it still contains quite a few short answers due to the low frequency.

5.2.2 Topics and the level of participation

The second expected factor to affect the level of participation is the categories of topics. There may be some specific topics in which participants have more to say. But based on the result of data analysis, no pattern was founded in the correlation of topics and level of participation. Although these topics fitted in family related topics, childhood related issues, career related topics and other life topics, the difference between number of replies, length of answer, number of active participates in various topics is not obvious. The implication of the result is that people have sufficient content to address each category. All participants in this research are over 60 years old; they all have a great deal of life experience, which enables them to talk about most topics.

5.3 People's acceptance of the system

Overall, people's level of acceptances of this new email based system is high. They enjoyed sharing their stories and reading other people's stories on the email platform.

5.3.1 Email and accessibility

No participants reported difficulties in using this system. Although this is a new system that combines the use of email and storytelling system, older adults became used to it quickly. No problems related to the accessibility of technology were found. The reason for this can be clearly explained. We did not introduce any new technology to older adults as was done with many previous researches. Instead, participants were able to use their own email to share and read stories. They were already familiar with the interface and the manipulation of an email service because most of them used email on a daily base. They were also recruited based on having a basic knowledge of email. The use of email as a storytelling platform in this research reduces the cognitive load that new storytelling technology may bring to older adults.

In addition, the use of email as a tool to share their stories respects their daily habits. There is no need to change their biological clock to participate in the storytelling program. Many previous face-to-face storytelling systems needed to be conducted at a certain time and place every week. To some degree, such systems did not provide enough freedom to tell their stories whenever and wherever they wanted. However, email is a routine activity for all participants in this research. They do not need to adjust their schedule to adapt to it, which contributes to the high accessibility of an email-based storytelling system.

Furthermore, the use of email enables the participants to edit before their stories so that they can review and make certain that their stories are interesting.

5.3.2 Core value of the system

For older adults, the most attractive part in the email storytelling system is the interesting topics that recall past memory. It seems that this conclusion is in conflict with the previous statement that topics are not key factors that affect the level of participation. Why did certain topics attract the participants most this time? The explanation is that these topics are all very specific and related to personal life experience. What participants really enjoyed was the time they spent on thinking about the topics. The process of memory recall was the key attraction of this email storytelling program.

Although the level of participation varied among the three groups, participants all express joy in taking part in the research. This factor indicates that people's acceptance of the system does not depend solely on the level of participation. In other words, slightly lower level of participation in Group A does not mean that it is less successful than Group B. The core value of the email storytelling system is the process of retrieving memories. Whether or not participants interact with others is not an important factor with which to gauge the success of a system. This system benefit older adults as long as they take time to think about the topics.

It is worth pointing out that the least significant part in the system is having someone to communicate with. The reason for this is that the participants in the research are not experiencing social isolation. Some of them have jobs and some of them have abundant activities. They have people to talk to and they opportunities to share their stories. They probably do not need an email storytelling system to assist them in communicating with the world.

5.3.4 Building relationship with strangers

Although the research lasted only four weeks and only 12 topics were discussed totally, participants were deeply involved in the system. Trust and relationship was built through the email storytelling system.

First, participants not knowing each other did not prevent participation and acceptance of the system. On the contrary, participants treasured the feeling of sharing their stories with strangers. They preferred talking about their personal experiences with strangers more than with close friends because they did not want to be judged. By talking to a group of strangers, people tended to be more open and provide more details.

Second, this relationship that was developed could be continued. Many of participants reported the intention of keeping in touch with some of their group members. But they did not want to develop the relationship any further. Participants wanted to keep their communication online forever. They were not willing to meet any of their group's members in person. The relationship built through storytelling system remained a weak tie.

5.3.5 Content of stories

Overall, the stories collected from the system along with the themes and subthemes overwhelmingly reflect the depth of thinking by participants. Most of the answers were thoughtful and revealing. They were not generated in a casual way. As shown in the content analysis, each topic had a variety of answers. Each answer reflected the unique background and personality of the participant. Although some participants had very short answers, these were in the minority. The depth of these answers indicated that

older adults took time to think about each topic and carefully examined their life experience that related to the topic. The process that older adults undertook illustrated the wealth of emotions, deliberation, joy and difficulties that they experienced over time.

Moreover, it demonstrated that storytelling program like this one helped them recall their memories; it could have a profound effect on their own introspection.

Although some topics were asking about experience that negatively affected their attitude and personality, the words they used to describe the situation were mindful and eloquent. They were grateful for everything that has happened in their lives and tried to live life to the fullest during every stage of life. It revealed the fact that by recalling and sharing their life stories, they have the potential to make peace with themselves, enjoy their life, and age successfully.

Although these topics were sent to participants and all of them knew that it was a part of a research, they did not treat it as a task that they had to perform. This research would be of no value if participants thought they were being forced to tell their stories and to share their life experience.

