IPRO-351

Combating Underage Drinking and Driving
Scope of the Problem

- 75% of seniors in high school have consumed alcohol
- 60% of juniors and seniors said they have ridden with an impaired teen driver
- 48% of teens that drink were said to be non-drinkers by their parents

National Highway Safety Traffic Administration
“Parents are the best resources to prevent children from drinking and driving.”

–The Surgeon General’s Call to Action

Increase communication between parent and child

Parents control access to the car
Parents’ Feelings on Underage Drinking

From parent surveys, we found they ask their child:

- How concerned are you with underage drinking and driving?
- 85% of parents said concerned or extremely concerned

<table>
<thead>
<tr>
<th>Question</th>
<th>Percentage of Parents</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Where are you going?”</td>
<td>90%</td>
</tr>
<tr>
<td>“Who are you going with?”</td>
<td>80%</td>
</tr>
<tr>
<td>“What are you doing?”</td>
<td>80%</td>
</tr>
<tr>
<td>Give child a curfew</td>
<td>70%</td>
</tr>
<tr>
<td>“How long will you be there?”</td>
<td>60%</td>
</tr>
<tr>
<td>Require them to call and check in</td>
<td>50%</td>
</tr>
</tbody>
</table>

90 Parents Surveyed
Our Solution

An iPhone application that will:
- Increase communication between the parent and child
- Test the key impairments: reaction time, dexterity, cognition, etc.

**Parental Informant**

*(Beginning of the night)*

**Impairment Apps**

*(End of the night)*

**Failed tests informs parents**
Other Impairments

- Parents were also worried about other impaired driving including sleep deprivation and drugs.
- 41% of drivers have admitted to falling asleep behind the wheel (Chicago Tribune).
- The impairments we found to be common among alcohol, drug use, and sleep deprivation included:
  - Slowed reaction time
  - Poor balance
  - Impaired cognitive thinking
  - Impaired memory
Parents who are concerned about the well-being of their children and control access to the car

Voluntary Market = $215.2 million (Daily Herald)
Value Proposition for Parents

- Peace of mind that the child is safe
- Reduce risk of catastrophic financial losses

“Too many young people die on the road AND take other people with them. Give me something that would let me know my child isn’t making poor choices, which will in turn make other people on the road more safe!” – Parent Survey Respondent
Impairment Test 1: Word/Color Game

Clinical Research: *Processing Bimodal Stimulus Information Under Alcohol: Is There a Risk to Being Redundant?*; University of Kentucky, Department of Psychology
Impairment Test 2: Memory Game

Clinical Research: *Differential Effects of Alcohol on Working Memory: Distinguishing Multiple Processes*; University of Missouri, Department of Psychological Sciences
Impairment Test 3: Obstacle Course Game

Clinical Research: *Effects of Alcohol on Tests of Executive Functioning in Men and Women: A Dose Response Examination*; Temple University, Experimental and Clinical Psychopharmacology
Testing Methodology

- Performed testing to validate impairment game concept
- Conducted testing using apps similar to our designs
- Used DrunkBuster impairment goggles
- Tested 100 students’ reaction times with and without goggles
Normal Distribution for Reaction Time

Without Goggles: Mean = 714 ms
With Goggles: Mean = 860 ms
## Competitive Advantage

<table>
<thead>
<tr>
<th></th>
<th>Clue-Me-In</th>
<th>Other Phone Apps</th>
<th>Breathalyzer</th>
<th>Transdermal</th>
<th>Infrared</th>
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<td><strong>Cost</strong></td>
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<td><img src="#" alt="Green" /></td>
<td><img src="#" alt="Yellow" /></td>
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<td><strong>Ease of Adoption</strong></td>
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<td><img src="#" alt="Green" /></td>
<td><img src="#" alt="Yellow" /></td>
<td><img src="#" alt="Red" /></td>
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<td><strong>Intrusiveness</strong></td>
<td><img src="#" alt="Green" /></td>
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<td><img src="#" alt="Red" /></td>
<td><img src="#" alt="Red" /></td>
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<tr>
<td>Measure multiple impairments</td>
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<td><img src="#" alt="Red" /></td>
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<tr>
<td>Scientific support</td>
<td><img src="#" alt="Green" /></td>
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<td><img src="#" alt="Yellow" /></td>
<td><img src="#" alt="Red" /></td>
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</tbody>
</table>
“Teens love the world of apps that smart phones are providing; it'll be a winner!” – Parent Survey Respondent

