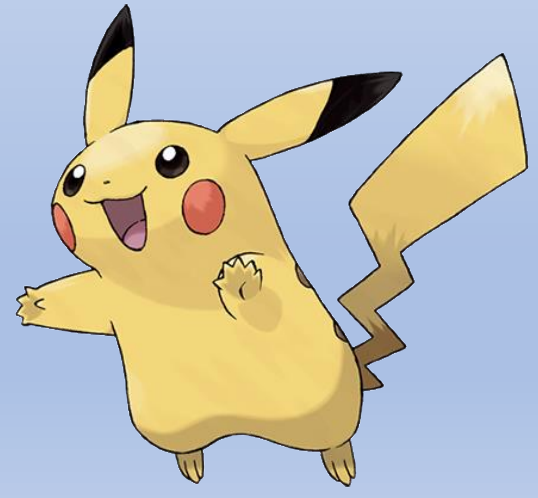
Effects of Playing Pokémon Go on Physical Activity: Preliminary Results of a Randomized Controlled Trial

Noe Crespo, PhD, MPH

School of Public Health

San Diego State University



Problem

- Leading causes of death in the US
  - Heart disease
  - Cancer
- Physical activity reduces risk of many health complications
  - High blood pressure, glucose control, mental health, etc.
- 21% of adults meeting physical activity guidelines
- 30% of high school students meet physical activity guidelines
- Barriers to engaging in sufficient physical activity
  - Time constraints (work schedule), access to facilities (parks, trails), neighborhood factors (safety concerns), social support (spouse, friends), neighborhood design (walkability)
- Novel strategies are needed to motivate people to engage in physical activity

Pokémon Go

- Augmented reality game
  - Developed by Niantic (stemmed from Ingress game)
  - Released summer 2016
  - Free to download (with in-app purchases)
  - Available for iOS and Android
  - Was a huge success

- Game features
  - Players are challenged to catch all Pokémon available
  - Must move to different locations to find and catch different Pokémon
  - Game tracks progress, player level, distance walked, Pokémon caught etc.
  - Each level is progressively more difficult to achieve

Early Evidence

- Retrospective study of Microsoft Band user data (Althoff et al. 2016)
  - Daily steps increased by 1,473 steps (25%) compared to before playing game
- Pre-post study of 167 players (Xian et al. 2017)
  - Daily steps increased 1,976 steps (34.8%) compared to before downloading the game
- Cohort Study 1,182 young adults (Howe et al. 2016)
  - Daily steps increased 955 steps (22%) compared to before downloading the game
- Cross-sectional study of university students
  - Compared to ex-players, current players spend more time walking/jogging to catch Pokémon
- Observational study of current players (Wattnapisit 2018)
  - No relationship between playing and physical activity

