

# Intrinsic motivation in sports, exercise, and exergames

Prof. Perttu Hämäläinen, 2020

"In science, if you know what you are doing, you should not be doing it.  
In engineering, if you do not know what you are doing, you should not be doing it."

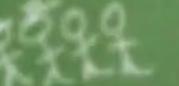


# Game Research

Public  
Deadline

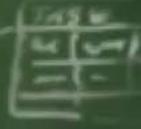


Research group



SILLY  
HATS !!!

:(){}:|:&}: :



“To be motivated means *to be moved* to do something. A person who feels no impetus or inspiration to act is thus characterized as unmotivated, whereas someone who is energized or activated toward an end is considered motivated.”

# Intrinsic and extrinsic motivation

- Extrinsic motivation: motivation by external elements, such as fame, winning a prize, earning a salary, scoring in an exam.
- Behavioral game design (Wednesday's topic) is largely about extrinsic motivation, especially the reward design principles.
- Intrinsic motivation: doing something for the sake of it, e.g., practicing something because one gets pleasure from becoming better at it

# Gamification

- Naive gamification centers around extrinsic motivation – slap on leaderboards, badges, trophies etc.
- Successful gamification often manages to facilitate intrinsic motivation as well through a wider application of game design thinking

# Intrinsic motivation

“Inherent tendency to seek out novelty and challenges, to extend and exercise one’s capacities, to explore, and to learn.”

“Children, in their healthiest states, are active, inquisitive, curious, and playful, even in the absence of specific rewards.”

“Natural inclination towards assimilation, mastery, spontaneous interest, and exploration that is so essential to cognitive and social development and that represents a principal source of enjoyment and vitality throughout life.”





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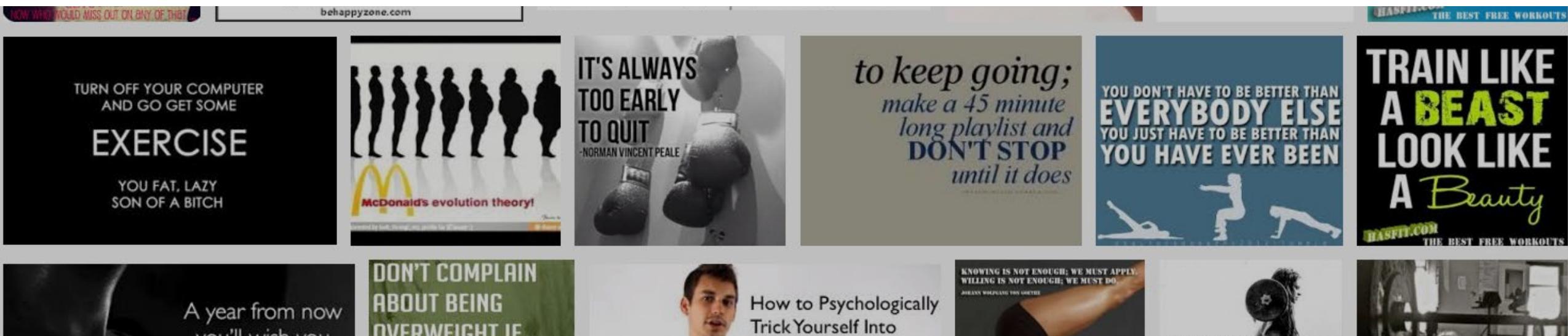


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# Problem: Exercise motivation

