

# Gerontoludic Design: Extending the MDA Framework to Facilitate Meaningful Play for Older Adults

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## ABSTRACT

Considering the popularity of digital games among older adults and the challenge of population ageing, this article identified a need for an integrated game design framework aimed at older audiences. An analysis of the literature on play in later life demonstrated how the literature is dominated by two themes, i.e., the benefits of playing digital games and the issue of accessibility. While this underlying model has been demonstrated to contribute to successful designs, it also risks reducing games to its motivational characteristics and ageing to cognitive and physical decline. The author therefore reviewed the literature on game design and later life to develop a design approach that considers the multi-faceted nature of ageing as well as the intrinsic value of digital games. The resulting “Gerontoludic Design Framework” sets meaningful play as the intended outcome of game design for older adults, identifies iterative player-centered design as its preferred design approach, and extends the MDA framework by suggesting age-specific aesthetics and mechanics.

## KEYWORDS

Accessibility, Design for Older Adults, Design Framework, Game Design, Inclusive Design, Multidisciplinary Design Methods, Quality Criteria, Research-Driven Design

## INTRODUCTION

The world is currently at the heart of a unique and irrevocable demographic transition. As fertility and mortality rates decline, the proportion of older adults and seniors in our society is growing rapidly. For example, the figures of the United Nations World Population Prospects (United Nations Population Division, 2012) demonstrate a clearly discernable trend towards a top-heavy society. Their predictions state that the world population over the age of 60 will have doubled between 2015 and 2050 (from 12.2% to 21.2%), and these demographic changes will be the catalyst for global socio-economic challenges and opportunities (Christensen, Doblhammer, Rau, & Vaupel, 2013; Smith, 2010). For digital game design aimed towards older adults, I see two possible directions.

First, there is the optimistic view of the aged society; a perspective that relies on the premise that large numbers of older adults are capable of playing and purchasing digital games in the near future. This could be a promising turn of events for game developers, especially considering that market research has indicated that many of today’s older adults love to play digital games. For example, the PEW Internet & American Life Project found that 23% of 65+ year-olds’ report playing games in 2008 (Lenhart, Jones, & McGill, 2008), the Entertainment Software Association estimated that 26% of US gamers were over 50 in 2015 (ESA, 2016), and a TNS/Newzoo survey found similar figures for Europe in 2009 (Hagoort & Hautvast, 2009). Older adults are therefore becoming a large, attractive, and currently untapped market for innovative game developers.

DOI: 10.4018/IJGCMS.2017010103

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However, a second direction assumes that this premise is problematic. If contracting retirement funds become incapable of supporting expensive healthcare needs, older adults might struggle to stay able to play games. From this point of view, older adults are not seen as an attractive market, but as a group that is in need of help. As digital games can offer many positive effects for the ageing individual (Granic, Lobel, & Engels, 2013), these potential benefits could then be leveraged towards combating age-related decline and support an ageing society.

Regardless of what the future might bring, I would argue that the design of digital games (and other playful activities) for ageing players will continue to gain relevance. This article aims to consolidate the fragmented but multidisciplinary literature on the topic in an integrated design approach for digital games.

## THEMES IN PREVIOUS LITERATURE

The study of digital games in later life has been inspiring academic research for more than 30 years, as Weisman's (1983) "Computer Games for the (Frail) Elderly" was possibly the first scholarly article on the topic. To develop the design framework that is proposed in this paper, I analyzed the literature on the topic of games and ageing in November 2014. While it was not the intention of this review to present an exhaustive meta-analysis, it did lead to a number of insights that would inform the eventual framework.

The search queried Medline/PubMed, Web of Science, Google Scholar and article reference lists, using the terms "games", "gaming", "play", "older adults", "seniors" and "elderly". Duplicates were removed from the search results, as well as result that were irrelevant to the goals of this project. For example, some of the results used the term "seniors" to refer to high school students, and others used "play" to refer to the performance of a certain act. The review therefore excluded articles that studied sports, music, gambling, and any form of play that did not include references to digital games or technology.

The resulting sample of 265 articles indicated that the field was fairly small until 2006 as only 17 of the 265 articles (6.42%) were published before that year. While 2005 had only 1 article in the list, 2006 produced 3 articles (1.13%), while 2007 added 4 (1.50%), and 2008 contributed 16 publications (6.04%) (see Figure 1).

The increasing interest in the topic around this time could hypothetically be related to the media attention for the 2006 Nintendo DS game "Brain Age: Train Your Brain in Minutes a Day!", a digital game that was marketed directly towards older adults as a form of cognitive exercise. December 2006 also saw the release of the Nintendo Wii, a motion-based gaming console that ended up being a popular gaming platform for health-related research (e.g., Agmon, Perry, Phelan, Demiris, & Nguyen, 2011; Bell et al., 2011).

Regardless of its cause, the interest for digital games in later life has kept increasing ever since: In comparison to the past decennium, the 4 years between 2010 and 2014 delivered 208 articles (which corresponds to an increase of 384%). After collecting the sample, the project performed an analysis of the titles of the articles, in order to identify the most important themes. Using the free web application Textalyser.net, a frequency table was made that contained all recurring words of 3 or more letters, and all recurring combinations of words up to 5 words. Next, all prepositions and articles were removed along with synonyms of the search terms and any research methods (see Table 1).

The analysis found many items that were related to potential health benefits of playing digital games for older adults. For example, the top 10 of most recurring terms contained items such as "training" (35; 13.21%), "balance" (35; this word was typically used as a reference to older adults' balance in the context of fall prevention), "physical" (33; 12.45%), "cognitive" (32; 12.08%), benefits (29; 10.94%), and "exercise" (22; 8.30%). These terms came from effect studies that evaluate digital games as a way for older adults to improve their cognitive and physical health (e.g., Agmon et al., 2011; Anguera et al., 2013). Similarly, the terms "social" (14 times or 5.28%; e.g., Kaufman, Sixsmith,

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