Analyzing Well-being for the Design of a Persuasive & Interactive Installation

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Abstract
Our aim was to design an installation of interactive devices that helps people to increase their well-being. This paper describes the project's analysis phase, consisting of mind maps, cultural probes and questionnaires.

Keywords
interactive system design, well-being, persuasive technology, intentional activities.

ACM Classification Keywords
H.5 Information interfaces and presentation (e.g. HCI): H.5.1 Multimedia Information Systems and H.5.2 User Interfaces

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Introduction
Persuasive technologies [2] intend to change people's attitudes or behaviors. With this in mind we want to support a positive change in people's well-being by facilitating certain behavior and after long-term usage, hopefully, reaching a change in behavior. We will design an installation comprising of several devices that will be embedded in people's homes. The interaction with it is voluntarily and it will support their well-being in an implicit manner.

What is well-being?
Since we wanted to investigate theory in context in order to support an existing physical activity, we used a design research approach [5]. We started by looking into the theory of well-being and health, where health is defined by the World Health Organization [7] as: 'health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity'. This indicates that well-being is related to health and that both are not limited to illness or disease. Examples of mental health include how people cope with stress in everyday life or how they challenge themselves intellectually, while social health has to do with e.g. having contacts with friends and developing norms and values. We decided to focus on well-being that has nothing to do with illness or disease, but with

ordinary people who try to increase their everyday well-being in their home environment.

The book 'The Science of Well-being' [6] was used as a starting point for creating five mind maps concerned with different topics within the context of well-being (see Figure 1). These mind maps were used to get an overview of all the different activities people can do that are related to well-being. For example, Figure 1 shows that daydreaming and searching for meaning in life are psychological activities that one can do to improve your (mental) well-being.

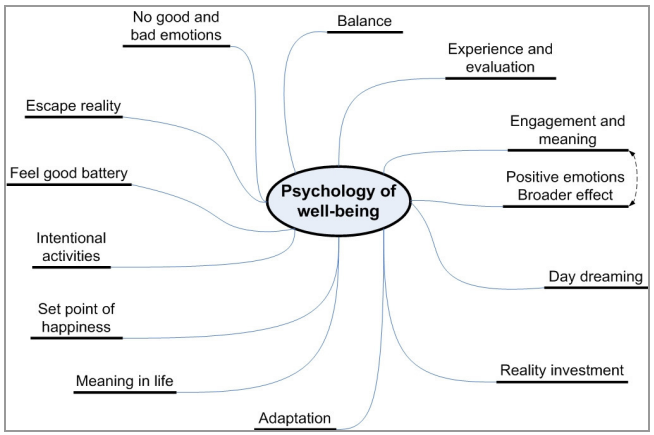

figure 1. A mind map focusing on topics related to the 'psychology of well-being'.

The results from these different mind maps were combined and the most relevant results for the project were put into one overview (see Figure 2) that lists the influences on well-being and the ways to manipulate these influences. E.g. if the goal is to increase well-being by fulfilling personal goals, this can be achieved by helping people to set, plan and work actively on these goals. This is an example of a so-called intentional activity, which is an activity one does consciously to increase long-term well-being.

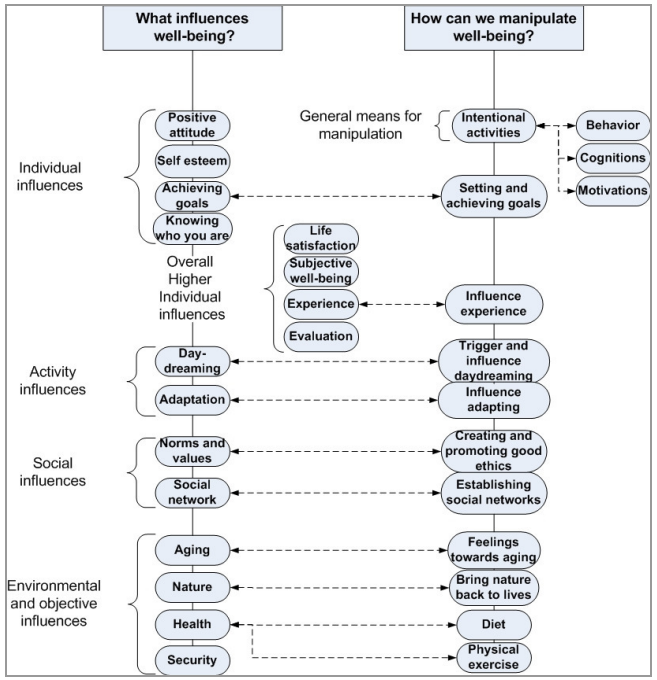

figure 2. List of and relations between influences and manipulations of well-being.

These influences were used as a list of possible design directions, but it also helped us to get an idea of what well-being comprises. Just for our own understanding we decided to work with the following all-inclusive explanation:

Well-being is a personal balance of mental, social and physical being, influenced by life factors and life circumstances. These factors include emotions, meaning, life satisfaction, intentional activities, social network, marital status, health and genes.

Who to design for?

