DESIGNING FOR POSITIVE EMOTION:
LUDIC ARTEFACTS TO SUPPORT WELLBEING FOR PEOPLE WITH DEMENTIA

Dr. Cathy Treadaway
Cardiff Metropolitan University
treadaway@cardiffmet.ac.uk

Dr. Gail Kenning
University of Technology Sydney
gail@gailkenning.com

Steve Coleman
Cardiff Metropolitan University
steve@steve-coleman.co.uk

Abstract

This paper presents recent research investigating the development of playful artefacts to support the wellbeing of people with dementia. It describes the initial scoping phase of the research and draws from two funded projects: one in South Wales, UK, and the other in Sydney, Australia. The context for the study is explained and the global scale of the research problem defined. The benefits of playful activities across the life-course are identified and the importance of hand use, crafting and creativity in later life are discussed. Research findings indicate that playful activities, particularly those that involve hand use, promote positive emotion and contribute to subjective wellbeing. These studies are being used to scope the design and development of ludic artefacts (age appropriate toys) for use in residential eldercare settings for people with dementia.

Keywords: Wellbeing, dementia, play, design, technology

Introduction

The global challenge of an ageing population has yet to be fully embraced by the design community. The implications of the increase in numbers of old people affect not only the individual, (who potentially will be facing a decline of visual and auditory functioning, slowed reaction times, decline in motor skills and agility and changes in cognitive processing), but also families, carers, health workers, eldercare facilities, social services and support networks, medical and health systems. It will impact on the structure of the workforce, housing and infrastructure requirements and national and international economic decision-making. Between 2000 and 2050 the proportion of the world’s population over 60 years will double. The World Health Organisation has identified the challenge of caring for the elderly, especially those with dementia, to be made a public health priority at international and national levels (WHO, 2012). It states that enabling the ageing population to maintain healthy ageing and wellbeing is a social and economic imperative. Many people are able to age in good health and remain active participants in society but others experience physical and cognitive limitations due to dementia and may lose the ability to live independently. The number of people living with dementia worldwide is currently estimated at 35.6 million, this number will double by 2030 and more than triple by 2050 (WHO, 2012).
People living with dementia are amongst the most discriminated against groups of individuals who receive health and social care services (Health, 2012, Alliance, 2010). ‘The language used in dementia care is frequently one of deficit, loss and behaviour management. Terms such as ‘elderly mentally infirm’, ‘dementia sufferers’, ‘geriatrics’, ‘senility’, ‘wanderers’ are still in common use particularly in the popular press’ (Andrews, 2013, p1). These labels foster negative stereotypes of people who have little to offer or live for and they have become a demographic that is frequently neglected by the design world.

Although ageing presents challenges to the individual and for society, it also presents opportunities for designers to creatively enhance life through socially responsible and appropriate design solutions. There exists a broad range of levels of independence and abilities of older members of the community and particularly those with dementia. It is important to not only provide support for physiological needs but also maximize the potential for people to socialise, have fun and enjoy their lives. This includes enabling interaction through play with other members of the ageing community, families including children, carers and professional health workers. Research indicates that happy people live longer, retain their independence, and require less medication and social care (Huppert et al., 2005). There are personal, social and economic benefits to finding new tools and strategies to promote positive emotion, social inclusion and foster wellbeing in later life. The focus on wellbeing and living well, rather than physical and medical care, will be a challenge for many social care providers. Design solutions that can help support elderly people, especially those with dementia, to live well and enjoy life are urgently needed. The Design Council UK has recognised these design challenges as an emerging theme within their Living Well with Dementia Design Challenge. A number of design projects focused on designing to enhance the lives of PWD have been undertaken. These embrace a range of solutions including the design of artefacts, services and technologies (Design Council 2012). The Design for Dementia project supported by the Royal College of Art and Helen Hamlyn Centre (Timlin, G. and Rysenbry, N. 2010) and socially aware projects at the Design Academy, Eindhoven (Cadamuro, A. 2014) are good examples of design research that is specifically addressing the needs of PWD. These projects identify the problems associated with designing for this demographic and add to the body of knowledge to inform future design. There is however, a clear need for appropriate design solutions that are not only concerned with practical care but that also consider living well and personal happiness.

Recent work by Desmet and Pohlmeyer (2013 p5) from the Delft Institute of Positive Design, advocates Positive Design as an appropriate design methodology to foster wellbeing. This approach encourages a shift in the design focus of new products away from material to more personal values that promote subjective wellbeing. Positive design methods are based on the principals of positive psychology and involve the explicit intention of designing to support human flourishing. The method takes account of pleasure, personal significance and virtue as core design values.