5.4 Design implications

Although email storytelling program are not new, the manner in which they are structured and delivered can be constantly revamped to reflect current opportunities. This type of program can be duplicated in many settings. As a result, it is important to point out the key design considerations for further development of internet-based system for older adults. Designers, researcher and practitioner in gerontology can build better Internet-based storytelling system for older adults by being aware of these implications.

The building of an Internet storytelling system must be based on the existing Internet knowledge of older adults. This research has repeatedly emphasized the significance of building a storytelling system without utilizing new technology. On the one hand, the curiosity of older adults for learning new skills is not as high as it is with the younger generation. On the other, it is important that older adults tell their stories in a more natural way. Existing technology not only solves the problem of inaccessibility of new technology or website but also addresses the issues that many face-to-face or Internet-based storytelling programs have when the research ends. The reason is obvious: older adults will not continue using the new ways of storytelling system because no one will continue the activity and no one will introduce and force them to try a new technology or website. The email service used in this research is more likely to be applied in practice because email is the most common Internet access for older adults. Some of them use it daily.

Another implication is the frequency of reminiscence trigger. It has a profound effect on a storytelling system. The more frequent the reminiscence trigger is, the more likely participants are to take part in the discussion. But a high frequency will not guarantee longer answers because it does not allow enough time for people to generate long answers. If more long answers are expected, people can reduce the frequency slightly to provide enough time for older adults to respond. However, a decrease of frequency may result in lower level of participation, which is not desired obviously.

Yet another implication is the selection of topics. It needs to be considered carefully. Although the selection of topics does not affect the level of participation and

rich life experience enables older adults to talk about any topic related to their life stories, it is important to make sure that topics are stated as specific as possible.

Privacy of information is another important implication for any storytelling group. Knowing that these stories are only accessible to members within a group may increase their motivation of participation. Participants feel more secure telling their stories to strangers if there is an expectation of privacy. In addition, an intimate group keeps the feeling of interaction while public conversation may cause information explosion.

Diversity of group members has more potential to attract older adults to take part in storytelling. Participants have reported that they did not expect diversity of group prior to the start of the research trial. Involving strangers from different places, with different backgrounds and different religions can increase the participants' acceptance of the system.

5.5 Limitations and further research

There are some limitations to this study. First is the sample size. Although many stories were collected, it is still difficult to generalize the conclusion from only 15 participants in three storytelling groups. The second limitation is the duration of the trial. A trial that lasts much longer will produce greater results regarding how an email storytelling system affects their later years in life.

Future research should examine the benefits of involving younger participants in a storytelling system. Evidence can be found that the diversity of members within a storytelling group makes it more likely that they will share their stories and listen to other people's stories. People of different background, beliefs and personalities have different

stories and different perspectives toward the same topics. Moreover, the combination of storytelling and Internet technology makes it easier for members of the younger generation to benefit from the experience of older adults. An email storytelling system that is designed to bridge the intergenerational gap will help determine how intergenerational connections can be facilitated by way of emails storytelling.

5.6 Conclusion

The research has indicated that an email storytelling system is an effective way of enabling older adults to share their stories as well as read each others' stories. The research has provided evidence that older adults accept this new form of storytelling and that they enjoy using it without any difficulties. At the same time, this research is a reminder to researchers, designers and practitioners in the field of gerontology that the exploration of the design of Internet-based storytelling systems can be developed further to benefit more older adults who do not have a chance to go to a storytelling program held in nearby senior center. The research also shows the importance of designing storytelling system for older adults based on their existing knowledge. By way of findings from this research, email-based storytelling systems are a powerful and potential way of connecting generations through storytelling.

REFERENCES

- Al Mahmud, Abdullah, & Martens, Jean-Bernard. (2013). Amail: Design and Evaluation of an Accessible Email Tool for Persons with Aphasia. *Interacting with Computers*, 25(5), 351-374. doi: 10.1093/iwc/iws025
- Arnott, John L, Khairulla, Zayneb, Dickinson, Anna, Syme, Audrey, Alm, Norman, Eisma, Roos, & Gregor, Peter. (2004). *E-mail interfaces for older people*. Paper presented at the Systems, Man and Cybernetics, 2004 IEEE International Conference on.
- Association, American Medical. (2013). Report of the Council on Ethical and Judicial Affairs: CEJA Report 3-I-02. *Ethical Guidelines for the Use of Electronic Mail between Patients and Physicians*. Accessed at www.ama-assn.org/resources/doc/code-medical-ethics/5026a.pdf on, 1.
- Atherton, Helen, Pappas, Yannis, Heneghan, Carl, & Murray, Elizabeth. (2013). Experiences of using email for general practice consultations: a qualitative study. *British Journal of General Practice*, 63(616), e760-e767.
- Bluck, Susan, & Levine, Linda J. (1998). Reminiscence as autobiographical memory: a catalyst for reminiscence theory development. *Ageing & Society*, 18(02), 188. doi:doi:null
- Bohlmeijer, ET, Westerhof, GJ, & Emmerik-de Jong, Monneke. (2008). The effects of integrative reminiscence on meaning in life: Results of a quasi-experimental study. *Aging and Mental Health*, 12(5), 639-646.
- Buchanan, D., Moorhouse, A., Cabico, L., Krock, M., Campbell, H., & Spevakow, D. (2002). A critical review and synthesis of literature on reminiscing with older adults. *Can J Nurs Res*, 34(3), 123-139.
- Butler, Robert N. (1963). The life review: An interpretation of reminiscence in the aged. *Psychiatry*, 26(1), 65-76.
- Chadwick-Dias, Ann, McNulty, Michelle, & Tullis, Tom. (2003). *Web usability and age: how design changes can improve performance*. Paper presented at the ACM SIGCAPH Computers and the Physically Handicapped.