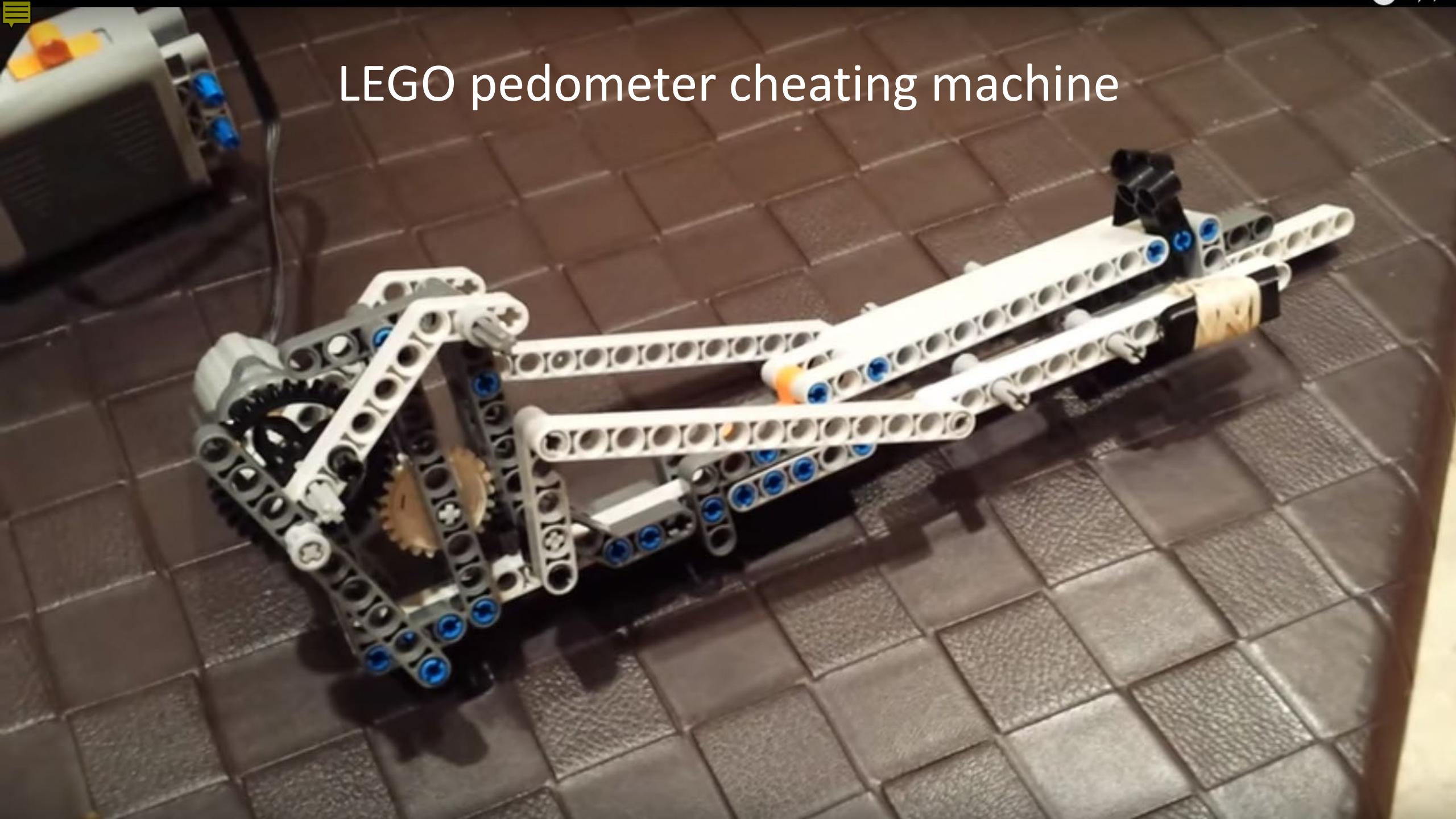




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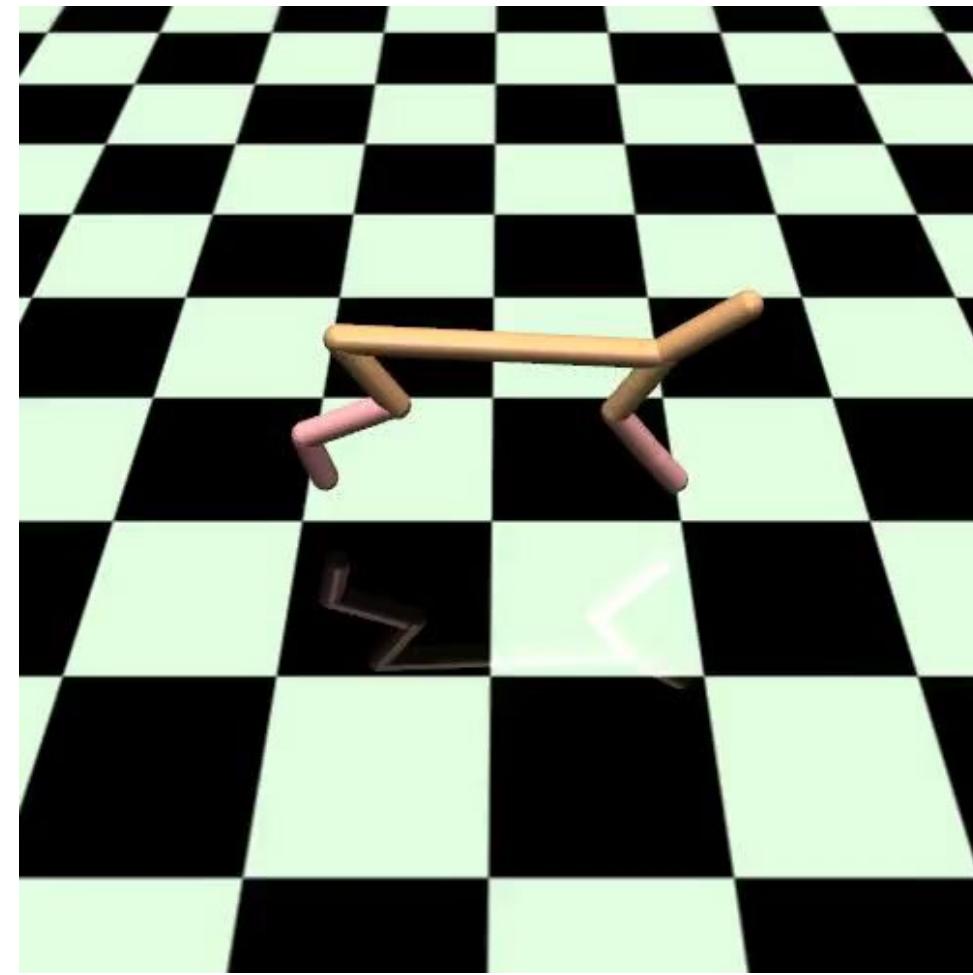
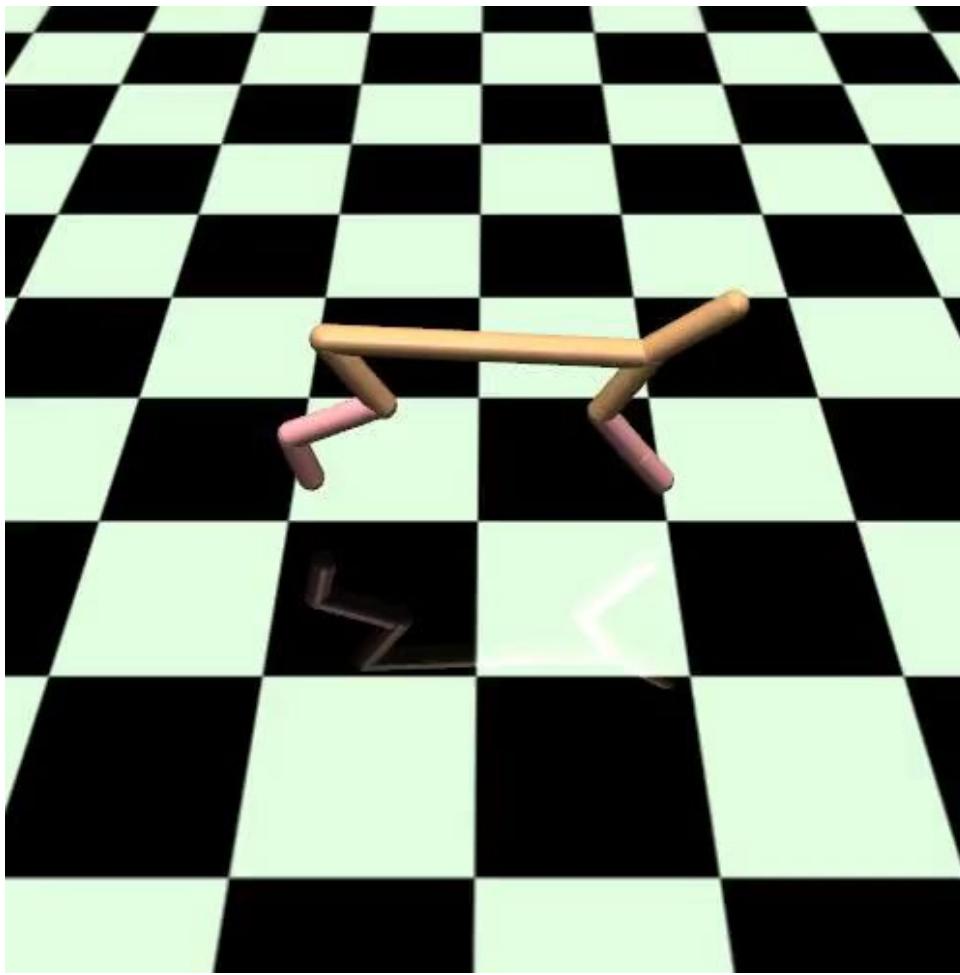
# LEGO pedometer cheating machine

