



Should we Wii?

an overview of the exercise gaming approach to falls research

Hands up who has bought a Wii for use in falls research/practice?



Keep them up it works the way you'd like it to

What are exergames?

Why use them?

Who is using them in a health (falls) context?

Where to from here?

What are exergames?



What are exergames?

Amiga/Atari Joyboard (1982)



Sensors used to transduce body movements into control of video game play

What are exergames?



Why use video games?

Video games have often received bad press with respect to health

- increased aggression and violence
- addiction to gameplay
- increased sedentary behaviour
- epileptic seizures
- Wii knee, haemothorax and ruptured tendons

Smith, ANZFPS, Dunedin 2010



Why use video games?

Because they are FUN






Smith, ANZFPS, Dunedin 2010



Why use video games?

Promote adherence

Perceptual and Motor Skills, 1997, 85, 835-844. © Perceptual and Motor Skills 1997

EFFECTS OF VIRTUAL REALITY-ENHANCED EXERCISE EQUIPMENT ON ADHERENCE AND EXERCISE-INDUCED FEELING STATES¹

JAMES J. ANNESI JOSÉ MAZAS
Rutgers, The State University of New Jersey *New York University*
The Club at Woodbridge Health and Fitness Center



Tectrix VR bike

39 participants (21-60yo)

VR vs standard exercise bikes (upright, recumbent)

Exercise 3x/week for 14 weeks, 20-30 mins/session

Attendance greater for VR over standard bike exercise ($F_{6,32} = 6.01, p < 0.02$)

83% adherence for VR, 61% recumbent, 57% upright

Smith, ANZFPS, Dunedin 2010



Why use video games?

Interventions for preventing falls in older people living in the community (Review)

Gilispie LD, Robinson MC, Gilispie WJ, Lamb SE, Gane S, Cumming RG, Rowe JB

We know fall risk can be reduced by exercise

Effective Exercise for the Prevention of Falls: A Systematic Review and Meta-Analysis

Catherine Sherrington, PhD,^{1*} Julie C. Whitney, MS,² Stephen R. Lord, DSc,¹ Robert D. Herbert, PhD,³ Robert G. Cumming, PhD,¹ and Jacqueline C. T. Close, MD¹

JAGS 56:2234-2243, 2008
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THE COCHRANE COLLABORATION®

High dosage of exercise is required (eg > 50 hrs or twice/week for 25 weeks).

Video games might offer a way to ensure compliance with exercise

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Who is using exergames in a health-related context?

Video Games That Keep Kids Fit



Researcher: Benjie on...
 Could the Wii be good for you?
 Burns victims in a UK hospital are the latest to be exposed to the apparatus.

Wiihabilitation

Researcher: Benjie on...
 Elderly wanted for Wii experiment



Researchers in Aberdeen are looking for people over 70 to take part in a study to see if the Nintendo Wii Fit could help their balance.

The University of Aberdeen and NHS Grampian want to find out if the games system's balance board can help prevent older people falling.

They are looking for volunteers who have fallen at least once in the past year and can attend regular sessions.

The study is funded by the British Geriatrics Society (BGS).

Smith, ANZFPS, Dunedin 2010



Who is using exergames in a health-related context?

Do older adults play video games?

Brand (2009) "Interactive Australia 2009"
 National survey of 1614 households



1034 individuals aged 36-50, 58% play video games

912 aged 51-65 52% play video games

221 aged 65+, 51% play video games





Smith, ANZFPS, Dunedin 2010



Who is using exergames in a FALL-related context? Check out our poster

VIRTUAL REALITY AND FALL RISK IN OLDER PEOPLE – A SYSTEMATIC REVIEW



Smith ST, Schoene D, Verhoef P, Lord SR
Neuroscience Research Australia, University of New South Wales, Sydney, Australia



But to give you a flavour.....

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Who is using exergames in a FALL-related context?

Clinical Use of Nintendo Wii™ Bowling Simulation to Decrease Fall Risk in an Elderly Resident of a Nursing Home: A Case Report

Robert Clark, PT, DPT; Theresa Korman, PT, PhD, ATC

Journal of Geriatric Physical Therapy Vol. 32:4:09

89-year-old resident diagnosed with an unspecified balance disorder and a history of multiple falls.

6 Wii Bowling session, 1 hour/session, over 2 weeks

Outcome measures:

	Pre	Post
Berg Balance Scale (49)	48	53
Dynamic Gait Index (19)	19	21
Timed Up and Go (13.5)	14.9	10.5
Activities-specific Balance Confidence (67%)	88%	90%



Figure 1. Components of the delivery: (a) seated with con...

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Who is using exergames in a FALL-related context?