The research described in this paper aims to contribute to this body of work. It seeks to address the spectrum of challenges facing the elderly, those caring for and those with dementia, through the development of digitally augmented craft activities and age appropriate toys that will stimulate creative and playful experiences to support wellbeing. These will be devices to amuse, distract, comfort, engage, bring joy, and promote ‘in the moment’ living with the potential for social interaction or individual engagement for those with limitations due to memory loss or cognitive impairment.
Wellbeing

There is now a wide body of research to support the theory that creative activities are beneficial to wellbeing in older age and result in better health, fewer doctor visits, less medication usage and increased activities and social engagement (Hickson and Housley, 1997; Cohen et al., 2006; Cutler, 2009). In addition to the intrinsic and fundamental joys of creativity, artistic expression through traditional creative activities such as knitting, sewing, and painting provide opportunities for: ‘personal fulfillment; the creation of meaning; lifelong learning; social linkages; celebration; communication; dignity and self esteem’ (Cutler, 2009 p13). Research undertaken for the Baring foundation identified the need for a new body of research into the positive wellbeing derived from participation in creative activities (Cutler, 2009).

Health and social care policy in the UK is currently going through a significant period of change. Legislation is being introduced to enhance the role of local authorities and health services and set out overarching wellbeing duties for them and their partners. In 2010, the National Dementia Declaration for England captured outcomes that are needed to live well with the condition (Alliance, 2010) and the Prime Minister’s Challenge expressed the need to build dementia friendly communities (Health, 2012). The focus on wellbeing and living well rather than physical and medical care will be a challenge for many providers. Design solutions that can help support elderly people, especially those with dementia, to live well and enjoy life are urgently needed.

Playfulness and wellbeing

Playful activities have been found to support subjective wellbeing (Woodyer, 2012; Hannaford, 2010; Rogerson et al., 2013). The concept of using playfulness as a strategy for caring for people with dementia is becoming more widely accepted in the UK and Australia (Killick, 2013b). Findings from the authors’ previous research have highlighted differences between what is considered by society as ‘play’ and those activities that are ‘playful’ (Rogerson et al., 2013). It has shown that it is the ludic, intrinsic playfulness in leisure activities that are able to reduce stress and support wellbeing. However, in cultures and society where there is a strong work ethic, playful activities are often considered a waste of time and money, serving no useful purpose. Play is often regarded as a form of resistance (as in ‘playing around’ or ‘playing up’) and has negative connotations which place it diametrically opposed to work (Kane, 2005). Play is the preserve of children and, with maturity, is put aside in order to attain adulthood. While society grants permission to play specifically to children, this permission is inhibited in adult life. An alternative view proposes that playing is an innate human characteristic, which is useful throughout the life course (Dissanayake, 2000). Where self-permission for adults is granted, for instance through hobbies and leisure activities, ludic playfulness has been shown to support subjective wellbeing, encouraging living in the moment, absorption and providing new mental spaces that stimulate imaginative thinking. These activities provide new ways of ‘being in the world’ that are non-goal orientated and open (Woodyer, 2012). They enable life to be lived more intensely since they rely on sensory experience and openness to the world, eliciting a combination of cognitive and ‘felt’ responses.

Older adults frequently find themselves isolated and disconnected from their communities or unable to engage with others as a result of issues relating to physical and mental health, anxiety or lack of mobility. Previous research indicates that social interaction and a sense of belonging in society are vital to subjective wellbeing.
Playfulness also supports ways of socially engaging with others through shared play spaces, either physical or imaginary.

The research described in this paper uses theories of relationship-centered care (Nolan et al., 2003) to scope the development of new craft based activities and artefacts using emerging technologies that enable and promote open-ended non-goal orientated ludic play to support wellbeing. Killick (2013a) argues that dementia should be regarded more as a disability than a medical condition. He contends that since dementia impacts significantly on interpersonal relationships that we have a ‘crucial task in helping people to create the atmosphere in which dementia flourishes’ (ibid pp13). The focus of the design challenge is, therefore, to develop designs that stimulate positive emotion, bring happiness, laughter and joy in both an individual and social context.

The concepts of playfulness, fun and laughter fly in the face of negative stereotypes and attitudes towards dementia and to date there has been little research into positive emotions (such as pleasure and happiness) and their impact on wellbeing within eldercare settings (Cohen-Mansfield et al., 2012). There is however, research evidence to suggest that the areas of the brain that are least affected by dementia are those associated with imagination, feelings and emotions (Zeisel, 2011). It seems likely, therefore that activities that utilise these brain regions may have potential to provide stimulation and engagement for a person even when memory is impaired. Advances in neuroscience have evidenced that laughter is a deeply embedded behaviour in humans and that it has a very important role in supporting social connectivity and sense of belonging (Scott, 2013).