[https://www.youtube.com/watch?v=MPse7\\_lsNc4](https://www.youtube.com/watch?v=MPse7_lsNc4)



# You get what you measure: Clickbaits

- Basic rule of gamification: you get what you measure, often at a hidden cost.
- Traditional good journalism: The header or title summarizes the news
- Journalism optimized based on click analytics: The news is held back.
- One gains clicks, but does one really gain loyal readership, positive effect on society etc.?



Story

Aesthetics

Mechanics

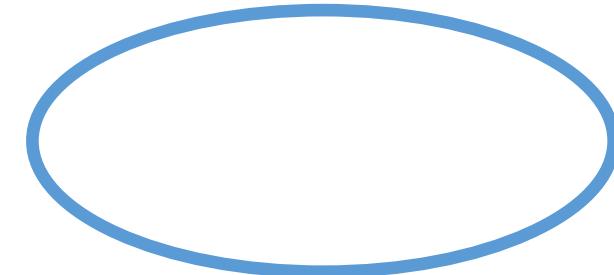
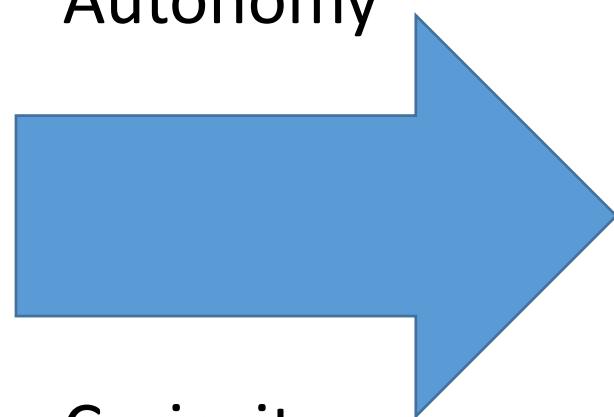
Technology

Competence

Autonomy

Curiosity

Fantasy



Saturday, September 29, 2012:

Watching my 11 months old daughter bubbling over with (drunk from the) joy of learning to stand without support ensures me that I'm on the right path when researching sports education technology and exergames. These are the experiences that I want to create and share.



