Carleton UNIVERSITY | Faculty of Engineering and Design

Technology & Active Lifestyle

A presentation especially for

ITEC5001 Seminar

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Outline

1. Thesis Research:

   Dynamic Player Pairing:
   A Competitive vs. Cooperative Attitudes Approach

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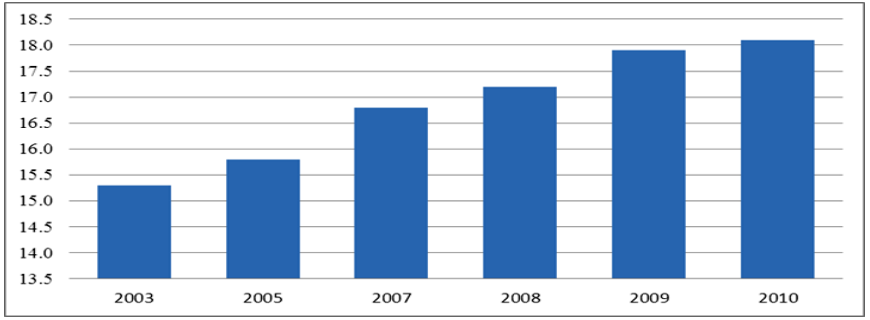
2. Wearable Technology:

   Keeping Users Engaged:
   A long-term study of wearable based, gamified exercise applications

Zhao Zhao
Ali Arya
Anthony Whitehead
Ali Etemad

Background



Canadian Institute for Health Information Health Indicator Reports.

- Exercise
- Exergames
- Motivation and Enjoyment
  - Intrinsic Motivation
  - Social Facilitation
- Competition and Cooperation
  - Both motivate behaviour
  - Competitive versus cooperative exergames

Objectives

- Motivate continuous exercise
- Novelty Effect
- Maximize enjoyment and engagement
  - Matched attitude pairings
    - Competitive and competitive
    - Cooperative and cooperative

Research Question

Would pairing people with similar attitudes increase enjoyment and hopefully, increase exercise motivation within the context of a videogame?

Experimental Design

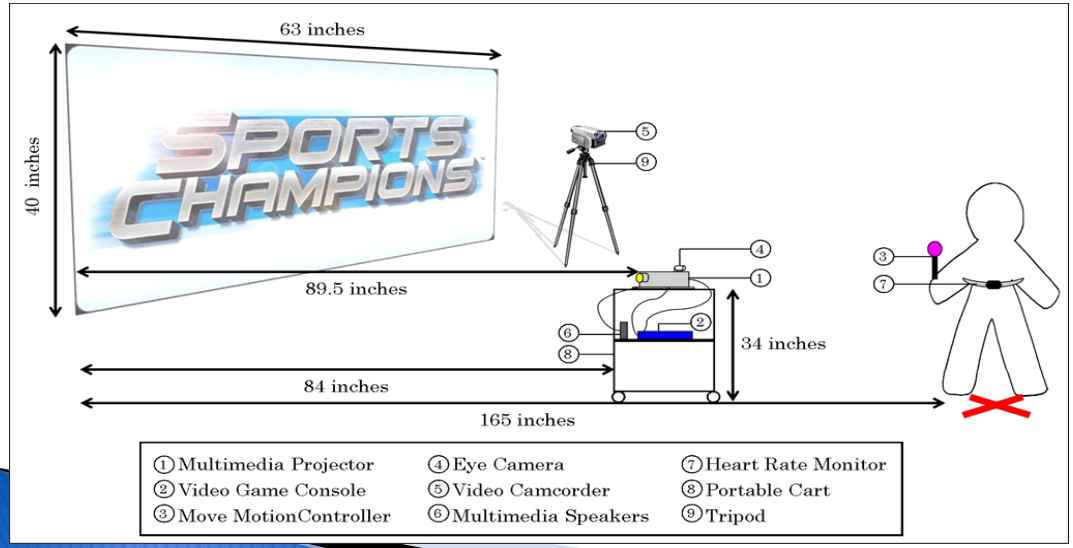
	Attitude Pairings		
Game Scenario	Competitive Match	Cooperative Match	Mismatch
Competitive	7	7	17
Cooperative	7	7	17

- Competitive Match = competitive vs. competitive
- Cooperative Match = cooperative vs. cooperative
- Mismatch = competitive vs. cooperative

- Hypothesis:
  - Matched pairings would enjoy playing together, yet mismatched pairings would not.

