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DIGITAL SPORTS GAMES AND THEIR PLAYERS

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Playing motivations and player's assessment of the effects of playing

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Abstract

The purpose of this research was to determine people's motivation and their reasons for playing digital sports games. In addition to this, the aim was to investigate the consequences of playing the games for these people. It was particularly important to analyze players' personal experiences as well as the effects of playing on the body and on everyday life.

The corpus of this qualitative research consists of questionnaire responses from eight people. Structured questionnaires were analyzed and four different digital game player profiles were created on the basis of this analysis.

Results show that the respondents' physical background was very fragmented; some respondents were active in sports, some of them had been rarely physically active before exergaming. It turned out that digital sports game playing increased most of the respondents' weekly exercise times, the amount of overall physical activity as well as the intensity of the exercise. Digital sports game playing was also a factor when starting a lifestyle renovation, as well as a smaller scale dietary change. However, mainly the respondents' view was that digital sports game playing cannot replace the daily physical exercise but playing is a good supplement to it.

The research was conducted on a small scale. Therefore generalizations cannot be made and further research on this topic is recommended.

Keywords
Activity, digital, exergame, exercise, game, physical, play, sports

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Tiivistelmä

Tämän tutkimuksen tarkoitus oli määrittää digitaalisten liikuntapelien pelaajien pelaamisen motiiveja sekä syitä pelata digitaalisia liikuntapelejä. Tämän lisäksi tarkoituksena oli selvittää pelaamisen seurauksia pelaajille. Erityisen tärkeää oli analysoida pelaajien henkilökohtaisia kokemuksia pelaamisen vaikutuksista kehoon ja jokapäiväiseen elämään.

Tämä laadullinen tutkimus perustuu kahdeksan hengen kyselyn vastauksiin. Strukturoidut kyselyt analysoitiin ja niiden perusteella muodostettiin neljä eri digitaalisten liikuntapelien pelaajaprofiilia.

Tulokset osoittavat, että vastaajien fyysinen tausta on hyvin erilainen. Osa vastaajista oli aktiivisia liikkujia, osa ei ollut harrastanut liikuntaa juuri lainkaan ennen liikuntapelaamisen aloittamista. Kävi ilmi, että liikuntapelaaminen lisäsi valtaosan vastaajista viikoittaisia liikuntakertoja, liikunnan määrää ylipäätään sekä liikunnan tehoa. Liikuntapelaaminen toimi myös yhtenä elämäntaparemontin alkuun panevana tekijänä sekä pienemmässä mittakaavassa ruokavaliomuutoksen avittavana tekijänä. Vastaajat olivat kuitenkin pääasiassa sitä mieltä, että digitaalinen liikuntapelaaminen ei voi korvata päivittäistä liikuntaa, mutta pelaaminen on sille hyvä lisä.

Tässä tutkimuksessa on ollut pieni otanta, joten pidemmälle vietäviä yleistyksiä tuloksista ei voi tehdä. Tutkimusaihe vaatii lisätutkimusta.

Asiasanat

Aktiivinen, digitaalinen, fyysinen, liikunta, liikuntapeli, pelata, peli, urheilu

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PREFACE

Long ago, media theorist McLuhan wrote:

> The student of media soon comes to expect the new media of any period whatever to be classed as pseudo by those who acquired the patterns of earlier media, whatever they may happen to be (McLuhan 14).

I would like to thank Professor Raine Koskimaa for the support during the process of my thesis and Susanna Paasonen for her comments, remarks and useful suggestions considering the background literature. I would also like to thank especially Äitimummo and Mummi, who allowed the writing of this thesis. Without your support, I would never have completed this work.

1. INTRODUCTION

My interest on computer games was revived at the time when *Nintendo Wii Sports* and *Nintendo Wii Fit* were launched in Finland. Gaming culture seemed to find a new trend, which was very different compared to the traditional computer games. Opportunities provided by new game technology fascinated me.

Digital sports games and the players in particular have not been studied extensively. The gaming industry is on a steep upswing, especially in Finland, and there are signs to suggest that the development of games is happening at a rapid pace. New digital sports games and applications are being developed constantly, worldwide.

1.1 AIMS OF THE THESIS

Currently, there is a variety of digital sports games in the market. However, the games, players and reasons for playing have been widely studied only recently. In this thesis I will examine digital sports games and their players. Special attention is paid to the players' own playing experiences.

There are three main research questions I search answers for:

1) Why are digital sports games played, why they are not played, and what people aspire to when playing?
2) How does the playing of digital sports games affect people?
3) Who play and what games are being played?

I decided to study digital sports game players in order to understand why the games are played, what are the motivations for playing and in addition to this, what are the players' personal interpretations on the effects of the game playing. I also wanted to find out the players' opinions on the effectiveness and intensity of game play and if it could be compared with real exercise. Also, I was interested in finding out if it is possible to replace the daily physical activity by

playing digital sports games and if there are similarities between the reasons to exercise and the reasons to play digital sports games.

Supporting material such as game books and game studies are used.

This research topic is a current one and will provide added value to research in the field. Digital sports game players and their motives for playing have not been extensively studied.

This study provides important information for game developers and game researchers. However, this study is small, and it reveals the players' personal opinions and thoughts regarding the research topic. Above all, the survey provides current information on the matter.

1.2. ORGANIZATION OF THE THESIS

This thesis comprises of six chapters. Chapter I outlines the aims of the research. Chapter II reviews literature relevant to the research area, from physical activity to digital games and the players. Chapter III discusses the methodology used in the study. Chapter IV provides an analysis of the findings and Chapter V discusses the main findings obtained by the research study. Chapter VI includes recommendations and implications for further research.

1.3. DEFINITIONS OF MAJOR TERMS

According to Marchall, video and computer games can be categorized into four types of electronic games. The first type is console games, such as PlayStation, Xbox and GameCube, which are displayed using a television. Then there are games that are played on a computer. The third type is Arcade games and the fourth, hand-held games, such as Gameboy and Wine Master (2004, 61)

This research focuses on exergames and in particular on the game play of *Nintendo Wii Fit* and *Wii Fit Plus*, *Xbox Kinect* and *PlayStation Move*, which are console games. Also other digital sports games, such as DDR (*Dance Dance Revolution*), are mentioned.

Brief explanation of the key terms used in this thesis:

Video Game	Early on this term was used to describe video games played primarily on home consoles. Today the term is used more widely to mean games that are played with a computer or hand held devices.
Digital Sports Game	The term is used to describe games that stimulate traditional exercise.
Exergame	This is a relatively new term that describes digital sports games that require the player to exercise in front of the television monitor either along with a digital physical exercise instructor or as a digital character: avatar or a player's self-portrait.
Exergaming	Playing games that are a combination of entertainment, video game and exercise. Purpose of the game is to increase the level of physical activity of the player.
Avatar	In the current sports games, the player often creates an avatar, a representation of him/herself. The player may have the possibility to make the avatar look like oneself.

2. THEORETICAL BACKGROUND

In this chapter, the people's physical activity behavior is described using the theory of physical sciences. After this, studies comparing the advantages, disadvantages and possible risks of playing digital sports games are discussed. In addition, people's physical activity motivation is examined in the light of self-determination theory and self-efficacy.

2.1. PHYSICAL ACTIVITY

In the old days, people had to move in order to survive. Modern technology has made our lives easy, and we are no longer physically active in our daily work. This has led to the need to exercise during our leisure time. People suffer more and more from illnesses related to the lack of physical activity. European Commission on Sport states that the lack of physical activity can lead to overweight, even obesity, and many chronic diseases such as cardiovascular disease and diabetes (White Paper 2007, 3).

Several descriptions of physical activity are used in literature. The EU describes physical activity as "any bodily movement produced by skeletal muscles that results in energy expenditure above resting level" (EUPHIX). In Fagerholm et al. (2007, 21), physical activity refer to all muscle work that raises energy consumption above the rest level. Exercise is done on purpose - it is physical activity that aims at raising physical condition, improving health, or just giving joy and pleasure.

2.1.1. Physical Activity Recommendations

Different countries have slightly different physical activity recommendations. They all, however, aim at the same goal: people's wellbeing.

The World Health Organisation (WHO) recommends for 5–17-year-old children 60 minutes and for adults 30 minutes of daily physical activity that ranges from moderate to vigorous intensity (WHO 2010, 7–8).

The guidelines of ACSM (American College of Sports and Medicine) and AHA (American Heart Association) recommends that people should practice medium level sports for about 30 minutes a day, 5 times a week or aerobic activity of vigorous intensity for at least 20 minutes at a time, three times a week. The recommendations can also be achieved by combining moderate and vigorous physical activity. In addition, all adults should engage in muscle tone sustaining or increasing physical activity at least twice a week (Haskell et al. 2007, 1425–6).

According to the Finnish recommendations, sufficient amount of physical activity for the health of adults will be half an hour of exercise during at least five days per week on the level of exertion that corresponds to brisk walk. Alternatively, enough physical activity corresponds to fitness training of at least for half an hour at least three times per week that causes sweating and getting out of breath. School-aged children should move at least moderately every day at least for an hour (Fagerholm 2006, 3).

UKK Institute's exercise recommendations for 18–64-year-olds are that people should improve their endurance by exercising several days a week for a total of at least 2 hours 30 minutes briskly or 1 hour and 15 minutes strenuously. People should improve their muscle tone and develop movement control at least twice a week (ukkinstituutti).

2.1.2 Exercise Behavior of the Population

Lack of exercise is a worldwide problem and causes considerable health and economic damage. Lack of exercise has a direct impact on the economy, as well as individual well-being. Any activity that promotes people's physical activity is developing for the better.

According to *Käypähoito* and *The Finnish Medical Society Duodecim*, exercise is essential for life-style change needed treating a number of important chronic diseases such as cardiovascular disease, type 2 diabetes, pulmonary disease, degenerative musculoskeletal disorders and in prevention, treatment and rehabilitation of mental illnesses. In addition, research evidence of the uses of physical activity as part of the treatment of obstructive pulmonary disease and depression has strengthened. In case of older people, more information has been obtained on the positive effects of physical activity on cognitive function. Increasing epidemiological evidence has been found on the harmful effects of sitting (sedentary lifestyle) (Käypähoito 2).

On the basis of UK 2008 self-reported data, only 32% of boys and 24% of girls between 2–15 years of age reported sufficient physical activity in accordance with the recommendation of at least 60 minutes of physical activity every day. Among adults, 39% of men and 29% of women reported sufficient physical activity in accordance with the recommendation of at least 30 minutes of activity of at least moderate intensity at least five times a week (NHS, 2010, 3).

Biddlea et al. state that physical activity is good for young people from the point of view of many psychosocial aspects including self-esteem, mood and cognitive functioning (2004, 681). The study of Currie et al. indicates that physical activity not only enhances long-term and short-term physical and mental health, but there is proof that it is also related to academic and cognitive performance. According to the study, younger children tend to be naturally more interested in sports than older children or adults. The study asserts that being physically active in childhood is essential, because the adulthood exercising behavior is already formulated in childhood and adolescence. According to the study, the probability of reporting higher daily MVPA (Moderate Vigorous Physical Activity) was higher among younger children. Remarkably higher portion of 11-year-olds than 15-year-olds reported higher levels of MVPA. Boys in all age groups and in every country reported higher daily MVPA than girls (2005–2006, 105).

According to Eurobarometer 2010, men exercise more than women. Regular physical activity decreases with age. 61% of 15–24-year-olds exercise at least once a week, while 44% of 25–39-year-olds do some exercise on a weekly basis. Among older age groups, regularly exercise only 40% of 40–54-year-olds, 33% of 55–69-year-olds and only 22% of over 70-year-olds. 19% of 15–24-year-old men exercise five or more times a week and only 8% of women of the same age were equally active. 71% of men and 50% of women of the same age exercise on a weekly basis. The study gave evidence that there is a clear link between education and the amount of physical activity. 64% of people who ended school by the age of 15 never took part in physical exercise. The study also shows that living with a big family supports being active in sports. 47% of people living alone never partake in any physical activity, while 32% of people living in four person households or larger reported the same. According to the study, financial problems also limit people's physical activity (12). This and the previous study show that regular physical activity behavior formulated in the early childhood or adulthood strongly predicts the physical activity in the older age (17). The study gave evidence that 48% of people preferably exercise outdoors in the nature. Popular places for sports are also fitness centers (11%), clubs (11%) and sports centers (8%). 61% of people exercise to improve their health, 41% to improve their fitness,

39% to relax, 31% to have fun, 24% to improve their physical appearance and 24% to perform (29). 45% of the respondents informed shortage of time as the greatest barrier for not exercising. For 13% of the respondents, a barrier to physical activity was disability or illness. 7% of the respondents informed that their dislike of competitive activities was the reason for not exercising (35). 58% of people living in households with four or more informed that they didn't have enough time to exercise and 30% of people living alone said the same (Eurobarometer 2010, 38).

Zacheus et al. studied exercising behavior of Finnish people especially from the point of view of generation and time of life. Taking an interest in sports was quantitatively higher with people in the beginning and in the end of their life than among people who were physically at the peak level. The study also revealed that the postmodern hunting of experiences with the help of physical education applies especially to 16–45-year-olds. Central points of the study were that nowadays exercising more and more emphasizes health, relaxation and experiences, whereas it used to focus on competitive sports (33). It appeared that 26–45-year-olds were the least physically active, taking interest in sports on average twice per week. The children took interest in sports three times per week on average and the elderly almost three and a half times per week. The 12th year was the year when a clear division into physically active and passive children took place. Among 16–25-year-old adolescents, the division took place between the years of 19–20. Family life hampered the sports activity of "life builders" more than other generations, especially among 26–35-year- olds. Lack of time and laziness prevents the sports activity among "family builders" even more than family life (35). Typical sports hobbies among children and youth were football, floor ball and downhill skiing, whereas aerobics, gym and jogging were popular among 16–45-year-olds. Walking and berry picking was popular among older people and the elderly. Walking was the most popular sports hobby, which was practiced by 84% of the elderly population, over 50% of all the other age groups and beyond 16% among children. The exercising motives of different generations were otherwise alike but the social aspect and the competition inspired children of 7–15 years to move more than the others. Competing indeed seemed to be a matter that no longer inspire over 15-year-old participants. Instead people searched sports for softer matters, such as those related to health and relaxation (2003, 36).

According to the results of Nuori Suomi physical activity study, 92% of 3–18 year old children indicate that they either have a sports hobby or they exercise. The study reveals that children's physical activity has changed permanently from daily play in the yard and the surrounding

areas to the practice of a specific sport during a specific time. Only 8% of children and adolescents are not engaged in sports or physical activity at all (6). The results show that Finnish children and young people exercise most frequently by cycling and playing football. Other popular sports are swimming, running, skiing and floorball (2009–2010, 7). The research shows a positive signal in that a large part of young Finnish people engage in physical activity. However, the question is if they exercise enough to improve their health? Study of Fagerholm et al. reveals that approximately 40–50% of young people exercise sufficiently to improve their health and 20–25% of young people exercise very little. Boys exercise more than girls. Approximately 60–65% of adults exercise sufficiently to improve their health. Women exercise generally a little more sufficiently than men to improve their health (2006, 3-4).

2.1.2.1 Barriers for Physical Activity

Many things affect people's physical activity behavior and barriers for physical activity have been studied a lot.

According to many studies, those who got high support from family, friends, school and workplace were more likely to be physically active (Ståhl et al. 2001, 7), (Kaori et al. 2010, 5). Aldair et al. suggest in their research that social support is even more important in committing to physical activity than in maintaining the activity (2011, 8-9). Remarkably important factors in relation to physical activity turned out to be accessibility, opportunities and aesthetic qualities, while climate and safety were less important (Leslie et al. 2002, 188)

Lack of time is mentioned as the most common barrier to physical activity (Eurobarometer 2010, 188;, Berry et al. 2005, 458; Tergerson et al. 2002, 376). Biddlea et al. found out in their research that for children, less physical activity was associated with greater perceived barriers, while greater activity was related to intentions and preferences for physical activity. For adolescents, only achievement orientation, perceived competence and intention to be active were positively associated, and depression negatively associated with physical activity (2004, 686). In addition to the fact that one must overcome personal, social and psychological barriers in order to be physically active, policies and environmental factors also contribute to the individuals' efforts (Berry et al. 2005, 458).

Weiss points out that enjoyment of the activity is a very important factor in increasing physical activity of children and adults (2000, 7). Because childhood physical activity behavior seems to move into adulthood, example of close adults is essential to motivate children in physical activity (Weiss 2000, 8; Eurobarometer 2010, 17). Therefore, particular attention should be paid to the sufficiency of children's physical activity.

2.1.3 The Health Benefits of Digital Sports Games

At the present time, studies on the effects of digital sports game playing are being done increasingly. Studies show comparable results, indicating that a large part of the digital sports games provide medium level exercise, such as brisk walking, and none of the games correspond to a real sports performance. Studies generally agree that the digital sports game playing is healthier than playing games in the "old fashioned" sitting position.

Below mentioned earlier studies deal with children and adult's digital sports game playing. Currently exergame studies tend to focus on children. I was therefore anxious to examine the digital sports game playing of adults. In this study I ended up using the child-centered research, because much more was not available. I think the results of children's physical play, however, can be generalized to a certain extent.

Daley states that exergames may increase children's physical activity, but points out that playing them still consumes less energy than the corresponding genuine exercises (2009, 769). Delay points out the need for high-quality RCTs (randomized controlled trials) with appropriate sample sizes and control groups in order to assess efficiency, sustainability and the clinical relevance of exergaming. According to the researcher, before any such research is available, potential benefits of exergames for children should be assessed with caution (2009, 769).

