Mobile Videogames for Risk Reduction and Prevention

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National Institute of Child Health and Human Development: R01HD062080; Women’s Health Research at Yale; Dartmouth’s Center for Technology and Behavioral Health
Video Game to Help Urban Teens Avoid HIV Infection Focus of Nearly $4 Million Grant To Yale

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New Haven, Conn. — Creating a video game to help teens avoid sex, drugs and alcohol use—behaviors that could lead to HIV infection—is the aim of a five-year, $3.9 million research grant to Yale from the Eunice Kennedy Shriver National Institute of Child Health and Human Development. The grant, to be paid out over five years, will fund work by Lynn Fiellin, M.D., assistant professor of medicine at Yale School of Medicine.

Fiellin’s study is designed to develop and test an interactive virtual reality-based video game called “Retro-Warriors” that will teach ethnically diverse adolescents how to make healthier choices. The research goes beyond the use of a game for education and proposes to create a world in which the game players can engage in role-playing to learn to avoid risky behaviors that could lead to HIV infection.

The study has far-reaching implications including the potential for this technology to become portable and global.

“The game could travel with the player—it could be used at home, on a console, a cell phone or a personal digital assistant,” said Fiellin, who also points to international
Project Goals

• To develop an interactive mobile videogame designed to help young teens acquire and practice skills to avoid or reduce behaviors that increase their risk for HIV

• To rigorously evaluate its impact using standardized “out-of-game” assessments as well as “in-game” data from the iPad software
The play2PREVENT Lab

Science Side:
- Lynn Fiellin, MD
- Kimberly Hieftje, PhD
- Lindsay Duncan, PhD
- Cindy Crusto, PhD
- E. Jennifer Edelman, MD
- Deepa Camenga, MD
- Marjorie Rosenthal, MD
- Linda Mayes, MD
- David Fiellin, MD
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The Community Side:
- Farnam Neighborhood House
- LEAP
- Clinton Avenue School
- McGivney Community Center
- John Martinez School
- PALS

Game Side:
- Ben Sawyer (Digitalmill)
- Alex Seropian (Industrial Toys)
- Schell Games
  - Jesse Schell (Founder, CMU)
  - Bonnie Bogovich (Audio Artist)
  - Derek Hetrick (Character Artist)
  - Heidi McDonald (Writer)
  - John Kolencheryl (Game Engineer)
  - Josh Hendryx (Background Artist)
  - Manoj Anand (Producer)
  - Patrick McKiernan (Art Manager)
  - Peter Kinney (Design Intern)
  - Rebecca Cordingley (UI Artist)
  - Reagan Heller (Art Director)
  - Rick Matchett (Tech Director)
  - Sabrina Haskell (Project Director)
  - Samantha Verlihay (UI Artist)
- Noah Falstein (Google)
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National Institute of Child Health and Human Development grant: R01HD062080
PlayForward: Elm City Stories

- Aligned closely with health behavior change theory

- Touch screen-based on the iPad

- RPG-like with over-arching story and recurrent player characters

- Player builds their Aspirational Avatar (Me Power): a representation of who they ideally want to be in the future

- 4 mini-games:
  - Knowledge: Know Sense
  - Self-efficacy around refusal: Refusal Power
  - Risky people/situations: People Sense
  - Short/long-term priorities: Priority Sense
**Project Ivy: My Future is My Life (Updated Design)**

- **2D RPG**: Choose your own adventure-style game about the effect of choices on short-term and long-term life goals.
- **Allows teens (11-14)** practice making decisions about risky situations.
- **Set primarily in junior and high school**.
- **Goal**: Change player's real-world behaviors about sex.

