Huffin' And Puffin': Can Exercise Games Make the Finish Line?

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Beads of sweat roll down your face. Your chest heaves up and down as you try to catch your breath. Muscles you never knew you had ache from the workout you just gave them. Sounds like a day at the gym? Not this time. You've actually been exercising while playing a video game. Some people think exercise video games is an oxymoron. Nintendo didn't think so. The year was 1988. Parents were concerned that their children were playing sedentary video games all day, exercising only their thumbs and vocal cords. Based on their belief that exercise could indeed be combined with the fun of video games, Nintendo came out with the NES Power Pad, a Twister-like foot pad in which players used their feet to control the game instead of the standard hand control. The goal was to provide the first games in a new genre of video games – exercise games. Why not combine the fun of video games with the value of exercise? It sounded like a good idea, but the Power Pad didn't catch on and was a commercial failure.

Konami's Dance Dance Revolution (DDR), a beat/dance game that became popular a decade later, can also be categorized as an exercise game – it has similar input controls as the Power Pad and even has a "diet mode". Perhaps Nintendo did not succeed in defining the new exercise game genre, but with the success of Dance Dance Revolution, exercise games may not have

been terminated forever.   Why has DDR been successful, while games for the

Power Pad – such as the similar Dance Aerobics – failed miserably? What

lessons from the failure of the Power Pad has the game industry learned and

how can it apply these lessons to the future of exercise game design? The focus

of this paper will be on the role of Nintendo's Power Pad and Konami's Dance

Dance Revolution in defining the exercise game genre, however, on the path to

answering the above questions, this paper will also briefly visit other exercise

games.

Nintendo's history began in 1889 as a Japanese playing cards company in

Kyoto, but didn't become a giant hit in the video game industry until the coin-

operated Donkey Kong was released in 1981. From the start, Nintendo

emphasized a machine that would bring the family together, naming their first

home video game console released in 1983 the "Famicom", short for Family

Computer. In 1985, Nintendo started selling the US version of the Famicom,

which they called the Nintendo Entertainment System (NES)[i]. In starting the

exercise game genre with the Power Pad for NES, Nintendo continued the trend

of building games intended for "family fun". The Power Pad's predecessor was

Bandai's "Family Trainer", which was released in Japan in 1987. It was then

released in the US and Europe as "Family Fun and Fitness", and then

repackaged and slightly redesigned by Nintendo in 1988 to be the "Power Pad",

an accessory for the NES[ii].

Front of Family Fun and Fitness Box

The earlier version of the Power Pad had eight different buttons - four in the middle and a set of two in front and in back.   The player usually started off on the two red buttons in the middle, and depending on the game they were playing would step on different buttons in turn.



Earlier version of the Power Pad

The later version had 12 buttons, 6 on each half so that players could compete with their friends.

Later version of the Power Pad

Although Nintendo expected families to embrace the Power Pad, Nintendo failed to give much support to it - only seven games were made for it. One of the more popular titles was World Class Track Meet in which the player could choose to compete in 4 different Olympic track and field events – 110-meter dash, long jump, triple jump and hurdles. Players would cause their character on the screen to run/jump at an analogous rate to the rate they were pressing the buttons with their feet. Players could compete against the computer or against their friends. Dance Aerobics, which was released in March 1989 by Nintendo and developed by Bandai, was another Power Pad fitness game that may have seemed like the precursor to DDR.   Dance Aerobics was designed for one player, and had eight levels of classes in which the player could participate in with hopping, stretching, bending, and other aerobic exercises which were taught by a cute animated instructor. The instructor would perform the steps first on her own Power Pad on

the screen, and the player would have to copy the exact sequence of moves that

the instructor did while stepping on the real Power Pad buttons. For every

mistake in timing or stepping, the player would get subtracted a certain number

of coins. If the player lost all her coins and made another mistake, the class

would end and she would not be able to reach the next level[iii].
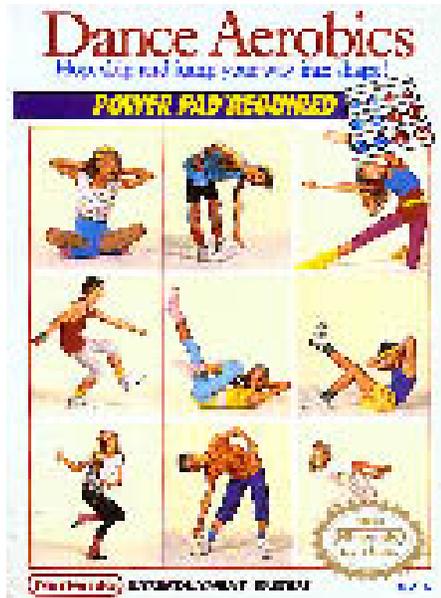
Front Cover of Dance Aerobics for the Power Pad