Method

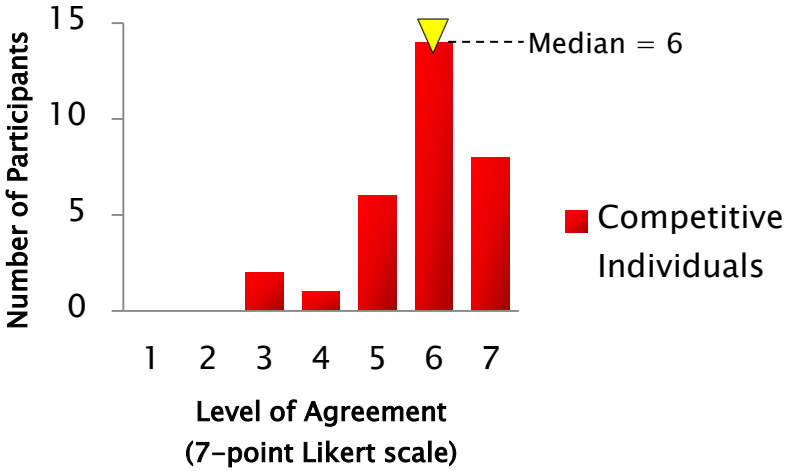
- Practice session
- Play game (virtual bocce)
- Questionnaire

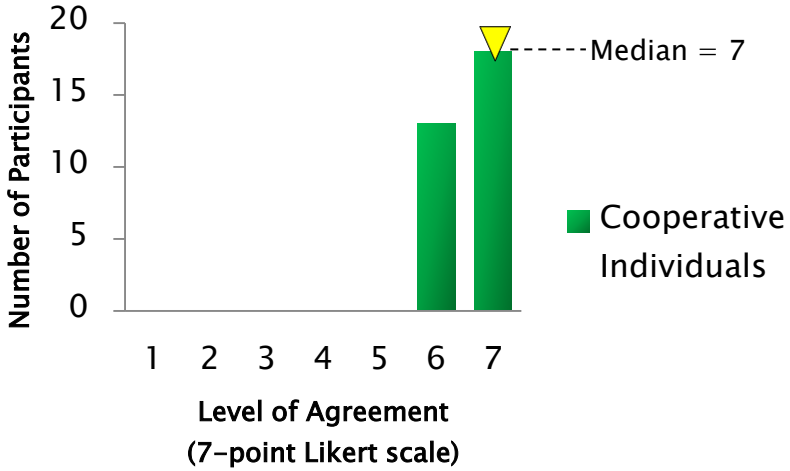


Analysis and Results

- **Individual Attitude**
- **Subjective**
  - **Effect of Individual Attitude**
  - Effect of Attitude Pairings
  - Effect of Gender Pairings
  - Effect of Relationship
- **Qualitative**

