

# **Mobile Survey Data Collection and Management Using Participants Own Smartphones**

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# Overview

- Ecological Momentary Assessment (EMA), Ecological Momentary Intervention (EMI)
- Different approaches to mobile implementation (PDA/APP/**SMS**)
- Introducing **SurveySignal**
  - Core features
  - How it works
  - User experiences
  - Security/Ethical issues
  - Resources

# Ecological Momentary Assessment (EMA)

- Ecological Momentary Assessment (EMA) involves repeated sampling of human subject's current behaviors and experiences in "real time" and in their "natural environments".
- EMA aims to minimize recall bias, maximize ecological validity, and allow study of micro processes that influence behavior in real-world contexts.
- EMA studies assess particular events in human subject's lives or assess human subject's at periodic intervals, often by random time sampling.

# Ecological Momentary Intervention (EMI)

- Ecological Momentary Intervention (EMI) method provides interventions to people during their everyday lives (i.e. in real time) and in natural settings (i.e. real world)
- Psychosocial and health behavior treatments and therapies can be extended beyond traditional research or clinical settings by using mobile technology to deliver interventions to individuals as they go about their daily lives
- Mobile technology-based EMI can be effectively implemented as interventions for a variety of health behaviors and psychological and physical symptoms.

# Different approaches

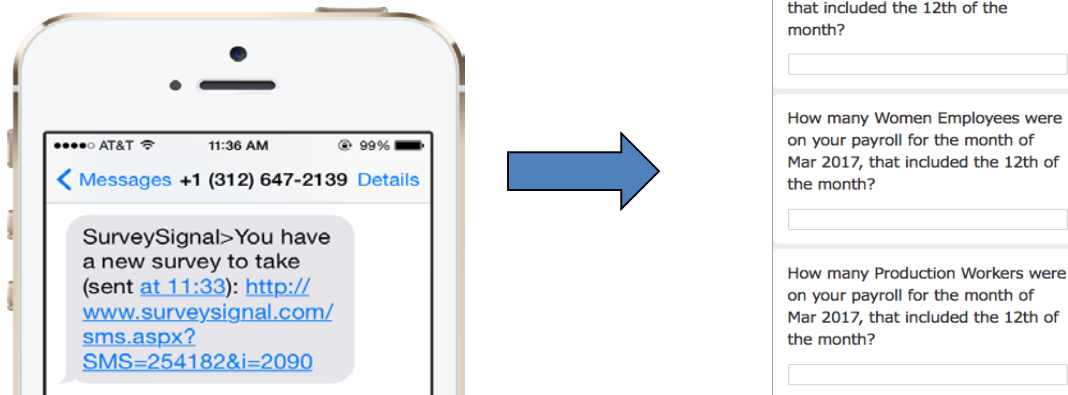
	PDA	Local App	SMS Distribution
<b>Device costs</b>	High	None (if using participant's smartphone)	None (text messaging costs apply)
<b>Level of (programming) effort for customized protocol setup</b>	Typically high	Moderate to high, depending on application	None (when using user-friendly SurveySignal software)
<b>Online access/data plans</b>	Not needed (local storage), unless results need to be fed back in real time	Not needed (local storage), unless results need to be fed back in real time	Required unless on a free Wi-Fi.
<b>Compatibility issues</b>	None (only one operating system)	High (e.g., Android vs. iOS vs. Blackberry vs. Windows Mobile)	Minimal (covers ALL operating systems, and mobile surveys display well on most smartphone browsers)
<b>Special participant burden</b>	Need to carry extra device and learn how to use it	Need to download and install app	None

# Easy-to-use EMA/EMI web-based Software

(*SurveySignal*; Hofmann, W., & Patel, P. V. (2015), *SSCR*)

SMS distribution approach, combining

- (1) A simple and fast signup and smartphone verification system
- (2) Text messaging as a signalling and reminder device, according to fixed, random, or mixed schedules for data collection and delivering interventions
- (3) Seamless integration with mobile-compatible survey software such as Qualtrics or SurveyMonkey

