

# WORKSHOP: PLAYFUL DESIGN FOR ALZHEIMER'S DISEASE

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## ABSTRACT

This workshop aims to bridge the gap between game-, and product design and the theoretical knowledge of the field of neuropsychology. During the workshop we will design playful experiences to stimulate older persons with Alzheimer's disease, in order to delay disease progression. Knowledge concerning the progressive course of neuropathology of the disease can substantially contribute to the design of suitable games, or playful products, for this user group. In view of the increasing population of older persons with Alzheimer's disease, the design of relevant games or playful products by well-informed designers will benefit this group and is urgently needed.

## INTRODUCTION

You may well recognize the enthusiasm of nursing home residents playing bingo or a game of chess. As older persons, particularly those with dementia, tend to remain passive most of the day (Bates-Jensen et al. 2004), playing games is an activating and entertaining way of spending time (IJsselsteijn 2007).

In elderly care, games are used for rehabilitation or leisure purposes and contribute to older persons' physical and cognitive functioning as well as their emotional well-being. Enthusiastic engagement while playing is crucial for the potential occurrence of benefits (Bavelier et al. 2011). However, games that are targeted at young age groups are rarely suitable for the older (cognitively impaired) population due to their specific needs concerning their physical and cognitive deficits.

Our aim is to design games, or playful products, for older persons with cognitive impairment, i.e. persons suffering from Alzheimer's disease (AD). AD is the most common form of dementia (Kester & Scheltens 2009) and older persons with AD form an increasingly growing segment of our population. AD is characterized by a progressive deterioration of the brain; so-called 'neuropathology', resulting in specific behaviour and care needs. Designers have the skills to design engaging games and beloved products, and neuropsychologists have the knowledge to understand behaviour of people suffering from AD. Therefore, we as one product designer and one clinical neuropsychologist collaborate to design playful products that meet the specific needs of persons suffering from AD.

In our studies we bridge the gap between disciplines by extracting design relevant information from the field of neuroscience. In this workshop we will introduce this theoretical framework to designers in order to give them the tools to design suitable games, or playful products, for older persons with different severities of Alzheimer's disease. Disease progression highly affects the perception of play and therefore determines which play experiences are most appropriate along the course of the disease. More specifically, play experiences that rely too much on brain structures that are (severely) affected by the disease could be meaningless and frustrating (Lucero 2000). On the other hand, play experiences that are somewhat challenging can be effective in slowing down the development of the disease. This phenomenon has been phrased as 'use it or lose it' (Swaab et al. 2003). Lastly, play experiences that fit the player are considered most enjoyable and motivating (Fang & Zhao 2010).

We have several aims for this workshop: we aim to create awareness for the broad variety of the user group; we aim to provide designers with knowledge from the field of neuroscience; we aim to collect examples of possible playful design concepts for different stages of Alzheimer's disease; and we are curious whether designers experience this hands on knowledge and tools as inspiring.

## NEUROLOGIC BASE FOR PLAY EXPERIENCES

Neuropathology in Alzheimer's disease slowly accumulates (Bastos-Leite et al. 2004). Although the behavioral symptoms of individual patients with Alzheimer disease may vary, specific cognitive problems are present from the start en result from neuropathology located in certain brain areas (Kester & Scheltens 2009). Alzheimer neuropathology follows a predetermined course specifically targeting certain areas and relative sparing of others (Bastos-Leite et al. 2004). To stimulate those areas that are not too much affected in the early stages of the disease warrant specific knowledge of the disease course. We are currently working on a paper focusing on which play experiences, elements formulated by Korhonen (2009), could be best triggered in which stage of the disease. We focus on cognitive healthy older adults, older adults with mild (amnesic) cognitive impairment, and persons with Alzheimer's disease in a mild-to-moderate, and a severe stage.