90 parents and 100 teens surveyed
App Business Research

- Phil Leslie, ProOnGo Expense Reporting

izUP helps drivers avoid distractions caused by their mobile phones
Business Model

- Subscription-based: $6.99 annually
- Begin with Clue-Me-In
- Additional platforms (Android, Palm, etc.), release new features at staggered points in time:

  - Slurred speech detection
  - Facial recognition
  - Strobe light in car
Go-To-Market Strategy

- Blogs and reviews
- Keyword optimization
- Freemium strategy
- Partnerships

Relevant orgs.
- M.A.D.D
- S.A.D.D
- DrunkBusters

Stakeholders
- Insurance Companies
- Surgeon General
- Secretary of State

Other
- Driver’s Education
- Draeger Safety Diagnostics
Financial Statement

- **Goal:** $50,000 donation to develop the App

### Financial Statement

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<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
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<tr>
<td><strong># of Active Subscribers</strong></td>
<td>20,000</td>
<td>30,000</td>
<td>50,000</td>
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<tr>
<td><strong>Gross Sales</strong></td>
<td>140,000</td>
<td>270,000</td>
<td>500,000</td>
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<tr>
<td><strong>Apple Commission</strong></td>
<td>42,000</td>
<td>81,000</td>
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<td><strong>Net Sales</strong></td>
<td>$98,000</td>
<td>$189,000</td>
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**Operating Costs**

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<tr>
<td>General/Administrative</td>
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<td>$10,000</td>
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<tr>
<td>Sales and Marketing</td>
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<td>Research and Development</td>
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<td><strong>Net Costs</strong></td>
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<td>$120,000</td>
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**Net Income**

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<td><strong>Net Income</strong></td>
<td>$18,000</td>
<td>$99,000</td>
<td>$230,000</td>
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</table>
Accomplishments

- Impairment research on alcohol, sleep deprivation, and drug use
- Research on clinical studies and testing
- Design of impairment games
- IRB Certification
- Testing of impairment games
- Survey feedback from target market (parents and teens)
- App business model
Next Steps For Spring 2011

- Develop the apps
- Conduct testing once apps are developed
- Establish key partnerships
- Marketing
Questions?

Special Thanks:
- Phil Leslie, ProOnGo
- Randy Sonnenfeld, State Farm Insurance
- Curt Kindschuh, DrunkBusters
- David Malham, M.A.D.D.
- Danny Gandara, IIT Psychology
- Tom Gorman, Entrepreneurial Design
- Dr. Matthew Matigian, Blue World Asset Managers
Impairment by BAC

Concentrated attention, speed control

Coordination

Tracking and steering

Information processing, judgment

Eye movement control, steadiness, emergency responses

Divided attention, reaction time, visual function

BAC

0.10

0.09

0.08

0.07

0.06

0.05

0.04

0.03

0.02

0.01
Parental Informant
Parental Informant (cont’d)

IPRO Day
IPRO 351 Presentation

Starts: 2:00 PM  Ends: 4:00 PM

Event Type

Contacts

Vinnie Cartabiano
123-456-7890

Stephanie Salem
555-555-5555

Melene Hajakian
222-222-2222

Event Details

Presentation regarding progress of Project development.