**Memory and emotion**

The research described in this paper seeks to identify ways to stimulate memory and engage, distract and calm people with dementia (PWD) for whom life is increasingly frustrating and limiting. Dementia is an incurable condition, which encompasses a range of neurodegenerative conditions: ‘symptoms can include severe memory loss, mood and personality changes and behaviors that challenge others such as serious confusion, agitation and aggression’ (Alliance, 2010 p2.)

A number of studies involving memory and reminiscence with PWD in conjunction with museums and art galleries have shown that handling objects and viewing art can be therapeutic (Kendall, 2013). Eldercare homes often use artefacts, or even whole rooms decorated in period style filled with appropriate objects, in order to stimulate residents’ memory. There is evidence that these forms of intervention can be very stimulating and bring pleasure to residents (ibid). For some PWD however, reminiscing can be difficult and may reinforce a sense of loss or evoke negative or painful emotions. Activities that promote flourishing and positive emotion are often those that are of the moment, engage the senses, and provide self-esteem or personal fulfillment. Creative activities such as art and craft, dance and music have been found to provide this kind of in the moment living and can be very uplifting (Cutler, 2009; Hickson and Housley, 1997). However, as the condition deteriorates, the potential to engage in such activities becomes increasingly limited. Development of new approaches to engagement in creative activities and new types of artefacts to be used with PWD in the later stage of the condition are desperately needed, especially those that might facilitate continued social interaction.

One approach that is being investigated is how different memory systems in the brain might be used to unlock different kinds of memories: emotional and procedural. Ledoux (1998) contends that the brain has multiple
memory systems devoted to different kinds of learning and memory functions. According to Ledoux conscious recollection (declarative or explicit memory), is the general meaning of the word memory in everyday conversation; it implies bringing to mind past experience and describing it verbally. However, other deep emotional (implicit) memories are stored in the brain and provide a trace of unconscious responses to experience. The brain subconsciously evaluates experience, deciding whether it is to be ignored or if it should lead to some physical reaction (such as sensing danger and then preparing for fight or flight). These reactions result in the stimulation of the autonomic nervous system and can be evidenced physically in changes in heart rate and sweat gland activity. Appraisal or conscious evaluation of experience is often accompanied by awareness by the individual of the internal body response, which then results in the feeling of the emotion (Damasio, 2000). The speed of this is so fast that it is perceived to be concurrent with the experience and this may go some way to explain gut reaction and intuition. There is evidence that co-activation of conscious memory can be assisted by emotional memory systems during remembering (LeDoux, 1998 pp. 213). The content of memory is also influenced by emotional experience and unpleasant memories are more likely to be remembered when we are sad and pleasant ones when we are happy. These insights suggest that it might be possible to tap into these deeper implicit memory systems when access to explicit and verbalised conscious memory declines.

Physical (bodily and dexterous) activities that have been practiced over many years become encoded in the brain as procedural memory that is tacit and outside conscious recollection (Sennett, 2008). Craft skills, music making and dance present good examples of such activities. It is possible that these different memory systems may help inform new ways to approach designing for people with dementia.

Research Methodology

The next section of the paper describes two studies that have been used to gather data about the kinds of activities that PWD currently engage in and their impact on wellbeing. Two recent projects are described, one in the UK and one in Australia, in order to scope requirements for the design of novel ludic artefacts to support positive wellbeing for people with dementia. Both have used ethnographic qualitative research methodologies: interviews, focus groups and participatory workshop sessions, to gather data about caring for people with dementia in residential care as well as wider issues concerning the ageing process and hand crafting activities.

