NEW WAYS OF PRACTICING SPORT AND PHYSICAL ACTIVITIES BASED ON VIDEO GAME: WHICH PERSPECTIVES FOR PEDAGOGY?

Denis Pasco
UBFC - ELLIADD

The male grammatical form is used through out this presentation as representing both sexes, without discrimination in regard to women and men and with the only purpose of keeping it short.

1 THEME, FEW NOTICES ET 1 EXPECTATION

11th ARIS Biennial - Shaping physically educated citizens: A challenge for school, sport and recreation professionals

- Fun culture
- Rising of new practices
- Technology explosion linked with physical activity and sport promotion

Which perspectives for pedagogy?

Articles

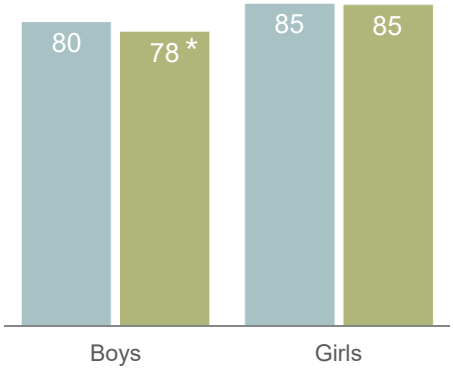
Global trends in insufficient physical activity among adolescents: a pooled analysis of 298 population-based surveys with 1·6 million participants

Regina Guthold, Gretchen A Stevens, Leanne M Riley, Fiona C Bull

Summary

Background Physical activity has many health benefits for young people. In 2018, WHO launched More Active People for a Healthier World, a new global action on physical activity, including new targets of a 15% relative reduction of global prevalence of insufficient physical activity by 2030 among adolescents and adults. We describe current prevalence and trends of insufficient physical activity among school-going adolescents aged 11–17 years by country, region, and globally.

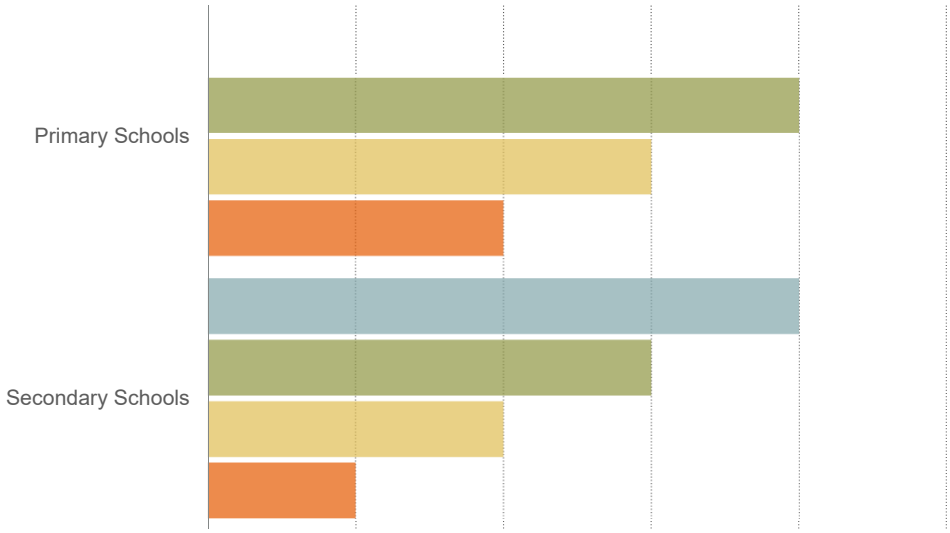
Lancet Child Adolesc Health 2020; 4: 23–35
Published Online November 21, 2019
https://doi.org/10.1016/S2352-4642(19)30323-2



YOUTH PHYSICAL INACTIVITY CONFIRMED AGAIN AND AGAIN…

- 11-17 ans
- Data on 146 countries
- **More than 4 young on 5 are not active enough**
- Mass media are talking about it
- College students at risk

PRIORITIES IN PHYSICAL EDUCATION CURRICULA (UNESCO, 2013)



STRATEGIES FOR KNOWLEDGE DEVELOPMENT AND INTERVENTION

RESPONSABILISATION DES JEUNES À UN MODE DE VIE ACTIF TOUT AU LONG DE LA VIE

Sylvain Turcotte, Ph.D., professeur titulaire

UNIVERSITÉ DE SHERBROOKE
Faculté des sciences de l'activité physique

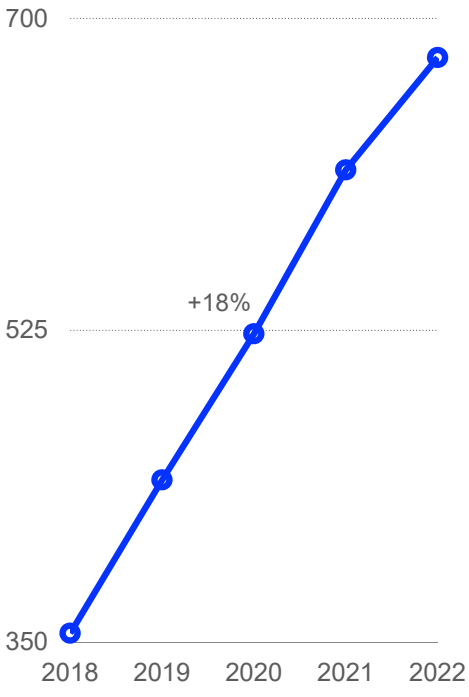
CRIFPE

10ème Biennale de l'ARIS
Lille, France
Jeudi, 21 juin 2018

STRATEGIES FOR KNOWLEDGE DEVELOPMENT AND INTERVENTION

esports

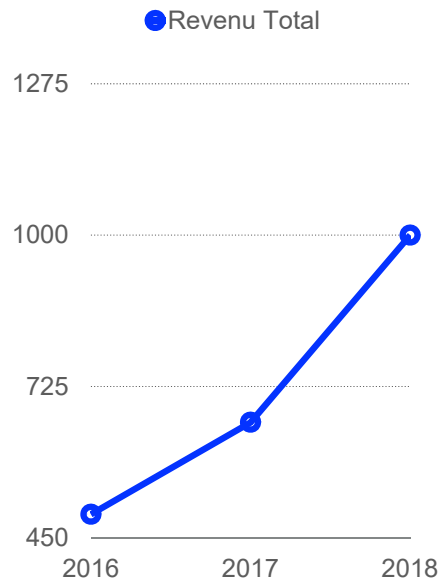
ESPORTS PHENOMENON



CRAZY NUMBERS

- 250M players worldwide
- >500M spectators
- “League of Legends” World final drew 12 million more fans than the NBA finals
- Sold out tournaments (17 000 in Seattle; 20 000 Madison Square garden)

STRIVING BUSINESS



- Best team : >$24M
- Best player : $3.5M
- "*esports financial stakes will exceed those of tennis in 2020*" (Salles & Durain, 2016)

THE LEGISLATOR SEIZE IT (SALLES & DURAIN, 2016)