# Supporting competence



<https://k62.kn3.net/taringa/A/9/2/E/7/E/doctorjav/674.gif>

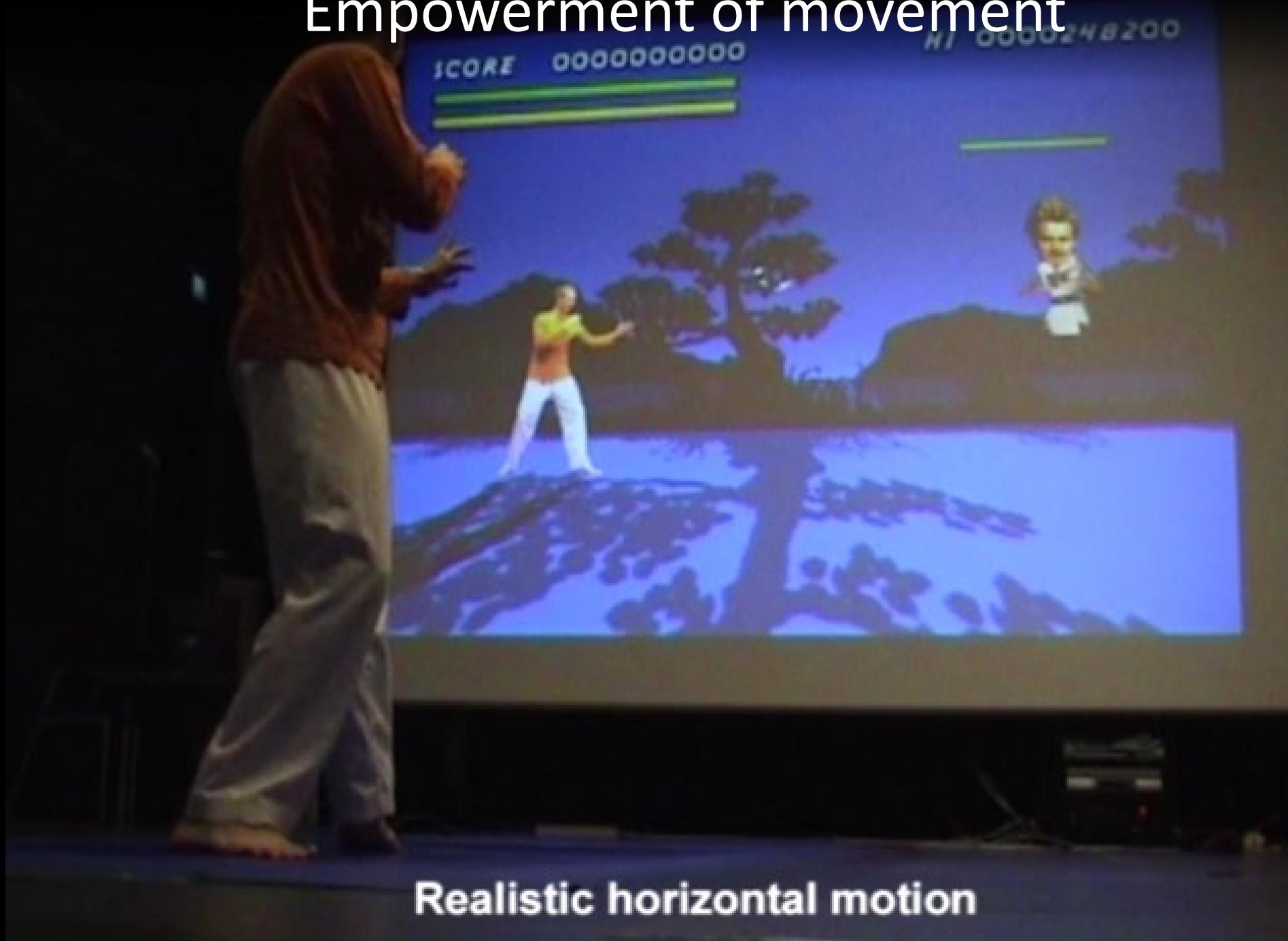
# Kick Ass Kung-Fu (Hämäläinen et al., CHI 2005)