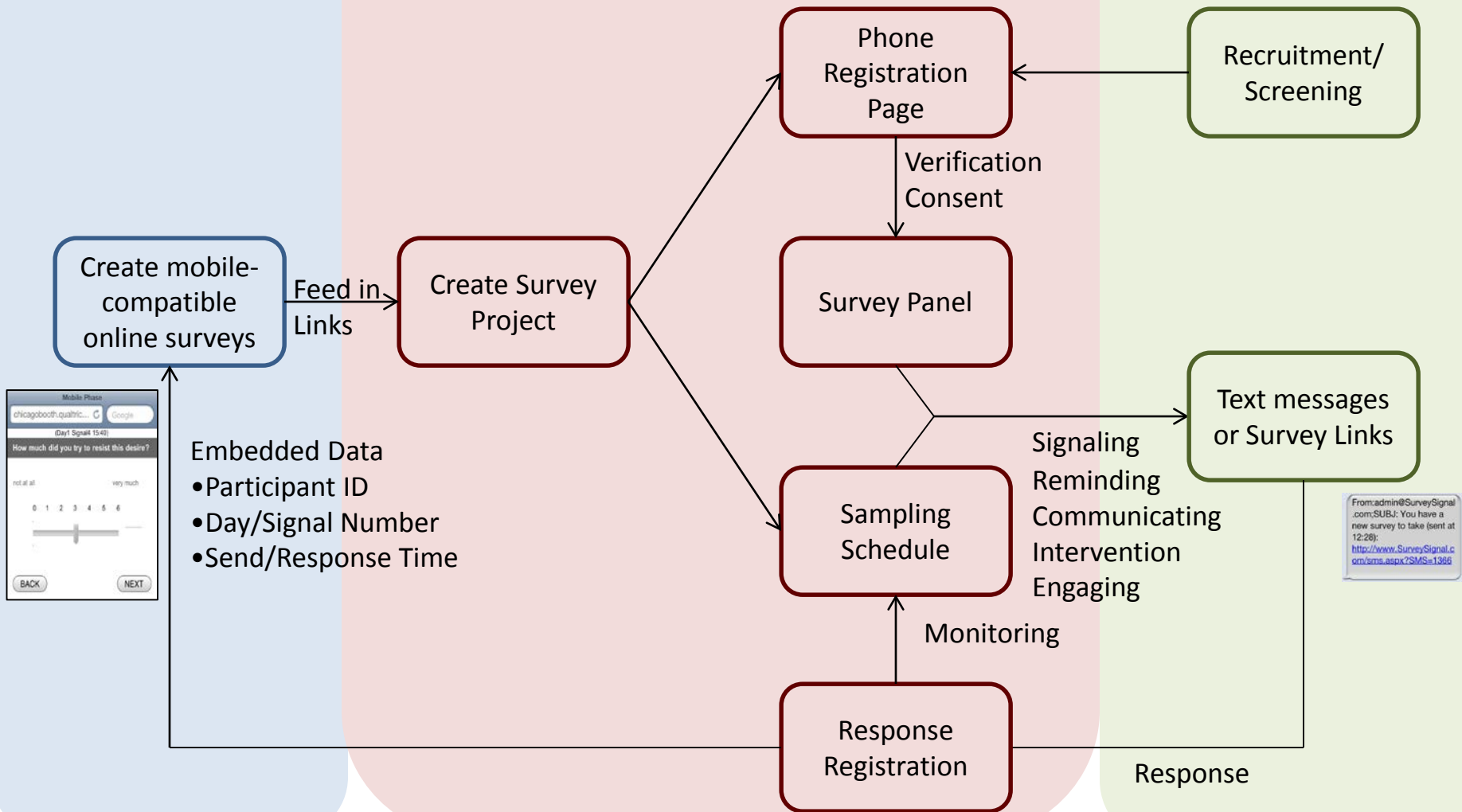


SurveySignal

# How it works

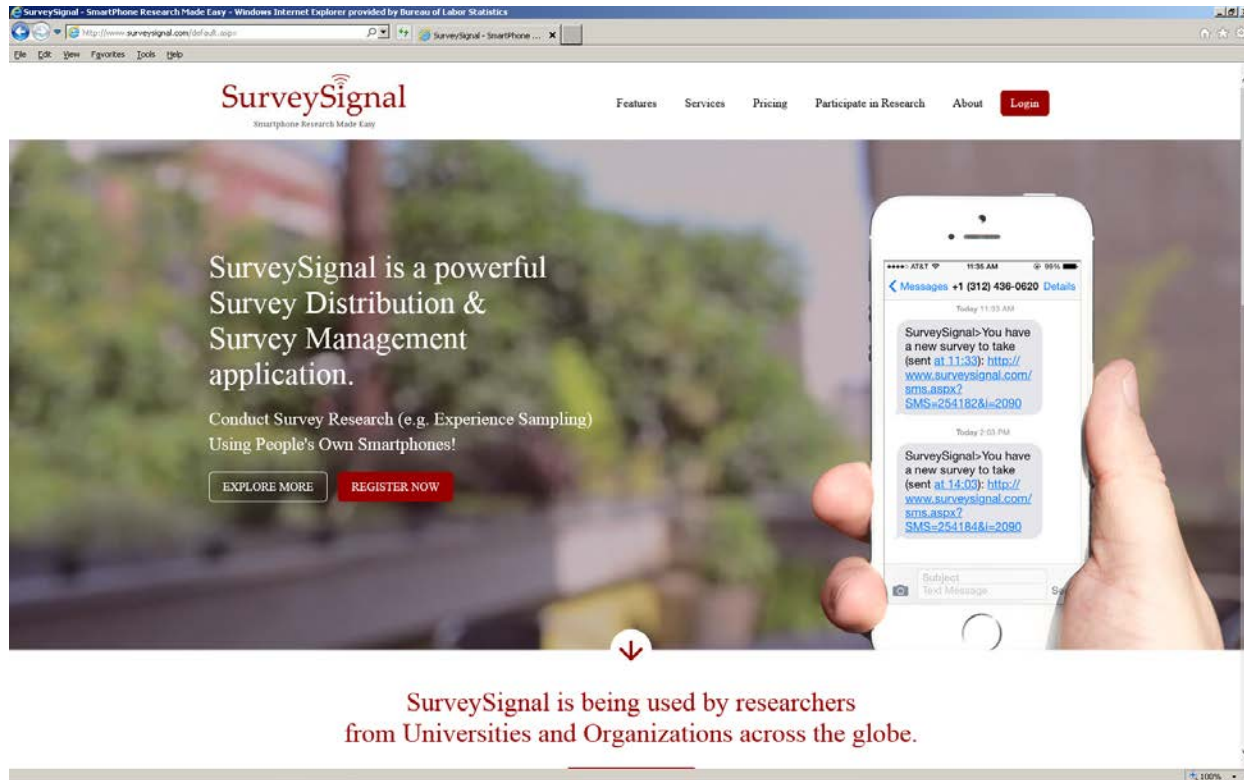


## SurveySignal



# SurveySignal Account

- Registering an account and exploring the system is free



The screenshot shows the SurveySignal website in a browser window. The browser title is "SurveySignal - SmartPhone Research Made Easy - Windows Internet Explorer provided by Bureau of Labor Statistics". The address bar shows "http://www.surveysignal.com/default.aspx". The website header includes the SurveySignal logo with the tagline "Smartphone Research Made Easy" and navigation links for Features, Services, Pricing, Participate in Research, About, and a red Login button. The main content area features a background image of a hand holding a white smartphone. The phone screen displays two text messages from SurveySignal. The first message, dated "Today 11:03 AM", says: "SurveySignal> You have a new survey to take (sent at 11:33): http://www.surveysignal.com/sms.aspx?SMS=254182&l=2090". The second message, dated "Today 2:03 PM", says: "SurveySignal> You have a new survey to take (sent at 1:43): http://www.surveysignal.com/sms.aspx?SMS=254184&l=2080". Below the phone image, there is a red downward arrow icon. The text below the arrow reads: "SurveySignal is being used by researchers from Universities and Organizations across the globe." At the bottom of the page, there are two buttons: "EXPLORE MORE" and "REGISTER NOW".

# SurveySignal



# Account Interface

The screenshot shows the SurveySignal account interface in a Windows Internet Explorer browser. The browser address bar shows the URL <http://www.surveysignal.com/survey.aspx>. The page title is "SurveySignal - Windows Internet Explorer provided by Bureau of Labor Statistics". The SurveySignal logo is visible at the top left, with the tagline "Smartphone Research Made Easy".

The interface features a dark sidebar on the left with navigation links: Dashboard, My Surveys, Panels, Accounts, and Help. The main content area is titled "My Surveys" and contains a "Create Survey" button in the top right corner. Below the button is a table listing various surveys.