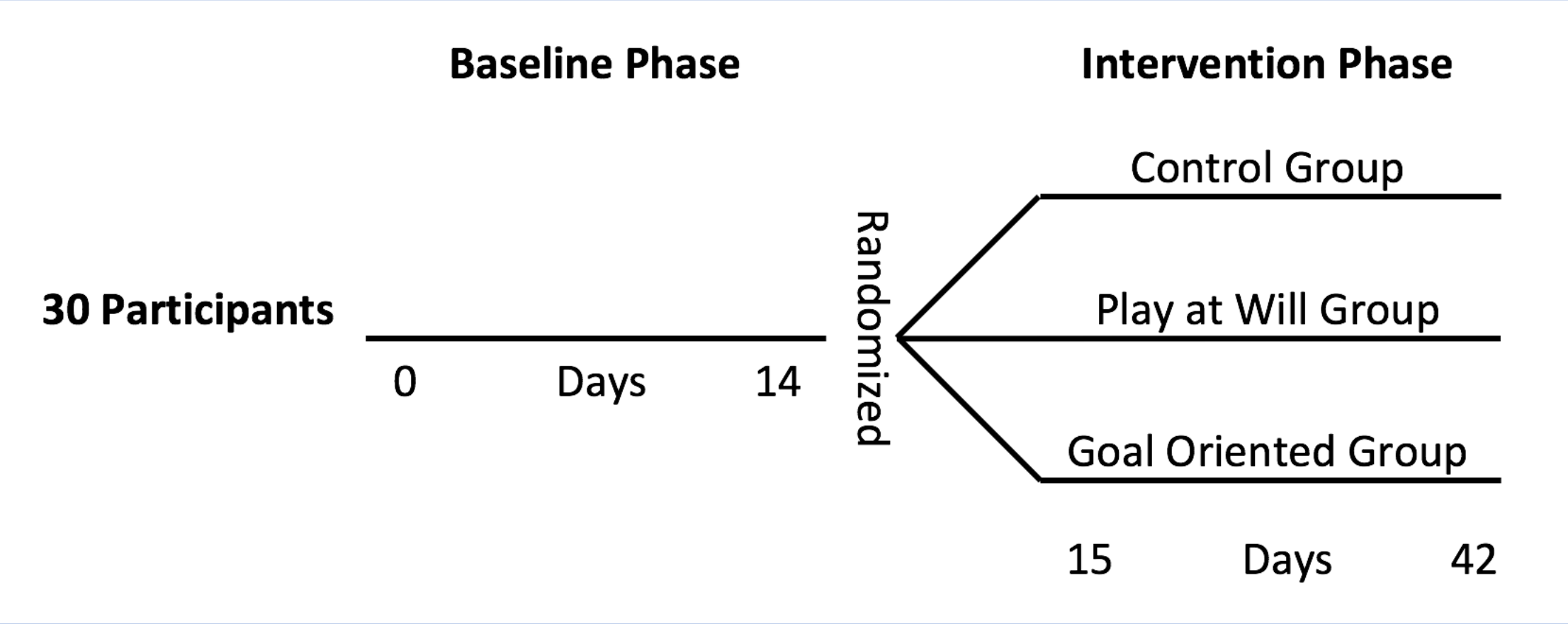
Current Study

- Funded by SDSU's University Grants Program ($10K)
- Aims:
  - To test the preliminary efficacy of playing Pokémon Go to increase daily steps among college students

- Inclusion Criteria
  - 18-25 years old
  - Full-time undergraduate student at SDSU
  - Can walk leisurely
  - Novice Pokémon Go player (not reached level 5)
  - Have 1GB of free space on mobile phone

Study Design

- 3-group Randomized Controlled Study



Protocol

- Control Group (n=10)
  - Continue with normal activities; do not download Pokémon Go
- Play at Will Group (n=10)
  - Play at least once and then play as much as desired
- Goal Oriented Group (n=10)
  - Achieve level 20
  - Provided with tips and resources to play game
- Incentives
  - Battery charger to complete baseline assessments
  - $50 at end of study

Study Measures

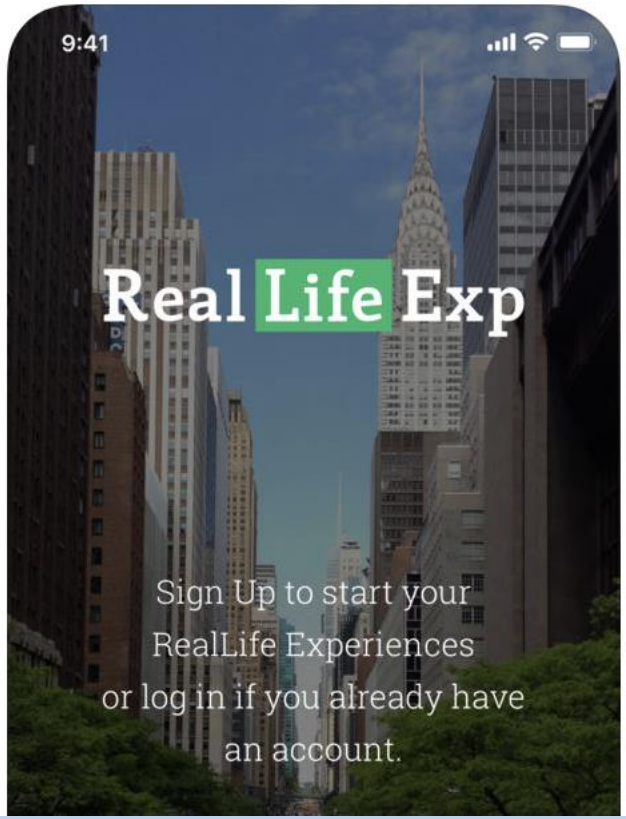
- Demographics survey
- Height and weight
- Fitbit
  - Worn continuously on the non-dominant wrist for entire study period
  - Study team created Fitbit account and managed/tracked wearing time
  - Participants were contacted to remind them to wear Fitbit (if needed)
  - Participants asked not to track/view their steps

Study Measures

- GPS tracking
  - FollowMee application installed on user's phone to track GPS location continuously
  - GPS location collected on 10 minute intervals
  - Study team created account to track/collect data
  - If needed, participants were contacted to remind them to turn on app

Study Measures

- Ecological Momentary Assessment
  - Installed RealLife Exp application on user's mobile phones
  - Collected 3 surveys per day for 7 days during the 5th week
  - Each survey asked about:
    - Affect, playing Pokémon Go, stress, social interactions, barriers to playing
  - Surveys were prompted in a random time during a selected time window