Effect of Individual Attitude



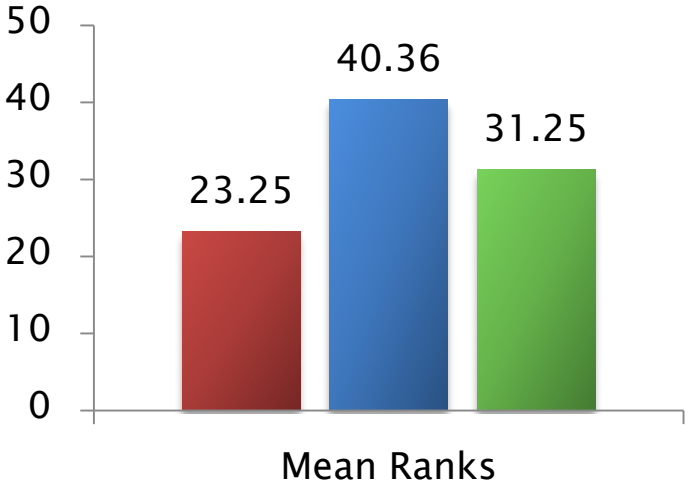


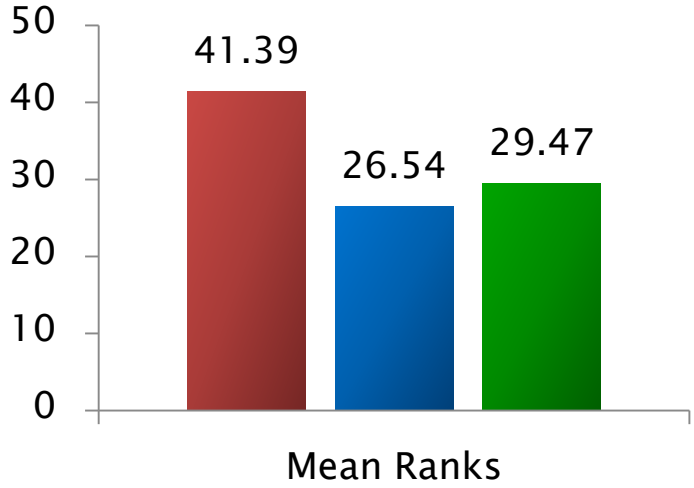
A Median test showed that cooperative individuals enjoyed playing together with another person more than competitive individuals ($x^2 = 4.17$, $p = 0.04$).

Analysis and Results

- Subjective
  - Effect of Individual Attitude
  - **Effect of Attitude Pairings**
    - **Competitive Match = competitive vs. competitive**
    - **Cooperative Match = cooperative vs. cooperative**
    - **Mismatch = competitive vs. cooperative**
  - Effect of Gender Pairings
  - Effect of Relationship

Effect of Attitude Pairings



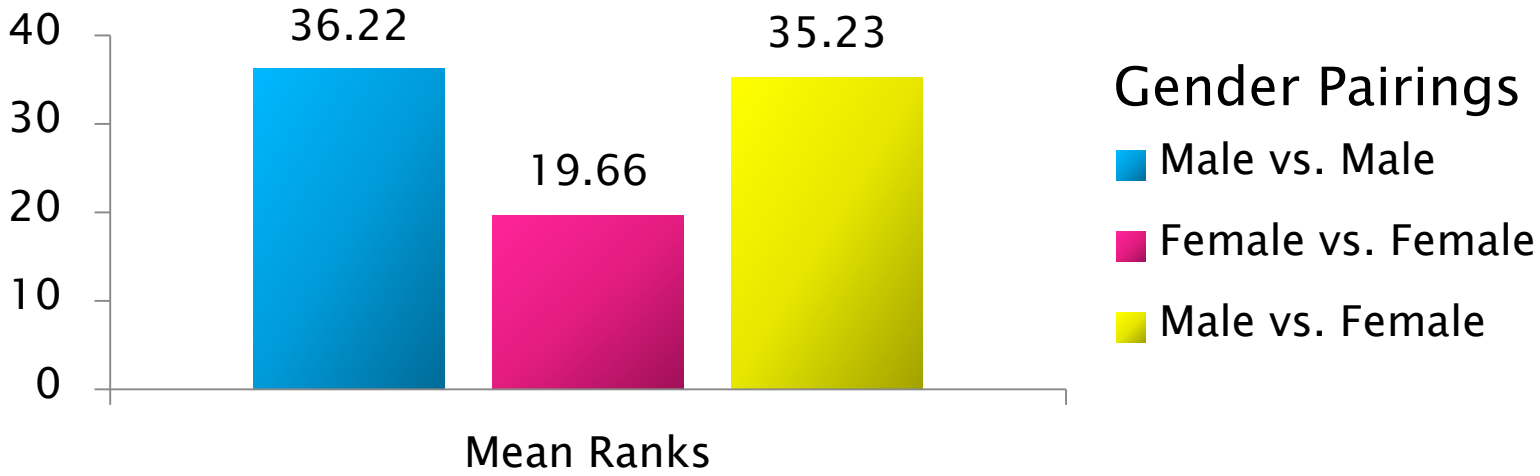


A Kruskal–Wallis test showed that cooperative pairings enjoyed playing mostly with another person ($H = 7.83$, $p = 0.02$) and competitive pairings preferred playing mostly alone ($H = 6.58$, $p = 0.04$).