However, several studies have shown that exergames have beneficial health effects. Graf DL et al. measured the energy expenditure of a small group of children during *Dance Dance Revolution* (DDR1 and DD2) and Nintendo's Wii *Boxing* game play, and the result was that the games could be compared to medium level walking. In addition, the researchers came to the conclusion that digital sports games could motivate children to exercise more (2009, 538–539). In their study, Deutch et al. present positive results from playing Nintendo Wii sports games. A teen with Cerebral Palsy was treated in a school-based setting. Researchers used three main result

measures: "(1) visual-perceptual processing, using a motor-free perceptual test; (2) postural control, using weight distribution and sway measures; and (3) functional mobility, using gait distance". Positive development was measured on the impairment and functional levels (2008, 1196). This research is a somewhat good example showing different ways gaming consoles, like the Wii, can be used in various cases and what benefits digital sports games potentially offer us.

Barnett et al. compared nine different studies measuring the energy consumption of physical game play. The average energy consumption of these games was at or about 3 METs, the moderate intensity physical activity threshold. None of the games reached more than 6 METs (vigorous energy expenditure), but still a substantial part of the participants playing *Play 2 Knockout* (boxing), *Homerun* (baseball), *EyeToy*: Cascade, *XavX J-mat Jackie's Action Run*, and Wii Sports *boxing* might have achieved the level of a vigorous intensity activity (728, 2011). Majority of the studies reported that digital sports game playing declined over time. The studies indicated that active video game playing might consume energy expenditure lower than the physical activity guidelines recommend for young people. According to the studies being identified, boredom and technical problems were barriers in maintaining digital sports game playing, while support from peers and family, competition, and a wide range of music were enablers for playing (2011, 733–734).

Guy et al. reviewed 34 studies dealing with children, video games and physical and/or nutritional outcomes. The conclusion was that active video game play may lead to achieving the daily recommendations of physical activity. The researchers conclude that active video game play is light to moderate physical activity. They also point out that further research is needed in order to draw conclusions for long-term benefits of the digital sports game playing (Guy et al. 2011). Song also notes that the current studies do not give a complete picture of the physical effects of digital sports games, and therefore it limits the use of exergames for promoting physical activity. Furthermore, the researcher observes that more studies are needed to understand how exergames affect across diverse population (2011, 149).

Song et al. studied how seeing one's self on the screen has different effect for individuals depending on their body image. The researchers found out that digital sport game playing works positively with players who have a low body image (when playing games with an avatar). If a person is not satisfied with his/her body image and the playing takes place with the player's own character, meaning the player can see oneself on the screen (Kinect), willingness to play may decrease (2011, 158). "Interaction effects were significant on all the dependent variables –

exercise self-efficacy using the exergame, positive mood after exercise, enjoyment, evaluation of the exergame, and buying intention" (2011, 157–158).

In a study of Owen et al., eight volunteer families were offered Wii Fit game consoles for home use for three months. Families were not provided instructions regarding playing, but rather the intention was to stimulate the actual situation in which a family purchases a game and uses it on their own (2011, 3195). According to the results, there were no significant changes in the health of the respondents during the three months Wii Fit use, when body composition (BMI and body fat), balance, flexibility and muscular fitness were measured. According to the researchers, the lack in the quantity of physical activity is a probable explanation for the general lack of changes found in this study. The researchers suggest that it may be that already active people simply replace MVPA (moderate vigorous physical activity) with other means, in this study by exergame playing (2011, 3196).

Maddison et al. measured the energy consumption and physical activity of 21 children between 10–14 years of age playing active (Eye Toy) and non-active console-based video games. They found out that playing active video games resulted in moderate to high energy expenditure in children (2007, 339,). The researchers argue that active video game play in general has the potential to promote growth of children's daily physical activity (2007, 340).

Miyachi et al. measured energy expenditure and MET values during the play of Wii Sports and Wii Fit plus activity games among 12 women and men, between ages 25-44. According to the study 46 activities (67%) were classified as light intensity (<3 METs), and 22 activities (33%) were classified as moderate intensity (3.0–6.0 METs). None of the games reached vigorous intensity activity (>6.0 METs). This survey revealed that for one third (33%) of the Nintendo Wii Sports and Wii Fit Plus activity gamers are provide with an moderate intensity activity, and therefore for them the playing of these games can be used to gain the recommended daily amount of exercise (ACSM and AHA). Compared to real sports or exercise, all the games required less energy expenditure. However, researchers came to the conclusion that playing active computer games should be encouraged to prevent overweight and obesity (2010, 1152).

Yue and Reagan designed a new casual exergame called GrabApple aiming to encourage people to increase their physical activity through playing a digital sports game that is both fast accessible and playable (2011, 44). The game uses the player's body as a game controller and body weight as resistance to elevate heart rate (2011, 38). The researchers did the study with

eight participants and asked them to play the game. According to the results, the game was considered fun, easy to access and fast to play. In addition, playing the game for 10 minutes was found to correspond moderate intensity aerobic activity, and therefore, according to the researchers, health effects are achieved when the game is played a few times a day, ten minutes at a time (2011, 41).

Delay states that digital sports game playing may encourage children to be more physically active. This in spite of the fact that energy consumption in playing digital sports games is considerably less than in corresponding genuine exercise. Delay notes that most of the digital sports games engage children in low intensity exercise, and even that may be sufficient to achieve the recommended amount of daily physical activity (2009, 769).

2.1.4 Exercising Motivation

The physical sciences talk about motivation in terms of participation motivation and achievement motivation (Deci and Ryan 2002, 277). Motivation plays a key role in the initiation of exercise and continuing a physical activity. Soini describes the motivation through three functions, which affect the active behavior. Motivation guides people to behave in the way they behave. When the goal is to reach something, motivation guides the behavior in that direction. "The motivation regulates the behaviour by putting people to evaluate their skills in a particular context, as well as it regulates the importance of context to themselves" (2006, 21).

According to the Eurobarometer, health improvement is the most often mentioned reason for physical activity. Other reasons to exercise are improving one's fitness, relaxing and having fun (2010, 8). Biddiss and Irwin found out, that the most commonly reported reason for children to be physically active was "fun" (2010, 664).

The study of Brunett and Sabiston showed that an effective way to increase physical activity in the age group of 18–64-year-olds would be promoting autonomous regulation (i.e. intrinsic motivation, identified regulation). According to the study, 18-64-year-olds are motivated to be physically active, as it reflects their values, goals and needs, or they experience the physical activity as enjoyable. The least motivating factors were achievement prizes and avoidance of punishments (2010, 100).

Maureen Weiss notes that the motivation of children to be physically active is best understood through their self-esteem, which in the case of physical activity is related to the competency perceived, social support, and enjoyment. This may be true for adults as well. “Considerable evidence shows that youth who report stronger beliefs about their physical competencies are more likely to enjoy activity and sustain interest in continuing involvement, which in turn enhances motivation to be physically active.” (2000, 1).

Maureen Weiss states that childhood activity may lead to activity in adolescence and adulthood, so the attention should be focused on motivating the children's physical activity. She notes that significant adults have the main role, when attention is focused on children´s motivation to increase physical activity (2000, 6). Weiss also points out the importance of encouragement of other significant people, such as parents, teachers, coaches and peers in increasing the activity behavior of children (2000, 3). Soini states that intrinsic motivation plays an important role in physical activity adoption and continuation. Therefore, a major goal in school sports can be seen as raising the internal exercise motivation (2006, 24). Soini's study did not provide evidence that the teacher and the teaching group would have a strong part on physical activity behavior. On the contrary, they had only a tenuous link to students' satisfaction and experiencing motivation climate (2006, 71). According to the Martine and Kulinna study, the role of school sports teachers is essential in motivating adolescents to exercise. Physical education teachers' demonstrations and promotions of fitness during lessons are related to higher student engagement in moderate or vigorous physical activities (2005, 266).

2.1.4.1 Self-determination Theory and Physical Activity

Self-determination theory examines the relationships between motivation and physical activity (Brunet and Sabiston 2010, 99). According to Deci and Ryan, self-determination theory explains sports and exercise participation through three innate needs; autonomy, competence, and relatedness, which all drive intrinsic motivation. According to the authors, when a man is in a state of intrinsic motivation, he feels free to do what he desires. In the author’s words, “they are fulfilling their need for autonomy”. A person participates in an activity feeling natural emotions such as joy, fun and satisfaction. Intrinsic motivation is attached to the emotions of gratification, pleasure, competence and desire, as well as the desire to continue the activity. In case of extrinsic motivation, the motive is due to the pressure to participate and the person is looking for approval or status (2002a, 279).

According to Deci and Ryan, some people experience feelings based on intrinsic motivation during sports and exercise. Self-determination theory explains the "flow" and being in "the zone" (Csikszentmihalyi, cited in Deci and Ryan 2002a), the terms that are widely used among both sports enthusiasts and in physical science as highest level of consciousness and a sense of well-being, which the theory connect to intrinsic motivation (2002a, 279).

The self-determination theory consists of six different motivational qualifiers: intrinsic, integrated, identified, introjected, external and amotivation (Deci and Ryan 2002a, 279). "Most self-motivated type of extrinsic motivation is integrated regulation, which occurs when an individual participates in activities because of experiencing them to be consistent in his/her personal values, goals and needs, which are a part of him/her, but which the person does not feel natural enjoyable" (Brunet and Sabiston 2010, 100). When a person participates in an activity he/she experiences as valuable and important, it is a case of identified regulation,. In this case, the person will carry out with the activity with "high degree of perceived autonomy" (Brunet and Sabiston, 2010, 100; Deci and Ryan 2002, 280). It is a case of introjected regulation, when the person participates in an activity in order to achieve social acceptance or avoid disapproval, to achieve self-esteem, or to avoid self-contempt (Deci and Ryan 2002, 280). This type of regulation is considered to be controlled rather than autonomous in nature (Brunet and Sabiston 2010, 100). The least self-determined regulation is external regulation, which occurs when a person is motivated to achieve rewards or avoid punishments. This form of regulation occurs when a person participates in an activity to satisfy an external demand or a socially constructed contingency (Deci and Ryan 2002, 17).

2.1.4.2 Self-efficacy and Sports Motivation

Self-efficacy has a great significance in initiating and maintaining regular exercise (Song et al. 2011, 150). According to Deci and Ryan, self-efficacy theory explains human behavior in social cognitive approach and they explain the term as follows: "Efficacy can be defined as a person's belief in his ability and capacity to enact goal-oriented behaviors within a domain of activity" (2002, 278). In short, this means one's image of their own skills and belief in them. The use of skills can be considered directly proportional to the person's self-confidence.

Physical activity has been shown to have many positive health and welfare effects. Digital sports

games playing may contribute people to exercise more and especially more efficiently. Lampila et al. suggest that ”If playful exercising solution is successful it supports improvement of physical activity self-efficacy though vicarious learning. This will support more frequent engagement in physical activity also outside exergaming situations.” (2006, 10). In other words, if a person finds new physical skills through digital sport games, he/she increases their self-confidence, and may also begin physical activity in the real world. This paper will later provide an example of such case.

2.2 DIGITAL GAMES AND THE PLAYERS

> "Videogames are an expressive medium. They represent how real and imagined systems work. They invite players to interact with those systems and form judgments about them" (Bogost 2007d, 8)

> Games represent a new lively art, one as appropriate for the digital age as those earlier media were for the machine age. They open up new aesthetic experiences and transform the computer screen into a realm of experimentation and innovation that is broadly accessible (Jenkins 2005).

Games are still looking for their place and cultural acceptance in the broad field of media. Radio and television have been in the same situation video games are today, fighting for cultural acceptance and searching for a place among other media. Today, games are recognized as one form of entertainment, but they still lack respect among the great public. Games are still generally seen as a playfield for teenagers.

Previous studies include fairly extensive takes on children's and young people's playing. Adult gaming should be studied more widely also in the light of national economy and social welfare. The game business is the fastest growing business in the world today. It is even greater than the movie business, in which a huge amount of money and know-how flows around the world. The gaming industry will certainly change and develop dramatically in the future, when games and playing spread into different spheres of society, for example through gamification.

2.2.1 Game Culture

The digital development has also changed the world of computer games and playing. Games have become a part of our environment. Yet today, games are still often considered to be a hobby for the leisure time, an activity that offers no advantages. Maybe we are beginning to get rid of the thought that games are just comfortable spare time entertainment for the kids and youth. Most of the adult gamers today grew up with the medium, and are therefore familiar with it. Markku Eskelinen suggests in "Pelit ja pelitutkimus luovassa taloudessa" that one might argue that the game industry would reach maturity in the very same way as rock music, which was also thought of as just a youth phenomenon, did (2005, 30).

Digital games have become part of cultural studies during the past decade. Games were a part of people's lives already in ancient cultures so the medium is not new at all. People are fascinated by gaming that provides them entertainment, pleasure and satisfaction, among other things. Game platforms have changed from board games to console and mobile games. New gaming platforms and applications are developed constantly. Digital games and their players have been studied quite a lot. However, the subject of this research, exergames, has not yet been studied extensively.

Jenkins states that games getting most of the attention in media are usually popular among men. These include shooter and aggression-oriented action-adventure games, real-time strategy and sport simulation games. PR and marketing strategies are also made for this type of AAA-list games, and this in turn distorts the idea of who the gamers are and what a game is (2003, 244).

Myers highlights the conflict between playing games and game studies. According to Myers, game studies are considered a topic requiring serious investigation, but the attitudes toward games and playing remain negative. Then again, games are considered to be developing and useful but also dangerous. Games are regarded bad, non-serious, illegal and notorious (2010, 15). This is a serious problem within game research as well as in societal attitudes. Violent games, in which a player intentionally harms an opponent, pose one problem, but negative attitudes towards harmless, developing games are also common.

According to Sihvonen, one of the reasons why digital games are an important research subject is the fact that they drive innovation: "the players are a demanding group that push for advances not only in technology, but also in interface, functionality design, connectivity protocols and the development of complex graphics and physics engines. The innovations in these areas spread beyond the gaming media" (2009, 38).

2.2.2 Digital Games and Gamers

Next, I will present a brief overview of the world and the historical situation in which the early video games were developed and of the needs they were met with.

Sihvonen remarks that the first digital games at the end of the 1950´s were experimental. Having been created with and for big computers in laboratories and study centers in the USA, they were unavailable to the general public. However, *Tennis for Two* was an exception. It was created in the research institute of Brookhaven National Laboratory with a team led by the physicist William Higinbotham, in purpose to entertain the guests on the annual Visitors´ Day. *The Pong*, an early arcade game from the 70s, was actually a developed version of this game (2009, 86–7). These early "exergames" did not require physical activity, but rather quick reflexes.

> Playing Pong does not necessarily require the player to think or draw up a plan beforehand, but it demands full concentration and quick reflexes at the time of playing (Sihvonen 2009, 86).

In the 1970s, digital games lived through a turning point and developed in a totally new direction. Many arcade games were now also available for home computers and consoles. Games were generally played in groups or with a friend, largely because both the games and the devices required to run them were still quite rare and expensive.

In the 1980s, the "game industry was increasingly dealing with concepts like ´branding´ and issues related with ´license products´, expanding the visibility and influence of games outside the gaming arcade". Japanese digital games became hit products and replaced the 1970s Atari classics. "The concept of game genre was discussed" and "such genres as puzzle games (*Pac-Man*), platform games (*Donkey Kong*) and role-playing games (*Ultima* IV) were introduced" (Mäyrä 2008, 86).

In the 1990s, the development of digital games technology made it possible to enlarge the special elements of games. The increased amount of memory provided opportunities for expanding the spatial aspects of game environments (Mäyrä 2008, 115).

Game technology went through an important development in the late 1990s and early 2000s. "The cultural role of games remained still rather marginal when compared with the status of

fine arts, literature or even cinema and television and one of the remaining concerns was the ´juvenile´ quality of games´ thematic or representational content" (Mäyrä 2008, 118).

2.2.2.1 ESA report 2010

According to The Entertainment Software Association (ESA) 2010 report, 67 percent of American households play computer games or video games. Game players are on average 34 years old. 25 percent of the players are under 18, 49 percent of the players are 18–49 and 26 percent of them are over 50 year olds (2). 60 percent of the players are male and 40 percent are female. The average age of a game buyer is over 40 years, 54 percent of them are male and 46 percent female (3). 64 percent of players play games with other players. 67 percent of American households own a game console or a PC to play games with (4). 64 percent of the parents see games as a positive part of their children's lives and 93 percent of them have been present when a game has been purchased or rented. 48 percent of parents play games with their children at least once a week (5). 83 percent of the parents keep a time limit on their children's gaming. 87 percent of the parents play games with their children, because they perceive it as being a leisure time fun for the whole family (6). Bestselling video games in 2009 were sports games with 19.6 percent of the units sold (7). US computer and video games sales in 2009 were 10.5 billion dollars, while in 2008 the sales were 11.7 billion dollars. At the time of the study, 41 percent of Americans had bought or were intending to buy one or more games in 2010 (ESA 2010, 11).