- Chonody, Jill, & Wang, Donna. (2013). Connecting Older Adults to the Community Through Multimedia: An Intergenerational Reminiscence Program. *Activities, Adaptation & Aging*, 37(1), 79-93. doi: 10.1080/01924788.2012.760140
- Coleman, Peter G. (2005). Reminiscence: Developmental, social and clinical perspectives. *The Cambridge handbook of age and ageing*, 301-309.
- Cosley, Dan, Akey, Kathy, Alson, Brian, Baxter, Jonathan, Broomfield, Mark, Lee, Soyoung, & Sarabu, Chethan. (2009). *Using technologies to support reminiscence*. Paper presented at the Proceedings of the 23rd British HCI Group Annual Conference on People and Computers: Celebrating People and Technology, Cambridge, United Kingdom.
- Cully, Jeffrey A, LaVoie, Donna, & Gfeller, Jeffrey D. (2001). Reminiscence, personality, and psychological functioning in older adults. *The Gerontologist*, 41(1), 89-95.
- Czaja, Sara J, Guerrier, Jos éH, Nair, Sankaran N, & Landauer, Thomas K. (1993). Computer communication as an aid to independence for older adults. *Behaviour & Information Technology*, 12(4), 197-207.
- Daft, Richard L, & Lengel, Robert H. (1986). Organizational information requirements, media richness and structural design. *Management science*, 32(5), 554-571.
- Debrew, Jacqueline K. (2009). Helping Older Adults Find Meaning and Purpose Through Storytelling.
- Dickinson, Anna, Newell, Alan F, Smith, Michael J, & Hill, Robin L. (2005). Introducing the Internet to the over-60s: Developing an email system for older novice computer users. *Interacting with Computers*, 17(6), 621-642.
- Erikson, Erik Homburger. (1953). *Identity and the life cycle* (Vol. 1): WW Norton & Company.
- Feinberg, Richard I. (1996). Use of Reminiscence Groups to Facilitate the Telling of Life Stories by Elderly Russian Jewish Immigrants. *Smith College Studies in Social Work*, 67(1), 39-51.

- Frohlich, David, Kuchinsky, Allan, Pering, Celine, Don, Abbe, & Ariss, Steven. (2002). *Requirements for photoware*. Paper presented at the Proceedings of the 2002 ACM conference on Computer supported cooperative work.
- Gaggioli, Andrea, Morganti, Luca, Bonfiglio, Silvio, Scaratti, Chiara, Cipresso, Pietro, Serino, Silvia, & Riva, Giuseppe. (2013). Intergenerational Group Reminiscence: A Potentially Effective Intervention to Enhance Elderly Psychosocial Wellbeing and to Improve Children's Perception of Aging. *Educational Gerontology*, null-null. doi: 10.1080/03601277.2013.844042
- Garton, Laura E, & Wellman, Barry. (1993). Social impacts of electronic mail in organizations: A review of the research literature: Ontario Telepresence Project.
- Gerfo, Marianne Lo. (1980). Three ways of reminiscence in theory and practice. *The International Journal of Aging and Human Development*, 12(1), 39-48.
- Gill, Barry. (2013). E-Mail: Not Dead, Evolving. *Harvard Business Review* 91(6).
- Gregor, Peter, Newell, Alan F, & Zajicek, Mary. (2002). *Designing for dynamic diversity: interfaces for older people*. Paper presented at the Proceedings of the fifth international ACM conference on Assistive technologies.
- Grundy, EM. (1996). Population review:(5). The population aged 60 and over. *Population Trends*(84), 14.
- Gutmann, David. (1977). The cross-cultural perspective: Notes toward a comparative psychology of aging. *Handbook of the psychology of aging*, 302-326.
- Haber, David. (2006). Life review: Implementation, theory, research, and therapy. *The International Journal of Aging and Human Development*, 63(2), 153-171.
- Harley, Dave, & Fitzpatrick, Geraldine. (2009a). Creating a conversational context through video blogging: A case study of Geriatric1927. *Computers in Human Behavior*, 25(3), 679-689. doi: 10.1016/j.chb.2008.08.011

