Thinking of You: Enhance Family Connection by Just One Touch

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Abstract

Research on older people has been more and more prevailing because of the increasing aging population. Improving seniors' wellness status is the core consideration. However, due to their mental and physical status, social isolation has a severe negative impact on them. Thinking of You is a digital photo frame app, which is designed to trigger social connection by just one touch. In this study, we evaluate TOY amongst older people and reflect the findings to refine this interesting idea by applying user-centered design process.

1 Introduction

The "population aging" has become a significant issue in the world. It is hard to reverse the increasing trend of aging population because of the conflict between the declining of younger population and the growth of human lifetime. The elderly population has to face a lot of personal issues. For example, they left career life and lost income; children grow up and leave them; physiological decline confines the movement and the capacity of taking themselves; friends and beloved are going [1]. All those make them feel unconfident and live with no companionship [2]. As a result, the elderly population is suffering from social isolation deeper than other demographic groups and their wellness is at risk as well.

While the social communication technologies are emerging in recent year, some researchers point out improving social contact can reduce the degree of isolation [3, 4]. The god-feeling tells us that enhancing social connection and intervening social isolation by applying those technologies is an alternative way.

The previous work, Thinking of You, has proved that a simple message telling other people you are thinking of them is a useful way to reduce social pressure and isolation feeling among university student. Some similar projects and studies have examined that applying ICT in the daily life of aging people to enhance the cross-generation connections has a definite meaning [5-7]. Therefore, we can rationally suppose that TOY has a positive potential to leverage older people as well.

This research aims to iterate the previous design of TOY. By following the human-centered design methodology, I start from a systematic evaluation in elder people to understand how they manipulate TOY in the latest context. To conduct the evaluation, I collaborate with a clinic psychology group. Any issue, observation, feedback and data generate from the evaluation can be valuable material to gain a sufficient understanding of the target audience. And then, based on those learning, I will refine or redesign TOY.

2 Background

Social isolation has been as a research object in the long term. Thoits [8] used traditional psychological theory, like social identities and identity accumulation hypothesis, to reveal the psychological mechanism of social isolation. Then, researchers attempted to establish a practical model of it. Chappell and Badger [1] examined ten common indicators of social isolation and assessed the relationship between subjective wellness among elderly individuals and each index and some pair of combined indexes. Wenger et al. [9] identified the different correlates on social isolation and loneliness and refined models of isolation and loneliness. Moreover, many studies [4, 10, 11] apply social network methodology, such as social contact observation and self-reporting, to detect the social network situation of the target, which indicates whether an individual is suffering from social isolation.

The old age group has been suffering from social isolation seriously because of its negative impact on health and wellbeing [1, 12]. The academic world has focused on this field since many years ago [9]. Living without companionship and social connectedness are referred to principal manifestations of social isolation [2] which can be resolved many factors causing it, such as being unmarried, having no children, having no confidant and having no companion [1].

In order to reduce the harm of social isolation on aging people, researchers have put such much effort on exploring a feasible approach to ameliorate it for older people. After reviewing the literature published over the last two decades on the evaluation of interventions aimed at reducing social isolation amongst aging people. Findlay [12] aroused an opinion that, so far, there is no substantial evidence supporting that those interventions could reduce social isolation. However, he also mentioned Internet-based way might be the most beneficial intervention type. Ballesteros [3] points out integrating different technical components and social networking is a potential way to reduce social isolation and support aging population living at

home. Some previous research also showed that good social connection can lead to a healthy life [13].

Given results of gerontology and psychology, ICT researchers made many efforts attempting to solve this issue. The Electronic Family Newspaper (EFN) [14] is an interesting trial to support old adults contact with remote family members by a blog-like system. Besides, Enmesh [5] intervenes social isolation amongst aging people by sharing media with others.