SIP visits and OPAN workshops

‘Making a Difference’ was a research project led by Dr. Cathy Treadaway, funded by Welsh Assembly Government and Higher Education Funding Council for Wales’ (HEFCW) Strategic Insight Programme (SIP) and Older People & Ageing Research & Development Network (OPAN). The aim of the research was to investigate how the subjective wellbeing of PWDs in residential care might be supported through playful activities. The first study involved a series of visits to eldercare homes and specialist dementia units to meet with staff including managers, occupational therapists, carers as well as people with dementia. The visits provided a clear picture of the context in which the designs might be used, highlighted the many issues that face staff caring for people with dementia and the spectrum of challenges that they encounter in daily life within a care home environment. In particular this research identified a clear need for age appropriate toys to be used in residential eldercare settings. Managers commented on the concerns expressed by relatives who felt that the children's toys being given to residents were ‘inappropriate’ despite the apparent benefits to the individual
elderly person. Although the managers prioritised the PWD’s needs, rather than the relatives’ opinions, they expressed concern that there was a gap in the market for age appropriate toys that stimulate and engage. In addition to this, carers and managers also identified a need for activities that would stimulate social interaction, communication and physical movement. Occupational therapists also highlighted difficulties experienced at particular points in the day when caring for PWDs in residential care, for example at bath time and bedtime. It was felt that anything that could be designed to provide a distraction or enticement to encourage residents at these times would be hugely beneficial in reducing stress for both residents and staff. Managers explained that there was an apparent correlation between residents’ falls (often with hospital admission) and stress levels amongst PWD and staff. Designs that could help mitigate this would not only relieve individual suffering but also have a beneficial economic impact.

This preparatory research enabled strong relationships to be developed with the eldercare provider, Gwalia Cyf, and led to the appointment of a fully funded research student who is currently working on a doctoral study as part of the project.

As a consequence of this scoping, research funding was awarded to assist the formation of a focus group, comprising care professionals, occupational therapists, eldercare home managers, medical clinicians, representatives of charities, academics and researchers who had a shared interest in the development of age appropriate toys. Three workshops were funded by OPAN in order to develop a research proposal and explore the research territory. Each workshop event focused on key areas to be examined in the research:

- Playfulness and dementia
- Haptic sensibilities and touch
- Technology and smart materials

Experts in the field facilitated the workshops stimulating discussion and leading practical activities with the group. These activities included participatory games, playful visualisation and ideation exercises using Lego® and children’s construction toys as well as post it note brainstorming and similar techniques. Each session was video recorded for analysis and participants completed feedback sheets in order to gather views and ideas.

Crafting Wellbeing
The CRAFTING WELLBEING: An exploration of the relationship between craft-based textiles and health and wellbeing was a study conducted in 2013 in Sydney, Australia. Focusing on craft-based textile activities, such as knitting, crochet and lace making, the research examined how creative or playful intrinsically motivated activities contribute to health and wellbeing. The investigation was carried out by Dr Gail Kenning, University of Technology (UTS), Sydney, Australia at the Lace Study Centre (LSC) at the Powerhouse Museum (PHM) in Sydney and the Epping Craft Centre (ECC), New South Wales (NSW), Australia. Sixteen women between the ages of 45 and 90 took part in a series of unstructured interviews between 40 minutes and 75 minutes long. While all of those interviewed had made lace, the majority did not confine themselves to lace making, they engaged in a wide range of textile activities. A growing body of self-reporting by craft practitioners in books and on websites attests to the importance of craft-based textile activities and suggests that craft activities have helped practitioners through times of loneliness, adversity and illness (Vercillo, 2012). In addition, independent research studies are corroborating long-held anecdotal views regarding the positive effects of, for example, knitting, crochet, tatting and lacemaking, for general health and positive wellbeing (Schofield-Tomschin, 2001; Jenkins et al., 2013). Therefore this research aimed to engage craft-practitioners in a series of interviews in an effort to find out whether these activities contributed to their sense of wellbeing and in what way, in effect, how, did they contribute to their positive wellbeing. The interviews began by simply asking makers how they began their craft activity, who taught them, when, and what was the activity. The ‘conversation’ was then allowed to develop; allowing a wide range of topics to be introduced by the interviewees.

Craft-based textile activities are frequently acknowledged as being social and communal practices, and so practitioners benefit from the effects on general health and wellbeing brought about through social interaction. Findings from the Crafting Wellbeing project supports this position, with many participants talking about the importance of the friends they have made as a result of being part of knitting, sewing or lacemaking group. However, craft-based textile activities seemingly positively contribute to health and wellbeing in a number of other ways. These include, but are not limited to providing both physical and cognitive challenges; positive self-identification; respect of peers; company during times of solitude; a sense of association with larger textile communities and practices, both historically and geographically; and a reminder of skills learned and achievements gained (Kenning, 2013). In addition, craft practitioners frequently highlighted the importance of the process and the act of making. Although the making process culminated in the production of an object, many of them did not undertake the activity with a focus on the end product; the creative activity itself gave them a sense of achievement and pride in what they had made. While some practitioners gained comfort from ensuring that their hands were busy, often making reference to the perceived risks associated with ‘idle hands’, others celebrated a sense of rhythm, pace and tempo arising out of the making process and the tactility of ‘fiddling with threads’ (Kenning, 2013). Without exception, in this study all participants made reference to an emotional connection to this form of making. This took the form of memories of family members, friends or mentors who taught them; hopes for the future that they may teach grand children or friends textile process or techniques; the sense of connectedness that they felt towards their local craft community or to the history of their particular form of craft activity; or the joy at being able to achieve. In the retelling and recounting of their experiences makers lay claim to emotional experiences that in actuality may have been less intense at the time, nevertheless in these cases it would seem that positive reflection in itself, seemingly contributes to positive wellbeing, however transiently. Craft-based textile activities are intrinsically motivated, frequently carried out for the pleasure gained from engaging in the activity, the research found that craft-practitioners were happy to talk...
about their experiences and the joy of making and from this we might draw parallels between the subjective wellbeing arising out of play.