CLIMACTERIC 2009; Early Online, 1-6

Is the Wii Fit™ a new-generation tool for improving balance, health and well-being? A pilot study

J. C. Nitz, S. Kays, R. Isles and S. Fu

University of Queensland, Physiotherapy, St Lucia, Brisbane, Australia

10 healthy women, aged 30-58, (8 completed)

Two 30-min WiiFit sessions per week for 10 weeks

Yoga, balance, aerobic and strength options

Outcome measures:

- TUG^{cognitive} speed improved
- Lower limb strength increased
- Unilateral stance (Balance Master) improved
- Weight loss observed



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Who is using exergames in a FALL-related context?

Exergames for Subsyndromal Depression in Older Adults: A Pilot Study of a Novel Intervention

Dori Rosenberg, M.P.H., M.S., Colin A. Depp, Ph.D.,
Ipsit V. Vahia, M.D., Jennifer Reichstadt, M.S.,
Barton W. Palmer, Ph.D., Jacqueline Kerr, Ph.D.,
Greg Norman, Ph.D., Dilip V. Jeste, M.D.

Am J Geriatr Psychiatry 18:3, March 2010

22 healthy older adults but presenting with SSD, aged >60, (19 completed)

Three 35-min Wii Sports sessions per week for 12 weeks

tennis, bowling, baseball, boxing and golf

Outcome measures:

TABLE 1. Mean Scores on Outcome Measures at Baseline, Week 6, and Week 12 (n = 19)

	Baseline Week 0, Mean (SD)	Mid-Point Week 6, Mean (SD)	End of Treatment Week 12, Mean (SD)	Significance of Change From 0 to 6 Weeks*, p	Significance of Change From 0 to 12-Weeks*, p
Quick Inventory of Depressive Symptoms-16	7.8 (3.7)	4.8 (2.3)	5.1 (3.0)	0.002	0.004
SF 36 Mental Composite	52.0 (9.5)	53.7 (7.9)	55.2 (9.6)	0.333	0.043
SF 36 Physical Composite	44.4 (11.3)	48.0 (8.2)	44.2 (9.9)	0.025	0.731
Beck Anxiety Inventory	6.4 (5.1)	—	4.7 (5.5)	—	0.228
RBANS Total Score	90.7 (18.0)	—	95.3 (16.9)	—	0.052

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Who is using exergames in a FALL-related context?

Dance Dance Revolution

Presents cognitively challenging, physical exercise to train stepping



Downloaded from bjm.bmj.com on January 18, 2010 · Published by group.bmj.com
BJSM Online First, published on November 29, 2009 as 10.1136/bjism.2009.066845

A novel Dance Dance Revolution (DDR) system for in-home training of stepping ability: Basic parameters of system use by older adults.

Stuart T Smith^{1,5},
Catherine Sherrington^{2,1},
Stephanie Studenski³,
Daniel Schoene¹,
Stephen R Lord¹

Smith, ANZFPS, Dunedin 2010



Who is using exergames in a FALL-related context?



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Where to from here?

Challenges posed by off-the-shelf video game technology



Sensor resolution of the gaming system may be poor/inappropriate for measuring movements in older adults

Interaction with off-the-shelf games not well suited to functional/cognitive limitations of older adults

Expensive to develop software titles for gaming consoles (Wii, Playstation, Xbox)

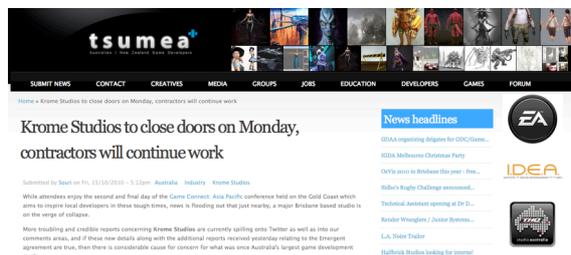
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Where to from here?

Expensive to develop age-appropriate games

BUT the game development industry NEEDS a new market



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Where to from here?

We need to build collaborations with game developers

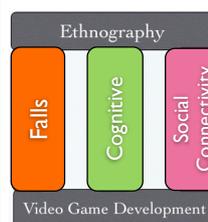


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Where to from here?

DDR, exergaming



strategy, memory logic games

casual, online games

Video Games for Independent Living (ViGIL)

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Should we Wii?

We should certainly explore the use of ALL exergames

They're fun

They facilitate engagement with exercise

They engage both physical and cognitive mechanisms

They employ levels of progression

They enable tracking of compliance for home-based exercise interventions

Smith, ANZFPS, Dunedin 2010



Thank you, if you're so inclined, join our facebook group to learn more.

(Games for Health Australasia)

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