Furthermore, there are many examples of the digital frame. Mynatt et al. [7, 15] initially discovered cross-generation communication within a family by digital portrait, which inspired CareNet project used the digital frame as a tool to make the connection between caretaker and their clients. While Taylor et al [16] critiqued they contributed to a comprehensive and complete work regarding display design, they gave out an in-depth study on designing a family digital frame. Additionally, Kim and Zimmerman [17] added a narrative note on digital photos exploratively, which wanted to address the need of memory reminiscence of older people.

3 Thingking of You

Mika Halpin Hassanah had explored that use a touch screen based digital photo frame to foster the aging in place [18]. The concept of her prototype is that the older people can directly send a message, 'Thinking of You,' to the mobile phone of their family or friends by touching the digital frame (Fig 1). The message would trigger a positive response from the receiver activating an active social connection.
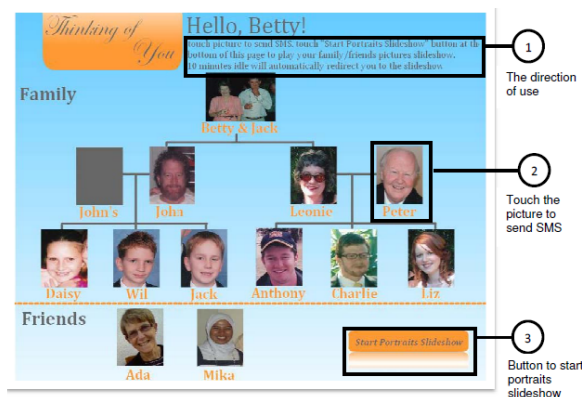

Fig 1. The primary version TOY designed by Mika

Her work inspired the follow-up project, Thinking of You, on 2014 [13]. Lin's research developed Mika's idea further. She applied the core concept that a 'Thinking of You' message will send to someone when touching their portrait on the screen (Fig 2). Not like Mika trying to support aging people live independently, Lin's goal was more straightforward. She wanted to use this simple interactive design to

enhance people's social connection, so that reduce social isolation.

Our evaluation is applying Lin's work into the seniors and exploring the design issues aroused in a real context with examining the initial assumption proposed by Mika.
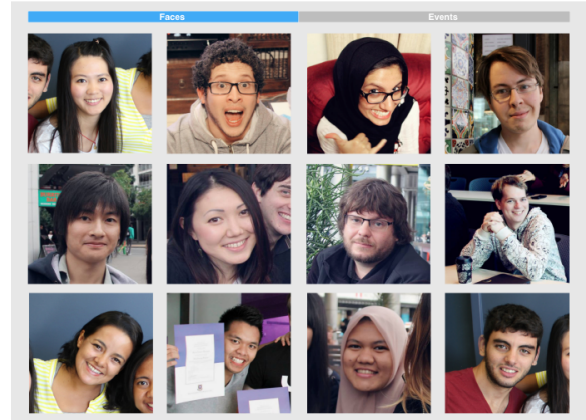

Fig 2. 'Thinking of You' interface developed by Lin

3 Methodology

The evaluation refers to the start point of this study. To control variables within it, we decide to cut down the number of photos displaying on the screen to maximum four (Fig 3). The benefit is touching portrait becomes the only interaction participants need to do.

We apply single-case research design as the fundamental framework of the evaluation. According to the plan, we were going to invite ten people, who live Regis Aged Care Facility, Wynnum, as well as their nominated family members to join our research. For each of them, the evaluation spans six weeks, which is separated into three equal phases: baseline, implementation (intervention), and reversal. Since this evaluation involves two groups of people: participants and their family members (be called contacts in the following paper), whose photos are put on the tablet, to measuring how TOY impacts on participants' social connection and satisfaction, we designed different approaches applying to each group.

Participants just follow their daily routine, except that a tablet running TOY will be placed in their suite in the second phase. In the very beginning, they take a quantitative questionnaire, which reflects their mental status, like Loneliness, Social Network Diversity, Mood, and Life Satisfaction. And we will reapply it as well as conduct a semi-structure interview to them at the end of the rest two phases.

