



## Physical computer games for motivating physical play among elderly

**Jessen, Jari Due; Lund, Henrik Hautop ; Jessen, Carsten**

*Published in:*  
Gerontechnology

*Publication date:*  
2014

*Document Version*  
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

*Citation (APA):*

Jessen, J. D., Lund, H. H., & Jessen, C. (2014). Physical computer games for motivating physical play among elderly. *Gerontechnology*, 13(2), 220.

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*Physical computer games for motivating physical play*

J.D. JESSEN, H.H. LUND, C. JESSEN. **Physical computer games for motivating physical play among elderly.** *Gerontechnology* 2014; 13(2):220; doi:10.4017/gt.2014.13.02.185.00 **Purpose** To avoid falls and stay healthy, it is important that elderly people preserve their muscle strength. Therefore, physical training for the elderly remains an ongoing area of research. Current training methods consist primarily of rehabilitative training and/or optional exercise classes with a physiotherapist or volunteers. This paper presents a new solution that motivates elderly people to engage in physical training by introducing simple, fun, and challenging physical computer games. **Method** In the project we use modular playware tiles (*Figure 1*)<sup>1</sup>. The tiles were used in two elder centers (16 participants, averaging 79 years old), a rehabilitation center (12 participants, averaging 79 years old) and a hospital (12 participants, averaging 85.33 years old). Each week, there was 1-2 training sessions, and care was taken to ensure that each participant received at least 12 minutes of training in each session. Observations and informal interviews were performed during the sessions. The data were categorized and analyzed using theoretical coding. **Results & Discussion** The introduction of physical computer games on modular tiles for elderly participants was highly motivating and very successful, corresponding with results from other user groups (i.e. rehabilitation patients and children<sup>2</sup>). There was special interest in memory games that challenged the elderly both physical and mentally. The coaches asked for 2 minutes of training time for each game, but the elderly kept playing for up to 10-15 min of a single game. The games created a playful atmosphere, which improved motivation compared with standard rehabilitation training and exercise. Several participants complained they did not have enough time to play. There was a high degree of competition among the elderly players for most points, and against themselves to beat their own records, which indicates that games can improve exercise time and intensity. This was supported by participants' physical improvement; measurements at the elder centers showed improvements on Chair Stand 24%, Timed Up and Go 21%, 6 Minutes Walking Test 29% (tests from senior fitness test<sup>3</sup>), Tandem Line Walk 66%, for all  $p < 0.001$ ) and measured at the rehabilitation center where improvement on Dynamic Gait Index was 12.3%,  $p < 0.05$ )<sup>4</sup>. Thus, play on modular tiles seems to create a strong motivation for participation in therapeutic activities, as well as measurable health improvements, among elderly users.

**References**

1. Lund HH. 2009 IEEE International Conference on Rehabilitation Robotics 2009;571-575; doi:10.1109/ICORR.2009.5209517
2. Lund HH. Modular Interactive Tiles for Rehabilitation – Evidence and Effect. WSEAS international conference on education and educational technology; Selected topics in applied computer science; 2010:520-525
3. Rikli RE, Jones CJ. *Medicine & Science in Sports & Exercise* 1999;31:S399; doi:10.1097/00005768-199905001-02042
4. Lund HH, Jessen J. Effects on community-dwelling elderly playing with modular interactive tiles. International Conference on Serious Games and Edutainment; 2010

**Keywords:** work & leisure, physical computer games, motivation, physical training, elder

**Address:** Center for Playware, Technical University of Denmark, DK-2800 Lyngby, Denmark  
**E:** [jdje@elektro.dtu.dk](mailto:jdje@elektro.dtu.dk)

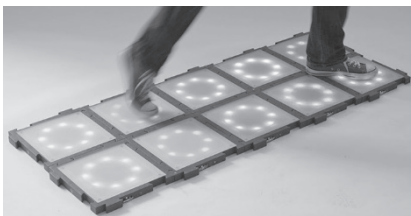


Figure 1. Modular Playware Tiles

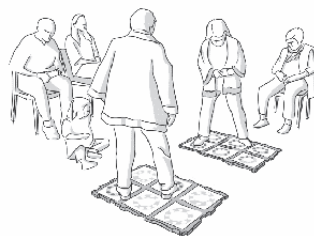


Figure 2. Playware Tiles in use in an elder center