Survey Name	Start Date	End Date	Active	Survey Type	Edit	Particip.	Reports	Panel	Email
SPSP New Orleans	09/19/2012	09/19/2015	YES	ONE-SHOT					
Experience Sampling Example	09/19/2012	11/18/2013	YES	REPEATED					
Happiness Project	04/24/2013	04/24/2014	YES	REPEATED					
Customer Satisfaction Survey	04/12/2013	06/11/2013	YES	REPEATED					
Couples Study	02/15/2015	04/16/2015	YES	REPEATED					
Tracking Desires Study	03/10/2015	06/08/2015	YES	REPEATED					
Emotions and Cognition Study	06/28/2013	08/27/2013	YES	REPEATED					
Positive Interventions	11/07/2013	11/30/2013	YES	REPEATED					

An arrow points from the text "Create an unlimited number of survey projects within a free online account" to the "Create Survey" button.

# Customize the Schedule

SurveySignal - Windows Internet Explorer provided by Bureau of Labor Statistics  
http://www.surveysignal.com/EditSurvey.aspx

SurveySignal  
Smartphone Research Made Easy

## Schedule Parameters

Survey Window Start Date	<input type="text" value="09/19/2012"/>
	<small>e.g. 04/06/2015</small>
Survey Window End Date:	<input type="text" value="11/18/2013"/>
	<small>e.g. 04/06/2015</small>
Daily Window Start Time	<input type="text" value="10:00"/>
	<small>e.g. 07:00 or 19:00</small>
Daily Window End Time:	<input type="text" value="20:00"/>
	<small>e.g. 09:00 or 21:00</small>
Mobile Survey starts after	<input type="text" value="1"/> <input type="button" value="v"/>
	<small>days</small>
Mobile Survey Duration	<input type="text" value="7"/> <input type="button" value="v"/>
	<small>days</small>
Number of Signals/Day	<input type="text" value="5"/> <input type="button" value="v"/>
Survey Schedule	<input type="text" value="FIXED"/> <input type="button" value="v"/>
Type of Randomization	<input type="text" value="FIXED"/> <input type="button" value="v"/>
Add Fixed Signals	<input type="text" value="1"/> <input type="button" value="v"/> <input type="button" value="Edit Fixed Signals"/>
Minimum Distance betw. Signals	<input type="text" value="30"/> <input type="button" value="v"/>