The games for the Power Pad were marketed towards 6-12 year old

children. For example, Dance Aerobics was geared towards preteen girls, with

the box cover featuring nine pretty preteen girls in stretching and exercising

poses. Furthermore, in the actual game play, if the player successfully

completed the eighth (final) level routine, the image of a leotard-and-leg-warmer

clad young woman would appear with the phrase "Here is your aerobic superstar

crown!" shown on the bottom of the screen. This character, representing the

player, would receive a regal robe and a sparkling crown, and then the screen

would start to flash in bright colors.

With the Power Pad aimed towards children, Nintendo made sure to cover any potential legal issues that could be brought up by parents by flooding its instruction manual with health warnings and warnings of safety risks. The following are sample phrases from the Dance Aerobics manual:

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WARNING
Persons with heart, respiratory, back and joint problems, high
blood pressure or under a physician's direction to restrict
activity *should not use the Power Pad without a physician's
advice.*  Pregnant women should not use the Power Pad.  Serious
personal injury can result.

CAUTION
All users should do several minutes of warm-up exercises before
starting to play games on the Power Pad.

Select an area to use the Power Pad where you will not be in the
way of other people or objects in case of falls.  Do not position
the television set where you may hit if you fall.  Failure to
read and comply with the instructions, including these safety
precautions may result in personal injury to you and/or damage to
the Power Pad.  Nintendo of American Inc. assumes no
responsibility, obligation, or liability for injuries sustained
due to such failure.

LESSON TIME

1.  Before starting Dance Aerobics, warm up with a few light
stretching and jumping exercises.

Caution: Sudden exercise is not good for your health.

*Special Precautions*

1.  Limit play to a maximum of one hour per day.
2.  Excessive exercise can be harmful.

REMEMBER
Warm up before playing Dance Aerobics.
Don't over do it!  We suggest a maximum of one hour a day.
When playing, don't strain yourself...relax and enjoy!ⁱᵛ
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Nintendo's overcautious approach may have played a part in the failure of the Power Pad. According to Chris Crawford's The Art of Computer Game Design, the four common factors of computer games are representation, interaction, conflict, and safety. Crawford explains the safety aspect of computer games:

"Games provide safe ways to experience reality. Special cases abound, but the central principle remains: games are safe." In other words, part of the appeal of games is that a player doesn't have to worry about hurting himself/herself. However, by raising so much attention to the dangers of the Power Pad, Nintendo does just the opposite – they struck a chord of fear into some parents' minds that the Power Pad could hurt their children. In this way, the Power Pad did not follow the guidelines of a "game", but rather was a piece of equipment for exercise. Why should kids exercise with the Power Pad and risk injury if they could exercise just as well without the Power Pad and be at little risk for injury? This question would have been answered successfully if the kids themselves had a strong inclination towards the Power Pad – if they thought it was a lot more "fun" than other forms of exercising.

However, by targeting a young age group, the Power Pad was being sold to players who were too young to have the desire to exercise themselves. Most were kids who had pressure from their parents to exercise because they were sitting around playing video games all day. Kids soon realized that the Power Pad only recognized their movements from pressure on the buttons – it couldn't tell if they didn't follow the correct upper body movements (as in Dance Aerobics), nor could it tell if they pressed the buttons with their hands instead of their feet. In addition, for games such as the World Class Track Meet, it took a lot more energy to run and jump in place than running and jumping in real life[v]. The player would have to move their feet more quickly than usual, creating a whole lot of noise and quick exhaustion. Thus, kids were quick to cheat when

playing Power Pad games, defeating the purpose of the exercise games.   As Chris Crawford asserts in The Art of Computer Game Design, one of the reasons people play video games is for exercise, whether it is mental or physical. However, he clarifies this assertion by saying that "players need to exercise their skills at an appropriate level". A game like World Class Track Meet, which required more physical ability than most kids were able to give, did not challenge kids at an appropriate level. Thus kids were not able to enjoy Power Pad games in a way that would make them successful.

The most successful video games are "addictive", meaning the players do not want to stop playing. To be addictive, a game must have the right reinforcement schedule and amount of reinforcement[vi]. Power Pad games did not have the right reinforcement schedule because the games were either too difficult for the player's level, in which case they became too tired after a short amount of time, or the risk of the game was supposedly too high, in which case they were advised to limit their playing time. As an example of the latter, in the Dance Aerobics manual, Nintendo recommended limiting the amount of playing time to one hour. Nintendo tried to be the forefront in defining the exercise game genre, however, without an enthusiastic target group, the Power Pad never became successful. Embarrassed by the failure of the Power Pad, Nintendo stopped making them and stripped its website of any mention of the Power Pad.