# Empowerment of movement



# Empowerment of movement



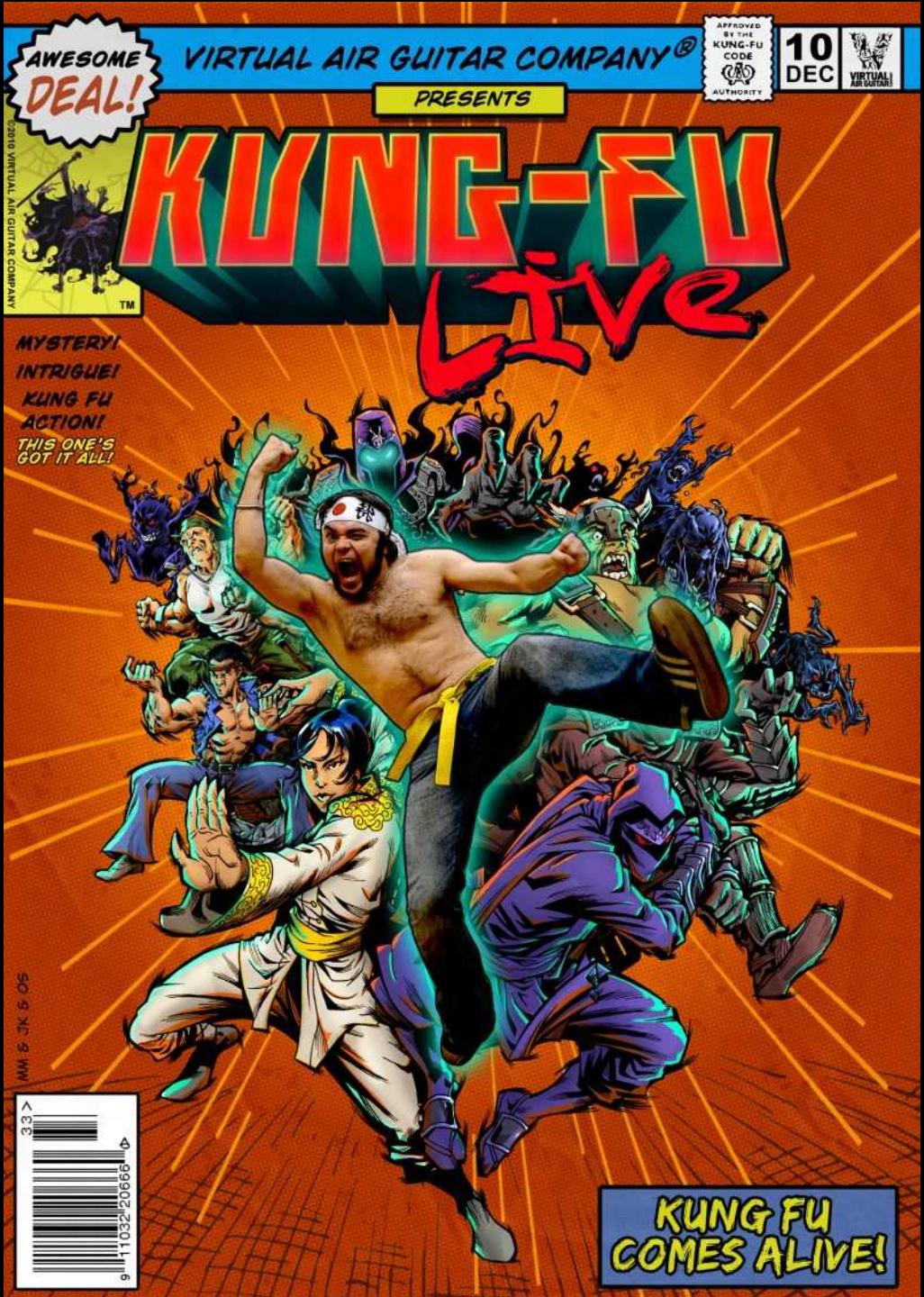
Realistic horizontal motion

Digital vs. real?