2.2.2.2 Player Barometer 2011

According to the Player Barometer 2011, playing games is on some level a part of almost every Finn's everyday life (2011, 16). 79% of population plays digital games. In 2011, men played more than women. People under 40 play more than 40-year-olds and older. 91% of women under 40 are players. 98% of men are players. 49% of women play digital games and 31% play at least once a month. The average age for a digital player is 36.9 years, whereas the average age for a non-player is 57.8 years. Between 2009 and 2011, the proportion of male digital players has risen from 71% to 80%. In 2011, Finns spent on average 3.23 hours per week and 7.23 hours per month playing digital games. People purchased on average 2.95 games during the year. The researchers note that among women, active video game playing does not decrease

with age as it does with men (2011, 20–23). In 2009, 75% of 70- to 75-year olds-played games, and in 2011 the amount was already 91% (2009, 3). In 2009, 51% of the Finnish population played digital games at least once a month and in 2011, already 56%. In 2011, people typically used only a couple of hours a week playing games. According to the study, the time used to play games by the Finnish population does not seem to be growing, although excessive playing has been extensively discussed in the media (2011, 24).

2.2.2.3 Digital Game Culture in Finland

According to Kallio et al., women play significantly less digital and time-consuming games, which are however popular especially among young men. Only a relatively small proportion of women play the kinds of games that are interesting or "sexy" from the point of view of the media. The average age of gamers is 37 years and the average age of non-gamers is 56 years. The study revealed that playing digital games decreased when moving from younger age groups to older ones (2007, 52-69). Women also reported more often than men, 9 percent against 26, that they would play more if they had more spare time. These findings speak about the fact that women probably have less free time than men, or that they want to spend it doing something else than playing games. And in general, when people get older, they have interests other than gaming. 12 percent of men and only 1 percent of women said that someone had asked them to decrease the time spent on gaming. What is interesting is that 41 percent of men and 23 percent of women reported that digital gaming was a quite cheap hobby. 11 percent of men and 3 percent of women reported that dangers related to gaming were discussed too much (72). The study also revealed that 54 percent of gamers and 71 percent of non-gamers were outdoorsmen. Also a significant finding was that 25–34-year-old gamer men spent less time on outdoor hobbies than did the non-gamer men. Members of the younger age group generally also went walking or jogging less than the older ones, and they also played digital games and used the Internet more frequently (2007, 73).

Under this information, the game designers should develop games that combine play and exercise, and thus attract young people to exercise more outdoors.

2.2.2.4 Women Players

Carrie Heeter and Brian Winn argue in their study that commercial games are still aimed at men and played by men. Game genres, game content and game mechanics have been defined and designed by and for young males. Even though both men and women play digital games, what is played with whom, how the game is played, and how much is played differs significantly. Kafai et al. found out that boys play games almost exclusively with other boys and girls play games alone or with boys, but only seldom with other girls (2009b, 281). One crucial reason for why women are a minority among video game players is the target group the games are aimed at. "Apparently the gaming industry holds a similar outlook towards the ever increasing population of women who count gaming as a hobby — we don't exist, or if we do, we are anomalies; games are for guys" (Kafai et al. 2008, 5). Game designers also play an important role in explaining who the players are. "By relating to both men and women, researchers and developers can analyze cross-gender play, which is invaluable to the growth of games, as concluded by the wide range of panelists at the Girls 'n' Games conference" (Dillon 2010).

If we want women to play more games, particular attention should be paid to the design of the game and the game designers. At the moment men generally design the games and dominate the game world. Men and women seek for different things in games; their motivation and interests are different. Age also influences the causes and interests of playing, so attention should be given to what the age are the people designing games for which target groups.

Women spend a lot of money to keep themselves in shape by jogging, using the services of fitness centers and generally seeking to live a healthier life. Designing digital sports games should be backed up by multi-disciplinary research in order for the games to be effective and better in every way. Advancing physical condition and improving welfare requires cooperation of doctors, sports professionals, nutritionists, educationalists, etc.

What, then, could be the future gaming niche for women? Currently self-development, self-knowledge and soft values have gained ground on the media surface. People, especially women, are seeking for ways to manage their lives and for some kind of escape from real life. Combination of real-life and game-play with different contexts could be an effective way to increase the number of female players. Self-improvement games are already on the market, but this type of development and diversification could be the thing of the future.

According to Kafai et al., boys of all ages play more electronic games than girls of same age (2008b, 283). Kafai et al. introduce some facts about computer game players in 2008:

> "About 38 percent of video game players and 42 percent of online game players are female. About seventy percent of casual gamers are women. Estimates vary, but it is clear that women have become a major subgroup in gaming. Yet the industry still ignores them (2008b, 283)."

In the 1990´s, home computers became more common. However, they were still generally considered part of men's area. In the field of the information technology, women were thought of as anomalies. Some people worried that if the development continued on the same track, women would remain outside the information society. Today the Finnish game industry is in search of women who are willing to work in game companies. Sonja Kangas, Product Manager of game design company Digital Chocolate, and the Finnish leader of an international network of IGDA Game Developer's, says that:

> Only 16% of people working in game industry are women, including HR and administrative tasks. There are many interesting tasks where the women could just as well seek to, if they would just know how (Luovasuomi).

> Through the network, experts have already found a couple of development projects. Currently, a yoga game based on life coaching and a story is being prepared. The game is played together with multiple players. Both the ongoing projects are such, which have not yet been performed. Perhaps this suggests, that women want different kinds of other games that are currently available (Luovasuomi).

Even though one might imagine Finland to be an egalitarian country, the game industry provides a good example of how women shy away from certain areas and do not seek work in certain sectors. On the other hand, they can be assumed as unsuitable for work in certain sectors.

According to Gourdin, 88.5 percent of game developers were male in 2005 (2005, 12). The research suggests that girls showing less interest in gaming may end up expanding the gender gap which will lead into less female professionals in game development, computer science and technology. According to many studies, technical and computer skills as well as self-esteem can be improved by playing games (Subrahmanyam 2000, 127; Kiesler et al. 1985, 452; Griffits,

2002, 48-50). Jenkins and Cassell state in *Beyond Barbie and Mortal Kombat* that some people thought that if girls were more interested in games, they would get interested in computers as well (Kafai et al. 2008b, 8). The writers continue that it was also clear that men who worked in game industry, together with boys and men who played computer games, were not interested in gender-related issues. Neither were they interested in changing the content of the games to be more pleasant for female players (Kafai et al. 2008b, 10).

Jenkins and Cassell also suggest that most women have at least tried playing games. Even though they have begun to play later than men, they usually play games with their boyfriends and tend to play different kinds of games than men and for shorter periods at a time. However, the author points out that the number of women in the game industry has not increased – rather, during the last ten years the number of women has even diminished. The writers also suggest that women play non-mainstream games. Games like casual games, educational games and advergames attract women. Leading casual game producers and developers have reported that women form 70–80 percent of the market, and that most casual players are 30-year-old or older women (Kafai et al. 2008b, 8–14).

Heeter and Winn discovered that differences in time management is one of the reasons that may explain the gender difference in video game play. Women reported having less leisure time than men, and women also divided their free time in smaller proportions. In addition, boys spend longer periods of time playing one game, whereas girls tend to play for a shorter period at a time. Researchers suggest that this may be the reason why women play more casual games than men (2009, 10–11).

The games are still generally regarded as rather harmful but despite that, gaming also has a lot of positive consequences for the development of the player. That is why it would be important to encourage girls to play more games and, most importantly, there should be more games designed especially for girls. This could lead into girls finding work in the technology sector more effectively.

Digital sports games may be an exception among other digital and console games in what comes to popularity among both genders. No scientific publications that consider the user groups of these games yet exist (at least that I know of), but according to the scholarly sources it seems that exercising games are popular irrespective of the player's sex or age.

2.2.2.5 Casual Gamers

According to Frans Mäyrä, people with a diverse gaming behavior are called casual gamers. These gamers do not want to think of themselves as belonging to any specific category of gamers. However, they form an invisible majority of the digital game players. Mäyrä suggests that the concepts of a "casual gamer" and a "hard gamer" are difficult to define by basing the definition on, for example, only the time they play per week. He continues saying that some games are considered as "casual games". These games are usually easily accessed. Mäyrä also suggests that the definition "casual player" might point to a person who uses a fairly lot of time to play games, but still considers him/herself as a casual player because, for example, of his/her preferred game style or genre (2008, 26-27). Taylor suggests that a casual gamer is usually seen as a gamer "with a life", a player who does not want to spend a lot of time playing games. A power gamer is seen as a player who doesn't have much social life and whose leisure time is spent gaming (2006, 70). Taylor points out that some people think the way gaming time is used is more important. Women simply do not have enough time to spend on playing, perhaps because of issues related to family or working life (2006, 73).

Digital sports games could be defined as casual games, especially when the games are easy and fast to use. Players might be motivated to play, for example, muscular movement games after jogging if starting the game was quicker than it currently is. Yue et al. designed a casual exergame, GrappApple, in order to allow for quick and easy physical play, and to help people exercise in accordance with the 30-minute-a-day recommendation. The researchers define casual exergames as "games that players can learn easily and access quickly, using simple rules, and special game mechanics, to motivate them to exercise at a moderate intensity, for a short periods of play" (2011, 36).

Eskelinen suggests that the increasing amount of casual gamers as digital game consumers means not only changes in the players' age distribution and gender distribution, but also in what kind of game types become commercially viable. Eskelinen remarks that ordinary players do not want to buy expensive games, bind themselves for playing them for ten hours and learn difficult or strange game mechanisms (2005, 53).

According to Mäyrä, players can define themselves by the "seriousness" of their dedication to game play. He also points out that "the most important thing would be to understand how these categorizations as 'casual' and 'hardcore' operate as cultural distinctions within a game culture" (2008, 28). Mäyrä also points out that trying to understand games and game culture one should

first understand how widespread the medium is. The media represents a unilateral picture of gaming, but as Mäyrä reminds us:

> "...lack of such visibility in popular media does not make those games and players insignificant if one is aiming to understand the larger picture of the digital games and play in contemporary life and society" (2008, 28).

Mäyrä continues by arguing that a large part of the game culture remains hidden because a considerable group of players does not actively participate in communities or fan activities that have developed around the games (2008, 28).

2.2.2.6 Senior Players

Probably the main reason why Nintendo Wii activity games are so popular among people of all ages is that people who may have lost their capability to exercise otherwise get the possibility to move by utilizing digital sports games and most importantly, the games most likely stimulate their spirits.

According to *The Christian Science Monitor*, retirement homes all over the USA are adding Nintendo Wii consoles in their living rooms (csmonitor.com). George Harrison, senior vice president of marketing and corporate communications at Nintendo of America, Inc., says that Nintendo started pursuing the senior demographic in 2006 by launching the Nintendo DS *Brain AGE* game. The objective of the company was to reach the senior citizens in Japan. "We had to approach people who were not previously video-gamers", said Harrison. Nintendo discovered that reasons why seniors have been in the minority among video game players were that the games were too tricky to operate and that the games for seniors did not actually exist. “That's where the easy to use Wii comes in”, Harrison said “Proponents say the Wii offers a welcome reprieve from a sedentary lifestyle, and boosts hand-eye coordination among the over-60 set”.

Beth Llewelyn, Nintendo's senior director of corporate communications says: "We certainly appreciate our 'core' gamers and will continue to supply them with games" (chicagotribune.com).

Chicago Tribune reports that Nintendo Wii was a great success at the *Sedgebrook* retirement community in Lincolnshire. "I've never been into video games, but this is addictive", said 72-year-old Flora Dierach about Nintendo Wii's bowling game (chicagotribune.com). Angela from *Wii Centre+,* writes about a 85-year-old gentleman who has been playing the Wii for over a year: "When the man is asked why he likes to play the Wii, he answers: ’It gets me moving and keeps my mind active.’ He states: ’I read the papers, go for walks, make my tea, but the Wii means I can do some things that in reality I’m a little past [laughs]… a game of bowling is my favorite and I’m actually fairly good.’ (wiicentre.com)”.

It must be taken into account that the above comments are somewhat disqualified. But the idea behind these is important: seniors are interested in games and playing. The most important things to understand in designing games are the needs of different age groups and their interests.

2.3 EXERGAMING – PLAY AND EXERCISE

2.3.1 Exergames

This study deals with exergames, the games that require the player to move her/his body. People are getting increasingly accustomed to exercise using a technical device. The technology is used, for example, to increase the motivation to exercise and for entertainment.

The secret behind the great success of digital sports games may lie in the fact that the users seem to find it easier to exercise when guided by a game than in the real world. The exercise is a mixture of sports and entertainment. Playing digital sports games is considered as fun, just as any other game. The exercise might also be considered as being easy when the player does not have to move outdoors in order to exercise. Games are easy to play for all age groups.

The findings of Lampila et al. support this study. Playing computer games does not reduce young people's physical activity. Instead the study provides evidence for the fact that digital sports game playing may motivate people to exercise even more. The young people who played a lot were physically equally as active as the young people who played less (Lampila et al. 2006, 3). The study also shows that those who had experimented with exergames had more positive opinions of digital sports games than those who had no previous experience of them (2006, 33). The study reveals that family members were the most influential social environment. Pressure from other people typically reduced time spent on computer games and increased time spent on physical activity (2006, 30).

2.3.2 History of Exergames

According to Ian Bogost, the roots of the exergames are in the 1970s and 1980s, when almost every arcade game from Pac Man to Pole Position were played in a standing position and usually alone. In the early 80´s an arcade game called *Track & Field* was launched, in which the players participated in six Olympic-style events. Bogost presents that even bigger precedents of exergames can be found in the non-screen based arcade and carnival games, such as *Spider Stomkin´* and *Video Reflex* (Bogost 2005a),

Bogost notes that media started to call the trend "exergaming", the "combination of exercise and videogames" (2005a). Lampila et al. define the term exergame in the following way:

> Exergaming means combining physical activity and instrumental playing. This kind of playing is also named as physical playing, body gaming, technically supported physical activity and fitness gaming. Examples of exergaming are dance games, camera controlled games, simulator games, and location information mobile games (2006, 17).

Nintendo refreshed the US game industry that was recovering from the Nintendo Entertainment System (NES) video game crash of 1983. NES was first launched in 1983 in Asia, including Japan, and in North America, Europe and Australia in 1985. NES was the first environment that released games developed clearly to advance or generate physical exercise (Bogost 2005a). In 1987, Exus launched the *Foot Craz* pad controller for Atari 2006. It was the first precursor of the modern DDR-style dance pad. A year after the new edition of NES, *Power Pad* was launched by Nintendo. It was released as *Family Fun Fitness* in Europe. *Power Pad* was two sided, much bigger and more complex game than *Foot Craz*. After this, in the late 80´s and early 90´s, Nintendo and other developers launched many games for *Power Pad* (Bogost 2005a).

Dance Studio is a music video game that was published by Bandai in February 1987 in Japan (Gamefaqs: Dance Aerobicks). It was the third game launched for the *Family Trainer* series by Bandai. The game was designed for the NES *Power Pad* dance mat. The game was the first one in the rhythm game genre (Wikipedia: Dance Aerobics). *Dance Aerobics* was released in the USA in March 1989 by Nintendo (Gamefaqs: Dance Aerobics). The idea of the game was that the player follows the aerobics teacher's instructions, and in order to succeed in the game, the player has to press the pads with their feet and hands simultaneously with the aerobics instructor (Mobygames: Dance Aerobics).

According to Ian Bogost, Play Station's *Dance Dance Revolution* (DDR) was the first rhythm and dance genre video game that was successful among the users upon its release in North America and Europe in 1999. The game was created by the Konami Corporation´s Bemami music games division. DDR was first launched in 1998 as an arcade game. Almost 100 updated versions have been made of it, such as those for Sony PlayStation, Sony Play Station 2, Sega Dreamcast, Nintendo 64, Microsoft Xbox and Nintendo GameCube (2007d, 10).

Bogost (2005a) states that in 2004 ResponDesign released an exercise program *Yourself! Fitness*. The game was first released for the Xbox, thereafter for PlayStation 2 consoles and PC. The game was the company's effort to try to reinvent the home fitness video as a videogame. The intention of the game is to improve the player's success in personal exercise and direct the player to take an interest in regular physical exercise. A virtual personal trainer Maya acts as the director of the game and provides the primary interface. The player sets up a profile with data including weight, length, and exercise aims. After this Maya creates a personal training programme, which usually lasts for 30 minutes per day. The majority of the actions are ordinary aerobic exercises. At the beginning of each exercise Maya asks the player to measure their pulse and asks how the player is feeling. Interestingly, if the player does not have enough strength to work out, Maya may give a permission to skip the practice for the day. The game also offers healthy food menus and recipes (Bogost 2005a).

Later, in 2008, Ubisoft released *My Fitness Coach* for the Wii and at the same time a PC version *PC Fitness*, which was followed by a new game called *Y!F Lifestyle* (Wikipedia: Yourself! Fitness) (Bogost 2005a).

2.3.3 Motivation to Play Exergames

Bogost makes a critical statement arguing that many articles have been released on the effects of exergames, but these studies do not tell how these games motivate people to take an interest in physical education and, moreover, how they help them to remain motivated. Bogost argues that playing an arcade game that contains physical exercise cannot be compared to jogging for several miles, although he says that arcade games offered considerably more exercise than traditional video games (Bogost 2005a).

This research will cover the players' gaming motivations. Motivation to play digital sports games is probably somewhat similar to the motivation to exercise. However, earlier studies indicate that there are also other motivators to play or not to play exergames. According to Marijke at al., the barriers that lead into discontinuing the playing of an interactive dance simulation video game (IDSVG) were boredom, the need to use the computer or the play space for something else, boring music and technical problems (2008, 165). Reasons for playing exergames, maintaining and raising the motivation to play, might include the possibility to save the player profile and track the personal development in different games. Some players may consider that the challenges of games and different game levels can serve as a source of motivation. Having fun, the entertainment value, might also act as a motivator for some players.