After Nintendo's failure at initiating the exercise game genre, there was doubt that exercise and video games could actually mix. In arcades, there were still exercise games such as simulation mountain biking, rowing, and skiing, but

exercise video games for the home console was something console game makers were staying away from. It wasn't until a decade later, in 1998, that Konami Co. of Japan tried their luck where Nintendo had failed. Konami's choice to enter the sports game genre was brought on by the successes in the early 1990's of games that were not the typical "beat-em-up" games – fighting and 3D simulation games like Street Fighter II, Virtua Racing, and Ridge Racer. In 1994 and 1995, Konami saw their first years of operating losses as they went from leader to follower in the video game industry – falling behind as they concentrated on "beat-um-ups" still while the gaming community was moving toward other genres. As a redirection of strategy the company decided to enter the sports game industry immediately, followed by racing and fighting games later on. That year, they struck a deal with Sony to use their Playstation technology in arcade 3D releases[vii].   Why did Konami think it could succeed in a genre that Nintendo and Bandai failed in? Perhaps it learned the lessons of how to market the genre and how to design better exercise games from the Power Pad failure. After much research and development into new creative ways of approaching the video game industry, Konami came out with Beatmania (a music/DJ game) and Dance Dance Revolution, a dancing game that would overcome the stigma of the Power Pad exercise games.

Dance Dance Revolution was developed and released in Japan in February 1998, appeared in U.S. arcades in 1999, and was brought into the U.S. home by Sony Playstation in March 2001. Unlike the complex Power Pad which had 8 or 12 colored buttons, the DDR foot pad has 4 buttons - labeled with up,

down, left, and right arrows. Instead of having an animated instructor, scrolling

directional arrows provide the cue for the player to step on the correct arrow on

the foot pad.[viii]

DDR Bundle for the Sony Playstation

DDR Screenshot

   With blaring techno-music and strong beats, DDR lets the player "perform"

and become creative while exercising, as a contrast to being simply an

instructional aerobics game. Unlike Dance Aerobics in which the levels were

structured linearly with each level more difficult than the last, DDR allows the

players to choose which level they want to play at any time. For example, a

player could choose to warm up with a slow song, then dance to a few fast

songs, then cool off with another slow song. In other words, DDR gives the user more control over game play. Furthermore, because Dance Aerobics had linear levels, the goal of the game seemed to be to reach the highest level, which gave the player a false goal to aim towards. With the player intent on reaching the highest level, she could not tailor the routine to her own pace. Konami realized the practicality in Crawford's statement about an "appropriate level" for each player, and thus allows the user to exercise at his/her own pace in DDR. The target user group for DDR is also different from Power Pad games. While Power Pad games were designed for young kids, DDR is geared towards the "rowdy" teenage crowd.

Instead of focusing on the risks of the game as the Power Pad did, DDR emphasizes the performance and excitement of dancing. With an older target user group, Konami structured the game to fit into the abilities and interests of teenagers, namely stomping to a strong beat. Because dancing is a sport that can be done "in place" (without having to move around too much as running and jumping does), it was more suited to the foot pad than a sport like track and field. Furthermore, there was no reason for users to "cheat" as they did with the Power Pad because with teenagers they were more apt to want to exercise for themselves, if not to perform and show off their abilities in front of their peers. Different modes of DDR allow flexibility and high replay value. A special "diet mode" helps players to keep track of the calories they burn. Training mode allows players to practice new moves without fear of failing. Solo and double modes allow players to challenge themselves or their peers to performing and

showing off their dance steps. Because of the performance aspect that DDR can bring, Konami brought exercise games into a new level, making it a "spectator sport".