# KUNG-FU Live

Copyright 2010 Virtual Action Company

# Mixed Reality Empowerment (2013)



≡

TIME LEFT

00:23

SUPER  
**STOMP**

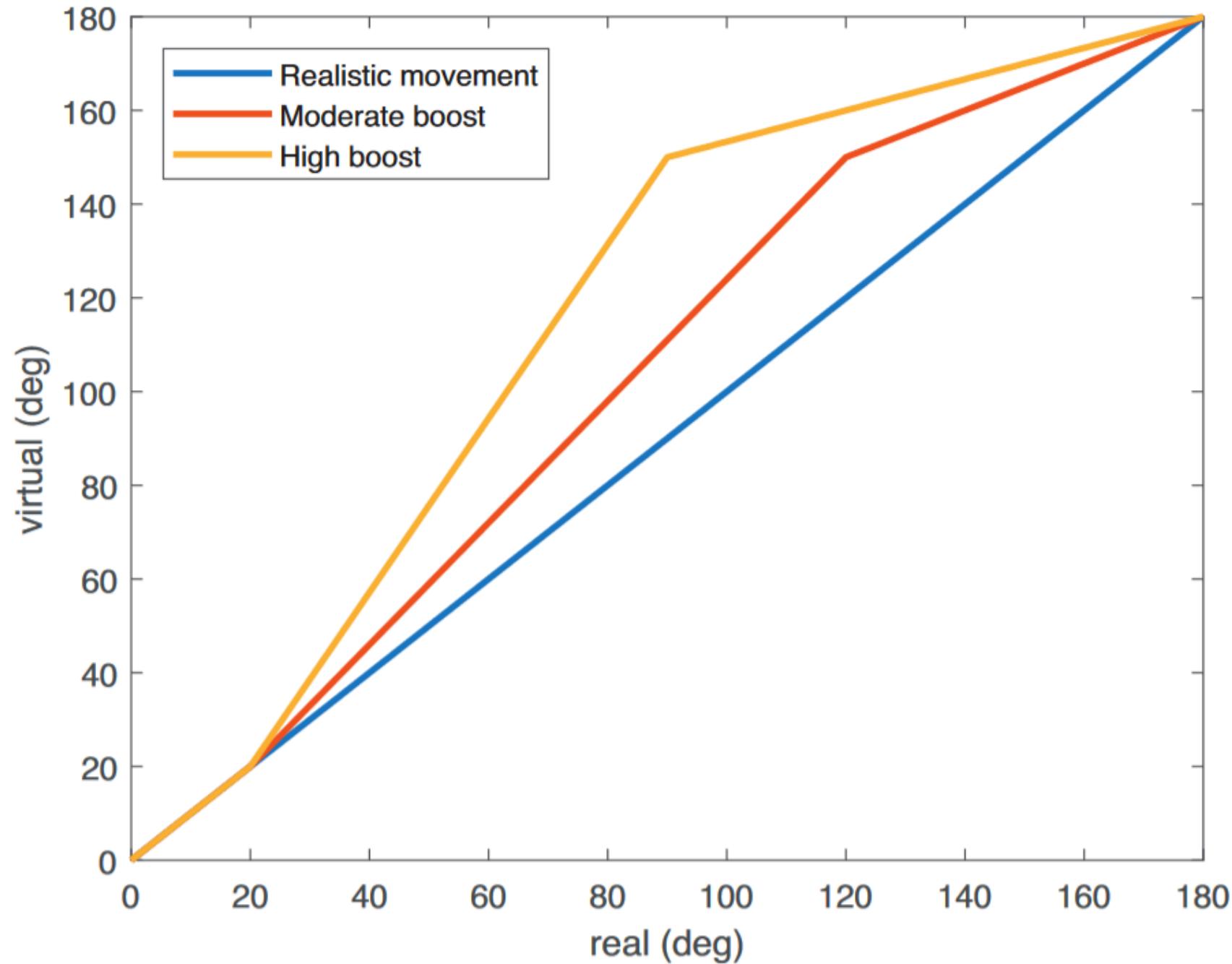
YOU	4 - 2	OTHER
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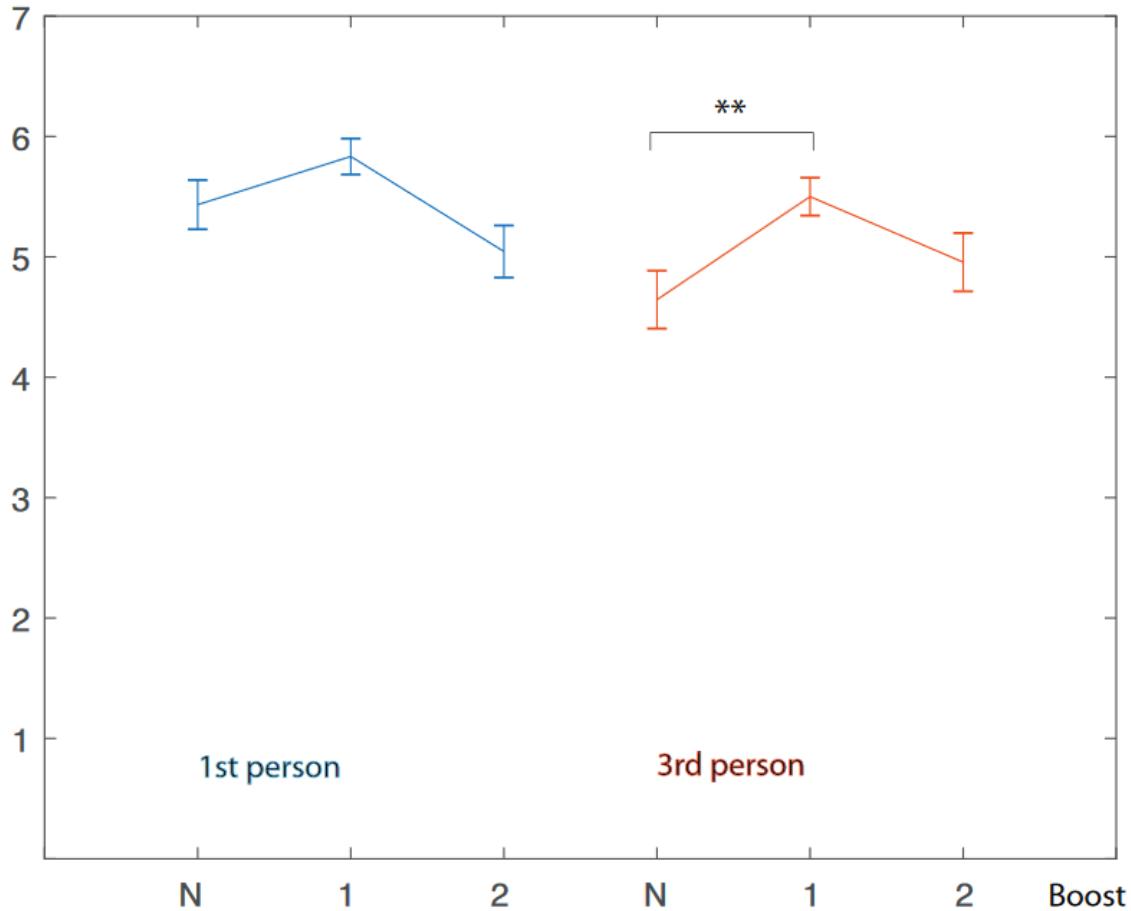