# Edit Survey Links

Specify which daily signal is connected with which individual survey

Update Links   Set all Links to 'inactive'   Set all Links to 'active'   Back

Survey ID	DAY	SIG	Segment Start Time	Survey Link	Active	Distribution	Reminder	Timeout
091912184440	1	1	10:00	<a href="http://chicagobooth.qualtrics.com/SE/?SID=SV_9N">http://chicagobooth.qualtrics.com/SE/?SID=SV_9N</a>	ACTIVE	SMS	Off min.	12h
091912184440	1	2	12:00	<a href="http://chicagobooth.qualtrics.com/SE/?SID=SV_9N">http://chicagobooth.qualtrics.com/SE/?SID=SV_9N</a>	ACTIVE	SMS	Off min.	12h
091912184440	1	3	14:00	<a href="http://chicagobooth.qualtrics.com/SE/?SID=SV_9N">http://chicagobooth.qualtrics.com/SE/?SID=SV_9N</a>	ACTIVE	SMS	Off min.	12h
091912184440	1	4	16:00	<a href="http://chicagobooth.qualtrics.com/SE/?SID=SV_9N">http://chicagobooth.qualtrics.com/SE/?SID=SV_9N</a>	ACTIVE	SMS	Off min.	12h
091912184440	1	5	18:00	<a href="http://chicagobooth.qualtrics.com/SE/?SID=SV_9N">http://chicagobooth.qualtrics.com/SE/?SID=SV_9N</a>	ACTIVE	SMS	Off min.	12h
091912184440	2	1	10:00	<a href="http://chicagobooth.qualtrics.com/SE/?SID=SV_9N">http://chicagobooth.qualtrics.com/SE/?SID=SV_9N</a>	ACTIVE	SMS	Off min.	12h
091912184440	2	2	12:00	<a href="http://chicagobooth.qualtrics.com/SE/?SID=SV_9N">http://chicagobooth.qualtrics.com/SE/?SID=SV_9N</a>	ACTIVE	SMS	Off min.	12h
091912184440	2	3	14:00	<a href="http://chicagobooth.qualtrics.com/SE/?SID=SV_9N">http://chicagobooth.qualtrics.com/SE/?SID=SV_9N</a>	ACTIVE	SMS	Off min.	12h
091912184440	2	4	16:00	<a href="http://chicagobooth.qualtrics.com/SE/?SID=SV_9N">http://chicagobooth.qualtrics.com/SE/?SID=SV_9N</a>	ACTIVE	SMS	Off min.	12h
091912184440	2	5	18:00	<a href="http://chicagobooth.qualtrics.com/SE/?SID=SV_9N">http://chicagobooth.qualtrics.com/SE/?SID=SV_9N</a>	ACTIVE	SMS	Off min.	12h
091912184440	3	1	10:00	<a href="http://chicagobooth.qualtrics.com/SE/?SID=SV_9N">http://chicagobooth.qualtrics.com/SE/?SID=SV_9N</a>	ACTIVE	SMS	Off min.	12h
091912184440	3	2	12:00	<a href="http://chicagobooth.qualtrics.com/SE/?SID=SV_9N">http://chicagobooth.qualtrics.com/SE/?SID=SV_9N</a>	ACTIVE	SMS	Off min.	12h
091912184440	3	3	14:00	<a href="http://chicagobooth.qualtrics.com/SE/?SID=SV_9N">http://chicagobooth.qualtrics.com/SE/?SID=SV_9N</a>	ACTIVE	SMS	Off min.	12h

# Administration and Response Monitoring Tools

The screenshot displays the SurveySignal web application interface. The browser address bar shows the URL [surveysignal.com/Reports.aspx](http://surveysignal.com/Reports.aspx). The SurveySignal logo is visible in the top left corner, with the tagline "Smartphone Research Made Easy". The top right corner features a user profile icon, a notification badge with the number "3341", and a help icon.

The main navigation menu on the left includes the following items:

- Dashboard
- My Surveys
- Panels
- Accounts
- Help

The main content area is titled "Customer Satisfaction Survey" and includes a breadcrumb trail: [Home](#) > [My Surveys](#) > [Customer Satisfaction Survey](#) > [Reports](#).

The interface features several tool icons for survey management:

- Edit Survey
- Participants
- Reports
- Use Panel
- Email

The "Reports" section contains the following tools:

- Schedule
- Daily Signals
- Signal Archive
- Participants
- Communication
- Appointments
- Summary Stats

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# Participant Engagement

← → ↻ [surveysignal.com/SendParticipantMessage.aspx](https://surveysignal.com/SendParticipantMessage.aspx) ☆ 📺 🔍

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🏠 **Dashboard**

📡 **My Surveys**


👤 **Panels**


🔒 **Accounts**


🔍 **Help**


## Customer Satisfaction Survey


🏠 Home > My Surveys > Customer Satisfaction Survey > Communicate

 Edit Survey

 Participants

 Reports

 Use Panel

 Email

### Send Message to Participants

From

Send via

Select Participants Group

Subject

Body

# Participant Custom Reminders

← → ↻ [surveysignal.com/SetAppointmentReminder.aspx](https://surveysignal.com/SetAppointmentReminder.aspx) ☆ 🔍

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Help

## Set Appointment Reminder

From

Send via  SMS  
 EMAIL

Date   
e.g. 04/06/2015

Time   
e.g. 07:00 or 19:00

Select Participants Group

Subject
















Body

[Set Appointment Reminder](#)

# SMS Data Collection

### SMS Data Collection

[Create SMS Data Collection](#)

SMS Data Collection Name	Active	Edit	Particip. Reports
Customer Experience	YES		 
Physical Therapy	YES		 
Smoking Cessation	YES		 
Emergency Alert System	YES		 
Drinking Cessation	YES		 

# SMS Data Collection (Opt in/out)

SMS Data Collection Project Id

040318233206

SMS Data Collection Project Name

Drinking Cessation

35 char max

SMS Data Collection Project  
Description

Drinking Cessation

255 char max

SMS Data Collection Enrollment  
Keyword

QUIT DRINKING

SMS Data Collection Enrollment  
Keyword Message:

Welcome to the Drinking Cessation program. You can opt out anytime by texting STOP. Message and Data Rates apply.