In addition to exercise, Chris Crawford mentions three other reasons why people play games: proving oneself, social lubrication, and the need for acknowledgement. DDR allows one to prove oneself by giving the player a formidable opponent – either a friend whose performance the player must match, or calories to burn if the player is in "diet mode", or a tricky combination of steps if the player is in "solo mode". With the Power Pad, players could also prove oneself by finishing a level (as in Dance Aerobics), or by winning a race or jump (as in World Track Meet). However, DDR takes game play to the next level by incorporating social lubrication and the need for acknowledgement, which the Power Pad could not do. Crawford says that "The game itself is of minor importance to the players; its real significance is its function as a focus around which an evening of socializing will be built." DDR lets players dance together, perform together, compete against one another, and gives them a common interest to talk about. One avid DDR player in an interview with the Golden Gate Xpress Magazine voices this fact: "'DDR totally brings people together,' Cheng agreed, nodding like a jackhammer. 'I meet people playing and we talk after we play. That's how we learn all the new moves.'"[ix] Players often have DDR parties, clubs, and official competitions. The need for acknowledgement is also fulfilled by DDR, which gives players an arena in which to "strut their stuff": "Dozens of people flock around the machine, often mesmerized by the creative flair and

acrobatic stunts that spice up a seasoned player's dance routine (Wong, <u>Mercury News</u>)." Fans of DDR explain that you don't need to be a good dancer to perform well, you just need to be dedicated enough to practice a lot. This encourages players of all levels to try DDR, because it is appropriate for any level. Even at the beginner level, one could be acknowledged: "But you don't have to be a disco king to attract attention with DDR. Arcade managers note that even novices draw crowds. `We've had an excess of 50 people watching. It looks like there's a line just to watch,' said Heath Nielsen, senior manager of business operations at Sony Metreon in San Francisco (Wong, <u>Mercury News</u>)." In contrast, the Power Pad did not allow users to socialize around it; either the games such as Dance Aerobics were made for one person, or the games such as World Class Track Meet were too dull to create a party out of. The Power Pad also did not allow players to be acknowledged – in fact, players usually looked funny running frantically in place or jumping up and down to soft music without a beat.

DDR spawned an enthusiasm for exercise games that gave the genre a foothold in the industry. Since DDR was released, other exercise games have been released successfully. One such game, Pump It Up, is a Korean dance game by Andamiro released in 2000 that is oddly reminiscent of DDR. The difference it that it has one extra button in the center of the pad, and the US version features recent pop hits such as Britney Spears and N*Sync songs. The movements in Pump It Up are more natural and mimic real dancing instead of the rave style hopping/stomping of DDR[x]. Pump It Up has been hugely popular in

Korea and is becoming more and more popular in the US, especially among the Asian population in Southern California. Being a "copy-cat" of DDR, Pump It Up derives the same qualities that make DDR successful, and thus dodge the problems that the Power Pad had.

Konami, having seen the exercise game genre take off with DDR, is not stopping there. Their next fitness game is Martial Beat, released on February 7, 2002, for the Playstation 2[xi]. It incorporates sensor units for the player's ankles and wrists that relay their position to an infrared sensor on top of the television, which relays that information to the game. Marital Beat incorporates martial art moves from Karate, Tai Kwon Do, and Kick Boxing, and the player learns from and then fights an instructor. Like DDR, Martial Beat is done to strong beat music, is geared towards teenagers, and has different modes including a practice mode, fitness mode, and attack mode[xii]. The focus of Martial Beat is on fitness rather than a battle with an opponent. Instead of levels organized around difficulty of gameplay, the levels are organized by the muscle groups used and how many calories burned. Even the warm-up exercise is a fitness regime in itself – equivalent to 13m of swimming[xiii].

MARTIAL BEAT

Martial Beat screenshot

Konami recognizes the genre that it has made successful and has a "Health Entertainment Division" specialized for dealing with exercise games. However, the exercise game genre still owes a lot to its first ancestor, Nintendo's Power Pad, for setting the example so others could learn from it. By taking Chris Crawford's timeless advice on video games and applying it to exercise games, as Konami has done, we can see that exercise games will indeed have a future. Not only will they make it to the finish line, they might even be a winner!

Bibliography

Carless, Simon. "Go East, Young Man!" Gamasutra: April 16, 1999: http://www.gamasutra.com/newswire/mgt_report/19990416.htm

Carmel-Veilleux, Tennessee. Power Pad Information: http://www.gamersgraveyard.com/repository/nes/peripherals/powerpad.txt

Channel Beat: Pump It Up: http://www.channelbeat.com/pumpitupseries.htm

ClassicGaming.com: Dance Aerobics Manual: http://www.classicgaming.com/thewarpzone/dancaero.txt

Clear Vision Gaming, World Class Track Meet: http://www.clearvisiongaming.com/classic/99961036240899.shtml

Crawford, Chris. The Art of Computer Game Design. Chapter 1: http://www.vancouver.wsu.edu/fac/peabody/game-book/Chapter1.html

Dance Aerobics. Dance Dance Revolution. All Game Guide: http://allgame.com/cg/agg.dll

Defunct Games: Nintendo Power Pad: http://www.defunctgames.com/collection/collection015.htm