# Competence through exaggerated avatar flexibility

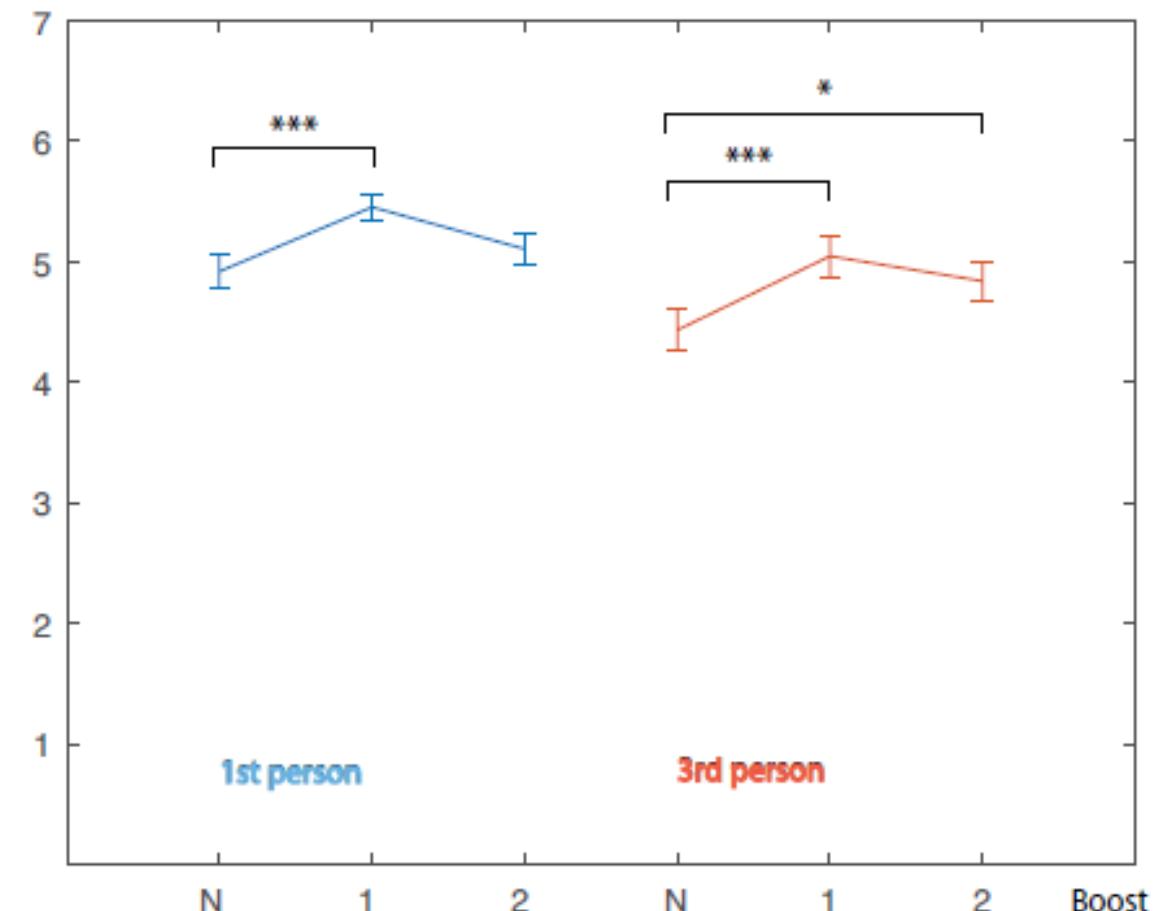




”I didn’t notice there was boosted movement, but I remember being very surprised that I was able to hit the high targets, initially it was kind of bizarre, like **’Wow am I really that good’**”



**Figure 6. Naturalness of motion.**



**Figure 8: Competence in performing the task.**

# Challenges of empowered, dynamic movement in VR

- Very hard to achieve the following at the same time:
  1. Natural full-body movement, e.g., martial arts fighting where one moves around, punches and dodges
  2. Navigating large spaces
  3. Low simulator sickness
- Natural 1st person: space limited
- Steering (joystick) locomotion: simulator sickness
- Teleport (the most common VR locomotion): interferes with movement, requires careful aiming

# Intro: A novel VR display and interaction technique



# Curiosity







Curious exploration, movement diversity









# Interest—The Curious Emotion

Paul J. Silvia

*University of North Carolina at Greensboro*

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**ABSTRACT**—*Despite their interest in why people do what they do, psychologists typically overlook interest itself as a facet of human motivation and emotion. In recent years, however, researchers from diverse areas of psychology have turned their attention to the role of interest in learning, motivation, and development. This article reviews the emerging body of work on the psychology of interest, with an emphasis on what contemporary emotion research has learned about the subject. After considering four central questions—Is interest like other emotions? What functions does interest serve? What makes something interesting? Is interest merely another label for happiness?—the article considers unanswered questions and fruitful applications. Given interest’s central role in cultivating knowledge and expertise, psychologists should apply research on interest to practical problems of learning, education, and motivation.*

## IS INTEREST AN EMOTION?

Interest is an eccentric emotion. Many theories don’t include interest in their lists of major emotions, and a few theories reject interest as an emotion altogether. Nevertheless, interest has a proud history in emotion psychology. In his landmark book on emotional expression, Charles Darwin (1872/1998) described emotions related to learning, thinking, and exploring. Darwin’s terms—*abstracted meditation, perplexed reflection, and stupefied amazement*—seem quaint to modern readers, but his ideas remain ahead of their time. Many decades later, modern emotion psychology doesn’t know much about what I’ll call *knowledge emotions*: states such as *interest, confusion, surprise, and awe*.