SMS Data Collection Opt-Out Keyword







EXIT

SMS Data Collection Opt-Out Keyword  
Message:

Sorry that you decided to quit the program. You can join anytime again by texting QUIT DRINKING to this number. Message and Data Rates apply.



# SMS Data Collection (Keywords)

-  Dashboard
-  My Surveys
-  My SMS Data Collection
-  My Virtual Phone
-  Accounts
-  Help

## Create SMS Data Collection Project

[Home](#) > [My Surveys](#) > Create SMS Data Collection Project



Edit SMS Data Collection Project



SMS Data Collection Keywords






Participants



Reports

### Keywords Parameters

[Add Keyword](#)

Keyword	Action	Edit
OPTIONS	MESSAGE	
SURVEY	SURVEY LINK	
DRINK	SMS DATA COLLECTION	

# SMS Data Collection (Keyword Qs)

## Questions

- ✓ Select a Question Type
- Informational Text
- Single Choice Question
- Multiple Choice Question
- Media Question
- Location Question
- Text Question
- Score Question
- Exit Survey

SMS Data Collection ID	Keyword ID	Question No.	Question	
0403182332060403182357501			You have initiated a Drinking Episode. You will now receive a series of questions. After completion of the questions, please text DRINK every time you have a glass of alcohol.	INFORMATIONAL
0403182332060403182357502			Have you consumed food prior to 60 minutes of Drinking Episode?	SINGLE
0403182332060403182357503			What kind of alcohol are you consuming? You can send multiple choice for e.g. 1 3 or 1 3 5 or 1.	MULTIPLE
0403182332060403182357504			Send us a Picture of your surrounding.	MEDIA
0403182332060403182357505			Send us a Video of your surrounding.	MEDIA
0403182332060403182357506			Send us Voice sample of your surrounding.	MEDIA
0403182332060403182357507			Send us your Location.	LOCATION
0403182332060403182357508			On a Scale of 1 -10 how are you feeling?	SCORE
0403182332060403182357509			Please let us know if you want to share anything additional regarding this drinking episode?	TEXT
04031823320604031823575010			Thank you for your answers. Remember to text DRINK with your next round of drinks.	EXIT

# SMS Data Collection (Intervention)

Question: Have you consumed food prior to 60 minutes of Drinking Episode?

Choices: YES  
NO

## General Parameters

Response Action Id 040418002324

Keyword Id 040318235750

SMS Data Collection Project Id 040318233206

Keyword No Food Consumed  
255 char max

Action MESSAGE

## Keywords Action Parameters

Message Text Please make sure to eat enough food and drink water at regular intervals.

# SMS Data Collection (Schedule)

Schedule by Day

Add Signal by Day

Add Signal by Date

ID	SMS Data Collection ID	Keyword ID	Signal Randomization	Day No.	Sig No.	Seg. Start Time	Seg. End Time	Signal Status
040418002818040318233206		040318235750	FIXED	1	1	09:00	09:00	ACTIVE
040418002846040318233206		040318235750	FIXED	1	2	21:00	21:00	ACTIVE
040418002932040318233206		040318235750	RANDOM WITHIN SEGMENTS	3	1	09:00	12:00	ACTIVE
040418003014040318233206		040318235750	RANDOM WITHIN SEGMENTS	3	2	15:00	20:00	ACTIVE
040418003045040318233206		040318235750	FIXED	3	3	21:00	21:00	ACTIVE

Schedule by Date

ID	SMS Data Collection ID	Keyword ID	Signal Date	Signal Time	Signal Status
040418003104	040318233206	040318235750	04/17/2018	09:00	ACTIVE
040418003111	040318233206	040318235750	04/18/2018	09:00	ACTIVE