**Basic Gameplay Loop**

1. **Player creates Aspirational Avatar based on their own life**.
2. **Player uses automatically generated Epilogue Collages to plan their life's journey**.
3. **Player explores their life**, looking for Challenge Scenes that will help them improve their Epilogue Collages.
4. **Player tries various Challenge Scenes** to complete them successfully, they must improve their Player Stats.
5. **Player plays minigames to improve their stats and improve their profile**.
6. **Improve stats to successfully complete Challenge Scenes**.
7. **In the Challenge Scene, the player navigates a branching storyline through a series of interactive graphic novel-style scenes**.
8. **After completing a Challenge Scene, additional scenes are unlocked**.
9. **Player continues playing minigames and completing Challenge Scenes until no more scenes are unlocked**.
10. **The player can now "re-roll" their life to see updates to their Epilogue Collages**.
11. **The player returns to the LifeLine where they replay scenes to improve their Epilogue Collages**.

**1. Aspirational Avatar (The Life I Want)**

- **Player Profile**
- **Goals from the player's perspective**
- **Future Goals for possessions, achievements, and qualities**
- **Player's personal background (risk profile, event state, etc.)**
- **Frames for the game such as avatar's car, school, etc.**
- **Customly updated by both the player and the game**.

**2. Epilogue Collages (The Life I Chose)**

- **3D visual collages** where the player can click on representations of their Aspirational Avatar to see updates to their collages.
- **Collages are not under the player's control**, but good items can be unlocked and used.

**3. The LifeLine**

- **High-level overview** of the player's life from 7th grade through high school.
- **Each year is represented by two Challenge Scenes consisting of several playable scenes.**
- **One scene is set during the school year, the other during summer**.
- **Multi-scene storyboards** are unlocked as the player completes other scenes and levels up their stats.
- **Each challenge has a Risk Factor associated with it**.

**4 & 7. Challenge Scene**

- **Character scenes** with motion还没等 QA
- **Dialog accompanied by animations**
- **Player navigates a branching storyline by making choices**
- **Player interaction with the scene can determine what choices are available to them and what they can know about the scene and the characters involved**.

**5. Minigames**

- **Examples of minigames**
  - **Life Skills**
  - **Career Success**
  - **Good Luck**
  - **Strong Family & Friends**

**6. Player Skill Stats**

- **Determine what, where players can change and access in the Challenge Scene**.
- **Examples of player stats**
  - **Make a decision**
  - **Time to gather info**
  - **How many times a day they interact**
  - **How many times they interact with others**
  - **How many times they interact with others**
We all have times when we have to make hard choices. Explore these stories and take charge of the future by changing poor decisions.

Get more Power and Sense skill stars to change your Elm City story.

In Elm City Stories, the more you change, the better life can turn out. When you have made a lot of changes press Fast Forward to see your future...
PEOPLE SENSE ACTIVATED!

Touch scene to search for keypoints!
WHO I AM

MY FUTURE
I'll have it made!

OTHERS SAY I'M...

FUNNY

COOL

WORDS TO LIVE BY...
Make the world a better place!

THINGS I AM ABOUT
ANIMALS
HELPING
If he’d just asked for a blow job there wouldn’t be any problem.

The PROBLEM is your facts, Brainiac. You can get STDs from a blow job.

Nice one!

Oh dip!
JONAS
Are you a tease? Why won’t you come upstairs with me?

PRESSURE ATTACK!

What kind of pressure is going on here?
New Invite:

CARSON

I got that new football game. Let’s play this weekend.

Sounds good.

Also going:

Henry, Drake

Another time...
THE EPILOGUE

DIANA

MADE THE GRADE

SWEET RIDE

HAPPY AT...

