USING SOCIAL MEDIA IN YOUR RESEARCH

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The Power of Social Media

- Social media can be used to observe and measure behavior.
- Social media can be used to disseminate messages.
- Social media can be used in surveillance.
- Social media can be used to create patient communities.
- Social media can be used to deliver behavioral interventions.
Observe and measure

25% of profiles displayed depressive symptoms and 2.5% met criteria for major depression
Disseminate info

Japan Tsunami of 2011

“We were able to notify displaced patients via Twitter on where to acquire medications. These ‘tweets’ immediately spread through patients’ networks, and consequently most could attend to their essential treatments.”

--letter to Lancet, Drs. Yuichi Tamura and Keiichi Fukuda, Keio University, Tokyo
Disease surveillance

In 2009, H1N1 and Haitian cholera outbreaks tracked via social media weeks before traditional surveillance methods could produce data.
# Patient Communities

# bcs - breast cancer social media is a community of breast cancer patients and docs on Twitter

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1. **Joanna Chapman @cosmiccasserole**
   - Divine Secret: Everything can change in an instant. Cancer is sneaky. #bcs #breastcancer #tatasisterhood

2. **Social Fly @ABHuret**
   - #CancerSmart presentation at @sloan_kettering with rock stars Dr Heerdt, Dr Offit & Emily Glogowski. #bcs

3. **#Cancer @CancerTuz**
   - 12 Things I Learned From #Cancer huffingtonpost.com/annie-buckley/... @drseisenberg #diagnosis #lcsm #bcs @HealthyLiving #healthy

4. **NBCC @Deadline2020**
   - Betty is a #BCD2020 advocate, and she’s taking action. What are you doing? buzz.mw/bivn1_f #FightBreastCancer #BCSM

5. **Sloan-Kettering @sloan_kettering**
   - Ovarian cancer is more of a risk in terms of longevity for women. #CancerSmart #BRCA #bcs

6. **Jude Callirgos @JudeCallirgos**
   - Last 4 days of normalcy before Round 3 of FEC lands me on the couch for a week. #ChemoProblems #bcs
Diabetes Support Community

About people who live with diabetes and support each other.
The Study:
Twitter-enabled Mobile Messaging for Smoking Relapse Prevention

**Rationale:**
While past research shows that face-to-face peer interaction has proved to be a strong source of support for smokers who want to quit, this study aims to open more channels of communication among smokers using social media networks. By using the modern, break-through technologies of the virtual and mobile world, the goal is to expand the availability and accessibility of social support resources for smokers during the most trying phases of quitting smoking.

**Principal Investigators:**
- **Connie Pechmann**
  *University of California, Irvine*
- **Cynthia Lakon**
  *University of California, Irvine*
- **Jodi Prochaska**
  *University of California, San Francisco*

**Purpose:**
This research study aims to examine whether Twitter-enabled peer interaction via web, mobile
Observational Studies
CAN HEALTH BEHAVIOR GO VIRAL?
Social contagion

 Obesity is “socially contagious” such that people are significantly more likely to be obese when they have an obese spouse and/or friends (Christakis and Fowler, 2007).

 Health habits are also shared in social circles.

 **Good news:** If you adopt healthy behaviors, your family and friends may be more inclined to.

 **Challenge:** To get healthier, you’re gonna need to find some healthy friends.
Organic online social network for weight loss on Twitter?

- **Observation:** Subculture of Twitter users who talk about their weight loss journey.

- **Study:** How much positive and negative social influence about weight loss do people get from Twitter vs Facebook vs in-person friends vs family?
Methods

- PI tweeted the survey 33 times over 4 weeks to get 90 complete responses for 2.72 surveys/tweet

  Tweet: “Do you tweet about your weight loss journey? Complete a brief survey!”

Survey evaluated:

- 4 areas of positive social influence (comfort, helpful, informative, supportive)
- 2 areas of negative social influence (embarrassment, judgmental)
Participants