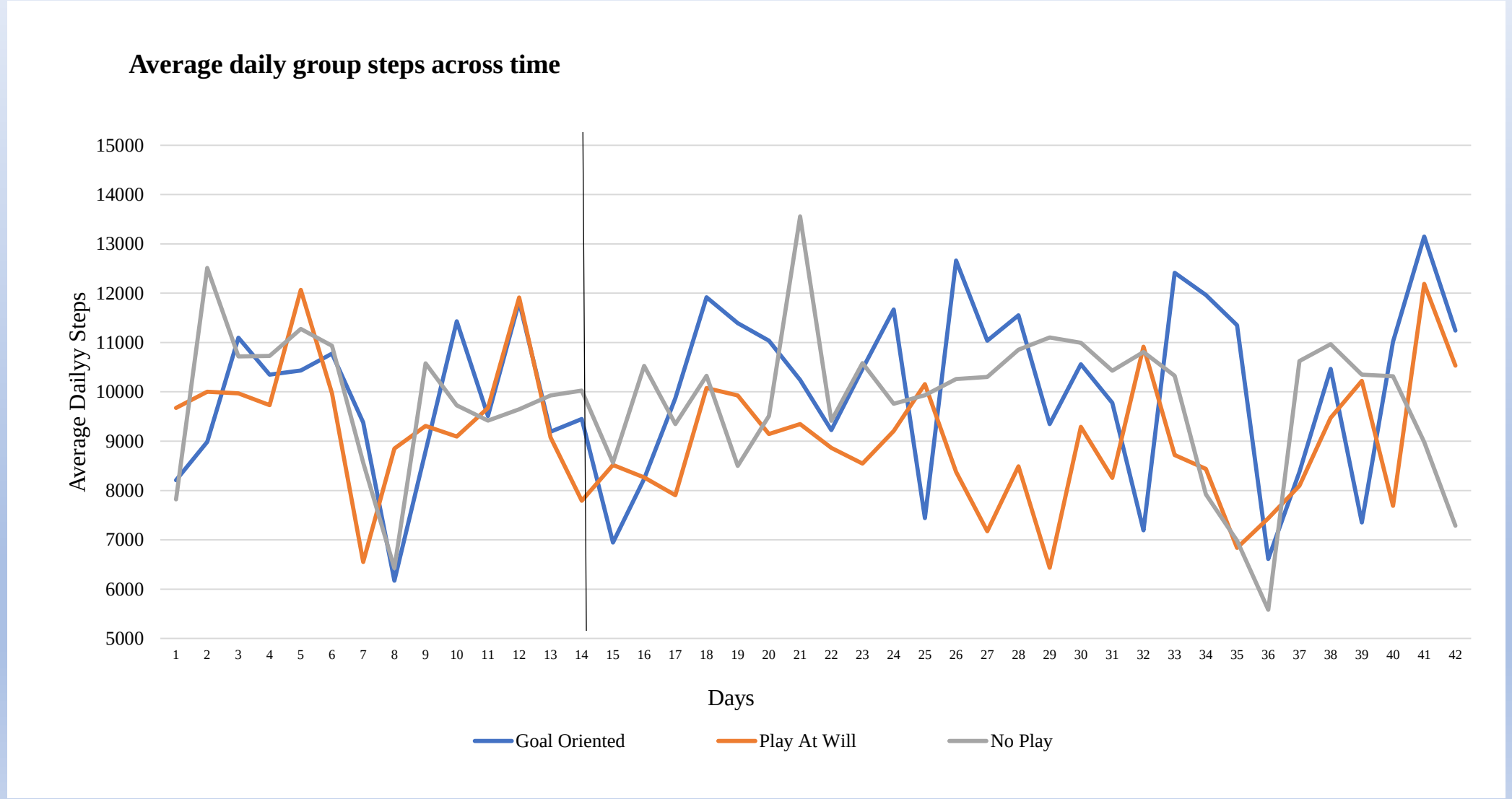
Study Measures

- Pokémon Go Player Data
  - Pokémon Go application tracks player level data
    - Number and type of Pokémon caught
    - Trainer level (0-40)
    - Player XP (points)
    - Distance traveled while app is open
    - Medals obtained
  - Study team created account to track/collect player data
  - Participants were asked to take snap shots of app information

Results

- 19 female (63%)
- Average 21.1 years old
- Player Level ($p<0.05$)
  - Goal oriented: 15.3 (5.8)
  - Play at will: 6.0 (5.0)
- XP Level ($p<0.05$)
  - Goal oriented: 143,446
  - Play at will: 26,876

Results


Average daily group steps across time
Average Dailyy Steps
15000
14000
13000
12000
11000
10000
9000
8000
7000
6000
5000
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42
Days
Goal Oriented
Play At Will
No Play

Conclusions

- Study measures and protocol was feasible and acceptable to participants
- Playing Pokémon Go slightly increases steps per day (~5%)
- Playing Pokémon Go may increase outdoor activities

Future Directions

- Longer-term studies
- High-risk, inactive populations
- Dose-response relationship
- Pokémon Go game characteristics (goal setting, social interactions)
- Health outcomes (blood glucose, blood pressure)

Acknowledgements

- Alma Behar
- Daniel Moreno
- Nhat Quang Thai
- Justin Ilejay
- Nanette Lopez
- Kiana Spencer
- Stefany Pickett
- Ming-Hsiang Tsou
- John Elder
- Genevieve Dunton

Thank You!