# SMS Data Collection (Management)



Edit SMS Data Collection Project



SMS Data Collection Keywords



Participants



Reports



Edit Keyword



Keyword Questions

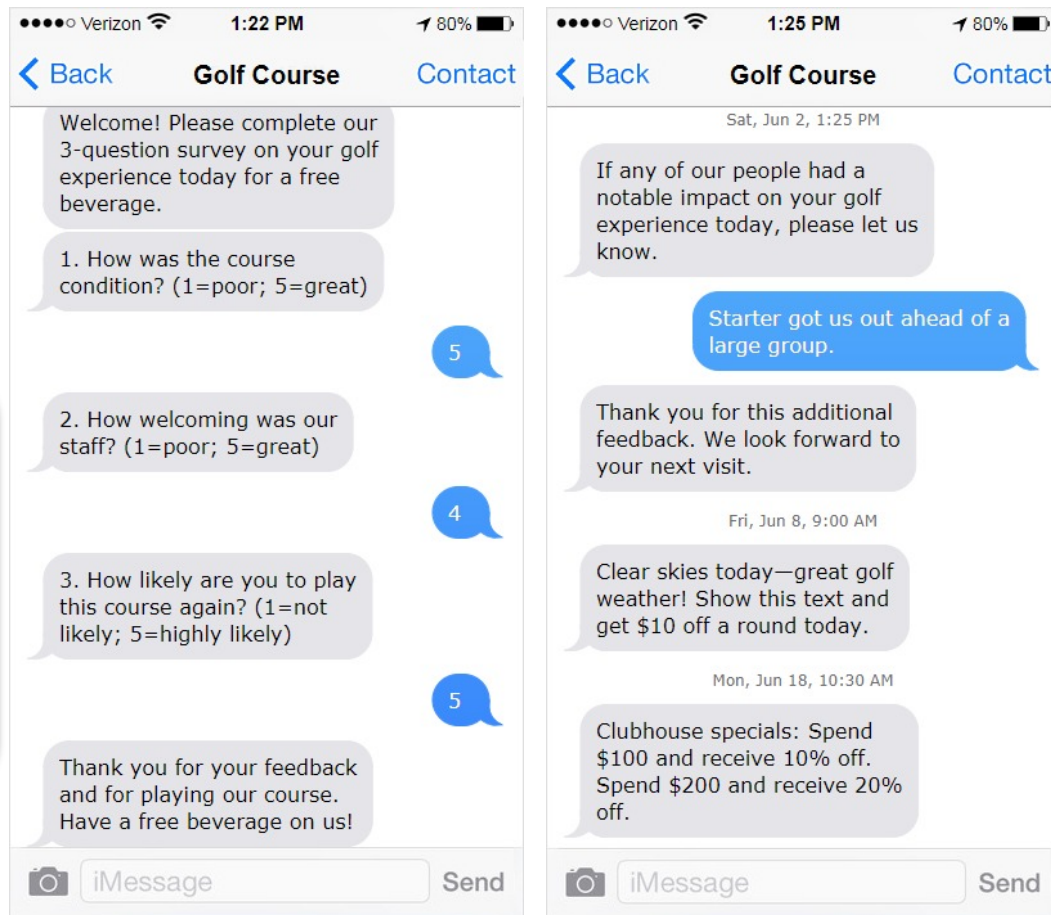


Keyword Schedule



Keyword Data

# SMS Data Collection: Golf Experience & Golfer Response



## Golfer Enrollment Options:

- Text "Reston" to specified number or SMS short code
- Visit specified website to fill in a form (requires a browser)
- Scan a quick response code (requires QR code scanner app and a browser)
- Capture golfer mobile phone number in point-of-sale system and transmit to SurveySignal (requires system-to-system communication)

## Benefits:

- Enroll golfers quickly and easily on any SMS-capable mobile phone
  - No app to install
- Collect "in-the-moment" responses from golfers during or after play via:
  - SMS direct response (as shown)
  - Link to online survey (requires a browser)
- Analyze responses for timely intervention with golfers—and with your people

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# SMS Data Collection: Golf Data

March 1, 2017							
Course	Responses	Avg.	Cond.	Pace	People	F&B	Return
Lake Ridge	19	3.2	2.5	3.4	2.4	4.9	2.8
Prince William	7	3.3	4.3	2.3	2.0	3.2	4.6
Redgate	14	2.9	4.5	2.3	2.4	2.5	2.9
Reston National	26	3.9	4.8	4.8	3.7	2.8	3.2

Reston National							
Date	Responses	Avg.	Cond.	Pace	People	F&B	Return
2/26/17	7	3.6	2.6	2.5	4.3	4.3	4.5
2/27/17	6	4.3	4.3	4.4	3.7	4.2	4.8
2/28/17	28	3.0	3.5	2.4	3.7	2.2	3.5
3/1/17	26	3.9	4.8	4.8	3.7	2.8	3.2

Reston National - March 1, 2017							
Golfer	Time	Avg.	Cond.	Pace	People	F&B	Return
Matsuyama, Hideki	3:25pm	4.0	4	4	4	5	4
McIlroy, Rory	3:56pm	3.9	3	4	3	4	5
Day, Jason	4:32pm	4.1	2	5	4	5	5
Johnson, Dustin	4:47pm	4.4	5	4	5	3	5

Comment: Starter got us out ahead of a large group.

Johnson, Dustin							
Course	Date	Avg.	Cond.	Pace	People	F&B	Return
Redgate	2/20/17	2.7	3	3	3	2	3
Prince William	2/23/17	4.0	3	5	4	4	3
Reston National	2/25/17	2.9	3	3	3	2	4
Reston National	3/1/17	4.4	5	4	5	3	5

Comment: Starter got us out ahead of a large group.