The results of the Alasdair study are important in terms of this study. According to them, designing a computer game requiring physical functioning, player's skills and experience are taken into account in game design. The game should be challenging enough, so the players don't get tired, while it should not be too difficult, so the player won't get frustrated and quit playing. The researchers argue that the ability to choose the difficulty level is a good thing (2010, 5).

Lampila et al. suggests that satisfaction might motivate people to exercise using digital sports games even without social support or any other contributing factors (2006, 12). The research group proposes that there is a group of people who play digital sports games but who are not sports enthusiasts, and this set of players would be the most interesting target group for increasing physical activity with digital sports games (2006, 32).

According to Lampila et al., in all age groups, enjoyment was the main reason to play computer games. The study gave evidence that among pensioners, social motivation for playing was not important while adolescents play computer games together in their free time. Others searched for relaxation and enjoyment for a short period at a time. More than 50 percent of the

respondents exercise sufficiently in the point of view of their health. Adolescents were the most active in sports, although the activity decreased with age. When comparing adolescent group to others, it was notable that physical activity decreased in young adults. According to researchers, the challenge is to come up with applications that allow young adults to maintain sports activity when they move on to live on their own. The study shows that seniors exercise the least and that the majority of respondents intended to move more in the future. The research also revealed that high occurrence in computer game playing was not associated with low physical activity or high body mass index (BMI). The social role of playing computer games seems to be different among adults and young people. For young people, playing games was a social event and they played for longer periods at a time, whereas the adults played for a short period at a time irregularly and for them playing was not a social event. According to the study, an interesting fact is that for men the social role of playing plays an important part for much longer than for women (2006, 52–53).

2.3.4 Gamification

Gamification means, in short, using game design elements in non-game applications, such as business and social impact challenges, making them more pleasant and fun. Gamification may be part of the future of exergaming by combining business, sports and entertainment.

Gamification promotes user involvement and commitment to a particular service through game features. Typically gamification is used in applications outside the game world, in particular in consumer Internet and mobile sites in an attempt to get the public to access applications and to do desired things. The idea of gamification is to encourage people to participate in activities that they usually find boring, such as the completion of a questionnaire, shopping and reading through web sites (Wikipedia, gamification).

Video games have a strong psychological impact, and they motivate people's behavior. Kevin Werbach notes in *Wharton Magazine*: "Well-designed games don't just entertain, they satisfy deep human needs for feedback, exploration, achievement, and social interaction". Werbach raises the idea that: "What if the same techniques that motivate hundreds of millions of game players could be used for marketing, productivity enhancement, or innovation within firms" (whartonmagazine.com). The concept is very promising, but it may involve risks. Among other things Werbach highlights legal and ethical questions and public policy responses.

People look for new experiences to everyday things, such as combining physical activity and technology. There are various examples of the use of gamification to motivate people to exercise, as well as maintaining the motivation, by using different rewards such as achievement marks, levels of achievement, best performers lists, progress bars measuring performance and virtual currency. Gamification can be used in almost any company and business sector to create fun and engaging experiences. The word "gamification" was first used in 2004 but the phenomenon became more widely known towards the end of 2010 (Wikipedia, gamification).

There are a number of applications available to make people healthier, skinnier or more motivated to exercise. Running no longer feels right without music on your iPhone. When you get bored of that, there is always a chance to run in order to avoiding zombies with *Zombies, Run!* installed on the iPhone (also works with iPod Touch, Android and Windows Phone). According to "zombiesrungame.com", the story is carried on by running, and the user automatically collects things, such as water, medicines and clothes. The more missions the user gets to play with, the bigger the increase in game level. Jogging is possible anywhere, in a park,

beach, a trail and treadmills. The program records the distance, time, pace, and calories burned on runs.

> I don't find working out fun. I enjoy how it feels when I'm done and I like the results, but the actual process sucks. Technology helps distract me as much as possible when my muscles beg me to stop and my lungs breathe hot ass (richretyi.com).

DailyBurn is a workout application with a variety of physical activity levels, promising workouts for beginners as well as those looking for serious challenges. It can be accessed using a computer, iPad, iPhone, Android or TV. The application includes at least the following exercises: cardio, strength, yoga, kickboxing, abs, mobility, core, metabolic conditioning and stretching. *DailyBurn* promises that each workout is interactive, engaging, and the user is able to monitor weight and performance through *IntelliBurn*, which analyzes the user's goals, strengths and weaknesses. The program also offers healthy food recipes (dailyburn.com).

Super Better mobile service aims at helping users to achieve their own health goals, or to be healed of sickness and injury, increasing the user's resilience. The user can follow their own development using the *Resilience Score* and *Well-Being Inventory.* Recilience in this connection means a person to remain curious, optimistic and motivated, even in the middle of difficult challenges (superbetter.com).

MyFitnessPal is a free website and mobile application that promises easy calorie accounting and diet monitoring (myfitnesspal.com).

RunKeeper application uses GPS to track the user's runs and audio cues. It offers manual entry for treadmill and other cardio equipment as well as customized interval workouts. *RunKeeper* also offers heart rate monitoring for iPhone and Android (runkeeper.com).

> Good gamification design seeks to understand and align an organization's objectives with a player's intrinsic motivation. Then, through the use of extrinsic rewards and intrinsically satisfying design, move the player through their journey of mastery. This journey requires elements such as desire, incentive, challenge, reward and feedback to create engagement (gamification.com).

2.3.5 Introduction to Digital Sports Games

There is variety of digital sports games in the market. What follows is a more precise definition about the games mentioned in this research.

2.3.5.1 Nintendo Wii Fit and Wii Fit Plus

Wii fit press photos

The Wii is a video game console released by Nintendo. It was launched on November 19, 2006 with 21 game titles. The Wii is played by waving a wireless, motion-sensitive remote control (Wii Remote) to control the movements of the players in different games. Vajk et al. describes the interface as following:

> "The Wiimote, a wireless controller, which is able to sense both rotational orientation and translational acceleration along three-dimensional axes. It achieves this through the use of inbuilt accelerometers, together with a light sensor. This light sensor is used in conjunction with an array of light-emitting diodes centrally positioned above or below the console's display, which allows for six degrees of freedom. The Wiimote can be augmented with additional features, one of which is the "Nunchuk," which features an accelerometer and a traditional analog joystick with two trigger buttons" (2008, Vajk et al. 1).

After Nintendo released Wii Fit for the Wii console, it became a great success and "is currently the third best selling console game in history (among games not packaged with a console) with 22.61 million copies sold as of May 2010" (Wikipedia.com, "Nintendo Wii Fit"). The Wii device is the primary controller for the console. Wii Fit Balance Board measures the user's centre of balance, centre of mass and weight. The user can stand on the board in various poses, balance or do pushups. The software in Wii Fit calculates the body mass index, among other functions. Wii Fit has about 50 exercises, such as yoga poses, strength training, aerobics and balance games. Wii Fit Plus, which is an enhanced version of the original Wii Fit, includes 15 new balance and aerobics games, six new strength training and yoga activities together with a calorie burning counter.

Patrick Crogan states in *Culture Machine*: "Wii Fit Plus follows up this offer of vicarious participation in the hi-tech feedback-based training and fitness evaluation systems of professional sports" (2010, 88). He continues: "This is what the Wii system is designed to boost - the familiarity of its attentive, embodied engagement of the user in virtual interaction" (90). Crogan argues that: "The Wii could be said to boost the immediacy of the virtual world by enhancing physical involvement in the mediated, virtualised world of play" (2010, 91).

Below a discussion about Wii Fit sports games in Gamecritics.com:

> Over on Game Critics, part of their ongoing series on Wii Fit suggests the question, is this exercise through a game, or just a simulation of exercise. The counterpoint might be: how does it really differ from any other pop-exercise regime, in book or video form, for example.

comment:

> It doesn't differ. Simply because people may be more inclined to exercise because of digital feedback doesn't mean it isn't real exercise, it is moreso a testament to our gratification culture. We need feedback to everything at every moment.

Mike Doolittle writes in Gamecritics.com:

> For many people, it will probably be the only exercise they get. Better than nothing of course, but it will be interesting to see how many of those people achieve their goals.

Researcher still disagrees with the benefits and physical efficiency of digital sports games. Crogan argues that the Wii games are related to the actual games such as tennis, baseball, golf and boxing, but he notes that they are only comparable, not the same (2010, 87). Users, however, experience that some of the games are very effective in terms of physical exercise.

> Some of the games have been developed just for exercise, and these games do not differ from real world exercise in any way, it is real exercise (Respondent 5).

Janell Troyer writes in Gamecritics.com:

> ...So you wonder if it's challenging??? Ever tried hula hooping for 6 or 10 minutes at a time. I tell ya, I didn't know I had muscles on my hip bones... they're screaming!! My obliques are sore, my back is sore, my arms are sore. I feel it in practically every muscle in my body–it's GREAT!! Even with 3 small children I'm able to get in over an hour a day...because it's fun and it's not disruptive to our daily routine.

2.3.4.2 Introduction to Xbox Kinect

Kinect Sports: Season Two – Tennis – Play with a Friend (microsoft.com).

Kinect advertises that Kinect for Xbox 360 lets the player to be the driver. According to the advertisements, the game is based on natural experiences. Kinect uses a motion detector, which monitors the whole body. When playing, the whole body is moving, also on the screen. During play, Kinect creates a digital modeling based on depth data. The sensor captures the movements of the body as the player moves around. Kinect ID uses the Kinect sensor to recognize the players face and automatically loads the player's profile. Kinect ID collects physics data of the player and saves the information on the profile. The navigation takes place by moving a hand; when the sensor detects the player, the screen cursor moves (xbox.com).

2.3.4.3 Introduction to PlayStation Move

PlayStation Move Press Photos

PlayStation Move Press Photos

The basic functions of Nintendo Wii and PlayStation Move remote controls are very similar. PlayStation Move is a wireless, gesture-based control system that imitates the player's movements using motion sensors and a web camera, enabling it to identify the position of the hand-held remote. The controller uses Bluetooth to communicate with the PS3. Body movements are displayed on the screen at the same time a player moves, holding the remote in their hand. The body movements are displayed on the screen at the same time the player moves holding the remote (extremetech.com). In the other end is a kind of a flashlight that shines with colored lights when it is used with the Eye (a game console accessory with a camera and a microphone). It is possible to track four controllers with the Eye (ps3explained.com).

The PlayStation Move was published on June 1, 2009. It was published in continental Europe and most Asian countries on September 15, 2010, as well as in North America and the UK on September 17, 2010 and in Japan on October 21, 2010 (Wikipedia.org/wiki/PlayStation_Move).

2.3.4.4 Introduction to DDR – Dance Dance Revolution

The Dance Dance Revolution (DDR) was created by the Konami Corporation's Bemani music games division in 1998 as an arcade game. Almost 100 updated versions has been made of it (Bogost 2005a). Bogost describes the game as follows: "*DDR* is a rhythm game; it is played by pressing sensors on a touch-sensitive dance pad in proper time with music. On-screen cues in the form of arrows show the player the proper timing, superimposed on top of visually sensuous animated backdrops representative of the game's characteristic electronic dance music" (2005a).

3. METHODOLOGY

This main chapter presents first the objective of the study, research methodology and research questions. The method consists of the practices, operations and functions through which the researcher produces the findings, as well as the rules under which the findings can be further modified and interpreted (Alasuutari 1999, 82).

3.1 RESEARCH METHOD

3.1.1 Meaning of the Research and Research Questions

It is typical in qualitative research for the research problem to change during the study. Researchers conducting qualitative studies prefer to speak of research tasks instead of "problems" (Hirsjärvi et al. 2004, 114). The research task of this study changed throughout the analysis phase, because the data revealed things I did not take into account at the early stages of the research.

This study aims to respond to the following, more detailed research questions:

1. Why are digital sports games played, why are they not played, and what do people aspire to when playing?

2. What effects does the playing of digital sports games have on people?

3. Who are playing and what is played?

This study aims to understand not only the ways digital sports games motivate players to engage in physical activity, but also the various reasons for playing digital sports games and most of all the player's own feelings and experiences about playing them. The ultimate purpose of this study is to identify the player's own interpretations on the effects of digital sports game playing, not the effects themselves.

The purpose is to determine whether people who play digital sports games are, generally speaking, interested in sports, and does the playing change their attitude toward sports. This study also aims to find out if there is a group of people who exercise a lot in real life (beyond playing computer games) and who play exergames having a goal in their mind, like aiming at visible physical changes and the development of physical condition. In addition, the respondents were asked what are the things they value in digital sports games and what kind of sports games they would like to play and why.

This research topic is current and will provide added value to research in the field. Digital sports game players and the motives for playing have not been extensively studied.

3.1.2 Qualitative Analysis and Structured Questionnaire

The study data was collected using a structured questionnaire, which was analyzed using a qualitative method. Based on the analysis, the respondents were classified into different types and four different profiles were formed. According to Alasuutari, the qualitative data is a piece of explored world in the sense that it is a sample of the area in language and culture (1999, 88). This study forms four different digital sports game user types and draws up the motivation climate of these digital sport game players.

Qualitative data is characterized by its expressive richness, multifaceted nature and complexity (Alasuutari 1999, 84). The reason for choosing this method was primarily the objective of the study to map views, opinions and experiences. I considered this approach to be the best when examining players´ experiences on playing various digital sports games, the experiences and the ideas that have emerged as a result of playing.

Qualitative research seeks to describe an event, to understand a particular activity or to provide a theoretically meaningful interpretation of a phenomenon. The aim is not just to explain the data but rather to build theoretically sustainable perspectives (Eskola and Suoranta 2008, 61–62).

Eskola and Suoranta observe that the analysis should proceed gradually and with confidence that the first parsing is not the last (2008, 151). At some point in the analysis, however, researcher has to come up with a conclusion and give his/her own interpretation of the material. The weakness, or on the other hand the strength, of the qualitative analysis may be the researcher's personal interpretations. If someone else were to do the study with the same material, the results could probably be somewhat different. Eskola and Suoranta note that the most problematic stage in doing qualitative research is making interpretations. The researcher's imagination is responsible for the fertility and relevancy of the interpretations (2008, 145). The most important background element, however, is objectivity. The researcher must seek to be objective, that is, the researcher should not mix his/her own beliefs, attitudes and values with the research subject (Eskola and Suoranta 2008, 17).

According to Alasuutari, qualitative research examines the material as a whole, as a phenomenon, which is turned and viewed from several angles and perspectives. Qualitative study is characterized by collecting data, which allows a variety of reviews (1999, 38, 83–84).
I felt it essential to do the survey a little broader so there were enough information for the final stage of the analysis.

It was also important to take into account the possibility of new themes coming up from the material, and to give room for the respondents to express these things.

Qualitative analysis consists of two stages: reduction of the observations and mystery solving. Data analysis draws attention only to what is essential in terms of the theoretical framework and from the question layout (Alasuutari 1999, 39–40). Denscombe has said: "In one sense, the word 'survey' means 'to view comprehensively and in detail'" (2003, 6). This was the key idea for my study, as I wanted to understand the emotions, motivation and feelings of the players. In addition, questionnaire with open questions allows respondents to express themselves in their own words. I felt it was important to create a broad but considered questionnaire, which is the basis for this study.

"Qualitative data analysis is intended to provide clarity for the material and thus provide new information on the topic of study. Analysis aims to strengthen the material without losing the information contained in it, on the contrary, it aims at increasing the value of information by creating a fragmented file a clear and meaningful" (Eskola and Suoranta 2008, 137).

The purpose of mapping surveys is generally to "bring things up to date". This is also the case with social surveys. Surveys usually relate to the present state of affairs and involve an attempt to provide a snapshot of how things are at the time the data is collected (Denscombe 2003, 6). Digital sport games are a piece of this moment and culture, which, however, is constantly changing. Cultural change is difficult to see up close, that is why it is particularly important to explore the phenomenon more broadly.

Format and order of questions are the same for everyone in a structured interview or form interview. The questions have the same meaning for everyone and the answer options are complete. In case of a semi-structured interview, questions are all the same but the respondent can answer the questions in their own words. (Eskola and Suoranta 2008, 86). The questionnaire of this research consists of open and complete answer options.

3.1.3 Thematic Approach and Typology

For this research, the responses collected and analyzed. After this, responses were approached thematically. The key topics were selected from the material in terms of the research problem. Qualitative data is often presented according to themes. This requires splitting the text into smaller units. It can then be arranged around different types found in the data. Basically this means organizing the data into narratives. (Eskola and Suoranta 2008, 182).

Typology of the material means grouping the data into clear groups with similar stories. At best, the types describe the material broadly and interestingly but still economically. Typology, however, requires forming the data by themes (Eskola and Suoranta 2008, 182).

The first thing to do is to find relevant topics from the mass of data after which the topics are separated into themes (Eskola and Suoranta 2008, 176). In this research, the typology method was used to bring together the same or similar answers, after which the comparison of the responses in relation to each other took place. The aim was to create digital game player profiles, highlight the key themes, convergences and differences between the players, and then identify the different player types. According to Alasuutari, searching for common characteristics from the material does not mean that the aim is to define the average individuals. In qualitative analysis, a single exception is enough to falsity a rule (1999, 40–43).