- Harley, Dave, & Fitzpatrick, Geraldine. (2009b). YouTube and intergenerational communication: the case of Geriatric1927. *Universal access in the information society*, 8(1), 5-20.
- Hawthorn, Dan. (2002). *Designing usable applications for older users-an example*.
- Kanayama, Tomoko. (2003). Ethnographic research on the experience of Japanese elderly people online. *New Media & Society*, 5(2), 267-288.
- King, KS. (1982). Reminiscing psychotherapy with aging people. *Journal of psychosocial nursing and mental health services*, 20(2), 21.
- Lewis, Charles N. (1971). Reminiscing and self-concept in old age. *Journal of Gerontology*, 26(2), 240-243. doi: 10.1093/geronj/26.2.240
- Lin, Yen - Chun, Dai, Yu - Tzu, & Hwang, Shiow - Li. (2003). The effect of reminiscence on the elderly population: a systematic review. *Public health nursing*, 20(4), 297-306.
- Longhurst, Robyn. (2010). Semi-structured Interviews and Focus Groups. *Key Methods in Geography*, 103.
- Magee, J.J. (1988). *A professional's guide to older adults' life review: releasing the peace within*: Lexington Books.
- Marqui é Jean Claude, Jourdan-Boddaert, L, & Huet, N. (2002). Do older adults underestimate their actual computer knowledge? *Behaviour & Information Technology*, 21(4), 273-280.
- McCarthy, Helen, & Thomas, Gillian. (2004). *Home Alone*. Demos, London.
- McMahon, Arthur W, & Rhudick, Paul J. (1964). Reminiscing: Adaptational significance in the aged. *Archives of general psychiatry*, 10(3), 292.

- McMellon, Charles A, & Schiffman, Leon G. (2002). Cybersenior empowerment: How some older individuals are taking control of their lives. *Journal of Applied Gerontology*, 21(2), 157-175.
- Molinari, Victor, & Reichlin, Robert E. (1984). Life review reminiscence in the elderly: A review of the literature. *The International Journal of Aging and Human Development*, 20(2), 81-92.
- Moos, Inger, & Bjorn, A. (2006). Use of the life story in the institutional care of people with dementia: a review of intervention studies. *Ageing and Society*, 26(3), 431-454.
- Morrell, Roger W, Mayhorn, Christopher B, & Bennett, Joan. (2000). A survey of World Wide Web use in middle-aged and older adults. *Human Factors: The Journal of the Human Factors and Ergonomics Society*, 42(2), 175-182.
- Mynatt, Elizabeth D, & Rowan, Jim. (2000). *Cross-generation communication via digital picture frames*. Paper presented at the Proceedings of the IFIP WG 9.3 International Conference on Home Oriented Informatics and Telematics (HOIT 2000). Wolverhampton, United Kingdom: Press.
- Parks, Malcolm R, & Floyd, Kory. (1996). Making friends in cyberspace. *Journal of Computer - Mediated Communication*, 1(4), 0-0.
- Peesapati, S Tejaswi, Schwanda, Victoria, Schultz, Johnathon, Lepage, Matt, Jeong, So-yae, & Cosley, Dan. (2010). *Pensieve: supporting everyday reminiscence*. Paper presented at the Proceedings of the SIGCHI Conference on Human Factors in Computing Systems.
- Petrelli, Daniela, Whittaker, Steve, & Brockmeier, Jens. (2008). *AutoTopography: what can physical mementos tell us about digital memories?* Paper presented at the Proceedings of the SIGCHI conference on Human Factors in computing systems.
- Pfeil, Ulrike, Arjan, Raj, & Zaphiris, Panayiotis. (2009). Age differences in online social networking – A study of user profiles and the social capital divide among teenagers and older users in MySpace. *Computers in Human Behavior*, 25(3), 643-654. doi: 10.1016/j.chb.2008.08.015

- Pincus, Allen. (1970). Reminiscence in aging and its implications for social work practice. *Social Work, 15*(3), 47-53.
- Rettie, Ruth. (2002). Email marketing: success factors.
- Rodríguez, Marcela D., Gonzalez, Victor M., Favela, Jesus, & Santana, Pedro C. (2009). Home-based communication system for older adults and their remote family. *Computers in Human Behavior, 25*(3), 609-618. doi: 10.1016/j.chb.2008.08.017
- Romaniuk, Michael, & Romaniuk, Jean Gasen. (1982). Life events and reminiscence: A comparison of the memories of young and old adults. *Imagination, Cognition and Personality, 2*(2), 125-136.
- Sellen, Abigail J, Fogg, Andrew, Aitken, Mike, Hodges, Steve, Rother, Carsten, & Wood, Ken. (2007). *Do life-logging technologies support memory for the past?: an experimental study using sensecam*. Paper presented at the Proceedings of the SIGCHI conference on Human factors in computing systems.
- Thiry, Elizabeth, & Rosson, Mary Beth. (2012). *Unearthing the family gems: design requirements for a digital reminiscing system for older adults*. Paper presented at the CHI '12 Extended Abstracts on Human Factors in Computing Systems, Austin, Texas, USA.
- Todman, John, & Drysdale, Emma. (2004). Effects of qualitative differences in initial and subsequent computer experience on computer anxiety. *Computers in Human Behavior, 20*(5), 581-590.
- Trentham, Barry. (2007). Life storytelling, occupation, social participation and aging. *Occupational Therapy Now, 9*.
- Tyler, Joshua R, & Tang, John C. (2003). *When can I expect an email response? A study of rhythms in email usage*. Paper presented at the ECSCW 2003.
- Watt, Lisa M, & Wong, Paul TP. (1991). A taxonomy of reminiscence and therapeutic implications. *Journal of gerontological social work, 16*(1-2), 37-57.