Touch each panel to learn more about your character's life

Drag the screen to view more
Games for Impact
THE TRANSFORMATIONAL GAME DEVELOPMENT PROCESS

SeriousGames@Google
PlayForward: Using Games to Improve Adolescent Health
Presented by:
Lynn E. Fiellin and Ben Sawyer
July 11, 2013

Google

SeriousGames@Google:
PlayForward: Using Games to Improve Adolescent Health

2013 International Serious Play Awards
Gold Medal Winner
Full-Scale Evaluation

• 330 teens aged 11-14 years old in after-school, school-based, and summer programs
• Randomly assigned to play either PlayForward: Elm City Stories vs. a set of attention/time control games on the iPad: Scribblenauts, Subway Surfer, Angry Birds
• Play twice weekly for 6 weeks = 12 sessions and 15 hours of game play
• Time-stamped data collected through the game software
• Web-based assessments collected at intervals to evaluate knowledge, self-efficacy, intentions, behavior
Results (to date)

Post-game play interviews:
• Majority described the goal of *PlayForward* as “to make good choices; to get a better future.”
• Described as “fun,” “interesting,” “cool,” and “inspiring”
• 85% reporting that they would recommend the game to a friend
• Reasons for recommendation:
  – Improving decision-making skills, future awareness, and increasing knowledge about sex, drugs, and alcohol
  – Reported *PlayForward* as relatable and transferrable to their own lives.
Results (to date)

- Randomized controlled trial
  - Began February 26th 2013
  - On-site at 15 in-school, after-school, and summer camp programs

- 301 adolescents randomized: 47% boys, mean age =13 years; 161 completed 6 weeks of gameplay; 157 have completed 3-month follow-up assessments:
  - No significant baseline between-groups differences
  - Comparable net playtime (10 hours); # of play sessions (9); playtime/session (60 minutes)

- **PlayForward** vs. control:
  - Higher knowledge (p=0.01) and self-efficacy scores (p=0.03) at 3 months

- Analysis of 1,289,903 events in log files:
  - Number of game levels completed (a measure of exposure to the intervention derived from log files automatically-generated through the iPad software) was positively correlated with knowledge gains measured at three months (r=0.42; p<0.001)
Videogame Event Logs – A New Data Source for Behavior Change Research

- Automatic recording of the player’s experience
- Computer software is used to parse millions of logged events into a table of discrete variables
Player Progress Over time – Sample of 4

Total Game Time (Hours:Minutes)

Total Score (Max 12)

Player 1 -
Player 2 -
Player 3 -
Player 4 -
Player Progress Over time – Sample of 4

Total Score (Max 12)

Total Game Time (Hours:Minutes)

Player 1 -
Player 2 -
Player 3 -
Player 4 -
Measuring Game Exposure

• What components of PlayForward account for its efficacy?
Measuring Game Exposure

• Does the time spent playing the game predict a positive outcome, or is it the score that matters?
Hours of Play, Levels Beaten, Knowledge Scores--6 Months

Total Hours of Game Play

Stacks Beaten

* Gained health knowledge
* No gain in health knowledge
Hours of Play, Levels Beaten, Knowledge Scores--6 Months

![Graph showing the relationship between total hours of game play, stacks beaten, and knowledge scores over 6 months. The graph includes data points and a legend indicating knowledge score ranges: *0 – 25%, *25 – 50%, *50 – 75%, *75 – 100%.]
Game Progress Correlates with Gains in Health Knowledge
Knowledge Score vs. Game Exposure

Stacks beaten

% Change In Knowledge Score at 3 Months

Knowledge Score vs. Game Exposure
Knowledge Score vs. Game Exposure

% Change in Knowledge Score at 6 Months

Stacks beaten

1 2 3 4 5 6 7 8 9 10 11 12

-50 -25 0 25 50 75 100
Next Steps

- Completing enrollment this Spring; currently collecting 12 month data; will have 6 month data on entire sample by October 2014
- Assessing the efficacy of the Aspirational Avatar
- Developing systems of evaluating “player profile” to optimize targeted outcomes
- Translating PlayForward to Android platforms
- Actively exploring distribution channels
New Projects

• *PlayitSafe*: a mobile game for HIV prevention in young black women (*Women’s Health Research at Yale*)
• *smokeSCREEN*: a mobile game for cigarette and marijuana prevention in young teens (*Dartmouth’s Center for Technology and Behavioral Health*)