DDR Freak: http://www.ddrfreak.com/press.php

Felps, Paula. "Disco-Tech Dance Game Sweeping Through Arcades" Knight Ridder Newspapers: April 11, 2001: http://www.azstarnet.com/public/startech/archive/041101/wire1.html

GameFAQs: Dance Aerobics: http://www.gamefaqs.com/console/nes/review/R8087.html

GameFAQs: Pump It Up: http://db.gamefaqs.com/coinop/arcade/file/pump_it_up.txt

Gamers Graveyard: Power Pad/ Family Fun and Fitness/ Family Trainer: http://www.gamersgraveyard.com/repository/nes/peripherals/powerpad.html

The Gaming Intelligence Agency: Dance Dance Revolution: http://www.thegia.com/psx/ddr/ddr.html

Garneau, Pierre-Alexandre. "Fourteen Forms of Fun" Gamasutra: October 12, 2001: http://www.gamasutra.com/features/20011012/garneau_03.htm

Horwitz, Jer & Mike Whalen. "The History of Konami":
http://www.videogames.com/features/universal/konami/

Konami Website. Information about Konami:
http://www.konamifitness.co.uk/info/konami/index.asp
http://www.konamifitness.co.uk/products/martial/index.asp

Larsen, David. "What's Hot, What's Not; Video Games and Old Favorites Top Best-Seller List" Los Angeles Times: November 25, 1988.

Loftus, Geoffrey and Elizabeth F. Loftus, "Why Video Games Are Fun," pp. 10-42 in *Mind at Play: The Psychology of Video Games* (New York: Basic Books, 1983).

McQuillin, Kristen. "Big Game Hunting".
http://www.tokyoclassified.com/tokyotechknow/396/tokyotechknowinc.htm

Miller, Skyler. "Dance Dance Revolution", Jan 23 2001:
http://www.salon.com/tech/feature/2001/01/23/ddr/

MobyGames.com: Dance Dance Revolution:
http://mobygames.com/game/sheet/gameId=3794/

Nintendo website: History of Nintendo:
http://www.nintendo.com/corp/history.html

Power, James & Michael Chapple. "Stuff Kids Buy. The Power Pad;
Can You Top This?" Newsday: October 26, 1988.

Smith, Heidi. "Dance" The Golden Gate Xpress Magazine:
http://xpress.sfsu.edu/custom/magazine/dance2.html

Teamgwail. Martial Beat. http://www.teamgwailo.com/archives/00000022.htm

Wong, Nicole. "Hip-Hop Music Sweeps Arcades with *'Dance Dance Revolutio*n,'"
Mercury News.
http://www.*DD*Rfreak.com/Press/SJ%20Mercury%20News%20-%20Hip-hop%
20music%20sweeps%20arcades%20with%20`Dance%20Dance%20Revolution'
%20(7-22-2000).htm

Endnotes

[i] Nintendo website: History of Nintendo:
http://www.nintendo.com/corp/history.html

[ii] GamersGraveyard: Power Pad/ Family Fun and Fitness/ Family Trainer:
http://www.gamersgraveyard.com/repository/nes/peripherals/powerpad.html

[iii] GameFAQs: Dance Aerobics:
http://www.gamefaqs.com/console/nes/review/R8087.html

[iv] ClassicGaming.com: Dance Aerobics Manual:
http://www.classicgaming.com/thewarpzone/dancaero.txt

[v] Clear Vision Gaming, World Class Track Meet:
http://www.clearvisiongaming.com/classic/99961036240899.shtml

[vi] Loftus, Geoffrey and Elizabeth F. Loftus, "Why Video Games Are Fun," pp. 10-42 in *Mind at Play: The Psychology of Video Games* (New York: Basic Books, 1983).

[vii] Horwitz, Jer & Mike Whalen. "The History of Konami":
http://www.videogames.com/features/universal/konami/

[viii] The Gaming Intelligence Agency: Dance Dance Revolution:
http://www.thegia.com/psx/ddr/ddr.html

[ix] Smith, Heidi. "Dance" The Golden Gate Xpress Magazine:
http://xpress.sfsu.edu/custom/magazine/dance2.html

[x] GameFAQs: Pump It Up: http://db.gamefaqs.com/coinop/arcade/file/pump_it_up.txt

[xi] Teamgwail. Martial Beat. http://www.teamgwailo.com/archives/00000022.htm

[xii] http://www.konamifitness.co.uk/products/martial/index.asp

[xiii] McQuillin, Kristen. "Big Game Hunting".
http://www.tokyoclassified.com/tokyotechknow/396/tokyotechknowinc.htm