Webster, J. D. (1997). The Reminiscence Functions Scale: a replication. *Int J Aging Hum Dev*, 44(2), 137-148.

Westerhof, Gerben J, Bohlmeijer, Ernst, & Webster, Jeffrey Dean. (2010). Reminiscence and mental health: A review of recent progress in theory, research and interventions. *Ageing and Society*, 30(4), 697.

Wright, KB. (2000). The communication of social support within an on-line community for older adults: A qualitative analysis of the SeniorNet community. *Qualitative Research Reports in Communication*, 1(2), 33-43.

Xie, Bo. (2007). Older Chinese, the Internet, and well-being. *Care Management Journals*, 8(1), 33-38.

Zickuhr, Kathryn, & Madden, Mary. (2012). Older adults and internet use. *Pew Internet & American Life Project*, June 6, 2012, at <http://pewinternet.org/Reports/2012/Older-adults-and-internet-use.aspx>.

APPENDIX A
INTERVIEW QUESTIONS

Instruction: Please do not use any names of yourself or others when you respond to interviews questions.

1. What do you think of email storytelling system? Is it easy to use?
 - a. Very easy
 - b. Easy
 - c. Moderate
 - d. Somewhat difficult
 - e. Difficult
 - f. Very difficult
2. (If you answered difficult or very difficult in questions 1,) what you find difficult?
3. Of all the stories in the trial, which was the most memorable? Why was it memorable?
4. When using the email storytelling system, were you concerned about? (choose all that apply):
 - a. Disturbing others or being disturbed
 - b. Privacy of information
 - c. Not knowing each other
 - d. Other people liking or disliking my stories
5. Please describe how you used the email storytelling system.
6. Please rank the importance that you place on the qualities of the email storytelling system?
 - a. Interesting topics that recall past memory
 - b. Reading other people's stories

- c. The feeling of sharing
 - d. Having someone to talk to
7. Have you had any experience of face-to-face story telling before?
- a. Yes
 - b. No
8. If the answer for Question 7 is yes, what are the advantages/disadvantages of email storytelling compared to face-to-face storytelling?
9. What other stories or life experiences do you want to share?
10. Would you continue to use the email storytelling system if it was available?
- a. Yes
 - b. No
 - c. It depends
11. Would you like to keep in touch with someone in your group? Who, why and how?
12. Have you ever mentioned the email storytelling system to other people during the test?
- a. Yes
 - b. No
13. Would you recommend the email storytelling system to your friends?
- a. Yes
 - b. No
14. If the answer for Question 13 is yes, how will you describe it to them?
15. If you could make changes to the email storytelling system, what improvements would you make? Please rank the options below.

- a. Only involve people I know
- b. Have the right to post a topic instead of answering a topic provided
- c. Make the stories public and receive feedback from more people
- d. Other (please specify)

16. Is there anything else about the email storytelling system you would like to share with me? Any improvements?

APPENDIX B

SAMPLE INTERVIEW TRANSCRIPT

1. What do you think of email storytelling system? Is it easy to use?

- a. Very easy
- b. Easy
- c. Moderate
- d. Somewhat difficult
- e. Difficult
- f. Very difficult

Very easy

2. (If you answered difficult or very difficult in questions 1,) What did you find difficult?

Nothing

3. Of all the stories in the trial, which was the most memorable? Why was it memorable?

The one that we all share together? The one I love the most is the one that about the toys, growing up with the toys and reading what people love. Because you can tell what age they were pretty much by what toys they were playing with. I mean I'm really enjoy that a lot because it says a lot about the person without really having to ask did you have this or this. Somebody talked about having a train set and I remember my brother has one. So that's really fun.

4. When using the email storytelling system, were you concerned about (choose all that apply):

- a. Disturbing others or being disturbed
- b. Privacy of information
- c. Not knowing each other

d. Other people liking or disliking my stories

I didn't have any problems of anything, if they didn't like my stories I just feel that they would disregard it.

5. Please describe how you used the email storytelling system.

At first I responded directly to your question because I get up so early in the morning that some people hadn't respond yet. And then later on when I get a littler bit time, then I started reading people's stories. If I didn't have a chance to do that in the morning then other people have replied during the day then I started reading their emails. My situation would have been fifty. I did it at the beginning, or I did it after I receive people emails.

6. Please rank the importance that you place on the qualities of the email storytelling system?

a. Interesting topics that recall past memory

b. Reading other people's stories

c. The feeling of sharing

d. Having someone to talk to

ABCD. It will be the same order interesting topics that recall past memory cause I like memory recall. I like to read other people's story Feelings of sharing just goes to here, I don't necessarily need anybody else to talk to though.