Economic growth

"*World class electronic tournaments do not exist yet. Make sure France will be one of the majors!*"

Institutionnalization

- "*Finally, this report proposes to move towards the establishment of a partnership governance structure for esports like others sports associations*"
- French Esports association + others

People protection

- Status and contract of professional players
- Protection of minors

TRADITIONAL SPORT WONDERS…

- "*esports will be an official medal sport at the 2022 Asian Games in China*" (Guardian, 2017)

- Olympic inclusion

TRADITIONAL SPORT WONDERS…

- "*esports will be an official medal sport at the 2022 Asian Games in China*" (Guardian, 2017)

- Olympic inclusion

TRADITIONAL SPORT WONDERS…

- "*esports will be an official medal sport at the 2022 Asian Games in China*" (Guardian, 2017)

- Olympic inclusion

AND GET CLOSER…

UCI UNION CYCLISTE INTERNATIONALE

2020 UCI Cycling Esports World Championships on the Zwift platform

ZWIFT

EMERGING RESEARCH FIELD

- An emerging research literature mostly oriented “sport management”

Sport Management Review 21 (2018) 7–13

Contents lists available at ScienceDirect

Sport Management Review

journal homepage: www.elsevier.com/locate/smr

Review

eSport management: Embracing eSport education and research opportunities☆

Daniel C. Funk*, Anthony D. Pizzo, Bradley J. Baker

Temple University, School of Sport, Tourism and Hospitality Management, Speakman Hall 300, 1810 N. 13th St., Philadelphia, PA 19122, USA

EMERGING RESEARCH FIELD

- An emerging research literature mostly oriented “sport management”
- Is it a sport?

Sport Management Review 21 (2018) 14–20

Contents lists available at ScienceDirect

Sport Management Review

journal homepage: www.elsevier.com/locate/smr

Review

eSports – Competitive sports or recreational activity?

Kirstin Hallmann*, Thomas Giel

Institute of Sport Economics and Sport Management, German Sport University Cologne, Am Sportpark Muengersdorf 6, Cologne, 50933, Germany

Sciences du jeu

5 | 2016
Jeux traditionnels et jeux numériques : filiations, croisements, recompositions

Les jeux vidéo compétitifs au prisme des jeux sportifs : du sport au sport électronique

Nicolas Besombes

EMERGING RESEARCH FIELD

- An emerging research literature mostly oriented “sport management”
- Is it a sport?
- Esport Superstars profiles

ESport Superstars

38 Pages • Posted: 19 Apr 2018

Michael R. Ward
University of Texas at Arlington - College of Business Administration - Department of Economics; ZEW, Mannheim

Alexander Harmon
Ascension Analytics Group

Date Written: March 30, 2018

Abstract

We analyze careers of eSports professional players. Professional video gaming is a fast growing spectator ‘sport’ with huge fan bases. The industry has been able to monetize this spectator demand to offer tournament prize money that now exceeds $100,000,000 per year. While tens of thousands of eSport gamers have earned prize money, only a few hundred earn enough to remain professional gamers exclusively. We examine three aspects of professional eSport player careers. First, we find a ‘superstar’ effect in which increases in prize money draws amateurs into the professional ranks. We examine the effects of age and experience on player productivity. We show that career exits reflect a quick resolution regarding the uncertainty a player has regarding his actual ability.

Keywords: eSports, Superstars

Acupuncture in Medicine

2.637 Impact Factor

Journal Indexing & Metrics »

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Acupuncture for eSport athletes

Nobuari Takakura, You Hiramatsu, Tomoaki Takanashi, more...

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First Published August 20, 2019 | Letter | Find in PubMed | Check for updates

https://doi.org/10.1177/0964528419848751

Article information

Altmetric 1

Article Information

Article first published online: August 20, 2019

Nobuari Takakura[1], You Hiramatsu[2], Tomoaki Takanashi[1, 2], Miho Takayama[1, 2], Crystal L Patil[3], Judith M Schlaeger[3], Hiroyoshi Yajima[1, 2]

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- Athlete health

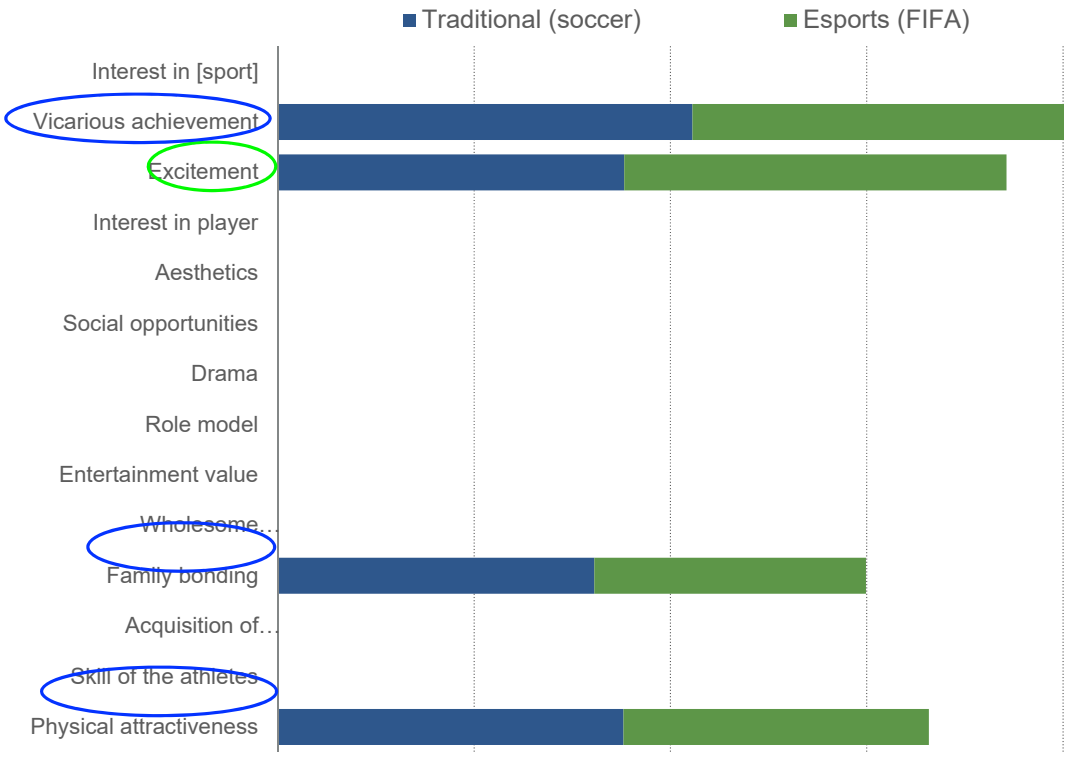
EMERGING RESEARCH FIELD

- An emerging research literature mostly oriented “sport management”
- Is it a sport?
- Esport Superstars profiles
- Athlete health
- Spectator motives