According to Eskola and Suoranta, the quotes removed from the answers and organized by themes are often interesting, but they do not necessarily indicate very far-reaching analysis and conclusions. Typology requires the interaction of theory and empirical data (2008, 175–176). In this research the quotes are used for adding value to the analyzed data and to bringing the subject matter closer to the reader thus making the text easier to understand.

For the qualitative basis for this study, I have consulted the following books: Alasuutari, Pertti: "Laadullinen tutkimus" (1999), Blaxter, Loraine: "How To Research", Eskola, Jari and Suoranta: "Johdatus laadulliseen tutkimukseen" (2008, 1998), Martyn Denscombe: "The Good Research Guide" and Hirsjärvi, Remes & Sajavaara: "Tutki ja kirjoita" (2004), Aaltola and Valli: "Ikkunoita tutkimusmetodeihin" (2010).

3.2 RESEARCH MATERIAL

The main research data used in this study is found on a questionnaire for game players. The time span of this research is from June 2010 until July 2012. The questionnaires were sent and the responses were analyzed during the summer of 2011. Background material was collected from June 2010 until July 2012, and the actual writing was done between September 2011 and July 2012.

Questionnaires were sent to 8 subjects. Subject ages were between 26 and 46. The mean age of all respondents was 36.6 years. Out of the 8 subjects, 4 were male and 4 were female. Men's average age was 32 years and women's 41.25 years. The responses are expected to be slightly distorted because of the relatively large age difference between men and women.

I divided the survey into four parts. At the beginning of the survey, participants were asked to provide background information about their personal and physical activity. This involved mainly closed-ended questions. Then the respondents were asked about their digital sports game play, mainly using open-ended questions. Finally the respondents were asked about the user experiences of their digital sports game play, again mainly using open-ended questions. The advantage of the open-ended questions is that they allow the respondents to elaborate their own thoughts.

I did not want to include children in this study so I focused on adults. Despite this, the background studies and literature used deals with children's game play. This is in part because of the common axiom in the physical sciences that the adult physical activity behavior is inherited from the childhood (Currie et al. 2006, 105; Eurobarometer 2010, 17; Weiss 2000, 8).

My initial idea was to survey the digital sports game playing of an acquaintance and turn it into a case study. The person in question did not practice any sports in the real world, so I was interested in finding out if playing digital sports games might encourage the person to change this. However, this person did not continue to play long-term so I had to change my approach. I decided to search for a group of digital sports game players who were on different physical activity levels in order to compare the experiences of these players.

The respondents in this study were found from among my social circle. One of the participants was asked to join directly. I made contact through a mutual acquaintance, who told me this

person plays digital sport games actively. I also found interested people among my friends on Facebook. In addition, I searched for digital sports game players via the Internet and found a few through a blog maintained by a person who was playing digital sports games. I sent the players an email asking if they were interested in answering the query. Overall, I selected a group of eight to whom I sent the questionnaire form. This study is based on their answers.

According to Aaltola and Valli, the questions form the basis for the success of research. It is therefore essential to be careful in making and shaping the issues. The form of the question causes most errors in the findings: if the respondent does not think the same way about the question as the researcher, the results are distorted. It is also important to think about the length of the questionnaire, that is, how long will the subjects manage to answer the questions carefully (2010, 103–104, 108). I started with a pilot questionnaire and asked my friend to fill it out in order to test the form. The frame of the questionnaire seemed to be in order. What worried me was the time it took to complete the form, which was estimated to be approximately 30 minutes, depending on the length of the respondents' answers. I made a few small corrections and sent the questionnaire to the players via email. I asked the original subject to fill in the questionnaire form as well and analyzed the answers as equivalent to those of the other research participants. On the basis of the responses I would say that the respondents wanted to focus on the answers, and the extent of the form didn't interfere with this.

The questionnaire consists of both open-ended and multiple-choice questions in order to get both rich and direct answers. I needed straight answers for simple questions, such as those considering age, gender and occupation. Multiple-choice questions were used to get direct answers to those questions that I needed to compare. Open-ended questions give the respondents an opportunity to explain their responses. It was also important that the answers and their meanings do not change during the analysis.

The data was analyzed by reading through the surveys several times. During the reading process, similarities together with differences emerged from the material. This study is based largely on the congruent and various aspects of the examination.

"Perhaps more relevant to the research process would be that data that doesn´t fit should not be ignored, but accepted, reported and cherished" (Blaxter 2010, 244). The analysis is much

deeper and more convincing when the researchers take into account the circumstances that do not entirely fit into the model they have created.

I combined the same, or similar, responses into groups and clear player types began to form. Finally these types were divided into four different player profiles. The majority of respondents were divided into clear homogeneous fractions on the basis of the responses, but the formation of the group D required more analysis, as well as the re-organization of pre-formed hypotheses. The final division into four player types is, however, quite clear, and each section has one or more clear features, the basis on which they can be identified.

In addition, I have analyzed the respondents' user experience of the games dealt in this study.

3.2.1 Games Mentioned in This Research

Wii	**Xbox Kinect**	**PlayStation Motion**
Wii Fit Plus Games: Strenght training, balance, yoga, aerobics	Your Shape Fitness Evolved	Fight
Wii Sport: tennis, bowling, boxing, golf	Fighers uncage	Sports Academy: Pingis, Frisbee golf
EA Sport Active	Tikkapeli	
Sport Resort	Dance Central	
Tiger Wood Golf 2010	Zumba	
Yoga	Taiji	
Bowling	Kickboxing	
Party		
Holahola		
Tennis		
Track and field		

3.2.2 Questionnaire

Below the frame of the questionnaire is presented.

Frame of the Questionnaire	
Personal information	Gender, age, occupation and status, education
Background information of physical activity	Physical activity, the intensity of the activity and place of activity
Digital sports game playing	When and why digital sport game playing has started, what games are played and with whom, in-game pros and cons, the attitude towards physical activity prior to playing, playing sessions per/week, and playing time per/week, own experience of progress both physically and game skills, the effects on everyday life, whether playing has effects on any other sport activity, effects on diet, what the respondent feels about playing the games, the current relationship with physical activity, the respondent's view if the games can replace the daily physical activity
User experiences	Physical performance, what the defendant wants to achieve by playing the games, good and bad experiences, game design, and whether it affects the game play, in-game execution, what kind of game the respondent would like to play.

Respondents were asked about the following issues: descriptive statistics, such as gender, year of birth, occupation and education, physical activity frequency, time spent on physical activity per week and the intensity and efficiency of the exercise. The respondents were asked for a wide range of information about digital sports game playing, such as their opinions about the games and playing, and of their playing frequency, intensity and efficiency. Sports skills and game skills development were asked about in addition to the other effects of playing. The user experience of games and the possible goals for playing were asked about. The defendants were asked whether in their view the real world exercise could be replaced by digital sports game playing. Respondents were asked to report their ideas about the games including the positive and negative aspects of games, the implementation, the design and their thoughts about what constitutes a good sports game.

3.3 ABOUT RELIABILITY AND VALIDITY OF THE RESEARCH

3.3.1 Reliability

Qualitative study researcher has to constantly reflect on the solutions made and take a stand both for the coverage of the analysis and for the reliability of the work (Eskola and Suoranta 1998b, 209).

"The repeatability of the study is called reliability, and it is designed to resist the effects of chance, and to highlight the similar results from different measurement times. The reliability of the study is directly proportional on the reliability metrics of the present study" (Metsämuuronen 2005, 64-5). Research reliability refers to the manner in which the research data results can be generalized.

I find it necessary to bring up a few things out of the collected data. The players who responded to this survey were on average quite active digital sports game players. Minority of the players played the games only once a week. Does this mean that the digital sports game players are on average active players? Or rather that the people selected for this research are active digital sports game players? It is likely that no generalizations should be based on this study sample and that further study on the matter is needed.

The basic idea of this research is to study the correspondents own experience of the effects of digital sports game playing, not the effects themselves. Because of this, the responses and the analysis cannot directly be compared to other studies in the same field. My research focus was on eight people, four men and four women. Since the survey was conducted with such a small number of subjects, it is clear that the results cannot be generalized and conclusions on digital sports game playing and about the players cannot be done.

If this research was conducted again and the object of the research were the same people, the results would most likely be different because of the time interval and the fact that people's behavior and preferences can change radically even within a short period of time. However, this does not mean that some conclusions about human motivation, reasons for action and experiences could not be made.

Inspite of that, some conclusions can be made. This material tells a story of the reasons this specific group of Finnish men and women play digital sports games. The most important thing this study reveals is the personal emotions and feelings the games and playing raises on the players. In addition, this study reveals reasons why people keep on playing the games and why some of them do not play.

The present study does not attempt to cover everything. I cannot be sure whether the respondents were honest. It may also be the case that respondents may "refine" the responses, that is to provide a picture better than the reality. On one hand, some respondents may underestimate themselves. Hirsjärvi et al. conclude that the researcher cannot be sure how seriously the respondent has answered the questions and if the answers are honest. On the other hand, the researcher cannot know whether the answer options were successful judging from the perspective of the defendant. There is always the possibility that the respondent did not understand the question in a way the researcher intended. Misunderstandings are difficult to control, Hirsjärvi concludes (2004, 191).

There are a number of limitations specific to this study that should be noted.

1) The study sample is very small, so generalizations should not be made.
2) Respondents of this research were people who mainly enjoyed playing digital sports games and who have previous experience in these games. Thus, this study does not provide broader understanding about the people who are not interested in playing digital sports games or who only play the games randomly.
3) Analysis of this study consists only of those games played by the defendants. Multiple digital sports games were therefore excluded from this study.
4) The respondents' age range is very limited, comprising of players between 27–46 years of age. That is to say this study does not include children, young adults or seniors.

During this study, a number of assumptions were made by the researcher. First, it was assumed that respondents answer the questions truthfully. Second, it was also assumed that problems with the questionnaire form regarding the layout and opening the form might occur because of software issues. This was taken into account and the defendants were informed that they could answer the questions without utilizing all the automatic functions.

Taking all these things into account, I still consider the material reliable.

3.3.2 Validity

Validity defines how well the material and questions measure the theoretical framework.

The concept of validity is used to answer the question “does the measurement measure what it should measure?” The instruments and methods may not necessarily correspond to what the researcher thinks they would examine. For example, the defendant may understand the questionnaire questions in a completely different way compared to what the researcher means (Hirsjärvi et al. 2004, 216–217, Metsämuuronen 2005, 109).

According to Eskola and Suoranta, the internal validity, i.e. competence, refers to the harmony of the theoretical and conceptual specifications demonstrating the scientific validity of the researcher. External validity means the validity of the relationship between the interpretations and conclusions made of the material. External validity is more closely connected to the behavior of the researcher than the respondent (2008, 214).

The concept of validity can be considered to some extent as lacking since a couple of the respondents felt the question number 20 to be unclear. On the basis of their answers, the researcher believes that the respondents had understood the question as intended. However, it may be that something has been missing. Perhaps too many examples were given with the questions, which confused the respondents.

3.4 RESEARCH ETHICAL ISSUES

This study describes the current experiences, thoughts and motives of the digital sports game players at the time they filled in the questionnaires. No long term assumptions or interpretations of this study should be made. Overall, my work deals with digital sports games and the causes and consequences of playing. I have investigated this issue through physical sciences, so the phenomenon would be understood and explained through the motivations of exercise. Nevertheless, my aim was not to make this work through the physical examination, but rather to investigate people's experiences, motivations and consequences on the use of digital sports games. This study describes the physical activity through play. The core of this study is formed by each player's personal playing experiences and the conclusions are based on them.

I have used new, or the latest possible, literature, plenty of domestic and international scientific articles and digital sports game player’s user experiences found on the internet to support my thesis work.

All participants were given total anonymity and confidentiality throughout the study.

4. ANALYSIS OF THE MATERIAL

In this chapter, I present an analysis of the questionnaires. The objective is to find the central themes of the material and to form digital game player user profiles.

Qualitative data analysis is designed to create clarity on the selected material and to provide new information under the study subject. The data is summarized, however, without losing the information contained. The analysis and reporting of information aims to increase the value by reviewing the fragmented data in a clear, meaningful and easy-to-read way (Eskola and Suoranta 2008, 138).

According to Eskola and Suoranta, qualitative data analysis is often referred to by either primary or secondary interpretations. Study participants interpret their personal daily lives through so-called first degree interpretations. Too often the qualitative research is about copying and reporting the first degree interpretations. Scientific thinking should be separated from everyday thinking. This means that the researcher must be able to transform the first degree interpretations into second degree interpretations, that is, to reach theoretical interpretations (2008, 149).

“Interpretation is the process by which you put your own meaning on the data you have collected and analyzed, and compare that meaning with those advanced by others” (Blaxter 2010, 242).

4.1. ANALYSIS OF THE QUESTIONNAIRES

In the following, all eight questionnaires are analyzed. First, each of the questionnaires will be analyzed one by one. The answers of the structured questionnaires will be opened, dismantled and interpretations based on the responses made. After that, the answers are divided into sections and similar, or same kind of, responses are collected together. Then the users are grouped into different types, which forms the foundation for user profiles.

Finally, the user experiences will be analyzed by forming themes out of the data encompassing the following: The Wiimote Against the Xbox Kinect; Negative Aspects of Games (Wii and Kinect); Positive Aspects of Games (Wii and Kinect); Virtual Sports Compared to Real World Physical Activity; Physical Strenuousness of the Games; Compatibility of games to replace the daily physical activity; Virtual Avatar; Game Design; Ideas for a Good Exercising Game. The analysis includes player's own comments, which brings the subject matter closer and makes it easier to understand.

The purpose of this study is to determine who plays digital sports games, what kind of players the participants of this study are, what experiences they have on games, what they appreciate about games and playing, and why they are playing digital sports games.

After this detailed review, the results are compared to previous studies.

4.1.1 Questionnaire Answers of the Respondents 1–8

Respondent 1, male, age 41

The respondent is physically active on average three times a week. Sport plays a large part in his life, and he prefers exercising outdoors and in groups. He also participates in beneficial physical activities including snow removal, gardening etc. He experiences physical exercise to be a strong part of his live. Digital sports game playing does not affect the rest of his physical behavior in any way. He wants to exercise often and as diversely as possible.

The informant is not interested in digital sports game playing. Playing games is only a way to spend time with the children and he only plays with them. He considers digital sports game exercise and real world exercise as two completely different things.

The informant feels that digital sports game playing does not offer him anything, and he preferably does something else. He plays digital sports games on average once a week, half an hour at a time. He does not consider digital sports game playing as exercise. His opinion is that the games are not challenging enough, and he also feels that success in a game is sometimes too easy to achieve. In his opinion, the games are not physically strenuous. He would like the games to be more virtual and interactive. He does not believe that digital sports game playing could, in his case, be a substitute for daily physical activity, but he adds that for someone else it might.

For the informant, the main thrust for playing digital sports games is spending time with the children.

Respondent 2, female, age 39

The informant began regular physical activity in adulthood. In the past, she participated in beneficial physical activity, was active at the school physical education lessons and also walked her way to school, which took her two hours every day. Currently she exercises mainly at home, by DVD workout or on treadmill and plays digital sports games. She also does some outdoor physical activity, such as walking, skiing and hiking. It is important for her to be able to exercise whenever she wants to. She also appreciates having her own peace to exercise. She is physically active more than 3 times a week. Digital sports game playing has increased the times she sweats or gets breathless from 2–3 times a week to several. She plays active video games once a week. She plays alone for 1 – 1.5 hours each time and with a friend for about 2 hours each time. She mentions that digital sports game playing has increased her beneficial physical exercise.

> "I started to be physically active around the age of 25. Since then, I've always liked sports and digital sports game playing is only a change from any other physical activity" (Respondent 2).

The informant plays digital sports games alone for fitness purposes, such as kickboxing, tai chi and strength training exercises. Her opinion is that in general digital sports game playing is quite effective strength and fat-burning exercise, but in the long run or alone the games do not offer enough challenge. She plays digital sports games also to get more variety, as well as when she wants to do a more peaceful fat-burning exercise or a supervised strength training workout. In her opinion good fat-burning and strength training exercises are for example dance games (*Zumba*) and *Kickboxing*. She preferably selects a cardio-workout DVD for fitness improvement.

The respondent plays entertainment games, such as athletics and boxing, with friends. She experiences the above-mentioned games as entertainment games and beneficial physical exercise, although she might break a sweat while playing those. The informant finds the Nintendo Wii's trajectory tracking of muscle workouts important because the program helps her do the movements correctly and reports wrong movements. In her opinion, the feedback the program offers is important. It is just like having a personal trainer. She thinks that with the program the player has to exercise harder, because it does not allow the player to cheat or make the movements more easily. She was surprised by the effectiveness of guided exercises. Yet in her view, digital sports games are not a substitute for daily exercise, and the games lack variety. She also thinks that the games do not have enough challenge, but adds that if the player is in poor condition to begin with, it is possible to elevate endurance and muscle tone by playing.

> My husband and I play other games just for fun. I experience these games as beneficial exercise. You do not sweat while playing, and the exercise is not as intense physical activity. The beneficial games can be considered as long-lasting interval type of exercises when played for a long time at a time (Respondent 2).

The informant plays digital sports games to improve her condition, control her weight, feel good, because of the physical effort and to have fun and variety compared to her other physical activities. The main push for the defendant for playing sport video games is the supporting recovery exercise and entertainment. She experiences the digital sport games as "only a factor that makes a change for any other sports activity."

Respondent 3, female, age 46

The respondent is an active sports enthusiast and exercises actively five times a week. In addition, she engages in beneficial physical exercise. She does not care about being physically active in group exercise classes.