7. Have you had any experience of face-to-face story telling before?

a. Yes

b. No

Yes because I belong to toast masters. It is a worldwide organization that brought people together basically to learn how to stand up and not be afraid in talking to people And in doing so it sorts of like storytelling that you bring to the table.

Certain stories you want to tell and certain projects you are working on.

8. If the answer for Question 7 is yes, what are the advantages/disadvantages of email storytelling compared to-face-to-face storytelling?

This is a lot more fun. This is more fun because you aren't being judged you are incorporating your memory with someone else. It's fun to share that, with toastmaster, you are basically to learn skills and so there is a bit of pressure on you to learn a format and learn to show nature. This is total pleasure. This is all about talking to someone without a kind of judgment.

9. What other stories or life experiences do you want to share?

I probably would say college is a big thing in my life, first time through and the second time through. Maybe not everybody goes to college, but the majority of people go to some sort of schooling here, technical school or something I think to share your background and education is extremely important.

10. Would you continue to use the email storytelling system if it was available?

a. Yes

b. No

c. It depends

Yes

11. Would you like to keep in touch with someone in your group? Who, why and how?

I would love to keep in touch with Norm. I really enjoy the way he wrote and described his life and I actually responded to something to him and he responded back and he said that really made me laugh I really need that. I feel like I almost knew him just because the way he spoke and the tenderness he has in the storytelling.

That's always fun to meet someone eventually my job is talking to people all over the united state. A lot of them I never met so I have the relationship with all these people just through phone contact. And it's fun to meet somebody. That doesn't necessarily always happen. So I would be happy just keeping email communications going with him

12. Have you ever mentioned the email storytelling system to other people during the test?

a. Yes

b. No

Yes. I was telling quite a few people in my neighborhood how much fun this was and so was my friends. So we were talking about different groups but I was telling the core people I sit with about how meaningful this has been...and you know, this really was a wonderful I don't know the dynamic for our group but I though its a good mix of people you know interactions. I would start to see where it goes.

13. Would you recommend the email storytelling system to your friends?

a. Yes

b. No

Yes. Absolutely.

14. If the answer for Question 13 is yes, how will you describe it to them?

Say that this almost like a coffee club, a coffee club where you get together and you talked about thing that has meant so much in your life. And I just think it helps to get away from all the problems of work. And it helps to realize what other people life was like.

15. If you could make changes to the email storytelling system, what improvements would you make? Please rank the options below.

a. Only involve people I know

No I don't want to talk to people I know. I like that total not knowing who the group is about

b. Have the right to post a topic instead of answering a topic provided

No, because I think we all have great experiences just want to talk about this, so you just want to talk about that so when you have a outside mediator like yourself, then everybody has to think a little differently and uniformly. I think it is more creative that way.

c. Make the stories public and receive feedback from more people

I don't belong to Facebook because I am very concerned about all the horrible stories I hear about people picking things out from that and I like the privacy of this. I don't like being that exposed so I would probably want it to be. It can get too big, you will get too many opinion and two many stories.

d. Other (please specify)

16. Is there anything else about the email storytelling system you would like to share with me? Any improvements?

I would just make it longer because you start to bond with this people and now four week were over and you had to bring it to a close, that maybe you need to say you make it for 12 weeks and there are so many questions. It feels sorry that you are not going to talk to these people I don't know whether it's appropriate to contact them and say I really enjoy emailing with you are you still willing to email back and forth I don't know. But if I contact them and said what have you done in your life; that would be too personal.

APPENDIX C
CONSENT FORM

Consent Form

Designing online storytelling system for older adults – Exploring the feasibility of online email-based storytelling group.

I am a graduate student under the direction of Professor Giard in the School of Design at Arizona State University. I am conducting a research study to discover the feasibility of building an online email-based storytelling system for older adults.

I am inviting your participation, which will involve a 4-week test in emails use. You will be assigned to one of the three groups including 5 people each. During the test, you will receive three emails every week, including one topic related to your life experience. You are encouraged to response to the email to share your life experience with other group members. After the test, a short interview regarding the user experience of this system will be conducted. You have the right not to answer any question, and to stop participation at any time.

Your participation in this study is voluntary. If you choose not to participate or to withdraw from the study at any time, there will be no penalty.

This research will help us discover the possibility of moving storytelling group online, which will help to benefit more older adults who are not able to attend face to face storytelling. There are no foreseeable risks or discomforts to your participation.

Every stories collected in the test will only be seen by professors and students within the research group. No personal information will be exposed to public. Please do not use any names of yourself or others when you respond to interviews questions or tell your stories in weekly emails.

These stories will be kept until the end of the research. Your responses will be confidential. This study may be used in reports, presentations, or publications but your name will not be used.

I would like to audio record the interview after the test. The interview will not be recorded without your permission. Please let me know if you do not want the interview to be recorded; you also can change your mind after the interview starts, just let me know. If you have any questions concerning the research study, please contact the research team at: yuanyili@asu.edu / jacques.giard@asu.edu. If you have any questions about your rights as a participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788.

By signing below you are agreeing to be part of the study.

