

## Chapter 9

# Play's the Thing: A Wager on Healthy Aging

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### ABSTRACT

*This study highlights the findings of researchers who, since the early 1980s, recognized the potential of engaging seniors in game interactions as an alternative to passive activities. Against this background, the perspective of anticipatory processes for evaluating specific gaming needs of the aging and providing games with anticipatory features is introduced. The hypothesis informing this work is that aging entails diminished adaptive abilities, resulting from decreased anticipatory performance. To mitigate the consequences of reduced anticipatory performance, we address brain plasticity through playing. Since anticipation is expressed in action, the games conceived, designed, and produced for triggering brain plasticity need to engage the sensory, cognitive, and motoric. The AnticipationScope, i.e., integration of motion-capture data and physiological sensors, is the platform for identifying individual characteristics and for validating the results of game participation. The output is the Anticipatory Profile. Implementations inspired by this original scientific framework are presented.*

### INTRODUCTION

The year was 1958. William Higinbotham, working at Brookhaven National Laboratory, conceived of a tennis game consisting of a Systron analog computer, handheld commands, some relays, and an oscilloscope. Simulated on a screen was a side view of a tennis court. The two players could rotate

a knob that changed the angle of the “tennis ball,” or press a button to send the ball toward the opposite side of the virtual court. If the ball hit the net, it rebounded at an unexpected angle. If the ball went over the net, but was not returned, it would hit the court floor and bounce again at a natural angle. Since this was an analog computer-based game, the ball sometimes disappeared from the screen. A *Reset* button could be activated, causing the ball to reappear and remain stationary until the *Hit* button

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was pressed (Brookhaven National Laboratory, 1981; Ahl, 1983).

## **CATCHING UP WITH SENIOR ADULTS**

Today, games for health, and in particular games addressing the rapidly growing aging population, represent a large segment—evaluated at 26%—of the entire effort to conceive, design, produce, and market games of all kind. One of the games used in this effort—Surprise! Surprise!—is tennis. And one of the most important observations made so far is that playing tennis with the computer is interesting at the beginning. However, playing with someone else, for instance, over the Internet, is what users want, regardless of whether they are beginners or those handicapped seniors who once upon a time used to play real tennis every day. The social aspect of playing is actually more important for the aging than for any other demographic group: “Games will entice the aging to remain fit and mentally active, *to connect with others*” (Montet, 2006).

During the 50 years that have passed since Higinbotham conceived his game, many more observations have been added to the one regarding the social nature of human interactions through games. In our days, there are many attempts to make games, usually associated with entertainment and therefore compared to the success of Hollywood. In the meanwhile, games became part of the awareness of the medical community (after being successfully adopted by the military, by education, and even by politics). There are competitions—in the USA alone, over 30 posted on the Internet in 2008—funding opportunities (associated with the NIH, NSF, AASHA/CAST and several private foundations), classes offered in various settings—from training sessions to Ph.D. studies. As far as medical applications are concerned, there are many research activities, ranging from addressing obesity in the young

(and not only), to PTSD, autism, cancer treatment, etc. The body of scientific contributions in peer-reviewed journals has increased spectacularly over the last five years. Many journals—from *Nature* and *Neuroscience* to *Science*—report on progress in understanding the various aspects of a game-oriented culture, and in particular of game adoption by healthcare professionals. The number of experiments dedicated to the extremely important issue of game impact validation doubled in the last three years. Indeed, to have a good time with a game is not really dependent on what various experts measure: How fast do you get bored? How long until you abandon the game? What gets your “juices” running? and so on. Experts continue to measure such characteristics anyway—because this is how funding can be secured, and because the game industry wants numbers for marketing purposes. Since the game industry is extremely competitive, but also very impatient, even a little knowledge (as dangerous as it can be) is considered better than none. But once you project expectations related to health, the name of the game (pun intended!) changes. As a matter of fact, a game for health—for young or old—will be judged almost like a physician is. Forget liabilities for a moment—which have already attracted the attention of lawyers and public advocates. The promise implicit in any treatment entails the necessity to produce the data validating the promise. Moreover, from casual games to massively multi-player online role playing game (MMORPG), what drives the effort in the first place is art and design, combined with good computer knowledge, extending into artificial intelligence and virtual reality. Once a certain game platform is made available, technological considerations are translated into game opportunities. Technological progress—faster processors, new forms of interaction, better interfaces, better I/O devices, etc.—have led to new game platforms. And this translates into opportunities. This is true also in respect to games for health. Consider only the impact of Nintendo’s Wii platform on new

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