Figure 2. Lace makers engaging in intrinsically motivated activities, part of the Crafting Wellbeing study

Discussion and future work

The two projects described in the previous section have provided insights into the types of activities currently used in eldercare facilities and amongst groups of older people and how these support their wellbeing. Both studies found that physical dexterity, as well as the various progressive stages of dementia place limitations and constraints on the scope of the research. Stakeholder groups including older people and professional carers, have contributed their knowledge and expertise about the condition, suggesting ideas for designing activities and products to support PWD. The two projects have highlighted the value of activities that are in the moment, creative and fun. Findings indicate that activities that involve the hands are particularly successful in supporting wellbeing in older adults. The Australian study has identified that intrinsic motivation and haptic sensibilities promote wellbeing through the life course and the act of remembering the pleasure of past making activities promotes positive emotion. The UK study has highlighted the need for activities that can replace the more intricate manipulative elements of crafting but retain the rhythms and movements that are ludic, and that bring pleasure and sensory satisfaction.

Haptics and hand use

The intrinsic reward that motivates craft practitioners stems, at least in part, from satisfaction derived from hand use and making. Dissanayake (2000) contends that making by hand fulfills an innate human need and that the
rhythms and flows, that repetitive crafting processes require, draw from a deep emotional knowledge. The connection between crafting by hand and emotional wellbeing has been shown to be associated with total immersion in an activity in a flow state (Csikszentmihalyi, 1996) and a deep physical pleasure from working with the hands (Treadaway, 2009). Older people, who have engaged in craft practice throughout their lives and for whom the skills of making are deeply embedded in procedural memory, are supported emotionally through the activity. This iterative cycle of physical dexterous repetition and emotional reward is combined with a sense of achievement and social connectivity (Yatczak, 2011). Craft activities adhere to the rules of construction (forming a stitch or following a pattern) but can also be ludic and playful (making for the sheer joy of making), as well as being purposeful and goal orientated. Anecdotal evidence from a participant in the OPAN research, described earlier, suggests that people in the later stages of dementia continue to be able to practice handcraft such as knitting, although their competence at following a pattern may decline. The rhythmic and repetitive manual activity is deeply embedded in implicit procedural memory. This area will be explored further in future research to examine how the rhythms and tacit knowledge from handcrafting could be integrated in design concepts.

**Play and Technology**

Technology and smart materials now provide huge potential for developing new kinds of devices that are able to augment traditional crafting processes with technology (Minuto and Nijholt, 2013). Many designers working for this demographic are utilising wireless technologies and mobile devices: mobile phones and i-Pads providing assistive technologies for eldercare staff and residents (Blythe et al., 2010; Maiden et al., 2013; Lindsay, 2012). One of the problems integrating technologies within a care home environment is limited staff time and availability (Maiden et al., 2013). Another issue for PWD is memory, and the obvious difficulties in remembering how to use a device. Projects have successfully overcome this issue through intergenerational support that encourages young people to use a device in collaboration with the older person (Blythe et al., 2010). Ideally however, devices made for PWD need to be intuitive, pleasurable to handle and enable both individual and social play without the necessity for a tech savvy assistant or carer.

The next stage of the research will require input from a range of stakeholders to capture the specific requirements and specifications of activities and devices to be designed. An inclusive participatory design method is proposed in which researchers, developers and users will come together in a series of workshop events to originate experimental digital devices that are intuitive, tactile and playful. These will be things to touch, hold and manipulate (fiddle with) that have no specific purpose other than their intrinsic ludic enjoyment – they will be for playful playing. Engagement of PWD with these new playful interfaces will be documented through qualitative case study methods and evaluated for their impact on positive emotion and mental wellbeing.

**Acknowledgements**

The authors would like to thank the following for their contribution to this research: Centre for Applied Research in Inclusive Art and Design (CARIAD), Welsh Assembly Government, Gwalia Cyf, AgeCymru, OPAN and the Powerhouse Museum, Sydney.