Name:

Signature:

Date:

APPENDIX D
SAMPLE STORIES

T1: How did you rebel as a child?

I used to pretty much have plenty of freedom as well as nurturing at home, growing up in a suburban-gated community on the beach. It was very safe and I could ride my bike around the neighborhood with almost no traffic at all. I don't remember rebelling at all, other than my mother not liking my Afro aka jewfro when it got frizzy and wild. Having worn rollers to bed, pins in my scalp and straighter chemicals to force my curly hair straight, I couldn't handle the pain and tedium and my sister cut my hair when I was in high school and it's been liberated ever since.

T2: Have you ever doubted your faith?

I have developed my own faith when I grew up as a cultural Jew, as opposed to a religious Jew. I always doubted 'faith' since my parents are both survivors of the holocaust from Poland. I have developed my own faith when I grew up as a cultural Jew, as opposed to a religious Jew. I always doubted 'faith' since my parents are both survivors of the holocaust from Poland. Then I met my current congregation and rabbi, wearing tie-dye and chanting with drums and maracas spoke to me, yet infused with ancient Jewish mysticism and acknowledging the divine mother as well as the divine father, I was immediately at one with this school of thought. We had a guest speaker come in from Carmel a few times, Rabbi Leah Novick, and she taught me that Judaism stands for truth, justice and charity. I have had conversations with my rabbi and she knows I have my own belief system but I respect hers too.

T3: What was your Mother like when you were a child?

My mother was very nurturing when I was a child, pretty much stay-at-home. My older sister and I spent most summers at the private beach club the neighborhood sported, being right at the tip of the Atlantic Ocean in Brooklyn, New York. Although she had some nightmares that occasionally disrupted an unusually wonderful childhood, these dreams of the Holocaust in WW2 and caused her great nervousness and anxiety about letting her children do anything in the outside world. Although my father was a calming influence on her, nevertheless, she would get panic attacks from time to time. My father went through the same hell but managed to rise above it. My mother packed a healthy lunch for us to school, juice, sandwiches, fruit and veggies – ahead of her time with health food. She always made a delicious dinner and I would sometimes help her prepare apple strudel and slice the apples in a slicer. Adele Davis was her favorite recipe author. She was very interested in everything we learned at school and always came to Open School Night and was so proud of her talented artistic daughters. She helped me do my hair until my sister cut it in the early 1970's and my natural curls went wild. No more rollers! She dressed us to the hilt and loved shopping for clothes with us. I never wanted for anything. She was actually quite merry in nature and liked to have fun and laugh with us. She must have missed her parents, they were murdered when she was only 20. I hope we made up for some of those gaps in her life. She died at age 54 from hormone replacement therapy. I have been an anti-hormone activist since that time, 1977.

Thank you. Perhaps they overmedicated her too. They still do that. Read Dr. Sherrill Sellman's 2010 book 'The Hormone Heresy'.

T4: Has a friend saved you literally or figuratively?

Yes, a friend, Dina, saved me from food poisoning in 1997 over the phone. She is a registered nurse and told me to make myself throw up by drinking as much warm water as I could and then sticking my fingers down my throat. Then I got mercury poisoning in 2012 from a can of fish, and I remembered her advice and called in another friend to watch me throw up and I was able to have them pickup herbal formulas from my herbalist who continued the purge process. After two days I was able to stand up and do my laundry, and after four days I was able to drive some. Earlier in 2012 my herbalist cleansed my system of the dysplasia that showed up on a PAP test and after two months of herbal formulae I was cured and have had normal tests ever since. Dr. Wong has since retired.

T5: Did you have any nicknames as a child? How did you feel about them?

My nickname was "Tor" which was really "Tar" because I used to stick to me sister like tar whenever she and an older cousin Ruthie was visiting us in Brooklyn. She had a Canadian accent that made the word sound like "tor". The name stuck and I am still known by that nickname from time to time by my dad and my sister. I really didn't mind the nickname at the time and got used to it more as an 'endearing' term, some people called me "Flurry" which is a lot cuter.

T6: What is your first job and how did you get it?

My first job was apprenticing at a summer stock theatre troupe in Lake Placid, New York in the Adirondack Mountains. After three summers I earned my equity card, which I since then put on honorary withdraw. The first summer, the theatre was a converted barn, a theatre-in-the-round, with Joan Frank as producer, Ron Taylor directing and Glen Scott as most of the male leads. This was in 1971. The first show was George M! about the life of George M. Cohen, the famous entertainer around 1920. Then we did Dracula, Cabaret, Do I Hear a Waltz, and Fiddler on the Roof, and another play I can't recall right now...a different show every week. A lot of fun. The actors all lived in a big house. I learned some good tap dance steps and took lessons ahead of time with Bea Cohen and her son Justin Ross at the Majestic School of Dance in Brooklyn. My mother used to drop me off and pick me up. Justin is in the movie 'a chorus line'. Funny...Floris

T7: Which family members do you wish you had kept in touch with better?