In her case digital sports game playing has added the times she gets out of breath and breaks a sweat every week. She prefers playing alone. She is goal-oriented and expects playing to resemble actual sports activity and result in sweating. She also plays entertainment games with children and other adults. Playing digital sports games has increased her weekly strength training workout times. On average, she plays more often than 2-3 times a week, an hour at a time. Playing digital sports games have no effect on her other sports activity. Playing has not reduced her physical activity. She has begun to follow a diet after starting to play digital sports games. She also mentions that she has begun to exercise on a more regular basis, her physical condition has improved, and she currently spends more time exercising than before.

The respondent experienced progress with the digital sports game play. She says that her agility, skill and strength have grown, and the game tactics have improved. She also mentions that due to playing digital sports games, her physical condition as well as her posture have improved. She views digital sports games as good daily physical exercise.

> The games are not a substitute for outdoor activities but the games are ideal for maintaining and uplifting muscle condition. In my experience, Nintendo Wii Fit Plus Yoga and strength training games as well as EA Sport Active games are good as daily physical activity (Respondent 3).

The informant plays digital sports games to improve her condition, control her weight, have a sense of wellbeing, and make a physical effort. The main push for the informant for playing digital sports games is improving and maintaining her condition. They will also work as entertainment.

Respondent 4, female, age 43

The respondent did not practice any physical activity before she begun to play digital sports games in February 2009. However, she used to participate in some beneficial physical exercise such as raking and snow removal. She feels that playing digital sports games partly helped her make a lifestyle change and radically added her physical activity over the previous years. The respondent indicates that she has never before been physically as active as during the last eight months

> Was one input achieving a lifestyle renovation. The best part was, that it allowed practising in peace without a group of women where the leader is more than eager busybody (Respondent 4).

The respondent is physically active on a regular basis for 2–3 times a week doing, for example, 20 minutes of strength training movements every day. The respondent says that she nowadays exercises outdoors by riding a bike and running. She also exercises at the gym.

The respondent has played digital sports games for two and a half years. She has held breaks from playing and has started to play again. She plays alone and with her children for about half an hour to one hour at a time, on average twice a week. Playing digital sports games has strongly changed her attitude towards physical activity - in a positive way. When asked about the attitude she had toward physical activity before she started to play digital sports games, she responded that it was very negative. She did not exercise at all and her physical condition was accordingly bad.

The respondent thinks it is particularly important that the device is interactive and that it saves data regarding physical changes and player's progress, which allows the users to monitor their development. Her view is that she has progressed physically and gained gaming skills. She says that her balance has improved and running time has prolonged, and she no longer gets breathless so easily.

> Over the last year my weight has dropped 20 kg (January 2011 – January 2012). Wii Fit Plus playing was one input for a lifestyle change. Due to the fact that the program showed my weight and BMI, which was clearly significantly on the overweight side, Of course, there were others too (Respondent 4).

The respondent plays digital sports games to get a good feeling and for the required physical effort. The main push for the respondent for playing digital sports games has been the low threshold to start regular physical exercise. Later, digital sports games have been in a supporting role to other sports and she also likes to play for entertainment.

> Previously, they offered the opportunity to practice in peace just by yourself. It was important because for a person who has not been exercising for more than 40 years, the threshold to go to a group or any other controlled exercise is hard. Wii Fit Plus was a low threshold form of exercise, and you did not have to take it so seriously (Respondent 4).

Respondent 5, female, age 37

The respondent is an active sports enthusiast and in her own words, "an avid athlete". Her hobbies include physical activity 5–6 times a week. She exercises at home and outdoors. Her hobbies include Xbox sport games, home gym and cross trainer. She also jogs.

The respondent plays digital sports games once a week for up to two hours at a time. She preferably plays physical condition enhancing games, such as Xbox Kinect *Dance Central* and *Yourshape Fitness Evolved* games by herself. She plays entertainment games, such as Nintendo Wii *Tennis*, with friends. The respondent's view is that some of the digital sports games are entertainment games, some digital sports games are "real-like" physical activity, that is, they do not differ from real world physical activity in any significant way. In her opinion Nintendo Wii games are entertainment games with sporty features and those games could not be considered as digital sports games. She thinks that playing entertainment digital sports games is a substitute for physical activity that does not equal exercise. There is no real physical experience, she says.

> Playing digital sport games just for fun is much different than proper exercise because the natural atmosphere is missing and the player is surrounded by an artificial world (Respondent 5).

The respondent appreciates good performance in games and that the fact that the games are developed to include physical activity. Playing should increase the heart rate and it should be an effective form of physical activity. Her view is that playing digital sports games is like exercising with a personal trainer.

The respondent's view is that both her gaming and sports skills have developed and she has reached more challenging athletic levels. The digital sports game playing has increased her frequency of training and her fitness condition has improved. She feels that the games inspired her to try new sports. Sports games cannot, in her opinion, replace daily physical activity, but may add to it. She says that the games bring versatility for sports enthusiasts and for those who would not otherwise exercise. Exercise is an important part of her life. Playing digital sports games have brought only positive things to her life:

> Digital sports games increase fitness and thereby affect the quality of life. The games stimulate the spirit and physical condition (Respondent 5).

The respondent plays digital sports games to improve her condition, control her weight, have a sense of well-being, and make a physical effort. She also thinks that the games that allow the whole family to play together tighten the family bonds.

The main push for the informant for playing digital sports games is versatility compared to other sports and entertainment playing.

> Some of the games have been developed just for exercise, and these games do not differ from real world exercise in any way, it is real exercise. The user can edit his/her own profile, and the development of the condition increases, and the user can challenge themselves to perform better (Respondent 5).

Respondent 6, male, age 28

The respondent is an active sports enthusiast, who engages in a wide range of physical activity in group exercise classes, outdoors and at home. He takes an interest in martial arts and circuits 2–3 times a week, and plays digital sports games 2–3 times a week for 1–2 hours at a time. In addition, he cycles and walks on a daily basis. Digital sports game playing had no effect on his other physical activity. He usually plays alone and sometimes with friends.

In his opinion, digital sports games in general are a very positive phenomenon. He likes the idea that the player's own body acts as a controller, and in his opinion the avatar brings more fun to the game. He feels that he has developed in games and his movements have improved in different games. He thinks games have had a positive impact on his daily life. Playing games makes him feel better physically and mentally. In his view, yoga and strength training workouts are not that much different compared to real world exercises. He believes that the games can replace the daily physical activity if the games are played on regular basis and with a goal in mind.

The respondent plays digital sports games to get a sense of well-being and physical effort. The main push for him for playing digital sports games is entertainment, which also has positive physical and physiological effects.

> Digital sports games can have a surprisingly realistic trajectory. The games have a real impact on the body after playing for a while. I have not noticed that many cons. Perhaps digital sports games should be moved outdoors (Respondent 6).

Respondent 7, male, age 33

The respondent exercises three times a week when he has the time for it. He exercises in a yoga room, outdoors and at home. Playing digital sports games has not affected his frequency of exercise. His attitude towards physical activity is varied and depends strongly on the situation of his life. He still feels that exercise is a part of his life. He usually plays digital sports games with friends and only rarely alone. He plays Wii Fit in company and sometimes alone. He only plays Xbox *Dance Central* game with friends.

The respondent also feels that playing digital sports games has a social significance and the most important thing he gets from playing is social fun.

As a problem with the digital sports games the respondent sees their lack of challenge and the inability to make him sweat. In his opinion, digital sports games cannot replace daily physical activity because the games are not demanding enough.

The respondent's view is that the Xbox Kinect is great because the player is free to move without additional controllers. He also thinks that the exercises done on a balance board are mainly good but the amount of things that can be done with the board are somewhat limited. For example yoga exercise tasks do not correspond with reality and the movements are hard to do efficiently compared to real world yoga.

In the respondent's view, the Wii games are ugly compared to Kinect games. He also thinks that the visual look of the game affects the playing experience.

The informant says that his balance has improved because of the games but his physical condition has not changed. On average, he plays once a week, 1–2 hours at a time. He plays digital sports games to get a sense of well-being.

The main push for the defendant for playing digital sports games is entertainment with friends.

Respondent 8, male, age 26

The respondent hardly takes an interest in physical activity at all; in his own words, "too little". Previously, he used to be physically active four times a week. He plays digital sports games 2–3 times a week for half an hour at a time. His view is that playing with friends is entertaining and solo playing is "a little uplifting physical activity". He prefers playing a boxing game, which he feels is an effective exercise. With friends, he likes to play *Frisbee golf* and *Bowling*, which in his view are good entertainment. He thinks that playing with friends is more fun than playing alone.

The respondent appreciates the digital sports games, because they allow him to exercise at home. He considers PlayStation Move *Sports Academy Ping Pong- and Frisbee golf* -games to be realistic. He also thinks that the game layout is relevant in terms of game play.

> It is important that I do not always have to go out to exercise, instead, I can do it in my living room, rain or shine (Respondent 8).

The respondent does not believe that digital sports games could replace daily exercise but they may be a good supplement to it. He plays digital sports games to improve his condition, control his weight, have a sense of well-being and make a physical effort.

The main reason why the respondent plays digital sports games is entertainment, with fitness-enhancing properties.

Reasons for playing digital sports games

Spend time with the children, family or friends
Entertainment
Social fun
Good and fresh mind
Well-being
Own time
Self-overcoming
Aiming for better results
Opportunity to exercise alone, in peace
Possibility to exercise at home, indoors
Weight loss
Weight management
Sweating
Variation for other exercise
Support to other sports
Physical effort
Improving fitness
Recovery exercise

4.2. PROFILES

Next, on the basis of the responses, the respondents are classified into groups and four different player profiles are formed. This is done in order to assemble and explain four different player types as well as the motives for playing digital sports games. Below, the profiles are first simplified in a table format, after which the reasons for playing digital sports games is presented in a table format. These are followed by a more complex description of the different player profiles.

4.2.1 Profile A (3,5,6): Sports Heavy User

Sport is an important part of the respondents' lives. They exercise 5–6 times a week, actively and diversely, and they enjoy playing digital sports games. The informants perceive digital sports games as good fitness training and they also play games for fun with friends or family. Digital sports games do not replace these respondents' real world physical activity, nor has playing had an impact on their real world physical behavior. Overall, the respondents play digital sports games on average 1–3 times a week, for about half an hour to 2 hours at a time. On fitness purposes, they play about once a week. In their view, digital sports games have had a positive impact on their lives; they have increased fitness, flexibility and improved sporting skills due to playing. They feel that digital sports game playing is good for maintaining muscle tone, just as well as they serve as a good muscular fitness educator.

The respondents appreciate the life-like exercise and the easy availability of games is important for these players. They feel that digital sports games are an overall positive phenomenon. They feel that digital sports game playing has lowered the threshold to try out new types of exercise. The respondents' view is that digital sports games bring richer exercise for sports enthusiasts and the joy of exercise for those who would not exercise much otherwise.

4.2.2 Profile B (2, 4): Late Starter

Respondents of the profile B type began exercising actively as adults. In childhood and adolescence, they have mainly exercised during the school PE lessons or have not participated in any sort of physical activity. In the past, attitudes towards physical activity have generally

been quite negative. However, they have been doing beneficial physical activity in the past, one way or another. Today the respondents are active sports and fitness enthusiasts. They exercise 2–4 times a week, and they may even do strength training exercise on a daily basis. For these respondents "real world" exercise, as well as digital sports game exercise, means a goal-oriented fitness and physical activity, although they also found digital sports games as entertaining. They play digital sports games, and enhancing physical condition games alone, and playful games with friends (these might also enhance the physical condition). For these players digital sports games bring variety and fun for other sports . Digital sports games have lowered the threshold to try out new ways to begin a new sports hobby or to start exercising. When exercising, the respondents do not like the company of others. They want to exercise alone, in peace. The respondents preferably exercise at home (doing a DVD workout, working out with fitness equipment and playing digital sports games), or outdoors, as well as at the gym (I just have to assume it is possible for them to practice in peace at the gym). Most importantly, the respondents want to practice in private.

The respondents are playing digital sports games on average 2–3 times a week. Their playing time differs from half an hour to hour and a half at a time. They play the games mainly to exercise. They also play for fun with a friend or with children, when the time spent playing might be two hours or more. They do not believe that in their present form digital sports games could replace daily physical activity, but it is a good supplement to it. They also argue that digital sports games, in their present form, are suitable exercise for those who have just begun physical activity, but when the physical condition develops, they no longer offer sufficient challenge.

The respondents feel that digital sports games have had a positive impact on their lives. They appreciate the real-life training, and the usability of games is important. Digital sports game playing has increased their frequency of training as well as the duration of the training time. The respondents recognize the value of the trajectories of identification, which they think is important because it helps the player do the movements right. Following their progress with the program is also considered important. They like the Xbox Kinect because the game does not require additional controllers. After playing the Kinect, the respondents also came to the conclusion that the Wii remote interferes with playing. On the other hand, the informants like the Wii balance board, which they considered as a good device because it saves the data of player's personal development. Monitoring the personal development was considered important. The respondents also mentioned the monitoring of weight and body fat.

4.2.3 Profile C (1): Is Not Interested in Exergames

The respondent of the profile C type only plays digital sports games with his children and never alone. In his view the digital sports games are for entertainment only. The respondent is an active athlete who exercises three times a week on average. Digital sports games have not affected the respondent's behavior regarding other physical activity. The respondent's view is that digital sports games are not exercise at all and the games, in his opinion, may not serve as a substitute to the "real world" exercise. "Exercise and sports games are completely different things" (Respondent 1). The respondent plays digital sports games about once a week, half an hour at a time. His view is that digital sports games are boring and that he would rather do something else than play them. He wants to exercise as often as possible and preferably outdoors. However, he experiences that digital sports game playing may be a suitable substitute for daily physical activity for some people.

4.2.4 Profile D (7,8): Entertainment Player

The respondents of the profile D type seemed at first to be very different kind of digital sports game players and physical athletes. After a more detailed review, I found similarities in their playing and physical activity habits. The respondents either did not engage in sports at all or they exercised only randomly. They might only exercise by playing digital sports games, or they do not consider digital sports games challenging enough to be compared to the "real world" physical exercise. However, some respondents thought that digital sports games, such as boxing, are effective forms of exercise. They play more for fun, with friends or alone, rather than with a specific goal in their mind. The respondents play 1–3 times a week for 1–2 hours at a time. The overall assessment of physical activity strongly depends on the situation of life and schedule. They experience improvement in balance due to playing digital sports games. The respondents' view is that digital sports games are, above all, a fun pastime and good entertainment that may have improving effects on their condition. The informants exercise or have been exercising three times a week on average. They also appreciate the physical look of the games as well as the beauty of them, and they feel that these things strongly affect the playability. Compared to others, this profile group plays digital sports games quite a lot for entertainment. One of the reasons for this might be the amount of free time.

	SPORTS HEAVY USER	LATE STARTER	IS NOT INTERESTED IN EXERGAMES	ENTERTAINMENT PLAYER
Exercising times per week	5–6	2–4	3	Randomly
Sports game playing times per week	1–3	2–3	1	1–3
Time used for playing per time	1–2 hour	1/2–2 hour	1/2 hour	1–2
Plays sports games preferably alone	x	x		
Plays entertainment games in company	x	x	x	x
Playing with friends is more fun than alone				x
Playing has increased other physical behaviour	x	x		
Playing had an impact on diet	x	x		
Experience progress with the games	x	x		x
Began to exercise actively in adulthood		x		
In the past negative attitudes towards sports		x		
Prefer to exercise alone, in peace		x		
Games are a good addition to other sports	x	x		
Playing has increased weekly frequency of training		x		
Playing has increased the duration of training times	x	x		
Following the own progress is important		x		
Important that the device is interactive and that the device saves the physical development and the players progress		x		
Low threshold to start regular physical exercise		x		
Plays only with the children, never alone			x	
The games are entertainment games only			x	
The games do not offer real exercise experience			x	
Playing digital sports games may be suitable substitute to daily physical activity	Some of the games		x	
Sports games are fun pastime and good entertainment	x	x		x
Games have had a positive impact on their lives	x	x		x
The games are not physically enough challenging				x
The usability of games is particularly important	x	x		
Playing has increased daily sweating times	x	x		
Exercising became more regular after playing	x	x		
Playing is good daily physical exercise	x			
Game design influence play experience	x			x

4.3 USER EXPERIENCE

In this chapter, players' user experience of the games discussed earlier is analyzed.

4.3.1 The Wiimote Against the Xbox Kinect

The Wiimote, the wireless controller of Nintendo Wii, received quite similar opinions. Most of the respondents felt the remote to be clumsy. Many respondents felt that the controllers are difficult to hold in hand and that they interfere with gaming. Some respondents thought that the Wiimote is stiff at first but over time the player gets used to it. It was also mentioned that if the game controller resembles a physically played game (for example tennis, golf), the controller does not matter. Most of the respondents who had played Xbox Kinect games felt Xbox Kinect to be clearly better than Nintendo Wii. The reason for this was that the game works without a controller for the player himself is the controller. It was also mentioned that the Xbox Kinect offers the freedom to move better.

The respondents felt that Wii Sports games were more accurate in games that require hand coordination. Xbox Kinect was preferred when the whole body was moved while playing. It was also mentioned, that "Nintendo Wii can be played only with a small wrist movement but PlayStation Move makes the player really move" (Respondent 8).

Some players reported that they found it irritating if the controller did not work as the player expected it to work or if the motion on the screen just did not match the player's hand movements.