# Security/Ethical Issues

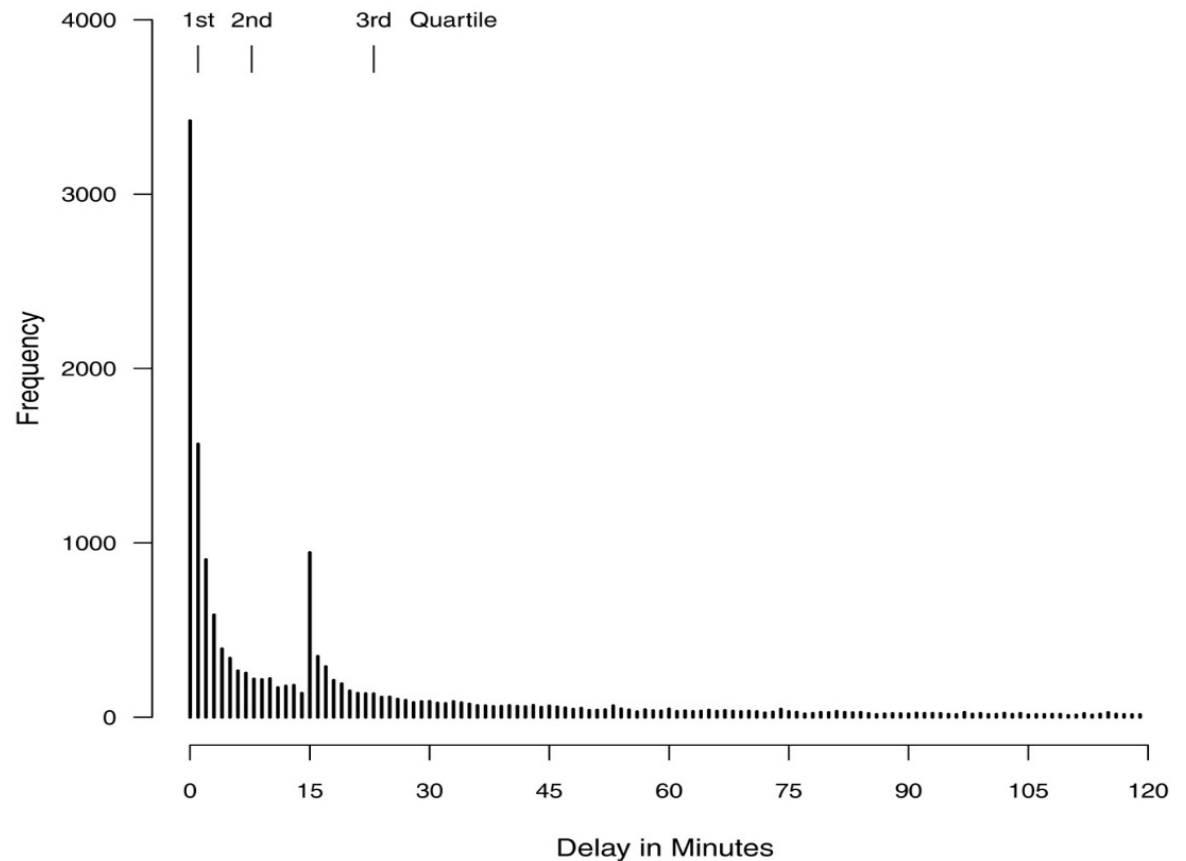
- Signup Security
  - Wireless phone check (optional)
  - Each phone number can be registered only once per study
  - Opt-in procedure during registration
- SurveySignal Participant Information
  - Protected within server architecture
  - Phone numbers never fully displayed (e.g., 77\*\*\*\*4326)
- Actual Survey Response Data
  - Collected within secure survey environment of choice (e.g., Qualtrics, SurveyMonkey, etc.)



# Benchmark data

(across 10 studies, n = 1,852)

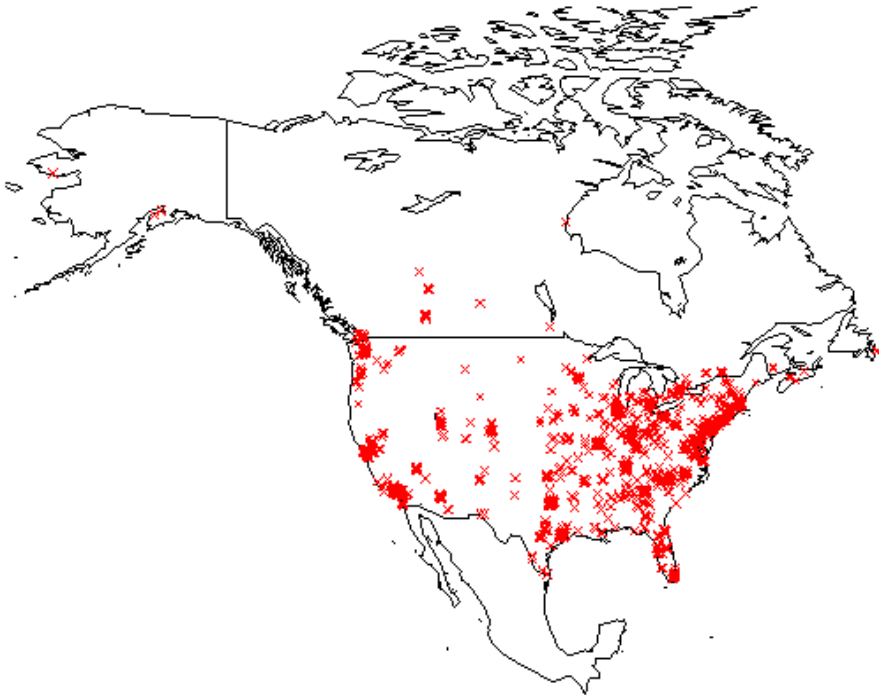
- Mean response rate: 77%
- Median response delay: 8 minutes
- Survey completion rate: 96%
- Reminders effective