Sport Marketing Quarterly, 2018, 27, 108-123, © 2018 West Virginia University

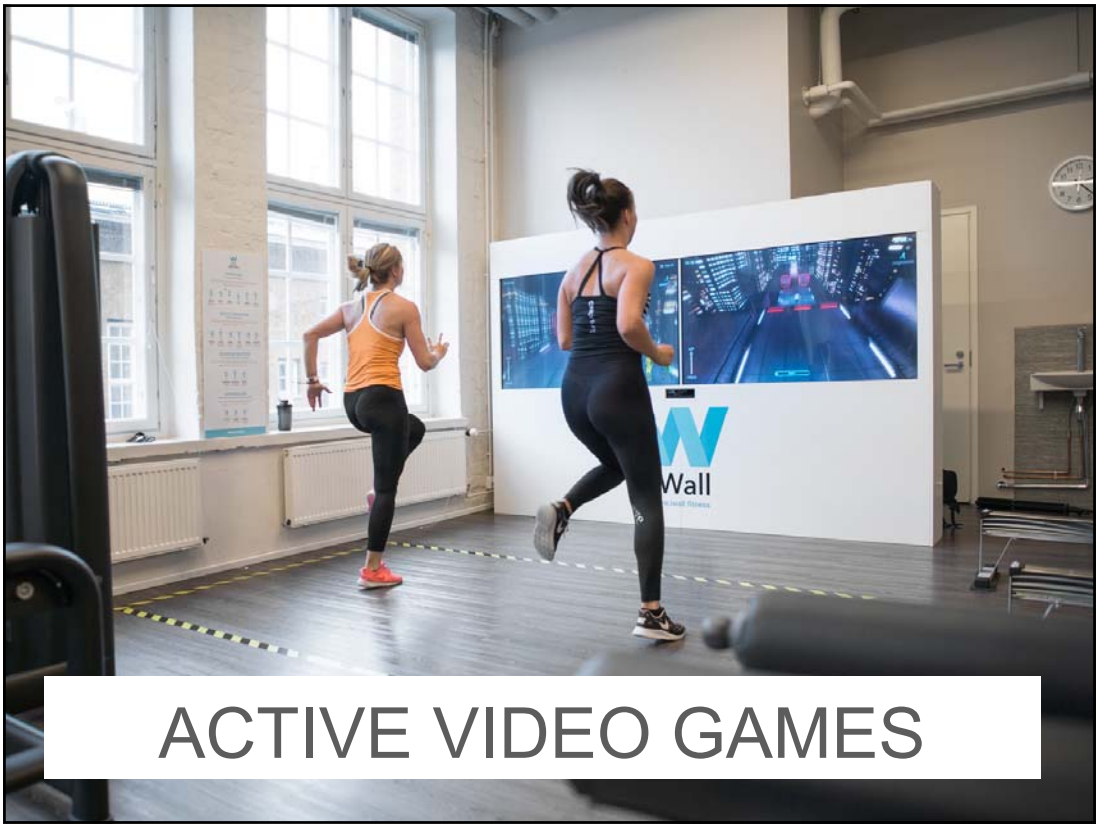
eSport vs. Sport: A Comparison of Spectator Motives

Anthony D. Pizzo, Bradley J. Baker, Sangwon Na, Mi Ae Lee, Doohan Kim, and Daniel C. Funk



PERSPECTIVES FOR INTERVENTION

- Performance support
- Esports coach program?
- Young players training
- Esports teacher certificate?
- Relations with secondary schools
- Variety of research topics to investigate



ACTIVE VIDEO GAMES

CONTEXT

- Active video games or exergames refer to video games that are also a form of exercise (Gao & Chen, 2014)

EXERCISE →  ← YOUTH MOTIVATION FOR VIDEO GAMES

↓

Physical activity promotion

LARGE RESEARCH LITERATURE…

ARTICLE

ONLINE FIRST

Energy Cost of Exergaming

A Comparison of the Energy Cost of 6 Forms of Exergaming

Bruce W. Bailey, PhD; Kyle McInnis, ScD

Objective: To determine the relative effect of interactive digital exercise that features player movement (ie, *exergames*) on energy expenditure among children of various body mass indexes (BMIs; calculated as weight in kilograms divided by height in meters squared).

Design: Comparison study.

Setting: GoKids Boston, a youth fitness research and training center located at University of Massachusetts, Boston.

Participants: Thirty-nine boys and girls (mean [SD] age, 11.5 [2.0] years) recruited from local schools and after-school programs.

Main Exposure: Six forms of exergaming as well as treadmill walking.

Main Outcome Measures: In addition to treadmill walking at 3 miles per hour (to convert miles to kilometers, multiply by 1.6), energy expenditure of the following exergames were examined: Dance Dance Revolution, LightSpace (Bug Invasion), Nintendo Wii (Boxing), Cybex Trazer (Goalie Wars), Sportwall, and Xavix (J-Mat). Energy expenditure was measured using the CosMed K4B2 portable metabolic cart.

Results: All forms of interactive gaming evaluated in our study increased energy expenditure above rest, with no between-group differences among normal (BMI < 85th percentile) and "at-risk" or overweight (BMI ≥ 85th percentile) children ($P \geq .05$). Walking at 3 miles per hour resulted in a mean (SD) metabolic equivalent task value of 4.9 (0.7), whereas the intensity of exergaming resulted in mean (SD) metabolic equivalent task values of 4.2 (1.6) for Wii, 5.4 (1.8) for Dance Dance Revolution, 6.4 (1.6) for LightSpace, 7.0 (1.8) for Xavix, 5.9 (1.5) for Cybex Trazer, and 7.1 (1.7) for Sportwall. Enjoyment of the games was generally high but was highest for children with BMIs in the highest percentiles.

Conclusion: All games used in our study elevated energy expenditure to moderate or vigorous intensity. Exergaming has the potential to increase physical activity and have a favorable influence on energy balance, and may be a viable alternative to traditional fitness activities for children of various BMI levels.

Arch Pediatr Adolesc Med.
Published online March 7, 2011.
doi:10.1001/archpediatrics.2011.15

Perceptual and Motor Skills, 2012, 114, 3, 1023-1034.

USE OF ELECTRONIC GAMES BY YOUNG CHILDREN AND FUNDAMENTAL MOVEMENT SKILLS?[1, 2]

LISA M. BARNETT
Deakin University

TRINA HINKLEY, ANTHONY D. OKELY
Interdisciplinary Educational Research Institute University of Wollongong

KYLIE HESKETH AND JO SALMON
Centre for Physical Activity and Nutrition Research, Faculty of Health Deakin University

Summary.—This study investigated associations between pre-school children's time spent playing electronic games and their fundamental movement skills. In 2009, 53 children had physical activity (Actigraph accelerometer counts per minute), parent proxy-report of child's time in interactive and non-interactive electronic games (min./week), and movement skill (Test of Gross Motor Development–2) assessed. Hierarchical linear regression, adjusting for age (range = 3–6 years), sex (Step 1), and physical activity (cpm; $M = 687$, $SD = 175.42$; Step 2), examined the relationship between time in (a) non-interactive and (b) interactive electronic games and locomotor and object control skill. More than half (59%, $n = 31$) of the children were female. Adjusted time in interactive game use was associated with object control but not locomotor skill. Adjusted time in non-interactive game use had no association with object control or locomotor skill. Greater time spent playing interactive electronic games is associated with higher object control skill proficiency in these young children. Longitudinal and experimental research is required to determine if playing these games improves object control skills or if children with greater object control skill proficiency prefer and play these games.