A good case can be made for viewing interest as an emotion. Modern theories of emotion propose that emotions are defined by a cluster of components. Typical emotional components are physiological changes, facial and vocal expressions, patterns of



Toys 1

<https://youtu.be/9FizCJdJDec>

Random Things 5





# Curiosity/novelty through crafting mechanics

# Curiosity/novelty through user-generated content

x2



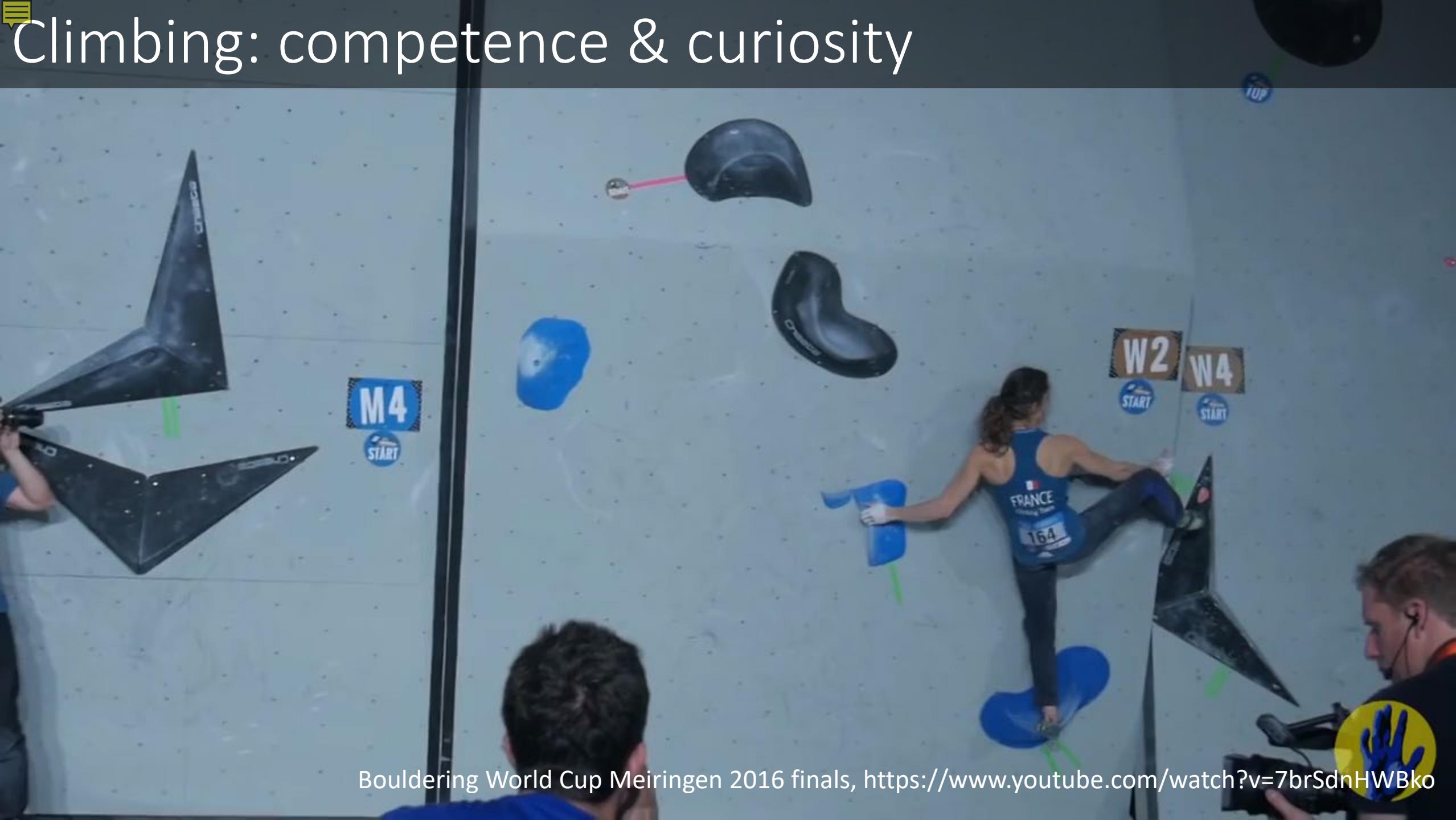


# Supporting a mixture of motivations



# Curiosity and relatedness through emergent dynamics





# Climbing: competence & curiosity

Bouldering World Cup Meiringen 2016 finals, <https://www.youtube.com/watch?v=7brSdnHWBko>



Novelty, autonomy, competence, relatedness

ValoClimb, a.k.a., Augmented Climbing Wall, CHI 2016

# Augmented Climbing Wall recap

- Competence: video beta, adjustable difficulty level, diversification of challenges (augmented climbing is less centered on finger strength, can get started on difficult levels although can't finish)
- Autonomy: level editor (user-generated content), quick browsing and selecting from a large variety of alternative routes and games (increase the probability of everyone finding something suitable)
- Relatedness: increased climber-spectator interaction through spectators warning the climber about dangers the climbers can't see (e.g., behind the climber's back), sharing and commenting of routes
- Curiosity: novel challenges and body poses, novel content created by users

# Locations

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