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JUMPGYM

A Jumping Exergame For Waiting Areas

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Abstract

Waiting in line can be a nuisance and a waste of time, but this doesn't have to be the case. We present *JumpGym*, a multi-player exergame that explores the opportunity and time afforded by queues to occupy people with exercise and interactive play as they wait. We conducted testing with 75 participants to understand the effects of playing the game on a participant's mood, perceived waiting time, exercise self-efficacy, and exercise awareness.

Motivation

Americans spend roughly 37 billion hours each year waiting in line (Blake, 2010). Research suggests that waiting impacts our mood and outlook on our days (Comm & Palacheck, 1984; Chebat, 1993). At the same time, obesity is becoming a larger and more ever-present issue in society as fewer people engage in physical activity. Studies have found that 97 percent of American adults get less than 30 minutes of exercise per day (Roberts et al, 2013). Lack of time, opportunity, motivation, and knowhow have been identified as top causes of our inadequate exercise culture.

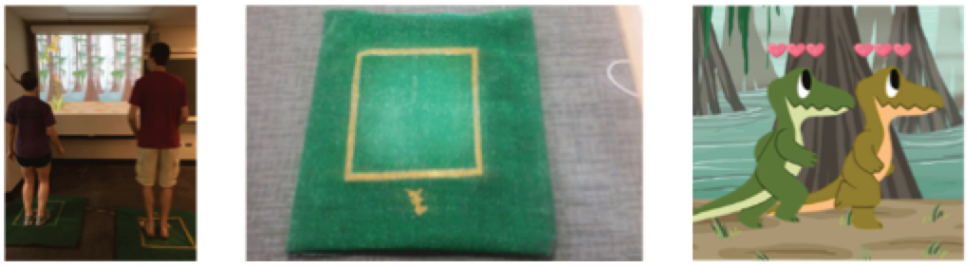

Figure 1. Two participants playing JumpGym (left). JumpGym platform (middle). JumpGym characters (right).

Game Description

Inspired by existing exergames such as Wii Fit and Xbox Fitness, we designed JumpGym to help people exercise and improve their waiting experience through play. JumpGym is an exergame designed for

waiting areas. Players use whole-body interaction (physical jumping) to control game characters on a computer screen. The game presents obstacles to the characters that players have to jump over. The game keeps track of the number of times the player jumps and displays health facts at the end of the game. JumpGym can be played single or multiplayer.

Game Objectives

JumpGym aims at reducing perceived wait time and increasing user mood by providing an opportunity for (a) player interaction and engagement with others through gameplay, (b) educational learning, and (c) exercise for people while they wait.

1. **Multi-player Interaction:** Playing games with other people can be a social activity (Lenhart, 2008)**.** JumpGym's two-player option provides an opportunity for people to interact while they wait. This is a means for people who may not know each other to socially connect during their wait and potentially improve their waiting experience.

2. **Health Education:** At the end of game play, JumpGym displays health facts to the player. The health facts inform the user about the advantages of jumping. This allows the users to immediately know how their game actions are beneficial to their health.

3. **Playful Exercise:** Adding the exercise component to the fun component of gaming is a strategy that is gaining popularity in addressing obesity (Sinclair, 2007). JumpGym also uses this strategy. JumpGym requires physical exertion by the player through jumping in order to control the game character. The player has to jump to avoid obstacles and continue game play.

Study Overview

We have conducted a study of JumpGym involving 75 participants in three conditions. In the first condition, players used JumpGym in pairs for a fixed period of 7 minutes. In the second condition, pairs played a non-physical version of JumpGym using a more traditional game controller, also for 7 minutes. In the final condition people waited without using JumpGym. After participating, we administered a questionnaire gauging participants' mood, perceived waiting time, exercise self-efficacy, and exercise awareness. We are in the process of analyzing these data.

Implications

This research has implications on the way we design interactive, multiplayer game systems for people as they wait. Through utilizing time that people typically stand idle and don't enjoy, we can both improve the waiting experience and encourage exercise through play.

Demo Links

- Demo Video: https://drive.google.com/open?id=0Bwp4SktRqpYBYTFHY0x2ak9XY0k
- Game Link: http://obiorahm.github.io/JumpGymJS

References

Blake, H. (2010). Waiting Line Models. Retrieved from

http://www.csus.edu/indiv/b/blakeh/mgmt/documents/opm101supplc.pdf

Chebat, J. C., & Filiatrault, P. (1993). The impact of waiting in line on consumers. *International Journal of*

Bank Marketing, *11*(2), 35-40.

Comm, C., & Palacheck, A. D. (1984). The Effect of Various Waiting Line Times and Regret Levels on

Individual Consumption Time. *Advances in Consumer Research*, *11*(1).

Lenhart, A., Kahne, J., Middaugh, E., Macgill, A. R., Evans, C., & Vitak, J. (2008). Teens, video games,

and civics: teens' gaming experiences are diverse and include significant social interaction and civic engagement. *Pew internet & American life project*.

Roberts, M. D., Brown, J. D., Oberle, L. P., Heese, A. J., Toedebusch, R. G., Wells, K. D., … & Brown, M.

(2013). Phenotypic and molecular differences between rats selectively bred to voluntarily run high vs. low nightly distances.*American Journal of Physiology-Regulatory, Integrative and Comparative Physiology*, *304*(11), R1024-R1035.

Sinclair, J., Hingston, P., & Masek, M. (2007, December). Considerations for the design of exergames. In

Proceedings of the 5th international conference on Computer graphics and interactive techniques in Australia and Southeast Asia (pp. 289-295). ACM