LARGE RESEARCH LITERATURE…

JOURNAL OF APPLIED BEHAVIOR ANALYSIS 2010, **43,** 591–600 NUMBER 4 (WINTER 2010)

THE EFFECTS OF EXERGAMING ON PHYSICAL ACTIVITY AMONG INACTIVE CHILDREN IN A PHYSICAL EDUCATION CLASSROOM

VICTORIA A. FOGEL, RAYMOND G. MILTENBERGER, RACHEL GRAVES, AND SHANNON KOEHLER
UNIVERSITY OF SOUTH FLORIDA

Childhood obesity, which is due in part to lack of physical activity, is a serious concern that requires the attention of the behavioral community. Although excessive video game play has been noted in the literature as a contributor to childhood obesity, newer video gaming technology, called *exergaming*, has been designed to capitalize on the reinforcing effects of video games to increase physical activity in children. This study evaluated the effects of exergaming on physical activity among 4 inactive children in a physical education (PE) classroom. Results showed that exergaming produced substantially more minutes of physical activity and more minutes of opportunity to engage in physical activity than did the standard PE program. In addition, exergaming was socially acceptable to both the students and the PE teacher. Exergaming appears to hold promise as a method for increasing physical activity among inactive children and might be a possible intervention for childhood obesity.

Key words: childhood obesity, exergaming, physical education, social validity, video games

HUMAN MOVEMENT
2010, vol. 11 (1), 95–99

THE IMPACT OF A SCHOOL-BASED ACTIVE VIDEO GAME PLAY INTERVENTION ON CHILDREN'S PHYSICAL ACTIVITY DURING RECESS

DOI: 10.2478/v10038-009-0023-1

Michael J. Duncan[1*], Victoria Staples[2]
[1] Department of Bimolecular and Sports Science, Coventry University, Coventry, United Kingdom
[2] Department of Psychology, University of Derby, Derby, United Kingdom

ABSTRACT
Purpose. To assess physical activity levels during active video game play over time and compare this to 'free play' associated with recess activity in a sample of British primary school children over a 6-week period. **Basic procedures.** Thirty children (ages 10–11, 12 boys, 18 girls) from central England were randomly selected to participate in a 6 week, recess based, active video gaming intervention (n = 15) or act as controls (n = 15). Repeated measures analysis of covariance (controlling for body fatness) was used to examine any differences in physical activity, determined by pedometry and heart rate monitoring over time and between intervention and control groups. **Main Findings.** Children in the intervention accumulated significantly greater steps/day than the control group during the first week of the intervention. This pattern was reversed at the mid and end points of the intervention (p = .03). Irrespective of time point, children engaging in active video game play spent a lesser percentage of time engaged in MVPA than the controls undertaking 'traditional' recess activity (p = .0001). **Conclusions.** Active video game play does not appear to be a sustainable means to enhance children's physical activity. Although physical activity (steps/min) was greater on initial presentation of active video games compared to 'traditional' recess activity, this appears to be an acute effect.

Key words: pedometer, heart rate monitoring, recess, steps, exergaming

LARGE RESEARCH LITERATURE…

Utiliser les Jeux Vidéos Actifs pour Promouvoir l'Activité Physique

(Une Revue de Littérature)

Denis PASCO • Cyril BOSSARD
Cédric BUCHE • Gilles KERMARREC

In the research literature, playing electronic video games has been traditionally associated with various risks for both mental and physical health. In recent years, a new type of video games call active video games or exergames have emerged. Exergames involve physical activity as a mean of interacting with the game. There is little evidence about the benefits of exergames to promote physical activity (PA). The goal of this study is to present an overview of the recently published literature on this area. A literature search on international online bibliographic databases was conducted. The expected benefits of exergames were used as categorization scheme. Studies reported that exergames significantly increase energy expenditure and heart rate compare to sedentary video gaming. Evidence is mixed on whether exergames engage children in levels of activity that are consistent with public health recommendations for physical activity and improving cardiorespiratory fitness. Studies suggested that multiplayer classes may increase children's motivation to play exergames. One study report that exergames can enhance students' motor skill. More investigations are necessary to confirm the benefits of exergames to promote PA. We suggest to move from design exergames for entertainment to design exergames for learning.

Keywords: exergame, physical activity, literature review.

Exergaming for Health: A Community-Based Pediatric Weight Management Program Using Active Video Gaming

Clinical Pediatrics
51(4) 382-388
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sagepub.com/journals/Permissions.nav
DOI: 10.1177/0009922811429480
http://cpj.sagepub.com
SAGE

Amy Christison, MD[1] and Huma Ali Khan, MD[2]

Abstract
Objective. To evaluate the efficacy and feasibility of a multifaceted, community-based weight intervention program for children using exergaming technology (activity-promoting video gaming). *Design and Methods.* This is a prospective observational pilot study. Forty-eight children, between the ages of 8 and 16 years, who are overweight or obese, enrolled in Exergaming for Health, a multidisciplinary weight management program, which used active video gaming. Primary outcome measures were change in body mass index (BMI) z scores. *Results.* Most children (n = 40, 83%) completed the program and participated in outcome evaluations. The average BMI change was −0.48 kg/m^2 (SD = 0.93), P < .002 (BMI z-score change was −0.072, SD = 0.14, P < .0001). The average Global Self-Worth score improved, screen time and soda intake reduced, and exercise hours per week increased. *Conclusions.* The Exergaming for Health program may be an effective weight management intervention that is feasible with high participation rates. A larger randomized controlled trial is needed to confirm these results.

Keywords
obesity, pediatric obesity, video gaming

Developmental Psychology

0012-1649/11/$12.00 DOI: 10.1037/a0026648

Exergaming Immediately Enhances Children's Executive Function

John R. Best
University of Georgia

The current study examined an important aspect of experience—physical activity—that may contribute to children's executive function. The design attempted to tease apart 2 important aspects of children's exercise by examining the separate and combined effects of acute physical activity and cognitive engagement on an aspect of children's executive functioning. In a 2 × 2 within-subject experimental design, children (N = 33, 6 to 10 years old) completed activities that varied systematically in both physical activity (physically active video games versus sedentary video activities) and cognitive engagement (challenging and interactive video games versus repetitive video activities). Cognitive functioning, including executive function, was assessed after each activity by a modified flanker task (Rueda et al., 2004). Whereas cognitive engagement had no effect on any aspect of task performance, physical activity (i.e., exergaming) enhanced children's speed to resolve interference from conflicting visuospatial stimuli. Age comparisons indicated improvements with age in the accuracy of resolving interference and in overall response time. The results extend past research by showing more precisely how physical activity influences executive function and how this effect differs from the improvements that occur with development.