For contacts, a backend system sends a simple daily diary question to them by SMS or Email at 7 p.m. every day. The question is a). "*Have you had any contact with [participant's name] today? Y/N - If yes, how many times?*". When the evaluation goes into the

implementation phase, the question will be twisted a little bit，which becomes b). "*Have you had any contact with [participant's name] today by means other than "Thinking of You"? Y/N - If yes, how many times?*" This diary records participants' social connections. At the end of the evaluation, each contact needs to fill in a qualitative survey as well, which assist us to understand the impact empirically.

Fig 3. Implement a tablet running TOY for one of participant on her cabinet.

4 Findings

First of all, we found that it is common for people who live in Regis to use an iPad. Some of them even have their 4G hotspot device. However, they could just use it for a specific aim, like, Participant 1 usually uses it to read The Bible; Participant 2's daughter will sync some new photos into her iPad regularly so that she always shares these photos with others. After an in-deep touching, we found that they can remember an exact operation path to access that function, but can't handle unexpected issues. For an instant, we apply Lenovo Yoga, an Android tablet, as the terminal device. It has a big soft power button on the bottom side which has a distinct touch-feeling with iPad's power button. Until the implementation phase finish, participant 1 still can't close the screen or open the device by herself. She asked a nurse to help.

The interaction metaphor or feedback must be very clear. Besides the blurred hand-feeling mentioned before, compare with iPad's one-direction-swap to unlock, Yoga's approach, which can swap to four directions on unlock-screen to quick start certain functions, is more complicated. Unlocking device is one of them. This complexity is another factor impeding participants enjoy using TOY.

When we designed the evaluation, we expected the social connections of participants could increase distinctly in the implementation stage. After that, in reversal stage, it could be a little bit higher than baseline's data, In the fact, the amount of connections between a participant and contacts doesn't show a fluctuation as we expect. The quantity of total weekly connections as well as individuals' data didn't show a significant difference.

From the recording, I found that participants interacted with TOY at serval fixed moments in a day. For example, one participant always touched the photo at around 12 pm and 4 pm because she finishes her lunch and afternoon tea at that time every day. Besides, each time she interacted with ToY, she tended to click all four contacts on the screen.

People living in Regis place many photo frames in their suite (Fig 3). Moreover, I observed participants I had visited who were pleased to share the story behind the photo if we talked about that. If they have updated photos of that person we were talking about their iPad, they were also glad to show them.

5 Discussion

One fatal issue happened on the eve of evaluation. Most people living in Regis Aged Care Facility cannot live independently because of cognitive and physical disorder, for example, amnesia. After all, just three people have enough cognition ability to be part of research. Unfortunately, one of them went to the hospital during the evaluation. Due to some unknown reasons, another one forgot to use TOY. Consequently, we just gained one valid data (that participant will be called Emma in the following paper). It causes I can't achieve convincing results from the evaluation. Nonetheless, those findings still can give me some thinkings about the needs of older people.

In above, I have mentioned Emma avoided to use TOY during the evaluation. The reason starts from screen backlight because it would cause participants hard to sleep in the night. Although we had anticipated this point and install a backlight control app on the tablet which can dim up to 75% backlight in the night, we still got Emma's complain. Therefore, she attempted to shut the screen by herself before went to bed. Due to the different touch-feeling and blurred feedback, she closed the device unconsciously. At the same time, the complicated unlocking approach stops her open the device. She had to ask a nurse to help to open and close tablet every day. As a result, she didn't want to use.

When designing for aging population, only considering whether the app's interaction is simply enough for them is not sufficient. The media of interaction is an essential component as well. In another word, as a designer, the context concludes all parts between user and products. To deliver a good user experience, we need to provide a comprehensive solution. The inferiority haunted by unconfidence is the other significant factor compelling Emma to avoid to use TOY. Feeling unconfident and self-esteem contribute a lot to social isolation amongst seniors [1,

Slide View   Photo View   Thinking of you Message

Fig 4. The new version of TOY designed by author

4]. In this case, Emma had to ask a nurse to help every day, which makes her feel uncomfortable, so she preferred not to bothering nurse rather than using a dispensable tool to build a connection with her family. Oppositely, if we want to encourage older people to accept new technologies, one of the potential approach is to establish their confidence to handle them.