The choice was made to target adults, since we assumed that it was easier for them to work on their well-being than it would be for children. Within the adult group we considered different family statuses, such as couples with or without children, single and married people. Comparing married with unmarried people, it was concluded that overall being married was related to a better mental health than not being married, no matter whether the unmarried people lived alone or with others, e.g. their children [4,6]. But we know that having a family provides life satisfaction, increases mental and physical health compared to unmarried people living alone, who do not get daily reinforcement from a partner, which can result in a negative influence on their well-being [4]. We chose as our target group the group with the least reported well-being, which turned out to be the group which was unmarried and living alone, which we narrowed even further down to single people, living alone (excluding people with long-distance relationships).

An interesting fact though is that for couples the value of their friends' and acquaintances' opinions declines over time, which is not the case for singles [1]. They seem to have more diverse and deeper social relations with friends than couples do, which in return can have a positive effect on their well-being. We decided to focus on singles, living alone, which is a quickly growing group in society.

Cultural probes exploring well-being

We set up a cultural probe study to find out how are target group deals with well-being in everyday life. Cultural probes are packages of materials like maps and postcards, designed to provoke inspirational responses from the target group [3]. In our study the probes consisted of a disposable camera, twelve postcards and a diary (see Figure 3) and were handed out to nine single participants that lived alone.

The disposable cameras were meant to take a number of photos of inspiring places or places were the participants felt good. The postcards contained questions that should give insight in the participants' activities that influence their well-being, e.g. 'in what activities can you completely loose track of time?' and 'what do you do to keep a positive attitude?'. In the diaries they had to write down activities they did to work on their well-being over a 2- to 3-day period.

The results from the probes were that inspiring places outside the home included: nature, the working environment and holiday locations. Places where the participants felt good included: the living room, the garden and the shower. Participants indicated to 'completely loose track of time' while surfing the internet, watching TV, being in nature, working and doing social activities, such as meeting friends. Seizing the day included activities like sleeping late, enjoying good food and drinks, socializing and listening to the radio and watching TV. Participants indicated they kept a positive attitude by: looking at the bright side of life, putting things into perspective, being inspired by and trusting other people, and by staying busy. It turned out all nine participants worked actively on their well-being, e.g. by helping others or taking time to relax.

figure 3. Cultural probe package with disposable camera, diary and postcards.

Studying Intentional Activities

Because most activities turned out to be intentional activities we decided to continue with it, finding it consists of three directions [6]: 1- *overt behavior*: exercises meant to actively increase well-being; 2 - *cognitions*: changing people's attitudes towards life and well-being, their feelings about the past, present or future, and 3 - *motivations*: influencing meaning or goals in life. The direction of 'cognitions' was chosen, because it was of use for the entire target group and realistic within the time constraints of the project. Examples of cognitive intentional activities [6] are: increasing a positive attitude, increasing awareness and gratefulness of the good aspects in life, and seizing the moment.

In order to investigate whether and how the target group dealt with cognitive intentional activities questionnaires were chosen. The 16 questions targeted well-being and intentional activities in general, seizing the moment, the awareness of good aspects in life and keeping a positive attitude, questions included: 'name three activities that you consciously do to make yourself happy' and 'I believe I can actively increase my own well-being'. The questionnaires were handed out to 19 participants (12 men and 7 women), all of which met our target group requirements.

The results showed that participants strongly believed they can influence their own well-being (4.1 average on a scale of 1-5, 1 is 'strongly disagree' and 5 is 'strongly agree'). Participants reported to develop themselves, socialize, do sports and hobbies to actively increase their well-being and they indicated to be willing to spend an average of 8-10 hours per week on activities intended to make them happy. We decided to design an installation of interactive devices that persuade and remember people to start and follow-up on intentional activities they can choose themselves and which they can share or do with friends.

Future work

We will work out the concept into a detailed design, implement it into a working prototype and perform a user evaluation in a home setting.

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References

[1] DePaulo, B. and Morris, W. Singles in Society and in Science. *Psychological Inquiry*, 16, No. 2&3 (2005), 57-83.

[2] Fogg, B.J. *Persuasive Technology: Using Computers to Change What We Think and Do*. Morgan Kaufman Publishers,San Fransisco, USA, 2003.

[3] Gaver, B., Dunne, T. and Pacenti E. Cultural probes. *Interactions*, vol. 6, issue 1 (1999), 21-29.

[4] Gove, W., Hughes, M. and Briggs Style, C. Does Marriage Have Positive Effects on the Psychological Well-Being of the Individual? *Journal of Health and Social Behavior*, 24 (1983), 122-131.

[5] Hoven, E. van den, Frens, J., Aliakseyeu, D., Martens, J-B., Overbeeke, K. and Peters, P. Design Research & Tangible Interaction. In *Proc TEI'07*, ACM Press (2007), 109-116.

[6] Huppert, F.A., Baylis, N. and Keverne, B. *The science of well-being*. Oxford University Press, New York, USA, 2005.

[7] World Health Organization, http://www.who.int/about/definition/en/print.html. Last accessed 15-Nov-2007.