- 90 surveys completed
- 79 participants had both Twitter and Facebook accounts
- 82% female, mean age = 35 (range 21-57)
- Mean weight lost in current weight loss effort = 35 lbs, sd=36 (range 0-193 lbs)
<table>
<thead>
<tr>
<th></th>
<th>Twitter</th>
<th>Facebook</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Account duration</td>
<td></td>
<td></td>
<td>.11</td>
</tr>
<tr>
<td>&lt; 1 year</td>
<td>25.3%</td>
<td>1%</td>
<td></td>
</tr>
<tr>
<td>1-3 years</td>
<td>55.7%</td>
<td>17%</td>
<td></td>
</tr>
<tr>
<td>3+ years</td>
<td>19%</td>
<td>81%</td>
<td></td>
</tr>
<tr>
<td>Log-in frequency</td>
<td></td>
<td></td>
<td>.60</td>
</tr>
<tr>
<td>Several times/day</td>
<td>68%</td>
<td>57%</td>
<td></td>
</tr>
<tr>
<td>Daily</td>
<td>23%</td>
<td>25%</td>
<td></td>
</tr>
<tr>
<td>Less than daily</td>
<td>9%</td>
<td>17%</td>
<td></td>
</tr>
<tr>
<td>Number of friends/follows</td>
<td>437 (533)</td>
<td>474 (621)</td>
<td>.73</td>
</tr>
<tr>
<td>% of friends/followers originated from an offline relationship</td>
<td>12% (19%)</td>
<td>82% (26%)</td>
<td>.00</td>
</tr>
</tbody>
</table>
Items

I feel **comfortable** talking about weight loss, diet, and exercise with ______.

In general, I find _____ to be very **helpful** to me as I try to lose weight.

I get **support** from _____ about my weight.

I get useful **information** from _____ about weight loss, diet, and/or exercise.

I have **felt embarrassed** about my weight when it comes to _____.

_____ tend to be **judgmental** about my weight.
Social Support

Comfort Talking About Weight

How Helpful Are They To Your Weight Loss Effort

How Supportive to Your Weight Loss Effort

Get Information
Negative influence

Feel Embarrassed About Weight

- Twitter: 2
- Facebook: 3
- Family: 4
- Friends: 4

How Judgmental

- Twitter: 1*
- Facebook: 2
- Family: 3
- Friends: 3
## What Do You Like Most?

<table>
<thead>
<tr>
<th>Feature</th>
<th>Twitter (n=103 responses)</th>
<th>Facebook (n=28 responses)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sharing information</td>
<td>31%</td>
<td>Support/encouragement</td>
</tr>
<tr>
<td>Support and encouragement</td>
<td>21%</td>
<td>Information sharing</td>
</tr>
<tr>
<td>Common interest/community</td>
<td>17%</td>
<td>Find in person friends with weight struggles</td>
</tr>
<tr>
<td>Motivation/inspiration</td>
<td>13%</td>
<td>Pic sharing</td>
</tr>
<tr>
<td>Anonymity</td>
<td>10%</td>
<td>Forming a private group</td>
</tr>
<tr>
<td>Lack of judgment</td>
<td>6%</td>
<td>Way to drive people to Twitter</td>
</tr>
<tr>
<td>Conciseness of tweets</td>
<td>1%</td>
<td>Lack of judgment relative to face-to-face interactions</td>
</tr>
</tbody>
</table>
What Do You Like Least?

<table>
<thead>
<tr>
<th>Twitter (n=36 responses)</th>
<th>Facebook (n=34 responses)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social comparison</td>
<td>Friends don’t care/think I’m bragging</td>
</tr>
<tr>
<td></td>
<td>19%</td>
</tr>
<tr>
<td>Too much info</td>
<td>Don’t want friends to know</td>
</tr>
<tr>
<td></td>
<td>19%</td>
</tr>
<tr>
<td>Lack of personal connection/don’t live close to people I follow</td>
<td>Misinformation/bad advice</td>
</tr>
<tr>
<td></td>
<td>17%</td>
</tr>
<tr>
<td>Inconsistent response from followers</td>
<td>Judgmental</td>
</tr>
<tr>
<td></td>
<td>14%</td>
</tr>
<tr>
<td>Ads/spam</td>
<td>Social comparison</td>
</tr>
<tr>
<td></td>
<td>11%</td>
</tr>
<tr>
<td>140 character limit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8%</td>
</tr>
<tr>
<td>Cliques</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6%</td>
</tr>
<tr>
<td>Misinformation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3%</td>
</tr>
<tr>
<td>At first hard to find people to follow</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3%</td>
</tr>
</tbody>
</table>
Discussion points

- Twitter is a source of positive social support for weight loss (more so than Facebook)

Why?

- More likely source of encouragement, community and information than Facebook
- Anonymity may circumvent stigma/shame, disinhibits discomfort about talking freely
- Social network is hand-crafted, negative forces are easy to eliminate
Limitations

- Selection bias – recruiting from Twitter may have selected folks who are more positive about Twitter than Facebook

- No social support measure has been developed specifically for online social behavior
Health hashtags on Twitter?

What is a hashtag?
A hashtag is when a # is used in front of a phrase or word in an online social network to tag it as a searchable term.