Albeit Emma overtly stated she attempt not to use TOY, the last interview proved that she is impressive about TOY. She informed that she would want the tablet back if she could. "*I missed the ability to message my family whenever I want easily. I also like the fact that my family could call me back in their own time*". To a large extent, the second half of the statement supports Chappell's idea [1]. When asking her "*How did you initiate contact with nominated family and friends? Was it using the TOY or other means?*", She said, "*It just depended on how quickly I needed to talk to them.*" In her context, TOY reduced her worry that she could interrupt her family for a non-essential issue. "*I touched the screen whenever I wanted my family to call.*" Based on those statements, I can assume that Emma has a clear awareness how TOY works, and she feels confident to send a message, "I am thinking of you", which is a better way to notice contacts without interrupting their routine.

However, by considering the mental model of user and designer, in this case, a gap shows between user and designer. The user focuses on notification feature of TOY. For Emma, it is a handy tool to tell family member "I want to contact with you" without any disturbance and annoying text input. Therefore, she wishes this device can present more feeling of her besides just "I'm thinking of you." On the contrary, designer focuses on the simple interaction containing human emotion and wishes this simple message can empathy the same feeling of contacts, so they make a new connection. But, to reach this aim, the premise is that contacts don't have this awareness before they see the message.

Another issue found from the evaluation is the unchanged social connections. Through comparing the pattern of connection between Emma and each contact, I suppose it is because all nominated contacts come from the core social relation level of participant. They already communicate frequently. Even if TOY arises one more time per week, it is hard to detect and prove. Also, based on the statement made by A, her family made a call back in their own time after she sent the message. Is it possible that connections triggered by TOY replace the original ones?

For elderly people, reminiscence and recollection of memory is a significant approach to anchor and preserve their life value [19]. Sharing photos' stories to others is a practical need for aging population [17]. Therefore, Kim and Zimmerman [17] integrate narration into digital frame to help older people recall their memory. Whilst, it is troublesome to update latest family photos by official sync tool. Why not update photo through Internet? In China, there are serval cloud services providing family album or called photo streaming.

6 Conclusion

In this paper, I discussed how social isolation affected the old group, reviewed some attempts in this field, and demonstrated the progress of evaluating Lin's work comprehensively. Although the evaluation can't allude to success, we still extracted valuable data and insights from it. The limited results enlighten me a lot regarding not only the understanding of aging population and their context but also the design of TOY. So far, based on what I learn from the evaluation and related literature, I have completed the iterative design work (Fig 4). Next, I will focus on improving this prototype through user testing.

Moreover, I want to post a few questions that what if the contact is not from participants' closest relationship, is "I'm thinking of you" strong enough to motivate that kind of contacts to make connection actively and timely? With the risk of no response being higher, should we offer feedback to tell user someone has received their message which arouses a mind that a new connection will come soon? Although I cannot answer those questions, they are worthy of being discussed and dug into in the future.

Acknowledgment

References

[1] N. L. Chappell and M. Badger, "Social Isolation and Well-Being," *Journal of Gerontology,* vol. 44, pp. S169-S176, September 1, 1989 1989.

[2] G. Hawthorne, "Measuring Social Isolation in Older Adults: Development and Initial Validation of the Friendship Scale," *Social Indicators Research,* vol. 77, pp. 521-548, 2006.

[3] S. Ballesteros, C. Peter, E. L. Waterworth, and J. A. Waterworth, "The role of ICT and networking in healthy ageing," presented at the Proceedings of the 5th International Conference on PErvasive Technologies Related to Assistive Environments, Heraklion, Crete, Greece, 2012.