I have relatives in Canada who were holocaust survivors and I wish...they are both deceased into their 90's. I had interviewed them. They were in Montreal and their daughter and grandson are doing well; however, there's very little contact. They were very shy and afraid to love anyone or be close to anyone. I heard Ulek, had spent the war in Russia and had a family there. Cesia, whom he was married to in Poland, wouldn't go with him because she didn't want to leave her mother. Her mother and their first daughter perished in the camps. Also Aunt Janka, who died in 2005 I think, was afraid to talk about the war. She was married to my mother's brother, Adam. She did have a surviving sister in Paris, and told me that

my mother had been in Ravensbruck concentration camp when the Swedish Red Cross rescued her and another 100 Polish women. My cousin Jack was born in Sweden.

T8: What was your worst boss like?

Out of very good bosses/clients being an independent contractor the very worst one was one of the four real estate brokers who never paid me for the extra work I did for this person (two others either stole my clients or used me as slave labor), harassed me with innuendoes, knew I let go of another client who books in advance, mentally tortured me by promising extra pay for extra work and hours, and did this to the former partner and other affiliates as well. I hope to attain some compensation because it hired an attorney to scare me into not informing the board of real estate about his unethical behavior by threatening to countersue me for damage to his reputation which I found out later was not allowed. I have an attorney's card to call and also a free legal service, which I will do as soon as I pay off my car scam in March. I have 6 yrs. from 2010 to file a case.

T9: What were your favorite toys as a child?

Barbie doll with dark curly hair called a bubble cut, still have her. Wish that I sewed clothes for – still have one my poodle pixie, a real dog, was my buddy for six years until the vet botched her up and she died when I was 12.

T10: What do you consider your greatest achievement?

My greatest achievement so far is writing a Broadway-style musical drama about my father's life. I plan to complete it in June 2014. Act one takes place in Europe 1938-1948 and act 2 takes place in North America 1949 thru the present day.

Thanks, Linda. The title is "hands of Gold" and although this is the end of storytelling I will shoot Ted and email when the show is going into staged readings etc.

T11: What life experiences shaped who you are?

Life experiences are so varied – probably choosing acting as a career and musical theatre. Also cat rescue taught me a lot about animals and people. Other than that finding Chinese herbalism for all my medical needs saved my life since 2002.

T12: What is your best relationship advice?

I have not been that successful in the marriage and mate department. Although I have a great friendship with my ex-husband, we did not do well as a married couple. We had a smooth and uncomplicated divorce, and I am proud of that. There was no rancor and no horrible issues came up as in many divorces. No divorce scars for our son, thank goodness. The lesson here, try to part as friends, if possible. After my divorce, I had a long-term boyfriend whom I loved dearly, but it did not work out as he met someone else. That was tough. I survived and ended up being friends with him later on until he passed away. Something I learned in my experience, and for my own well being, is to not hold grudges, Don't retaliate when you think you've been wronged. Keep an even keel with spouses, mates, friends, children, acquaintances, and with anyone you meet in

life. Put each episode in life in perspective before you react. Finally, be supportive and generous to those who are closest to you.

APPENDIX E

QUESTIONS TO BE ASKED IN THE SYSTEM

Family

What is your best relationship advice?

What was your Mother like when you were child?

What was your Father like when you were child?

Which family members do you wish you had kept in touch with better?

As a child, were you closer to your Father or your Mother?

How did you meet your spouse?

Career

What is your first job and how did you get it?

What was your first boss like?

What was your worst boss like?

What do you consider your greatest achievement?

What were you like when you were 40?

Childhood

How did you rebel as a child?

What about being a child do you miss the most?

Did you have any serious accidents as a child?

Did you have any nicknames as a child? How did you feel about them?

What were your favorite toys as a child?

How well did you do in school?

Were you well behaved or badly-behaved as a child?

Others

What is the best choice you ever made?

What is the stupidest thing you've ever done?

What life experiences shaped who you are?

Have you ever doubted your faith?

How has the place where you live changed throughout time?

Are you the same person you were as a child?

Has a friend saved you literally or figuratively?

APPENDIX F
IRB CERTIFICATE

EXEMPTION GRANTED

Jacques Giard
 The Design School
 480/965-1373
 JACQUES.GIARD@asu.edu

Dear Jacques Giard:

On 11/6/2013 the ASU IRB reviewed the following protocol:

Type of Review:	Initial Study
Title:	Designing online storytelling system for older adult - Exploring the feasibility of online email-based storytelling group.
Investigator:	Jacques Giard
IRB ID:	STUDY00000240
Funding:	None
Grant Title:	None
Grant ID:	None
Documents Reviewed:	<ul style="list-style-type: none"> • Consent Form, Category: Consent Form; • Designing online storytelling system for older adults, Category: IRB Protocol; • Possible questions to be asked in emails, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Interview questions, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions); • Recruitment scripts, Category: Recruitment Materials;

The IRB determined that the protocol is considered exempt pursuant to Federal Regulations 45CFR46 (2) Tests, surveys, interviews, or observation on 11/6/2013.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

Sincerely,

IRB Administrator

cc: Yuanyi Li