Keywords: executive function, physical activity, exergaming, cognitive engagement

Supplemental materials: http://dx.doi.org/10.1037/a0026648.supp

LARGE RESEARCH LITERATURE…

Video Game Play, Child Diet, and Physical Activity Behavior Change
A Randomized Clinical Trial

Tom Baranowski, PhD, Janice Baranowski, MPH, RD, Debbe Thompson, PhD, Richard Buday, FAIA, Russ Jago, PhD, Melissa Juliano Griffith, MPH, Noemi Islam, MPH, Nga Nguyen, MS, Kathleen B. Watson, PhD

Background: Video games designed to promote behavior change are a promising venue to enable children to learn healthier behaviors.

Purpose: Evaluate outcome from playing "Escape from Diab" (Diab) and "Nanoswarm: Invasion from Inner Space" (Nano) video games on children's diet, physical activity, and adiposity.

Design: Two-group RCT; assessments occurred at baseline, immediately after Diab, immediately after Nano, and 2 months later. Data were collected in 2008–2009, and analyses were conducted in 2009–2010.

Setting/participants: 133 children aged 10–12 years, initially between 50th percentile and 95th percentile BMI.

Intervention: Treatment group played Diab and Nano in sequence. Control Group played diet and physical activity knowledge-based games on popular websites.

Main outcome measures: Servings of fruit, vegetable, and water; minutes of moderate to vigorous physical activity. At each point of assessment: 3 nonconsecutive days of 24-hour dietary recalls; 5 consecutive days of physical activity using accelerometers; and assessment of height, weight, waist circumference, and triceps skinfold.

Results: A repeated measures ANCOVA was conducted (analyzed in 2009–2010). Children playing these video games increased fruit and vegetable consumption by about 0.67 servings per day ($p<0.018$) but not water and moderate-to-vigorous physical activity, or body composition.

Conclusions: Playing Diab and Nano resulted in an increase in fruit and vegetable intake. Research is needed on the optimal design of video game components to maximize change.

(Am J Prev Med 2011;40(1):33–38) © 2011 American Journal of Preventive Medicine

Impact of an Active Video Game on Healthy Children's Physical Activity

WHAT'S KNOWN ON THIS SUBJECT: Active video games can enable children under laboratory conditions to participate in moderate, and even vigorous, physical activity. There are inconsistencies in the literature, however, about whether active video games enable children to increase physical activity under more naturalistic circumstances.

WHAT THIS STUDY ADDS: This study tests whether children receiving a new active video game spontaneously engaged in more physical activity, and whether commercially available active video games have a public health benefit. No additional physical activity was detected, suggesting no public health benefit.

AUTHORS: Tom Baranowski, PhD,[a] Dina Abdelsamad, BA,[a] Janice Baranowski, MPH, RD,[a] Teresia Margareta O'Connor, MD, MPH,[a] Debbe Thompson, PhD, RD,[a] Anthony Barnett, PhD,[b] Ester Cerin, PhD,[b] and Tzu-An Chen, PhD[a]

[a]*Children's Nutrition Research Center, Department of Pediatrics, Baylor College of Medicine, Houston, Texas; and* [b]*Institute of Human Performance, University of Hong Kong, Hong Kong SAR*

KEY WORDS
exergames, Wii

ABBREVIATIONS
CNRC—Children's Nutrition Research Center
PA—physical activity

This project was conceptualized and managed by a multidisciplinary team. All the coauthors made substantial contributions to this manuscript. Dr Baranowski, a psychologist, helped conceive the study, chaired the weekly meeting of coinvestigators that reviewed progress, and wrote the initial draft. Ms Abdelsamad, research coordinator, had day-to-day responsibility for conduct of the study with participants, including data collection. Ms Baranowski, a dietitian, supervised the conduct of the study and maintained correspondence with external agencies (eg, the institutional review board). Dr O'Connor, a pediatrician, and Dr Thompson, a qualitative research specialist, participated in the weekly meeting of coinvestigators, and made many valuable contributions. Dr Barnett, an exercise physiologist, participated in the conceptualization of the study and wrote the grant application. Dr Cerin, a statistician and psychologist, participated in the conceptualization of the study, reviewed and edited the grant application, and intensively reviewed the data analyses. Dr Chen, a psychometrician and statistician, conducted all data analyses. All the authors critically reviewed early drafts of the manuscript and provided final review of the manuscript to be published. All the authors take responsibility for the content of this manuscript.

The contents of this publication do not necessarily reflect the views or policies of the USDA, nor does mention of trade names, commercial products, or organizations imply endorsement from the US government.

This trial has been registered at www.clinicaltrials.gov (identifier NCT01024153).

www.pediatrics.org/cgi/doi/10.1542/peds.2011-2050
doi:10.1542/peds.2011-2050

Accepted for publication Nov 9, 2011

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PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275).

(Continued on last page)

LARGE RESEARCH LITERATURE…

Open Access

The Addition of a Video Game to Stationary Cycling: The Impact on Energy Expenditure in Overweight Children

Bryan L. Haddock*, Shannon R. Siegel and Linda D. Wikin

Department of Kinesiology, California State University, San Bernardino

Abstract: *Introduction:* The prevalence of obesity in children has reached epidemic proportions with over 37% of children aged 6-11 years in the U.S. being classified as "at risk for overweight" or "overweight." Utilization of active video games has been proposed as one possible mechanism to help shift the tide of the obesity epidemic.

Purpose: The purpose of this study was to determine if riding a stationary bike that controlled a video game would lead to significantly greater energy expenditure than riding the same bike without the video game connected.

Methods: Twenty children, 7-14 years old, with a BMI classification of "at risk for overweight" or "overweight" participated in this study. Following familiarization, energy expenditure was evaluated while riding a stationary bike for 20 minutes. One test was performed without the addition of a video game and one test with the bike controlling the speed of a car on the video game.

Results: Oxygen consumption and energy expenditure were significantly elevated above baseline in both conditions. Energy expenditure was significantly higher while riding the bike as it controlled the video game (4.4 ± 1.2 Kcal·min^{-1}) than when riding the bike by itself (3.7 ± 1.1 Kcal·min^{-1}) ($p<0.05$). Perceived exertion was not significantly different between the two sessions ($p>0.05$).

Conclusion: Using a stationary bike to control a video game led to greater energy expenditure than riding a stationary bike without the video game and without a related increase in perceived exertion.

Key Words: Obesity, Oxygen consumption, Kcal, BMI.

GAMES FOR HEALTH JOURNAL: Research, Development, and Clinical Applications
Volume 1, Number 1, 2012

DOI: 10.1089/g4h.2011.0005

Pilot Study of an Active Screen Time Game Correlates with Improved Physical Fitness in Minority Elementary School Youth

Terrence C. Bethea, MD,[1] Diane Berry, PhD, CANP,[2] Ann E. Maloney, MD,[3] and Linmarie Sikich, MD[1]

Abstract

Objective: The aim of our feasibility study was to examine the acceptability and utility of "Dance Dance Revolution" (DDR) (Konami of America, Redwood City, CA)) to increase physical fitness in 8–11-year-old black and Hispanic youth.