How are they used?
To find conversations on a topic, or people who have a shared interest, i.e., build a community.
Online social networks a vehicle for health behavior change?

We (unintentionally) launched a health challenge on Twitter that entailed completing an abdominal exercise and using a hashtag (#PlankADay) to report completion.

Pagoto, Schneider, Smith & Bauman, in press, Journal of Physical Activity and Health
Accountability can be fun...

48 hours with no #plankaday earns you a reminder tweet from the @plankpolice:

Has your #PlankADay been ABducted by aliens?

Careful, don't go 3 days without #PlankADay!

ABracadABra! Your #PlankADay disappeared!
Since June 2011
~9,000 people on Twitter used hashtag 2 or more times
# PlankADay Study

- Programmed a database for surveillance of the hashtag

- Survey (participants in first 2 months)
  - Demographics
  - Length of participation
  - Degree people encouraged others to join (spread)
  - What they like about participating
Participants (n=100)

- 81% female
- Mean age = 35.8 (SD = 7.9; range: 18-59)
- 86% Caucasian, 4% Black, 4% Asian, 4% Latino/Hispanic, and 2% of unknown ethnic origin
- Mean BMI = 24.87 (SD = 4.85), lean= 54%, overweight= 34%, obese= 7%, NR=5%
- 57% reported to be trying to lose weight
- Baseline ab exercise: 24% said they were doing ab exercises several times per week, 19% said once/week, 31% said 1-2 times/month, 14% said less than once/month, and 12% said never.
**Engagement**

The hashtag has been used by over 8,000 people in 22 months (with new adopters daily)
Length of Participation (max 8 weeks)
How many people did you invite to participate?

Did you encourage anyone else to join #plankaday?

68% yes
32% no

How?
46% Twitter
42% in person
12% Facebook
6% text/chat
5% email
How many people did you invite to participate?

- 7% 1 person
- 41% 2-4 people
- 9% 5-12 people
- 3% 50+ people

Hubs?
What did you like MOST about participating?

- 43% accountability/reminders/plankpolice
- 26% social aspect/meet new people/community
- 12% motivation
- 10% fun
- 4% stronger abs
Discussion points

- Hashtag fitness challenges are organically appearing on Twitter
  - #rwrunstreak, #candyfree, #marathonaweek, #5aday, #yogaaday

- How do we leverage this in health behavior interventions?

- Potential for spread is massive
Healthy Hashtag Project

- What type of health hashtags are there?
- How often are health hashtags being used?
- How are they being used?
- What are the features of hashtags that seem to get the highest rates of use?
Search strategy

- Investigators each made a list of health hashtags they have observed
- Searched those hashtags on Twitter to find tweets that might have other hashtags
- Searched streams of Twitter users who started a hashtag (e.g., @Fitfluential) or who have 3000+ followers and tweet primarily about weight/fitness (e.g., @irisheyes1984)
- Searched mobile app hashtags to identify (#myfitnesspal) additional hashtags
- 34 hashtags produced from search
Data collection

- We used an open source cloud-based tweet collection service that pulled all public tweets with our hashtags into a database
- 50 days of data collection (April to June 2013)
- Final N=30
  - 2 hashtags had < 3 uses per day (#candyfree, #marathonaweek)
  - 2 crashed during data collection (#crossfit, #fitfam)
- Total tweets – 458,350 or 9,167/day
Categorization

- 10-20 tweets for each hashtag were evaluated by an investigator to evaluate the purpose of its use.
- The investigator then developed themes.
- The themes were refined upon review of 10-20 more tweets using the hashtag.
- Team consensus was reached for all categories.
- Hashtags were then placed into categories by team consensus.
### Hashtag categories (n=7)

<table>
<thead>
<tr>
<th>Category</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavior</td>
<td>Indicates the user performed a health behavior (e.g., #runstreak, #plankaday)</td>
</tr>
<tr>
<td>Generic healthy</td>
<td>Denotes the users support for a generic healthy concept (e.g., #lowcarb)</td>
</tr>
<tr>
<td>Commercial workout-specific</td>
<td>Initiated by a commercial exercise program (e.g., #trx)</td>
</tr>
<tr>
<td>Noncommercial community</td>
<td>Indicates inclusion in a noncommercial health/fitness community (e.g., #fitbloggin)</td>
</tr>
<tr>
<td>Category</td>
<td>Definition</td>
</tr>
<tr>
<td>---------------------</td>
<td>--------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Commercial community</td>
<td>Indicates inclusion in a commercial health/fitness community (e.g., #imagreatist)</td>
</tr>
<tr>
<td>Chats</td>
<td>Indicates engagement in a health/fitness chat (e.g., #wwchat)</td>
</tr>
<tr>
<td>Mobile app</td>
<td>Indicates use of a fitness/health mobile app (e.g., #myfitnesspal)</td>
</tr>
</tbody>
</table>
Hashtags by category