Analysis and Results

- Subjective
  - Effect of Individual Attitude
  - Effect of Attitude Pairings
  - **Effect of Gender Pairings**
    - **Male vs. Male**
    - **Female vs. Female**
    - **Male vs. Female**
  - Effect of Relationship

Effect of Gender Pairings

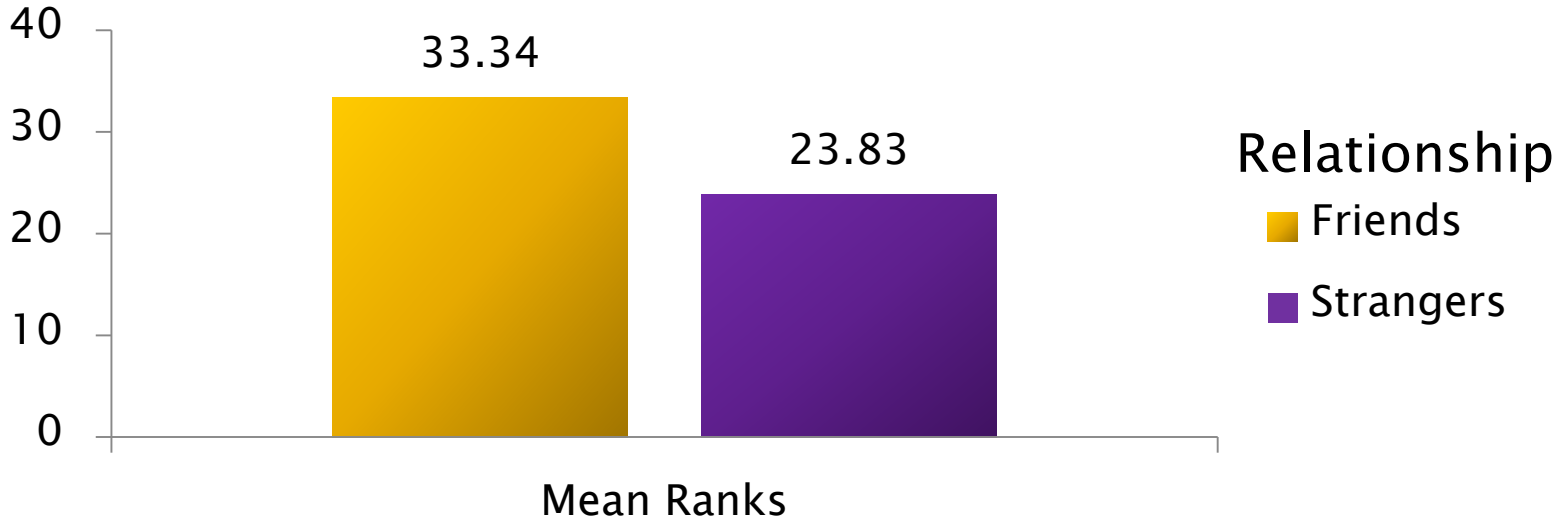


A Kruskal–Wallis test showed that male vs. male and male vs. female pairings enjoyed playing mostly a competitive game whereas female pairings least enjoyed playing in a competitive game ($H = 10.67$, $p = 0.01$).

Analysis and Results

- Subjective
  - Effect of Individual Attitude
  - Effect of Attitude Pairings
  - Effect of Gender Pairings
  - **Effect of Relationship**
    - **Friend vs. Stranger**

Effect of Relationship



A Mann-Whitney U test showed that friends would prefer playing together compared to strangers ($U = 208$, $p = 0.07$).