Subjects and Methods: Twenty-eight 4th and 5th grade children attending an afterschool program participated. Outcomes included physical activity, physical fitness, use of home DDR, survey of safety and acceptability, anthropometrics, and fasting metabolic profile measured at baseline, 12 weeks, and 30 weeks.

Results: At 12 weeks, physical fitness (maximum O_2 uptake [VO_2max]) increased by 4.9±9.9 percent and was sustained through 30 weeks, when the VO_2max was 105.0±9.9 percent (range, 93.0–133.9 percent) of baseline values. Absolute VO_2max increased by 2.97±4.99 mL/kg/minute (95% confidence interval 0.75–5.19, $P=0.013$). Participants maintained an average of 1.12 hours/day of increased movement to music. Trends suggested increased total moderate–vigorous physical activity, decreased light activity, and a modest increase in sedentary screen time. There were no significant changes in body mass index, fasting lipids, or glucose. Participants and parents approved of the activity.

Conclusion: DDR appears feasible and acceptable to minority youth. DDR may increase moderate–vigorous physical activity and improve physical fitness in at-risk populations.

EMPIRICAL EVIDENCES

- AVG have a **large effect** on children/adolescents' physiological and psychological outcomes as compared to sedentary behaviors
- AVG produce the equivalent magnitude of effect as **light-to-moderate-intensity PA**
- AVG are **more attractive** and enjoyable for children/adolescents in comparison with traditional games

OBESITY Reviews
Edited By: Professor David York
Impact factor: 8.192
ISI Journal Citation Reports © Ranking: 2018: 8/145 (Endocrinology & Metabolism)
Online ISSN: 1467-789X

obesity reviews doi: 10.1111/obr.12287

Pediatric Health Promotion

A meta-analysis of active video games on health outcomes among children and adolescents

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Summary

This meta-analysis synthesizes current literature concerning the effects of active video games (AVGs) on children/adolescents' health-related outcomes. A total of 512 published studies on AVGs were located, and 35 articles were included based on the following criteria: (i) data-based research articles published in English between 1985 and 2015; (ii) studied some types of AVGs and related outcomes among children/adolescents and (iii) had at least one comparison within each study. Data were extracted to conduct comparisons for outcome measures in three separate categories: AVGs and sedentary behaviours, AVGs and laboratory-based exercise, and AVGs and field-based physical activity. Effect size for each entry was calculated with the Comprehensive Meta-Analysis software in 2015. Mean effect size (Hedge's g) and standard deviation were calculated for each comparison. Compared with sedentary behaviours, AVGs had a large effect on health outcomes. The effect sizes for physiological outcomes were marginal when comparing AVGs with laboratory-based exercises. The comparison between AVGs and field-based physical activity had null to moderate effect sizes. AVGs could yield equivalent health benefits to children/adolescents as laboratory-based exercise or field-based physical activity. Therefore, AVGs can be a good alternative for sedentary behaviour and addition to traditional physical activity and sports in children/adolescents.

Keywords: Body composition, cardiovascular fitness, energy expenditure, moderate-to-vigorous physical activity.

obesity reviews (2015) **16**, 783–794

OUR APPROACH

- Players do not spend most of their time in PA levels compatible with health-related outcomes when playing commercial exergames
- AVG designers focus on fun and entertaining features of games and target large population with various PA capacities (Beaudoin, 2012)
- A design-based exergame approach

THE DESIGN-BASED EXERGAME APPROACH

- An emerging strategy in AVG design in which **game designers** and **researchers collaborated** in order to design exergames that **promote players' health-related PA outcomes** (Pasco et al., 2017)

- What kind of motivation in AVG practice?

SITUATIONAL INTEREST (SI) (PASCO & SPREUX, 2014)

The appealing effect of the characteristics of an activity on individuals (Chen et al, 2006, 237)

Dimension	Definition
Novelty	refers to information deficiency between information known and unknown
Challenge	The level of difficulty relative to one's ability
Attention demand	Concentrated cognition and mental energy required in learning an activity
Exploration intention	Learning aspects that drive the learner to explore and discover
Instant enjoyment	Characteristics that lead the learner to an instant positive feeling of being satisfied

Pasco, D. & Spreux, D. (2014). La motivation en situation. Une revue de questions en éducation physique. *ejRIEPS,* 31, 70-91.

EXPLORATORY STUDY

- Design of “Greddy Rabbit”
- 163 students from a kinesiology department
- Exp Grp (n=94) : 15min of the game
- Cont Grp (n=69): 15min of free pedaling

Pasco et al. (2016) ; Pasco et al. (2017)

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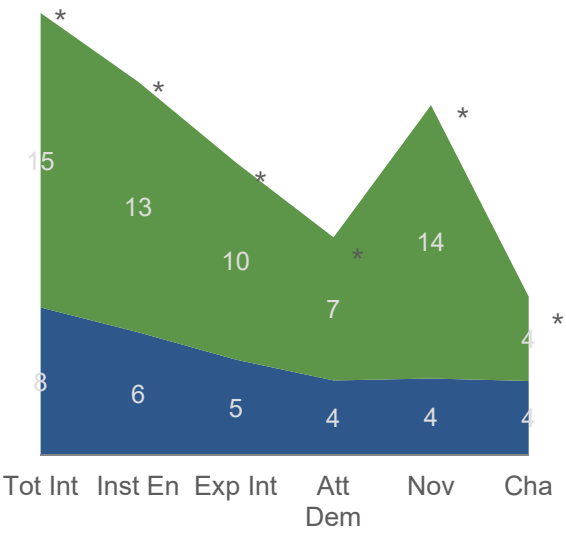
- Exp Grp (n=94) : 15min of the game
- Cont Grp (n=69): 15min of free pedaling
- 90% in MVPA
- “*I did not see the time spent*”
- SI masks the intensity of exercise



Pasco et al. (2016) ; Pasco et al. (2017)

ARE GAME ELEMENTS INVOLVED IN LEVELS OF PA?