## WORKSHOP CONTENT

### FOCUS AND STRUCTURE

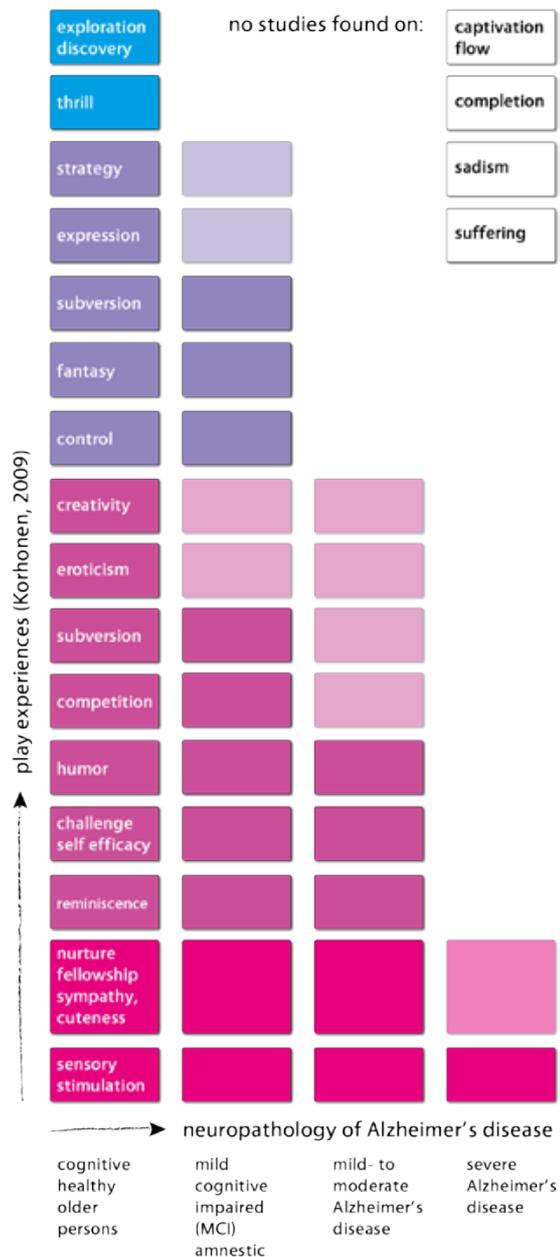
The general idea for the workshop is to provide designers, or design-related professionals, with knowledge from the field of neuroscience and to do a mini-design project. Although the focus is on the theoretical framework of the neurological base of play experiences, we do take into account the general design guidelines for elderly (see the workshop outline for the time distribution). The structure of the design project is based on the basic design cycle (Roozenburg and Eekels 1995) and we will address the first two steps during this workshop; the analysis and synthesis phase.

### INTRODUCING THE THEORY

The theoretical framework will be explained by an interactive presentation of both authors representing the two different fields. Currently we are working on a paper about the theoretical framework 'Neurological base for play experiences' which will be finished at the time of the workshop. We will prepare a booklet that is based on this paper, but the framework will be presented to the designers by less written text, more illustrative (info) graphics and rich information of the user group.

### SENSITIZING

Besides the theoretical knowledge we will 'meet' the user group in order to be able to design products empathically. We will work in small groups and work for different 'personas' living in a nursing home. The personas differ in stage of Alzheimer's disease, physical deficits, background, and personality. The personas are based on real stories that we collected from field studies in the Netherlands. The groups have time to discuss their persona and share their own experiences.



### DESIGN

The aim is to design either a game or a product for everyday use that facilitates a playful interaction. The severity of Alzheimer's disease is determined by the persona and the play experiences that suit your persona best can be inferred by using the theoretical framework. The design phase is divided into several steps. Firstly we will diverge by brainstorming to come up with plenty of ideas. After sharing your ideas with the other groups you and your group will discuss the ideas and select the best ones. You will elaborate on these concepts to make your final design.

## PRESENT AND DISCUSS

Every group will present their final concept design in a couple of minutes. By presenting and discussing the concepts the differences in design for patients in other stages of Alzheimer's disease will become visible.

## EVALUATE THE DESIGN PROCESS

With a mini-questionnaire we will ask you to evaluate your experience of the workshop. We are interested in how you as designers and design-related professionals experienced the theoretical framework as a design tool.