> For children, it may be easier to play without a joystick (Respondent 8).

> PlayStation Move's 'Fight" corresponds to actual boxing because you have to swing to straighten out your hand far enough so that it hits. The only difference is that your hand does not bump into anything (Respondent 8).

4.3.2 Negative Aspects of Games (Wii and Kinect)

Negative aspects of games
Slowness
Breaks within the game
Games and exercises do not develop enough with the player
Games are not challenging enough
Lack of game levels
Selection of games is narrow
The correct position of the driver is at first difficult to understand

According to the respondents, one of the biggest negative matters in games is their slowness. The biggest annoyance is the transition from one activity to another, which requires a number of "clicks" causing breaks in the game progression and movement. Breaks within the game were seen as particularly annoying. However, one respondent mentioned that Nintendo Wii solved the problem by offering a chance to build your own workout that progresses rapidly and does not require breaks and “clicks” in between. A major problem with the games is the lack of game levels. Overall, the players have different levels of playing and physical skills but still the games lack any seriously demanding game levels. If the player does not have the potential to develop in the game, the motivation to play falters. Obstacles to long-term play were clearly the lack of game levels and the lack of challenge. Respondents felt that the selection of games was too limited.

According to the respondents, the Xbox Kinect user identification is sometimes bad and movements are occasionally ignored. The Kinect game motion sensor is disturbed if someone else than the player walks near the play area. Xbox Zumba was mentioned as a game that doesn’t work. It was also mentioned, that the correct position of the Wii driver is difficult to understand at first.

4.3.3 Positive Aspects of Games (Wii and Kinect)

Positive aspects in games
The programme guides the player to make the movements right
Wii Fit balance board was considered as a functional device
Wii Fit Plus was seen as a good programme,
because it saves the players personal progress
Playing with friends and family was seen fun
Most of the players view was that the games motivate to
exercise

The biggest positive aspect in sports games is that the program helps the player to do the movements right. At least this is the case with some games, such as strength training workouts, kickboxing, yoga and tai chi. The Wii Fit balance board was generally considered as a good device, especially when the Wiimote was not required. The majority of the respondents felt that the Wii Fit Plus is a good device because the program saves the player's personal information, such as weight, BMI, playing time, calories and the results of the balance exercises.

The control of the movement and the use of motion correction was seen positively. Most of the players felt that the games motivate to exercise, which is particularly important for the continuity of the game play.

The social aspects of games were also seen as a positive thing. Playing with friends and family were in general seen as a positive thing. Everybody mentioned playing with friends or family in the questionnaire. Playing together with the family was said to tighten the relationships between family members.

> Games have to be functional, well designed and inspiring. Usability has an important role. I also like that the games are developed just for exercise, so the games will increase your heart rate and are effective (Respondent 5).
>
> Games have a surprisingly realistic trajectory, and playing really affects the body (Respondent 6),
>
> The program also displays those body parts, which range of motion you need to improve (Respondent 2).

4.3.4 Virtual Sports Compared to "Real World" Physical Activity

Games which respond to real world physical activity
Strength training workouts of Xbox Kinect and Wii Fit Plus
Wii Fit Plus Games
Wii Free Jogging
Wii Boxing
Wii Hula Hula Ring
Xbox Kinect Your Shape Fitness Evolved
Xbox Kinect Dance Central
Wii Tiger Woods Golf
Xbox Kinect Dance Central
PlayStation Move "Sports Academy" Ping Ball
PlayStation Move "Sports Academy" Frisbee Golf

When asked to compare "real world sports" with virtual sports, the respondents quite unanimously stated that Xbox Kinect, Wii Fit and Wii Fit Plus strength training workout games responded to real world sports activity relatively well or almost completely. The respondents mentioned that the Wii remote control interferes with playing when the aim is to exercise.

PlayStation Move *Fight* game was considered realistic because it requires realistic hand movements. "The game only differs from real life boxing in that the hand does not bump into anything when the player punches" (Respondent 8).

The respondents who were yoga enthusiasts felt that the Wii Fit Yoga doesn't work because the game does not reach the same level of challenge real yoga does.

A minority of the respondents mentioned that virtual sports will not replace real world sports activity.

> After all, it is much more limited to exercise in the living room than in a hockey rink, for example (Respondent 8).

4.3.5 Physical Strenuousness of the Games

The vast majority of the players felt that some of the games are quite efficient in terms of physical strenuousness and that playing them causes sweating and getting out of breath.

Games which were felt to be physically effective
EA Sport Active Game
Wii Fit Plus Games
Wii Free Jogging
Wii Boxing
Wii Hula Hula Ring
Xbox Kinect Your Shape Fitness Evolved
Xbox Kinect Dance Central
Wii Tiger Woods Golf
Xbox Kinect Dance Central

Minority of the respondents did not get breathless or sweat while playing the games. Most of the players felt that some games are effective in terms of exercise. Games that require jumping and bouncing were seen as being physically effective, causing perspiration and shortness of breath. It was also mentioned that it is possible to sweat playing every game, if the player exercises really hard.

In this research, all the respondents who practiced digital sports game playing for physical exercise were women. Reason for this could be time management or the lack of time or possibilities to exercise outside home, or the lack of interest to exercise with other people.

Minority of the informants did not sweat or get breathless playing digital sports games. The respondents who fell into this category were all men. Some of them also felt that the biggest problem with the games is that they are not efficient enough in terms of physical strain.

> Well this is the problem- that I do not really sweat when playing (Respondent 7).

4.3.6 Entertainment Games

A wide range of games were seen as being good entertainment. These games were not considered to be effective in terms of physical exercise but they were seen as a good way to spend free time with friends and family.

Entertainment Games
Wii Party
Wii Golf
Wii Tennis
Wii Bowling
WiiParty
Xbox Kinect Tikkapeli
Wii Sports Resort
Fresbee Golf
Wii Sports Resort games
Wii Fit Plus other than fitness and yoga games
Dance Central

It was also mentioned that playing digital sports games for entertainment is much different compared to proper exercise because it lacks a natural feeling and the player is surrounded by an artificial world.

4.3.7 Compatibility of Games to Replace the Daily Physical Activity

The vast majority of respondents felt that digital sports games, at least the current selection, are insufficient for daily physical activity due to lack of challenge. The respondents mentioned that the games bring versatility for players who are in good condition. The games may uplift the endurance and muscle tone of players who are in poor physical condition.

4.3.8 Virtual Avatar

People who have high self-image probably enjoy seeing their own image on the screen while exercising. The situation is quite the opposite when a person lacks self-confidence. Seeing oneself on the screen might be terrible, disgusting and this may stop them from playing altogether. In general, movements under the virtual avatar guidance were seen as fun, clear and easy. Minority of the respondents mentioned that playing with own picture on the screen would

be more pleasant when playing for exercise. When playing for pure entertainment, the avatar does not matter.

> I hope that my character shows "as myself", I do not want to look at a "cartoon character" when doing real sports. It's different with entertainment games, you can of course have pre-given characters playing (Respondent 2).

> Playing as a virtual character was ok. I was not irritated as with a real gym instructor who is in good condition (Respondent 2).

4.3.9 DVD Workouts and Digital Sports Games

The respondents compared the effectiveness and other features of digital sports games to those of DVD workouts. The main difference is that a player gets feedback from the digital sports game instructor, which a DVD workout won't provide. The player may easily fix the movements under the guidance of a digital sports game instructor. In that way the player develops both as a player and physically.

The feature of digital sports games is that the player can modify the profile when developing game and physical skills. The players can also challenge themselves to perform better. Traditional exercise videos cannot be edited and the workout remains the same even if the user develops physically. Also the users cannot move forward and challenge themselves.

The motivation to exercise was seen as higher when playing digital sports games than when watching workout videos.

> Gamification created a motivation measurement for digital sports games so people can better monitor their progress than when watching videos (Respondent 6).

4.3.10 Game Design

Appearance of the game was seen as an important factor in terms of game play, but it is not generally perceived to be a limiting factor in gaming. Graphic clarity, easiness to follow and the

comfort of playing were considered as the most important factors in game design. Particularly important seemed to be the players' ability to experience the movements to correspond with what is shown on the screen. According to the respondents, there has to be a feeling that the game and the movements work together. Minority of informants felt that the better and more realistic the graphics, the better the feeling is in playing the game. A minority of informants gave the games graphical beauty a particularly important role and thought it was an important factor in terms of game play.

4.3.11 Ideas for a Good Exercising Game

Digital sports games are still a relatively new genre that develops constantly. Current digital sports games that enable the whole body to move were the first of their kind. Existing games have lot of deficiencies (as well as positive things), some of which are mentioned in this study. Biddlea et al. remind about the importance of game design when designing new active video game systems. According to the authors, an active video game must provide positive feedback, be easily available, easy to use and inexpensive. Early exposure to active rather than passive games may increase the acceptance of the games. Thirdly, motivation to play active video games might be prolonged and more accepted when there is a personal choice in the background instead for example treatment or therapy. In addition, immediate reinforcement (i.e. enjoyment and reaching goals) and continued or long-term reinforcement (i.e. progress toward goals and skills development) are important and allow long-term commitment to playing (2004, 670).

The respondents of this research had a lot of ideas regarding what in their view would be a good game. Below are their ideas.

The respondents wished for a game with a variety of challenging levels for players on different physical activity levels. Feedback on performance was seen particularly important. The respondents also asked for more interactivity and virtuality, and the possibility to connect a large group of players in the same game. They also hoped for more games that will appeal to all ages, from children to seniors. Game functionality should be quick, easy and practical. Unnecessary time consuming, the clicking, was considered very frustrating. It was also hoped that the games would be developed by sports professionals to make them effective and challenging.

The respondents wanted the opportunity to build their own training programs. They also hoped for a game that would combine the Wii Balance Board and its functions as well as the wireless Kinect, and which would also connect with other sports equipment such as a heart rate monitor.

> I wish for games where you can actually build a series of own training programs. The graphics could be better (Respondent 3).
>
> Pre-customized training packages. In other words, a kind of integration of fitness equipment applications and software for game consoles (Respondent 4).

Ideas for new types of games also were presented, like a game that would unite game play, people's everyday functions and activities, similar to role playing games.

> I would like to play games that could take more into account the basic chores of everyday life and movement, including a kind of a role playing adventure. A combination of these two cases could be an interesting experience (Respondent 6).
>
> NHL for PlayStation Move could be interesting (Respondent 8).

A good game would be
More interactive and virtual
More challenge levels for light and heavy training
Feedback on performance
Possibility to connect a larger group of players to the same game
Games that will appeal throughout your life, from children to seniors
Quick, easy and practical game functionality
Games developed by sports professionals
Opportunity to build own training programs
Game console that could be combined with other physical devices, such as a heart rate monitor
Wii Balance Board and its functions connected to wireless Kinect
Role playing type of adventure game, combined with daily exercise

5. MAIN RESULTS

Next, the results are mirrored to the research questions, after which the results are compared to earlier studies.

The respondents' educational background was fragmented and included both basic degree and Master's degree graduates. Professional status of the defendants ranged from workers to managing directors.

5.1. DIGITAL SPORTS GAME PLAYER PROFILES

It seems that there is a wide range of reasons for playing digital sports games. According to this study, profile A type players play to improve their fitness workouts and for the provided entertainment. These players exercise and they can be considered as heavy sports users. For these people, digital sports game playing may also act as a support for other sports, such as strength training exercises. The players are serious about the game and also expect a true sports performance when playing. These players play specific games with sports in mind, and for them the game is sports. These players also play light intensity games with friends or other people for entertainment. The respondents exercise overall 5–6 times a week. They play digital sports games on average 1–3 times a week, for an average of 1–2 hours at a time. For fitness purposes, they play about once a week. Overall, the profile A type players play digital sports games quite a lot for entertainment.

The profile B consists of players who also exercise actively, begun exercising only in adulthood or after starting to play digital sports games. They exercise 2–4 times a week and play digital sports games 1–3 times a week, from half an hour to 2 hours at a time. For them, at present, digital sports games bring variety and fun to complement other sports pursuits. The players appreciate the opportunity to exercise in peace, without other people. For them, digital sports game playing has lowered the threshold to try out a new sports hobby or start fitness in general.

The profile C type players do not like digital sport games and do not consider games as exercise at all. They play games only with children and would rather do something else. They consider the games boring. They play on average once a week, half an hour at a time. They are active athletes who exercise on average three times a week and they prefer to exercise outdoors.

Profile D consists of players who either do not engage in sports at all at the moment or exercise only randomly. They might only exercise by playing digital sports games or they do not consider digital sports games challenging enough to be compared with the “real world” physical activity. The respondents play for fun, with friends or alone, rather than with a specific goal in mind. The informants play digital sports games 1–3 times a week for 1–2 hours at a time. The respondents exercise or have exercised on average three times a week. The informants view is that digital sports games are, above all, a fun pastime and good entertainment, which may have improving effects on their condition.

5.2 RESEARCH QUESTIONS

5.2.1 Research Question 1

Why are digital sports games played, why are they not played and what people aspire to when playing?

There are a variety of needs for playing digital sports games. They change as the culture changes. Games and gaming tools evolve, after which the individual's needs also evolve. For playing games, one can have both external and internal needs. External needs can be caused by the social environment: a friend has a new game, the game has a great cover or there's a new update for the game. The motivation to adjust the quality of life and the desire to lose weight are examples of internal needs.

It appears that motivation plays an important role in playing digital sports games and sports in general. If the internal motivation to play digital sports games does not exist, playing won't become a part of life. It seems clear that without motivation, the digital sports game players do not commit to long-term play. There is a wide range of motivators for playing. In this research, the respondents were given closed questions answering which they got to describe their motivations to play digital sports games. Additionally, they had a chance to describe, in their own words, any other reasons for playing games. According to this study, almost all respondents aimed for a good feeling and physical exertion. Half of the respondents also sought for good condition and weight management. In general, the responses revealed that the players play a lot for entertainment and look for variation to other sports. Some players are playing for entertainment only. They may not feel that the playing is physically strenuous enough to be considered as physical workout. There is of course a chance that they have not played games that are physically strenuous enough. Some of the players are playing for sports and entertainment. This might be the biggest group among digital sports game players. For them, the playing of digital sports games is only one way to spend their leisure time. And at the same time they gain the benefits of light physical activity. These players also practice other sports. According to this study, some only play digital sports games with their children and are not motivated to play alone.

The responses also suggest that among the digital sports game players, there are people who play digital sports games for exercise and expect results and development. They feel that some specific digital sports games are in fact effective exercise and games have, therefore, become a part of their lives. For these players, digital sports games are just one form of exercise among others. However, most of the respondents feel that digital sport games are an excellent addition to any other sports and that they are entertainment games that help them develop their condition. Most of the players considered that the games were both entertainment and a good form of exercise. Minority of the players considered digital sports games to be entertainment that offer nothing physically.

The results of this study support the previous studies by suggesting that the games are played in order to relax, enjoy and have fun (Zacheus et al. 2003, 33; Lampila et al. 2006, 52; Biddiss and Irwin 2010, 664). This study also strongly supports the findings of the Brunett and Sabiston study, according to which people are motivated to be physically active as it reflects their values, goals and needs or because they experience the physical activity enjoyable (2010, 100). The respondents played digital sports games in order to achieve various goals, such as improving their fitness, overcoming themselves and losing weight. They also aimed for better results and searched for wellbeing and physical effort. The respondents also played for fun and entertainment.

Biddlea et al. propose that psychological atmosphere and social interaction that dominate in occasions of physical activity are in more central position than physical action itself (2004 682-3). In this context, variations may occur among children and adults as well as between various sports: physical activity in groups (football, aerobic) and physical activity done alone (jogging, DVD workouts at home). This study revealed that people with low self-esteem may have a very high threshold to participate in group exercise classes.. The worse the fitness level, the higher the threshold to participate in sports.

It would be interesting to find out what it is about digital sports games that fascinates the players who are not interested in the “real world” sports or who do not exercise. According to this research, some people’s physical behavior is greatly impacted by the barrier that prevents them from exercising with other people. Reasons for this may be due to a sense of inferiority or shame. In this case, digital sports game exercise is a safe way to exercise without the feeling of having anyone’s eyes on your back.

According to previous studies (Heeter and Winn 2009 10–11; Eurobarometer 2010, 35; Berry et al. 2005; Tegerson et al. 2002, 376), time management differences may explain the gender differences in video game play. This study revealed that women difficulties with time management as a reason not to play digital sports games. Also when asked about physical activity in real world, both men and women reported time management as a reason not to exercise. The respondents also stated that they wanted to do something else than play digital sports games. This may be caused by the lack of interest to play any games or the lack of challenge in sports games, which will lead into a diminished interest to continue playing.

According to Marijke at al., a the most common reasons not to continue playing an interactive dance simulation video are game boredom, the need to use the computer or the play space for something else, boring music and technical problems (2008, 165). In this study, the profile type C was clearly not interested in digital sports game playing and informed the boring nature of the games as the reason not to play them.

Lampila et al. suggest that people might be motivated to exercise without social support or other common factors by playing a satisfactory digital sports game (2006, 12). This study reveals that social support is of secondary importance when playing digital sports games with fitness in mind. In this case, the satisfaction comes from physical performance.

This study gave evidence that people might play more digital sports games if the games were easier and faster to access. In the current form, it takes a long time to start the game. This was seen as particularly frustrating and time consuming. It has also become clear that the games lack challenge and game levels, which makes it difficult to retain interest in the long run.