Students in kinesiology (n=60)

Incremental cycling test

Maximal aerobic power

VO2max

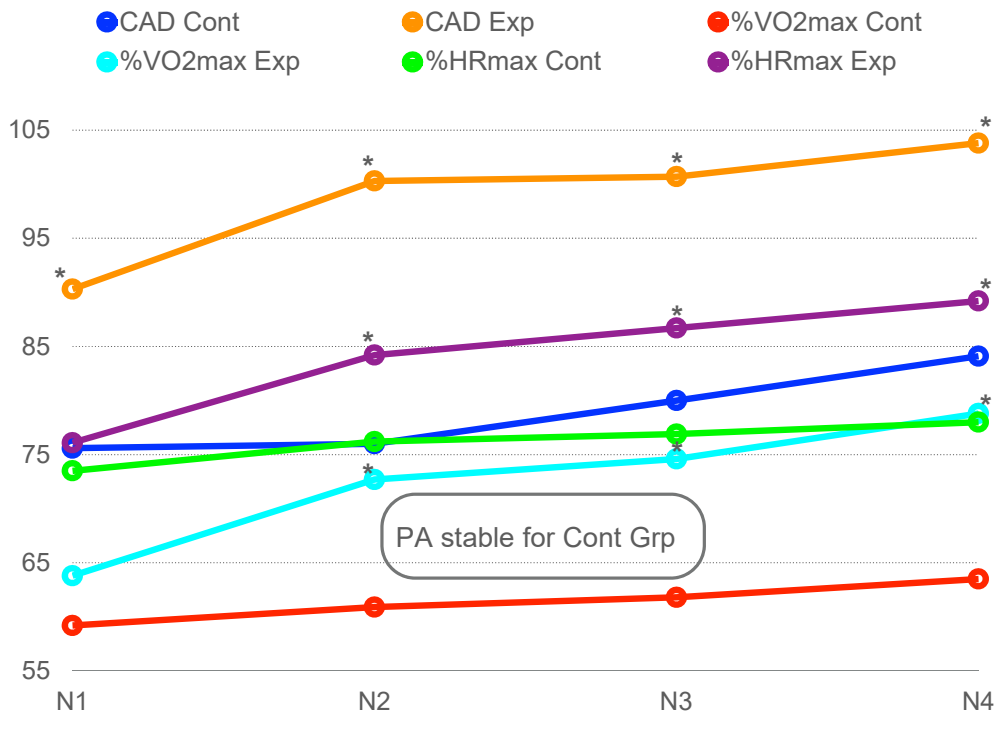
HRmax

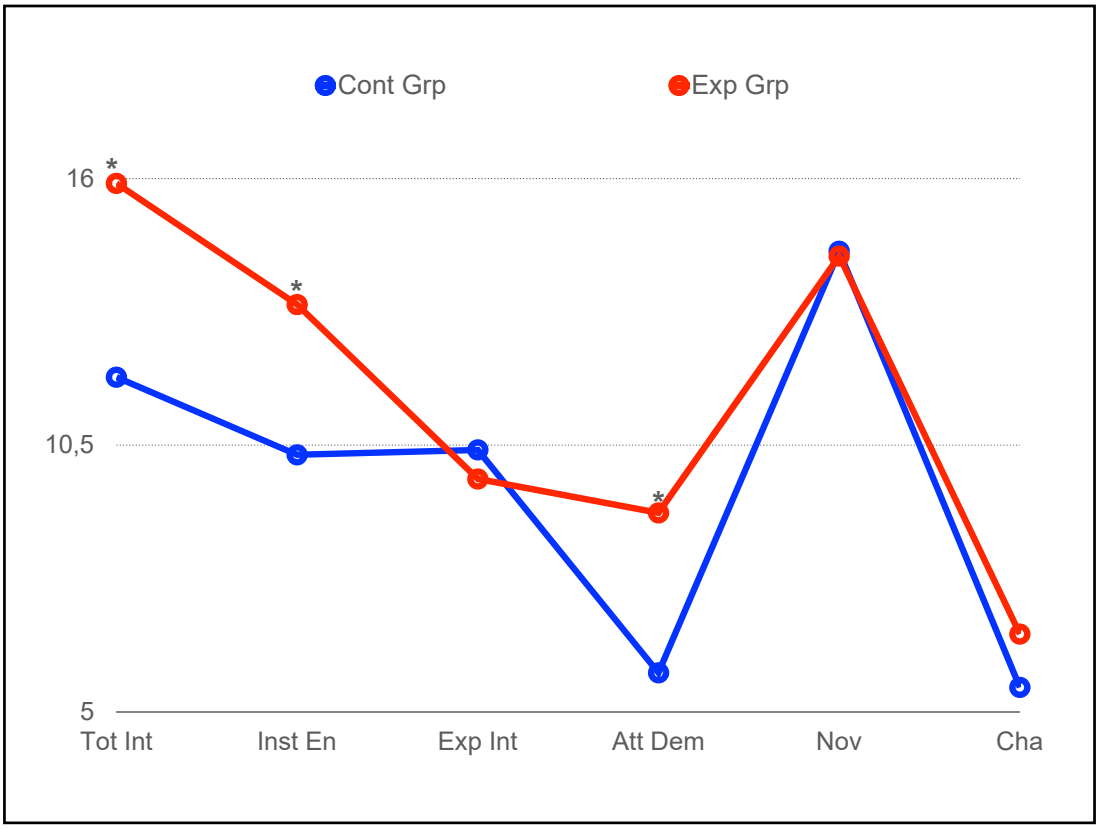
Exp Grp (n=41)

Cont Grp (n=19)

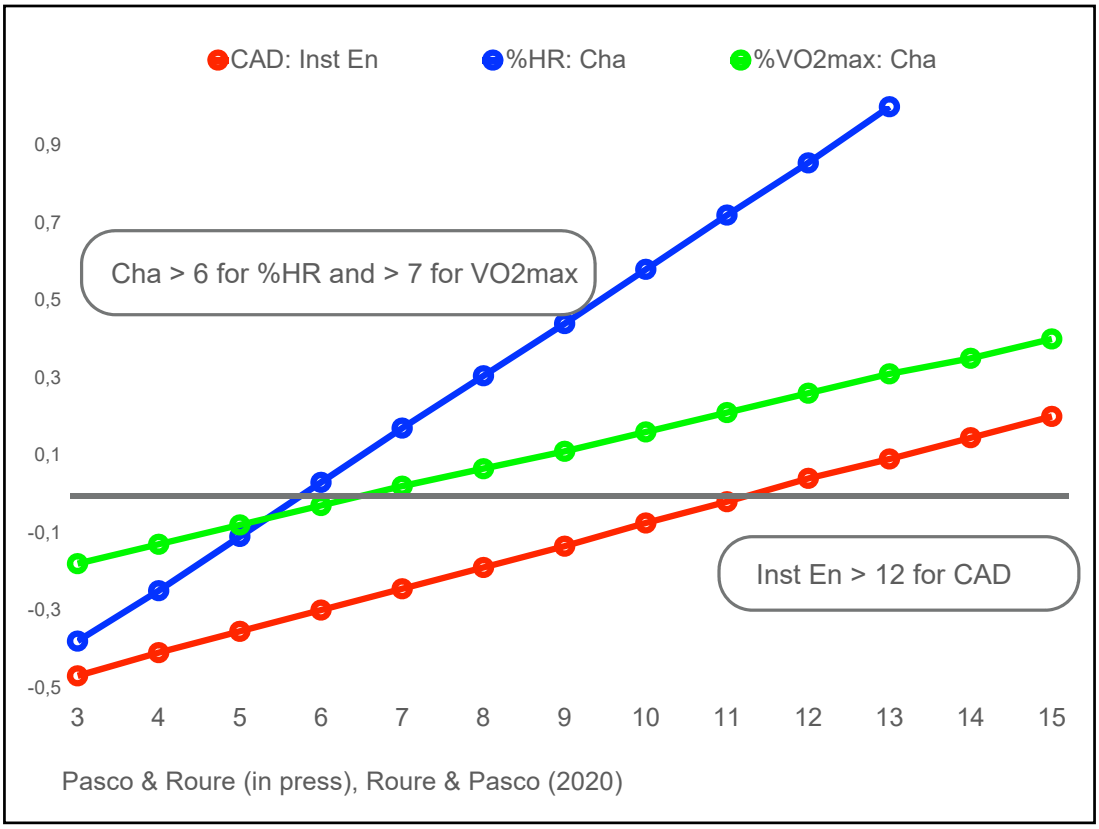
- Exp Grp: 4 sets of 8 stages (32 stages in total)
- Cont Grp: same as Exp Grp without game elements
- PA : HR, VO2 via indirect calorimetry
- Cadence (CAD)
- Situational interest (SI)