# Current Research Examples

- **Example 1: Assessment**

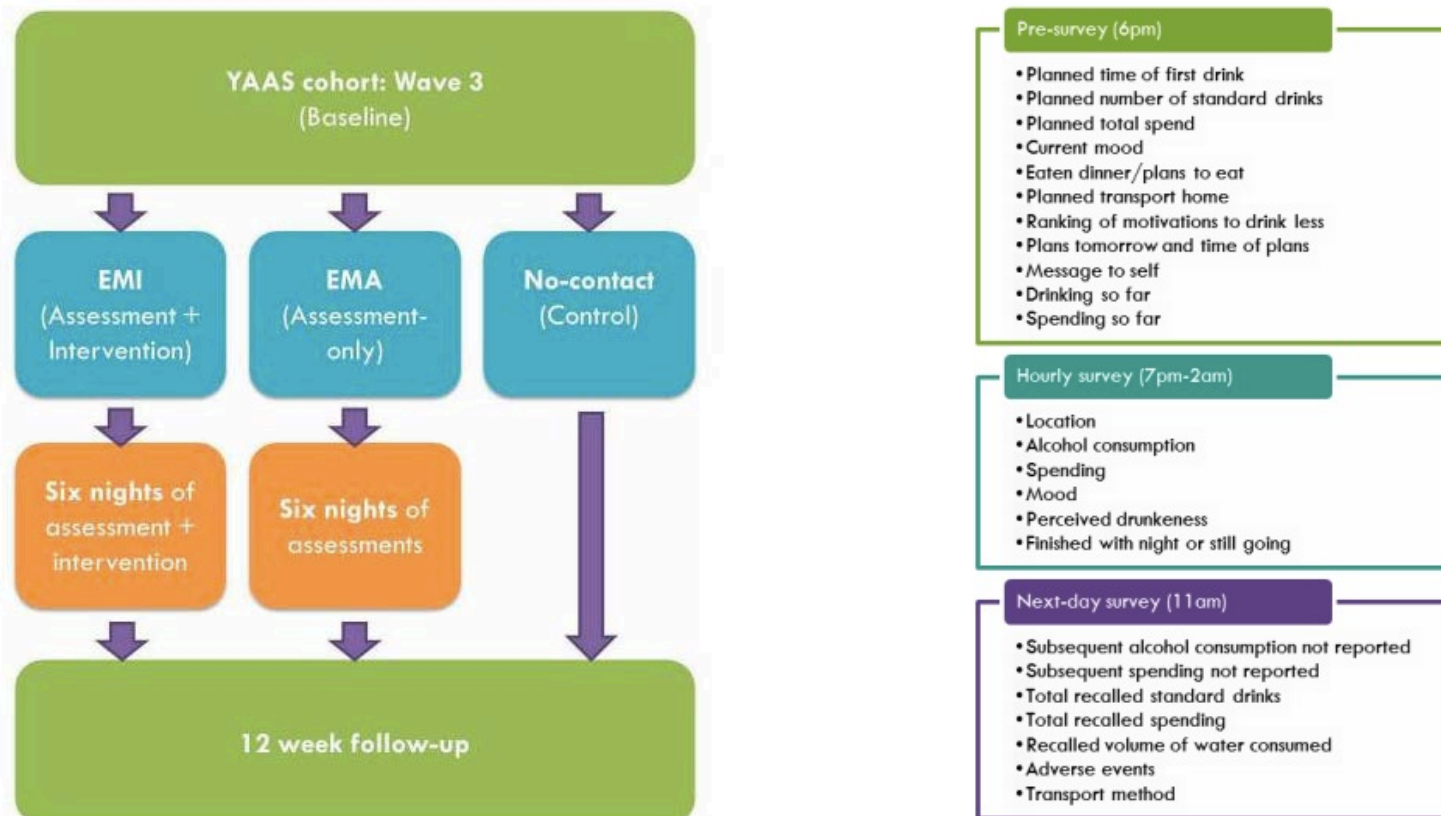
Hofmann, Wisneski, Brandt, & Skitka (2014, *Science*):  
sampled morality in everyday life, including connections to  
momentary happiness N=1,252



# Current Research Examples

## • Example 2: Intervention

Cassandra JC Wright, Paul M Dietze, Paul A Agius, Emmanuel Kuntsche, Robin Room, Michael Livingston, Margaret Hellard, and Megan SC Lim: An Ecological Momentary Intervention to Reduce Alcohol Consumption in Young Adults Delivered During Drinking Events: Protocol for a Pilot Randomized Controlled Trial



# Sample Research Studies conducted via SurveySignal

- Leading Amusement Park in the world conducted EMA on park goers
- Leading Smartphone manufacturer conducted UX research on mobile users
- Leading Online Booking site conducted EMA study on their customers
- Medical Research Hospital conducted EMA/EMI to influence public health outcomes
- Leading Non Profit Research firm conducted US Hospitals ER patient experience EMA
- Leading Business School conducted multiple EMA/EMI market research studies



# Potential Federal Uses of SurveySignal

- Bureau of Labor Statistics
  - Reminders for Current Employment Statistics Survey
- Census Bureau
  - Current Population Survey
  - Survey of Income and Program Participation
- Health and Human Services
  - Clinical Trial Studies: EMA and EMI in Randomized Trial
- Department of Education
  - Real Time EMI for students and parents.
  - Can develop EMI programs for Stress, Bullying, Admission help.
- Veterans Administration
  - Can develop EMA and EMI programs to monitor health experiences at VA center and mental health.

# Resources

- [www.surveysignal.com](http://www.surveysignal.com)
- Email Support ([support@surveysignal.com](mailto:support@surveysignal.com))
- Custom Solution ([paresh.patel@surveysignal.com](mailto:paresh.patel@surveysignal.com))
- Online resources (within account)
  - Manual
  - FAQs
  - Parameter cheat sheet
  - Example survey project

**Thank you very much for your attention!**

SurveySignal