## WORKSHOP OUTCOME

If this theoretical framework turns out to be inspiring and useful while designing for playful experiences of persons suffering from AD we will make this knowledge available to designers worldwide by making the booklet accessible online. The booklet that is used as reference work will be improved by your feedback and enriched with your design concepts as inspirational examples.

## WORKSHOP MATERIALS

### WE WILL BRING:

- The booklet with the theoretical framework of play experiences for Alzheimer's disease and general design guidelines for elderly
- Personas of future users
- Video camera
- Posters to brainstorm and present ideas
- Pencils, stickers and post-its

### WE NEED:

- Wall or flip-overs (to present ideas)

## WORKSHOP OUTLINE

This half-day workshop will take approximately four hours. The outline of the workshop is presented in the table below.

Table 1: Workshop schedule

Time	Activity
Start	Welcome and presentation on the Alzheimer's neuropathology and play experiences (30 minutes)
00:30	Presentation: general design guidelines for aging (10 minutes)
00:40	Introductory assignment (5 minutes)
00:45	Step 1: Analysis phase: meeting the user group by reading the personas in small groups (15 minutes).
1:00	Step 2: Synthesis phase: idea generation (40 minutes) and display the ideas on the wall (flip-over)
1:40	Coffee break and possibility to walk around to be inspired by other groups (20 minutes)
2:00	Step 3: Select your best ideas and choose 1 to 3 favourites from your group (30 minutes)
2:30	Step 4: Elaborate on your final concept design (30 minutes)

3:00	Step 5: Mini-presentations & discussion (40 minutes)
3:40	Last step: evaluate your experience with designing from this theoretical starting point (a very short questionnaire: 10 minutes)
3:50	Wrap up

## PARTICIPATE

To participate in the workshop you can just sign up by sending an email to the first author. We would like to ask you to mention your profession to have an idea of the composition of the group.

## REFERENCES

- Bates-Jensen, B., Alessi, C., Cadogan, M., Levy-Storms, L., Jorge, J., Yoshii, J., et al. 2004, 'The Minimum Data Set Bedfast Quality Indicator Differences Among Nursing Homes', *Nursing Research*, 53, 260-272.
- Bastos Leite, A.J., Scheltens, P. and Barkhof, F. 2004, 'Pathological aging of the brain: an overview', *Topics in Magnetic Resonance Imaging*, 15, pp.369-389.
- Bavelier, D., Green, C.S., Han, D.H., Renshaw, P.F., Merzenich, M.M. and Gentile, D.A. 2011, 'Brains on video games', *Nature Reviews Neuroscience*, 12, pp.763-768.
- Fang, X. and Zhao, F. 2010, 'Personality and enjoyment of computer game play', *Computers in Industry*, 61, pp.342-349.
- Kester, M.I. and Scheltens, P. 2009, 'Dementia: the bare essentials', *Practical Neurology*, 9, pp.241-251.
- Korhonen, H., Montola, M. and Arrasvuori, J. 2009, 'Understanding playful user experience through digital games', *International Conference on Designing Pleasurable Products and Interfaces, DPPI09. 13-16 October 2009, Compiègne University of Technology, Compiègne, France.*
- Lucero, M., Kijek, J., Malone, L., Santos, R., and Hendrix, K., 2000, 'Products for Alzheimer's patients with "null" behaviour', *American Journal of Alzheimer's Disease and Other Dementias*, 15: pp.347-356.
- Swaab, D.F., Dubelaar, E.J., Scherder, E.J., van Someren, E.J. and Verwer, R.W. 2003, 'Therapeutic strategies for Alzheimer disease: focus on neuronal reactivation of metabolically impaired neurons' *Alzheimer Disease & Associated Disorders*, 17, S114-122.
- IJsselsteijn, W., Nap, H.H. and de Kort, Y. 2007, 'Digital Game Design for Elderly Users', *Future Play '07 Proceedings of the 2007 conference on Future Play*