Games were also seen as boring and lacking the real world physical experience. People might play the games more if the games would be more realistic, more interactive and more virtual. There is a group of people who do not like games generally, and they might commit to playing if the games and game features would better reflect the real exercise experience. Maybe these particular people are more team players and enjoy outdoors activities. The respondents of this survey generally called for more interactivity and the possibility of add more players into games and the opportunity to play team games. In general, the respondents were also interested in combining games and game features into other physical devices.

According to Barnett et al., digital sports game playing declined over time (2011, 733). This research gave similar indications. When the player has reached the maximum level, the interest in playing diminishes.

5.2.2 Research Question 2

What effects does the playing of digital sports games have on people?

Games and playing have a wide range of effects on players. According to Song et al., self-efficacy has a great significance in initiation and in maintaining regular exercise (2011, 150). This study revealed that self-esteem and self-efficacy guides the physical game play as well as continuing the play. This can be seen from the answers of respondent 4, who described digital sports games as "low-threshold form of exercise". She started physical activity in the real world as a result of digital sports game playing after realizing that she is in fact capable of exercising. On the basis of the results, digital sports games may inspire the players to exercise in the real world by increasing their self-esteem. The player may find out that she can do the exercises correctly and that she is not as bad as she has always imagined. This may lead to the conclusion that lack of courage has led the person to abstain from exercising. These findings support the findings of Lampila et al. according to which a successful playful exercise supports improvement of physical activity self-efficacy through vicarious learning. This will support a more frequent engagement in physical activity outside the exergaming situations. This study also supports Lampila et al. conclusions that there is a group of people who do not exercise but still play digital sports games (2006, 10). These players formed a minority among the respondents. This study also gave evidence that these players may change their sports behavior after playing digital sports games for a while. Direct analogy however, is impossible to base on this study.

Bogost (2005a) argues that exergames cannot be compared to actual jogging, and Crogan notes that Wii games are related to the actual games such as tennis, baseball, golf and boxing, but that they are only comparable, not the same (2010, 87). The earlier studies show (Song 2011, 149; Guy 2011, 66,; Daley 2009, 769) that the researchers still generally disagree about the benefits of digital sports game playing. It is still generally acknowledged that the games do not correspond to the real world exercise in effectiveness, but according to earlier studies (Song

2011, 149; Miyachi et al. 2010, 1152:, Yue and Reagan 2011, 41; Daley 2009, 769; Guy 2011, 9; Barnet et al. 2011, 728; Graf DL et al. 2009, 538), most of the digital sports games correspond at least from moderate to vigorous physical exercise. This research supports earlier studies suggesting that digital sports game playing is low intensity exercise and can be a good supplement to other sports. In addition to that, digital sports game playing may well prevent overweight and obesity (Graf DL et al. 2009, 538; Motohiko Miyachi et al. 2010, 1152; Daley 2009, 769). Nevertheless, this study revealed that playing some of the muscle movement games were seen as being very effective "real" exercise. It was even claimed that these games do not differ from the real world exercise in any significant way.

More studies are needed to determine why people in general and even the researchers in particular disagree so greatly with the effectiveness of the games. Perhaps it is because people are physically on very different levels. Some exercise with the taste of blood in their mouth, while the other find nothing physically strenuous. Then again, maybe the study samples of earlier researches have been so small that they cannot be generalized. According to this study, games generally lack game levels and challenge, and therefore, after reaching a certain stage, the players cannot develop any further.

Lampila et al. suggest: "Successful sport video game application supports enhancing of physical activity self-efficacy though vicarious learning". The research also showed that high occurrence of computer game playing was not associated with low physical activity or high body mass index (BMI) (2006, 53). In addition, the researchers argue that this also supports commitment in real life physical activity (2006, 10). In the light of this research, it seems that digital sports game playing may encourage physical exercise. This study shows that it is possible to start physical activity in the "real world" after playing digital sports games. I was interested in seeing whether digital sports game playing increased sports activity overall and outside gaming situations. The majority of the respondents in this study said that digital sports game playing has increased their exercising.

I believe that if a player experiences rewards and feelings of success in digital sports games, it may have an effect in the real life and it may also encourage the making of choices that improve the quality of life in terms of physical activity. In addition, I believe in the light of this research that digital sports games in their current form do not encourage long-term physical and goal-oriented training, but they may be a good addition to real world exercise. Also, playing digital sports games may encourage players to start real life physical exercise. On the other hand,

playing may be a good supplement to any other sports. Furthermore, according to previous studies and the results of this research, I did not find enough evidence to support the idea that it would be possible to replace daily physical activity by playing exergames.

Based on this study, digital sports games may very well increase people's weekly exercise times and time spent on physical activity. Activity games can be a good supplement to other sports if the player himself considers the games pleasant. Digital sports games may well serve as a push to begin physical exercise, if the person has previously experienced physical activity in a negative manner. It is also possible that people may find the joy of sports through digital sports games. Digital sports games may therefore well serve as a tool in achieving a healthier life.

Almost all respondents felt that by playing digital sports games their physical and game skills improved. The majority of respondents felt that digital sports games have a positive impact on their everyday life. Based on the responses, the digital sports games have been initiating lifestyle renovations and increased the amount of weekly physical activity and the time spent to exercise. The games have also lowered the threshold to experiment with different forms of exercises.

Song argues that people who are already in good physical condition may benefit more by playing exergames and achieve physical benefits when playing digital sports games (2011, 149). This study does not support the idea. This study revealed that there are people who are physically active in the real world and who also play digital sports games. On the other hand, there are people who are physically active and do not consider exergames as exercise at all because of the lack of challenge or lack of real sports experience. This study revealed that increasing game challenge by adding additional game levels would also raise exercise intensity. The games in their current form do not offer enough challenge physically or in terms of game skills for advanced players.

Forming physical activity as a routine and a part of life is often challenging. Digital sports games may serve as a good way to include physical activity as a part of daily life, but this would require developing the games and game features further.

5.1.3 Research Question 3

Who are playing and what is played?

Earlier studies have shown that girls play less time-consuming and digital games than boys (Kallio et al. 2007, 52–69; ESA 2010, 6; Kafai et al. 2008b, 283; Lampila et al. 2006, 3), and that games are mainly designed for boys. According to Eurobarometer, men exercise more than women (2010, 12). According to the results of this study, women were the only ones who utilized the exergames mainly for fitness purposes, whereas men played mostly for entertainment and received the benefit of physical exercise as a bonus. This study did not reveal any results regarding the assumption that games are designed for boys. Moreover, it appeared that game design did not matter that much. More importantly, the game needs to be effective physically.

Women generally reported that they play more strength training games while the vast majority of men reported that they play mainly entertainment games. Playing together with family and friends was seen as particularly important.

Most of the players separated digital sports games that were played for fitness purposes and digital sports games that were played for entertainment. In general, the playing time was significantly longer when playing for entertainment purposes than for fitness purposes. In general, the respondents played games alone for fitness purposes and with friends or family for entertainment.

I did not directly ask the respondents whether they have families and children, but their responses made it clear that some played digital sport games for entertainment with friends or with the family. I assume that those who played only with friends do not have a family or children to play with. Those informants also played more for entertainment only. According to Lampila et al., playing was a social event for young people and they played for longer periods at a time than adults who played irregularly and for whom playing was not a social event (2006, 53). My study revealed that playing for fitness purposes only was popular, but the majority of the players also enjoyed playing with their friends or family. According to the ESA 2010 report, 87 percent of parents play games with their children because they consider it a fun for the whole family (2010, 6).

The results of this study support those of Song's study according to which digital sports game playing works positively for players with a low body image, when they play games that contain avatars (2011, 158). That is to say the players do not have to see their own picture on the screen, what some might perceive as unpleasant. Players with high body image reported that they rather play with their picture on the screen when they play for fitness purposes. They were not disturbed by the cartoon characters presenting them on the screen when they played for entertainment.

If a person is afraid or shamed to take part in group exercise classes, digital sports game playing is a safe way to start physical exercise alone at home, without a feeling that the personal performance is monitored and judged. After self-esteem has increased, the person may commence physical activity in real life.

The responses also suggest that among the digital sports game players, there are people who play digital sports games in order to exercise and get results and also expect development. They feel that some specific digital sports games are effective for exercise and, therefore, games have become a part of their lives. For these players, digital sports games are just one form of exercise among others. However, most of the respondents feel that digital sports games are an excellent addition to other sports, or that the games are entertainment games with fitness developing properties. Most of the players thought that the games were both entertainment and a good form of exercise. Minority of the players were of the opinion that digital sports games are entertainment games, which do not have anything to offer physically.

6 Ideas for Further Research

Further research is needed in order to draw conclusions of the long-term benefits of digital sports game playing (149, Song). Further research is also required in order to answer the question of whether there are differences between digital sports game playing in terms of player ages, gender, playing times, the possibility to replace daily physical activity by playing exergames etc.

The effectiveness of digital sports games has been studied and measured quite a lot but the players own voice has been largely ignored. This study increases our understanding of why digital sports games are played and what the players look for in playing them. This research could be extended to include a larger set of players and non-players. The problem with implementing the format of this study on a larger scale is that this study is largely based on the respondents' own comments and experiences on the effects of playing. Going through a large number of respondents' open answers would be very laborious. Then again, a multiple-choice questionnaire would not produce such diverse answers. It would therefore be reasonable to select a portion of this research area and examine it further. Possibilities are many: the effectiveness of playing on the players own body and life, user experiences of a specific game, digital game player's development physically and in game skills, etc.

Going through a lifestyle renovation by playing would also be an interesting research area were the study to combine physical activity behavior outside the gaming situations and the consequences of their combination.

The players' motivation to play should be studied further than just through the efficiency of playing or the meaningfulness of the play due to its effectiveness. Although it is an important point that should, of course, be taken into consideration.

Digital sports games are also used in rehabilitation of seniors and people with disabilities. Digital sports game playing in such context would be an interesting field of study, especially in terms of the efficacy of physical activity, the effects of the game play and the motivation to play.

Further research should explore the reasons and obstacles to play and not to play the digital sports games and compare these reasons for those regarding motivation for physical activity in the real world.

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APPENDIX:

The Questionnaire Form

Kyselylomake
Liikuntapelaaminen

Lue alla olevat kysymykset huolellisesti ja vastaa niihin. Osaan kysymyksistä voit vastata rastiruutuun menetelmällä (voit valita useita vaihtoehtoja) ja osaan vaaditaan tarkempaa kuvausta. Kirjoita vastauksesi tummennetun alueen, ”kirjoita tähän” tekstin päälle. Tekstiä voi kirjoittaa tummennetulle alueelle niin paljon kuin tarve vaatii. Vastaamiseen menee 15–30 minuuttia, riippuen siitä, kuinka perusteellisesti vastaat kysymyksiin.

Lopuksi tallenna lomake muotoon Pelikysely_etunimi_sukunimi.doc

Kaikki vastaukset käsitellään anonyymisti, eikä mitään tietoja luovuteta ulkopuolisille. Vastaajille lähetetään FinnKinon leffalippu. Gradun valmistuttua voin lähettää sähköisen version siitä kiinnostuneille.

Henkilötiedot:

Sukupuoli:
Ikä:
Ammatti ja asema:
Koulutus:

Liikunta ja urheilu taustatiedot:

Miten vanhempasi suhtautuivat lapsen/nuorena liikunta- ja urheiluharrastukseen?

Mitä liikuntaa olet harrastanut elämäsi eri vaiheissa

(myös työmatkat, puutarhaliikunta yms.)?

☐ yleisurheilua
☐ ryhmäliikuntatunteja
☐ juoksu
☐ kävely
☐ hyötyliikunta (esim. Työmatkat, puutarhatyöt tms.)
☐ jotain muuta, mitä

Kuinka monta kertaa viikossa harrastat liikuntaa? (kerro tässä sekä ”oikeat” että virtuaaliliikunnan harrastamiskerrat)

Miten harrastat liikuntaa (esim. Kuntokeskuksessa, ulkona, kotona)

Kuinka monta kertaa viikossa liikuit yhtäjaksoisesti yli 10 minuuttia ennen liikuntapelien pelaamisen aloittamista?

☐ en kertaakaan
☐ [kerran viikossa
☐ 2–3 kertaa viikossa
☐ useammin

Kuinka monta kertaa viikossa liikuit yhtäjaksoisesti yli 10 minuuttia liikuntapelien pelaamisen aloittamisen jälkeen?

☐ en kertaakaan
☐ kerran viikossa
☐ 2–3 kertaa viikossa
☐ useammin

Kuinka monta kertaa viikossa hengästyit tai hikoilit liikuntaa harrastaessasi, ennen liikuntapelien pelaamisen aloittamista?

☐ en kertaakaan
☐ kerran viikossa
☐ 2–3 kertaa viikossa
☐ useammin

Kuinka monta kertaa viikossa hengästyit tai hikoilit liikuntaa harrastaessasi liikuntapelien pelaamisen aloittamisen jälkeen?

☐ en kertaakaan
☐ kerran viikossa
☐ 2–3 kertaa viikossa
☐ useammin

Liikuntapelaaminen:

Milloin olet aloittanut liikunnallisten tietokonepelien pelaamisen?

Miksi olet alkanut pelaamaan liikuntapelejä?

Mitä pelejä pelaat ja miksi pelaat juuri näitä pelejä?

Pelaatko yksin ja/tai yhdessä muiden kanssa?

Pelaatko joitakin pelejä mieluummin yksin/kaverin kanssa, kerro mitä pelejä?

Kuvaile pelaamiesi pelien hyviä ja huonoja puolia.

Millainen on ollut oma suhtautumisesi liikuntaan ennen liikuntapelaamisen aloittamista?

Miten liikuntapelaaminen mielestäsi eroaa oikeasta liikunnasta / perinteisistä liikuntavideoista?

Onko joku suositellut sinulle liikuntapelejä, kuka?

Kuinka monta kertaa viikossa pelaat liikuntapelejä?

☐ en kertaakaan
☐ kerran viikossa
☐ 2–3 kertaa viikossa
☐ useammin

Kuinka kauan pelaat keskimäärin kerrallaan?

☐ ½ tuntia
☐ tunnin
☐ 1–2 tuntia
☐ pidempään. Kerro kuinka pitkään

Koetko edistyneesi liikunnallisesti/pelitaidollisesti eri liikuntapeleissä? Kuvaile edistymistäsi, ovatko suoritusajat pidentyneet tms.

Koetko liikuntapeleillä olevan vaikutusta arkeesi ja elämääsi? Jos, niin millaisia vaikutuksia?

Onko liikuntapelien pelaaminen vaikuttanut muuhun liikkumiseesi, esim. vähentänyt/lisännyt/muuttanut sitä? Kerro miten.

Onko liikuntapelaaminen vaikuttanut ruokailutottumuksiisi ja painonhallintaasi? Syötkö esim. terveellisemmin/vähemmän, kuin aikaisemmin? Kerro miten.

Mitä koet saavasi pelatessasi liikunnallisia tietokonepelejä?

Tarjoavatko liikunnalliset tietokonepelit jotain, mitä et voi saada ”oikeasta” liikunnasta?

Miten kuvailisit tämän hetkistä suhdettasi liikuntaan (niin liikuntapeleihin kuin liikuntaan yleisesti)?

Soveltuvatko liikuntapelit mielestäsi korvaamaan arkiliikuntaa? Jos, niin mitkä pelit erityisesti?

Käyttäjäkokemukset:

Kuvaile pelaamiesi liikuntapelien käyttökokemusta. Voit kuvailla esim. seuraavia asioita:

- Miltä tuntui liikkuminen virtuaalihahmon ohjauksessa?
- Miltä pelaaminen tuntui Nintendo Wii- tai Playstation Move peliohjaimilla?
- Miltä tuntui pelata ohjaimetonta Xbox 360:n Kinectia?
- Tuntuvatko peliohjaimet ylimääräisiltä ”palikoilta”, häiritsevätkö ne liikkumista?
- Miltä joku peli tuntuu virtuaalisesti ja oikeasti (voit verrata esim. Wii-golf, Wii-juoksu tai Kinectin Fighters Uncaged -pelejä)?
- Vertaa esim. Nintendo Wii-Fit lihaskuntopelejä ja joogaharjoitteita ”oikeasti” tehtäviin suorituksiin. Miten liikuntasuoritukset eroavat toisistaan?
- Jos olet pelannut Nintendo Wii Sports ja Xbox Kinect Sports –pelejä, voitko verrata näiden konsolipelien eri lajien pelikokemuksia toisiinsa?

Hengästytkö tai hikoiletko jotakin/joitakin liikuntapelejä pelatessasi? Kerro missä pelissä.

Tavoitteletko liikuntapelien pelaamiselta:
☐ kunnon kohotusta
☐ painonhallintaa
☐ hyvän olon tunnetta
☐ fyysistä rasitusta
☐ jotain muuta, mitä?

Kerro pelaamiesi pelien hyvistä ja huonoista kokemuksista, mikä jossakin pelissä on mielestäsi erityisen hyvää ja mikä pelissä ei mielestäsi toimi.

Mitä mieltä olet pelaamiesi pelien graafisesta ulkoasusta? Onko ulkoasulla mielestäsi vaikutusta pelien pelattavuuteen?

Mitä mieltä olet pelaamiesi pelien toteutuksesta? Ovatko jotkut pelit mielestäsi haastavia, helppoja, huonosti toteutettuja tms. ja perustele miksi.

Millaista peliä itse haluaisit pelata ja millaista pelikokemusta peliltä toivot?