Roure, Pasco et al. (2019)



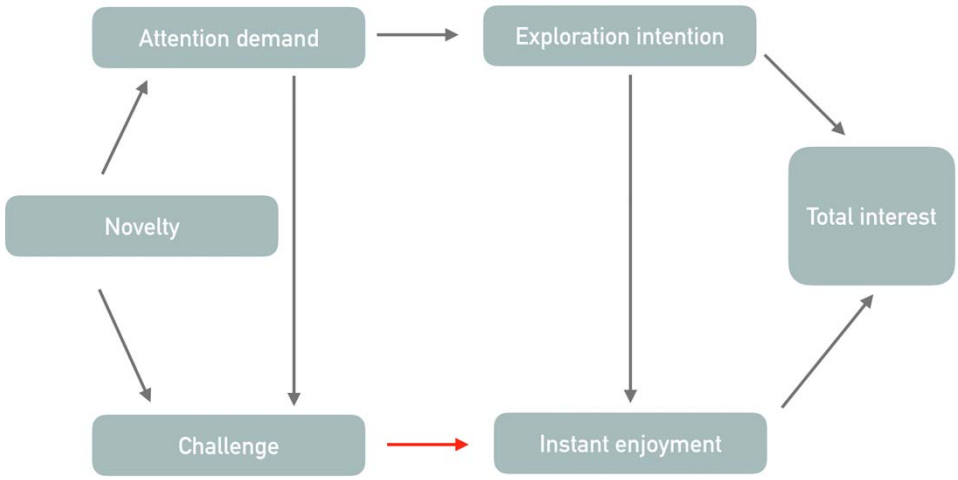


- Game elements impact instant enjoyment and intention demand
- PA stable for cont grp: game elements withdrawal impact players' level of PA
- Vigorous PA for the Exp Grp: practising Greddy Rabbit help to develop a PA compatible with health outcomes
- What are the SI dimensions that should be mobilized during the game design process in order to promote a level of PA compatible with health outcomes?



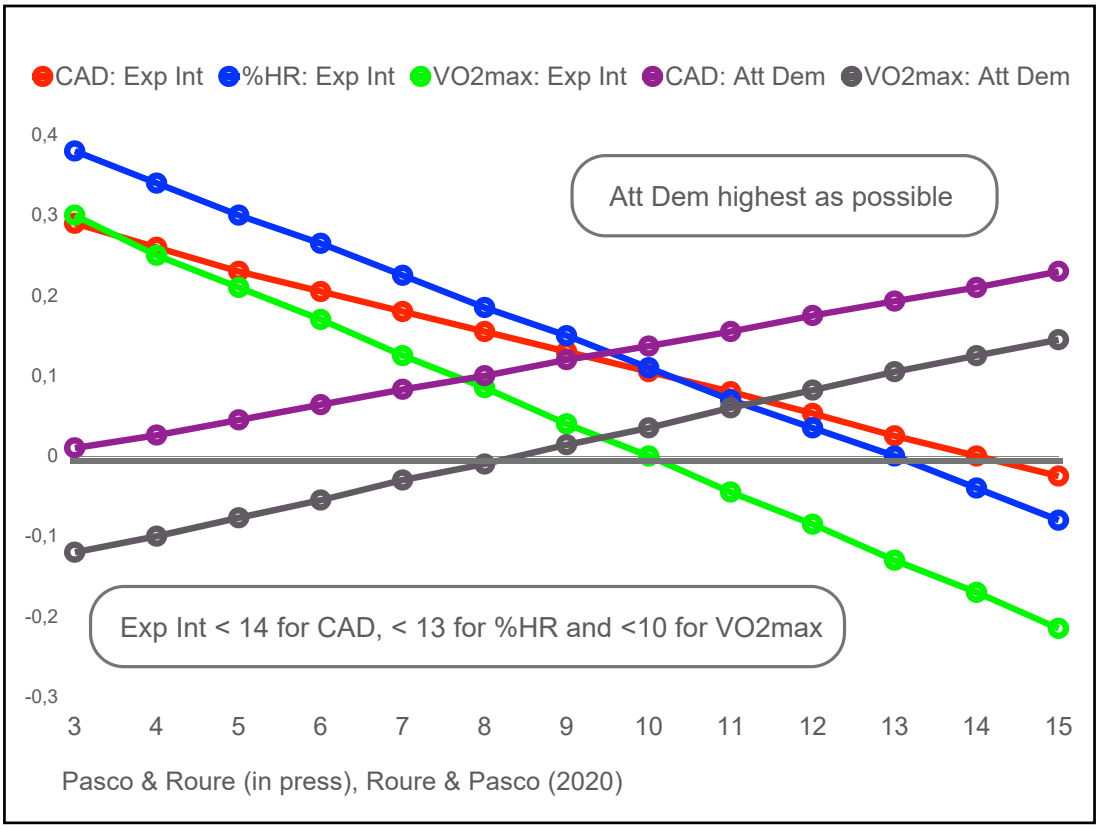
Pasco & Roure (in press), Roure & Pasco (2020)

- Progressive challenges and rewards are key elements in traditional game design



- Within the exergame design, a balance to be find

Roure & Pasco (2018)



Pasco & Roure (in press), Roure & Pasco (2020)

CONSEQUENCES FOR DESIGN-BASED EXERGAMES

- Design an AVG (including games elements) based on empirical evidences to trigger SI dimensions that promote a PA level compatible with health-related outcomes

- How to engage youth within AVG? “fun” to mask a level of PA compatible with health-related outcomes

Pasco & Roure (in press), Roure & Pasco (2020)

PERSPECTIVES FOR INTERVENTION

- Integrate a design-based exergames station in PE classes targeting health-related fitness
- Design-based exergames area in schools

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- Integrate a design-based exergames station in PE classes targeting health-related fitness
- Design-based exergames area in schools
- Integrate design-based exergames in student recreation centers
- Funding by health coverage providers
- Health professionals, PA before and after school
- Others…
- A fun theory related to PA promotion?

PERSPECTIVES FOR INTERVENTION

THANKS FOR YOUR ATTENTION

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