Cash Bar available.
<table>
<thead>
<tr>
<th>Substance</th>
<th>Impaired Memory</th>
<th>Impaired Cognitive Thinking</th>
<th>Poor Balance</th>
<th>Blurred Vision</th>
<th>Slurred Speech</th>
<th>Slowed Reaction Time</th>
<th>Poor Concentration</th>
<th>Drowsiness/Sedation</th>
<th>Pupil Constriction/dilation</th>
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<td>Sleep Deprivation</td>
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<td>Game Idea:</td>
<td>Measures:</td>
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<tr>
<td>Memory card game</td>
<td>Cognition, memory, reaction time</td>
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<tr>
<td>Word/color match game</td>
<td>Visual processing, cognition, reaction time, multitasking</td>
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<tr>
<td>Identify X colored car as it passes</td>
<td>Visual processing, cognition, reaction time</td>
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<tr>
<td>Organize number bubbles</td>
<td>Cognition, visual processing</td>
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<td>Math games</td>
<td>Cognition, reaction time</td>
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<td>Math obstacle course</td>
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<td>“Secret hand shake” game</td>
<td>Balance, memory</td>
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<td>DDR game for fingers</td>
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<tr>
<td>Spelling/word games</td>
<td>Memory, cognition</td>
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</tbody>
</table>
Many states now require a Car Ignition Interlock device which costs $1,200 to $3,600

<table>
<thead>
<tr>
<th>Total Cost of a First Time Offender</th>
<th>$7,828 to $10,828</th>
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</thead>
<tbody>
<tr>
<td>Minimum Fine</td>
<td>$390</td>
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<tr>
<td>Penalty Assessment</td>
<td>666</td>
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<tr>
<td>State Restitution Fund</td>
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<tr>
<td>Alcohol-Abuse Education Fund</td>
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<tr>
<td>Blood/Breath Testing Fee</td>
<td>37</td>
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<td>Jail-Cite-and-Release Fee</td>
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<tr>
<td>Driving/Alcohol Awareness School</td>
<td>375</td>
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<tr>
<td>License Reissue Fee</td>
<td>100</td>
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<tr>
<td>Attorney Fees</td>
<td>2500</td>
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<tr>
<td>Auto Insurance Increase</td>
<td>3,600 to 6,600</td>
</tr>
</tbody>
</table>
Apple iTunes Store

- 160 million registered credit cards on file
- Largest, with 250,000 apps
- Market share was 24.2% at the end of August

Wall Street Journal
Accomplishments This Semester

**Finance/Marketing**
- Pricing model
- Business model
- Financial statements
- Go-to-market strategy
- iPhone app business research
- Contact with insurance companies, app business experts

**Behavioral/Survey**
- Impairment research: cannabis & sleep deprivation
- IRB certification
- Survey for teens
- Survey for parents
- Data analysis of survey results

**App Research/Design**
- Impairment research
- Design of impairment apps
- Clinical study research
- Impairment testing
- Test analysis

**App Development**
- Clue-Me-In prototype
- Simulation of impairment apps/screenshots
- Became familiar with XCode
## Alcohol Impairment: Women

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<th>120</th>
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</table>

Subtract .01% for each 40 minutes of drinking.

One drink is 1.25 oz. of 80 proof liquor, 12 oz. of beer, or 5 oz. of table wine.
# Alcohol Impairment: Men

<table>
<thead>
<tr>
<th>drinks</th>
<th>100</th>
<th>120</th>
<th>140</th>
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<th>180</th>
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<td>0.11</td>
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<td>0.09</td>
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<tr>
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<td>0.22</td>
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<td>0.21</td>
<td>0.19</td>
<td>0.17</td>
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</tr>
</tbody>
</table>

**Subtract .01% for each 40 minutes of drinking.**

*One drink is 1.25 oz. of 80 proof liquor, 12 oz. of beer, or 5 oz. of table wine.*
Key Benefits

Gives parents peace of mind

Cost effective
- Less intrusive

Objective measure of impairment
- Apply to broader market
- Easy to adopt
- Measure other impairments
Features:

- Prevents outgoing text messages, emails and phone calls while driving.
- Sends incoming calls to voicemail and holds text messages when the vehicle is in motion.
- Prohibits web browsing and application use while driving.
- Three authorized phone numbers allowed (e.g. mom, employer, etc.).
- One authorized application allowed (e.g. navigation application).
- Emergency 911 quick dial always available.
- Emergency 911 notification sent with a map to account holder showing location and time of the call.
Survey Results: Parent Demographics

- **Parents**
  - 87 parents surveyed

- Some stats on our participants
  - 60% fell between the ages of 46-55
  - 77% Caucasian
  - 58% had a Bachelor’s degree or higher
  - 58% owned an iPhone, iPod touch, iPad, or smartphone
Survey Results: Teen/Young Adults Demographics

- **Teens/Young Adults**
  - 97 teens and young adults surveyed

- **Some stats on our participants**
  - 36% were 16-17 yrs old, 30% were 18-19 yrs old, 44% were 20-21 yrs old, 20% were 22-23 yrs old
  - 73% Caucasian
  - 82% own an iPhone, iPod touch, iPad or smartphone
Parent and Teen Driving Stats

Have you ever driven while intoxicated or ridden with a driver who was?

**Parent**
- Yes: 20
- No: 80

**Teen/Young Adult**

**As Driver**
- Yes: 35
- No: 65

**As Passenger**
- Yes: 44
- No: 56
Survey Results: Parent/Child Relationships

1% said they don’t listen to their parents

4% said they listen to their parents for fear of getting into trouble

22% said they listen to their parents because they are expected to

66% said they listen to their parents because they trust them

7% said none of these were applicable
Team Organization

Survey/Behavioral
- Sandi Menezes
  - Stephanie Salem
  - Mikayla Mazur
  - Kim Nealy

Finance/Marketing
- Alex Szalko
  - Stephanie Salem
  - Claire Wong

App Research/Design
- Melene Hajakian
  - Rawan Abbasi
  - Edinam Kurenty

App Development
- Vinnie Cartabiano
  - Stuart Graham
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Clinical: *Processing Bimodal Stimulus Information Under Alcohol: Is There a Risk to Being Redundant?*

Results showed that alcohol slowed reaction time in a general dose-dependent manner in all three stimulus conditions with the reaction time (RT) speed-advantage of the redundant signal being maintained, even under the highest dose of alcohol. Evidence for an RT advantage to bimodal stimuli under alcohol challenges the general assumption that alcohol impairment is intensified in multistimulus environments.
Clinical: Differential Effects of Alcohol on Working Memory: Distinguishing Multiple Processes

Alcohol consumption impaired memory for auditory and visual sequences but not memory for simultaneous arrays of auditory or visual stimuli. These results suggest that processes needed to encode and maintain stimulus sequences, such as rehearsal, are more sensitive to alcohol intoxication than other Working Memory mechanisms needed to maintain multiple concurrent items, such as focusing attention on them. .. The results suggest that moderate doses of alcohol impair Working Memory by affecting certain mnemonic strategies and executive processes rather than by shrinking the basic holding capacity of WM. (PsycINFO Database Record (c) 2010 APA, all rights reserved) (from the journal abstract)
Clinical Research: Effects of Alcohol on Tests of Executive Functioning in Men and Women: A Dose Response Examination

The TMT is a widely used test of EF composed of two parts on separate sheets of paper. On Part A of the TMT (TMT-A), the participant is instructed to use a pencil to connect 25 randomly arranged numbers in order (1–2–3–4 . . .), and on Part B of the TMT (TMT-B) the participant is instructed to use a pencil to connect 25 randomly arranged numbers and letters in alternating numerical and alphabetical order (1-A-2-B . . .). The participant is also instructed that erasing is not allowed, and if an error is made (which is quickly pointed out to the participant), then he or she should return to the last correct circle to continue performing the task.