Qualitative Results

- Thematic Analysis

1. Positive reciprocation:

2. Winning reactions:

Design Recommendations

- Offer opportunities for interaction
- Offer competitive scenarios for competitive individuals
- Offer a second player for cooperative individuals
- Attitude test may be embedded into a MMORPG
  - If players are not friends, matched attitude pairings could increase game enjoyment
- If gender is known:
  - Male and Male – competitive game
  - Female and Female – cooperative game
  - Male and Female – competitive game

Keeping Users Engaged: A long-term study of wearable based, gamified exercise applications

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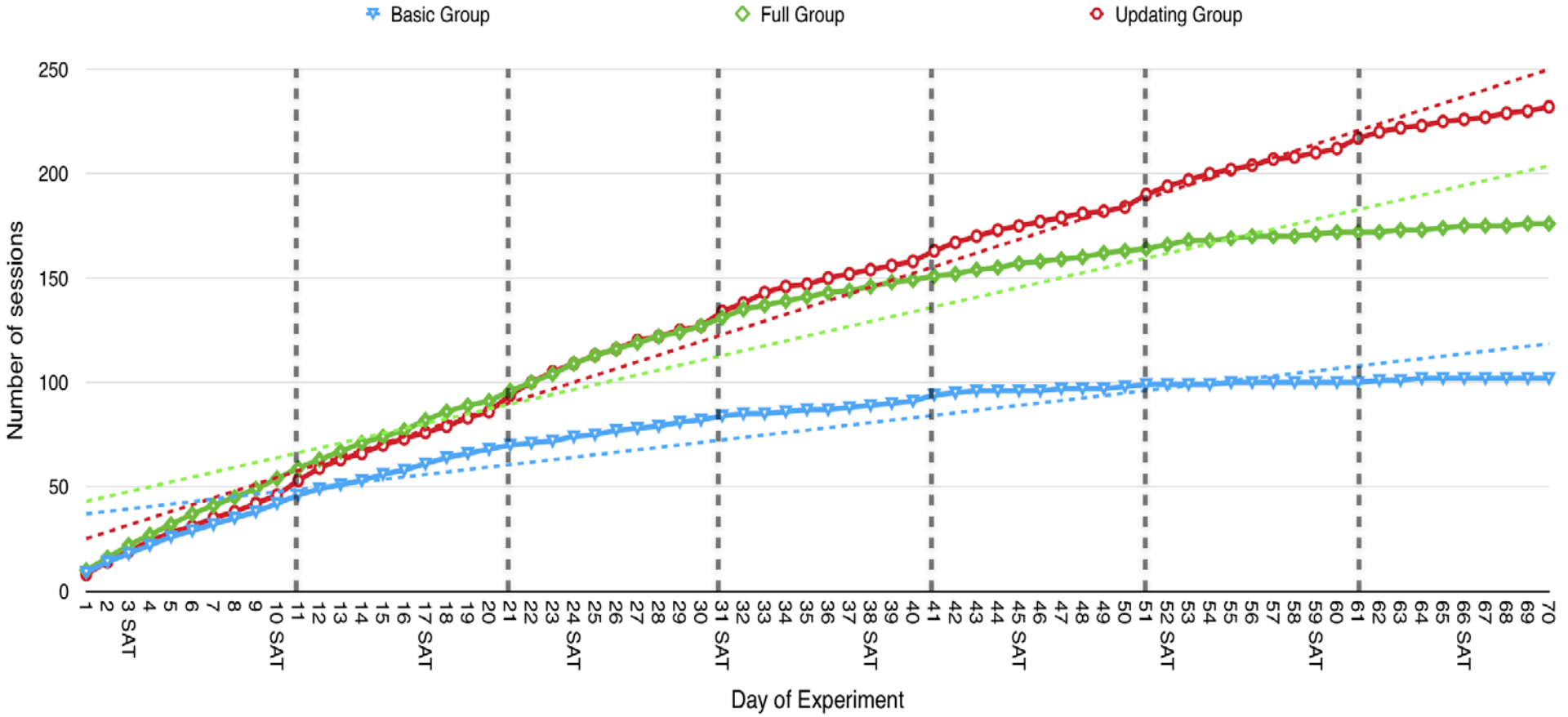
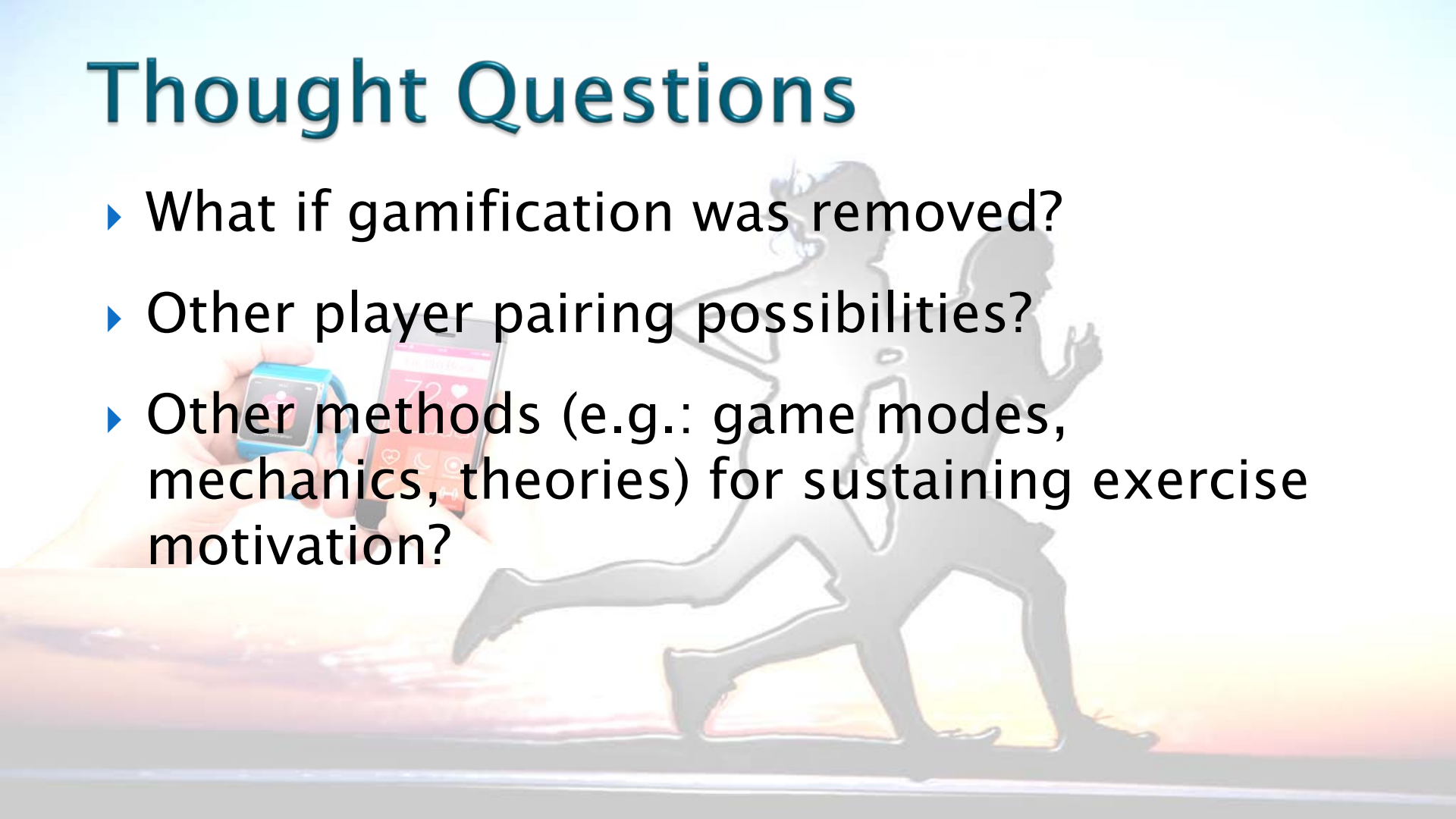
Wearable & Gamification

- Long-term study
  - Base features
  - Full features
  - **Gradual upgrade**

Wearable & Gamification



Thank you!

Thought Questions

- What if gamification was removed?
- Other player pairing possibilities?
- Other methods (e.g.: game modes, mechanics, theories) for sustaining exercise motivation?