[4] K. N. Hampton, L. F. Sessions, and E. J. Her, "CORE NETWORKS, SOCIAL ISOLATION, AND NEW MEDIA," *Information, Communication & Society,* vol. 14, pp. 130-155, 2011/02/01 2011.

[5] F. Vetere, "Mobile and broadband technologies for ameliorating social isolation in older people," 2012.

[6] P. C. Santana, M. D. Rodriguez, V. M. Gonzalez, J. Favela, and L. A. Castro, "Supporting relationship maintenance for elders and family living abroad," *IEEE Pervasive Computing,* vol. 5, p. 47, 2006.

[7] E. D. Mynatt and J. Rowan, "Cross-generation communication via digital picture frames," in *Proceedings of the IFIP WG 9.3 International Conference on Home Oriented Informatics and Telematics (HOIT 2000). Wolverhampton, United Kingdom: Press*, 2000, pp. 77-84.

[8] P. A.Thoits, "Multiple Identities and Psychological Well-Being: A Reformulation and Test of the Social Isolation Hypothesis," *American Sociological Review,* vol. 48, pp. 174-187, 1983.

[9] G. C. Wenger, R. Davies, S. Shahtahmasebi, and A. Scott, "Social Isolation and Loneliness in Old Age: Review and Model Refinement," *Ageing & Society,* vol. 16, pp. 333-358, 1996.

[10] B. Chamberlain, C. Kasari, and E. Rotheram-Fuller, "Involvement or Isolation? The Social Networks of Children with Autism in Regular Classrooms," *Journal of Autism and Developmental Disorders,* vol. 37, pp. 230-242, 2006.

[11] K. H. Rubin and R. S. Mills, "The many faces of social isolation in childhood," *Journal of Consulting and Clinical Psychology,* vol. 56, pp. 916-924, 1988.

[12] R. A. Findlay, "Interventions to reduce social isolation amongst older people: where is the evidence?," *Ageing & Society,* vol. 23, pp. 647-658, 2003.

[13] Y. Lin, "Thinking of You: Keeping Socially Connected by Just One Touch," The degree of Master of Interaction Design in the division of Multimedia Design, The School of Information Technology and Electrical Engineering, The University of Queensland, Brisbane, St. Lucia, 2014.

[14] M. D. Rodríguez, V. M. Gonzalez, J. Favela, and P. C. Santana, "Home-based communication system for older adults and their remote family," *Computers in Human Behavior,* vol. 25, pp. 609-618, 5// 2009.

[15] E. D. Mynatt, J. Rowan, S. Craighill, and A. Jacobs, "Digital family portraits: supporting peace of mind for extended family members," presented at the Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, Seattle, Washington, USA, 2001.

[16] A. S. Taylor, L. Swan, and A. Durrant, "Designing family photo displays," in *ECSCW 2007: Proceedings of the 10th European Conference on Computer-Supported Cooperative Work, Limerick, Ireland, 24-28 September 2007*, L. J. Bannon, I. Wagner, C. Gutwin, R. H. R. Harper, and K. Schmidt, Eds., ed London: Springer London, 2007, pp. 79-98.

[17] J. Kim and J. Zimmerman, "Cherish: smart digital photo frames for sharing social narratives at home," presented at the CHI '06 Extended Abstracts on Human Factors in Computing Systems, Montrééal, Québec, Canada, 2006.

[18] M. H. Hasanah, "Smart House Design to Support Aging in Place," The degree of Bachelor of IT (Honous) in the division of Interaction Design, The School of Information Technology and Electrical Engineering, The University of Queensland, Brisbane, St. Lucia, 2008.

[19] G. Borglin, A.-K. Edberg, and I. Rahm Hallberg, "The experience of quality of life among older people," *Journal of Aging Studies,* vol. 19, pp. 201-220, 5// 2005.

Biography

I am a postgraduate student in UQ and focusing on general interaction design topic. I have completed serval projects about the wellness of aging population during my master degree. I completed a bachelor thesis regarding non-linear user information retrieval behavior. I am also interested in how to use interaction to support information serendipity or a related topic.