- **Non-Commercial Community**
  - #fitbloggin
  - #pspfit
  - #wwchat
  - #rdchat
  - #fitblog

- **Commercial Community**
  - #girlsgonesporty
  - #sweatpink
  - #weightwatchers
  - #fitfluential
  - #imagreatist
  - #getafterit
  - #livewithfire
  - #tiuteam
  - #makeitcount
  - #drop10

- **Commercial Workout Specific**
  - #yogaaday
  - #plankaday
  - #nwrunstreak
  - #5aDay
  - #runstreak

- **Behavior**
  - #getfit
  - #fit4life
  - #lowfat
  - #lowcarb
  - #getstarted
  - #irunbecause

- **Generic Healthy**
  - #myfitnesspal
  - #100pushups
  - #c25k

- **Mobile App**
  - #TRX
## Hashtag frequency by category

<table>
<thead>
<tr>
<th>Category</th>
<th>Mean Frequency</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Mobile app</td>
<td>30,937</td>
<td>1,105 - 57,741</td>
</tr>
<tr>
<td>2. Commercial community</td>
<td>23,403</td>
<td>923 - 71,685</td>
</tr>
<tr>
<td>3. Generic Healthy</td>
<td>12,110</td>
<td>428 – 57,209</td>
</tr>
<tr>
<td>4. Commercial workout specific</td>
<td>10,429</td>
<td>10,429</td>
</tr>
<tr>
<td>5. Chats</td>
<td>6,120</td>
<td>3,574 – 9,324</td>
</tr>
<tr>
<td>6. Behavior</td>
<td>5,201</td>
<td>1,782 – 11,507</td>
</tr>
<tr>
<td>7. Noncommercial community</td>
<td>2,021</td>
<td>1,495 – 2,548</td>
</tr>
</tbody>
</table>
# Hashtag frequency in 50 days

<table>
<thead>
<tr>
<th>Hashtag</th>
<th>Total frequency</th>
<th>Frequency/Day</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. #girlsgonesporty*</td>
<td>71,685</td>
<td>1,433</td>
</tr>
<tr>
<td>2. #myfitnesspal*</td>
<td>57,741</td>
<td>1,155</td>
</tr>
<tr>
<td>3. #getfit</td>
<td>52,209</td>
<td>1,044</td>
</tr>
<tr>
<td>4. #fitfluential*</td>
<td>50,031</td>
<td>1,001</td>
</tr>
<tr>
<td>5. #makeitcount (Nike)*</td>
<td>45,666</td>
<td>913</td>
</tr>
<tr>
<td>6. #c25k*</td>
<td>33,966</td>
<td>679</td>
</tr>
<tr>
<td>7. #livewithfire (Reebok)*</td>
<td>23,878</td>
<td>478</td>
</tr>
<tr>
<td>8. #sweatpink*</td>
<td>11,949</td>
<td>239</td>
</tr>
<tr>
<td>9. #plankaday</td>
<td>11,507</td>
<td>230</td>
</tr>
<tr>
<td>10. #tiuteam</td>
<td>10,462</td>
<td>209</td>
</tr>
</tbody>
</table>

*commercial
### Commercial vs noncommercial

<table>
<thead>
<tr>
<th></th>
<th>Mean frequency</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Noncommercial</td>
<td>7,857</td>
<td>428 - 57,209</td>
</tr>
<tr>
<td>Commercial</td>
<td>21,771</td>
<td>923 – 71,685</td>
</tr>
</tbody>
</table>

\[ F (29) = 3.83; p = .06 \]
## Dissemination potential

<table>
<thead>
<tr>
<th>Category</th>
<th>RT</th>
<th>@</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mobile app</strong></td>
<td>.02(.02)</td>
<td>.62 (.90)</td>
<td>1.20 (.14)</td>
</tr>
<tr>
<td><strong>Commercial community</strong></td>
<td>.24(.14)</td>
<td>.75 (.28)</td>
<td>2.57 (.68)</td>
</tr>
<tr>
<td><strong>Generic Healthy</strong></td>
<td>.24(.10)</td>
<td>.59 (.23)</td>
<td>2.86 (1.08)</td>
</tr>
<tr>
<td><strong>Commercial workout specific</strong></td>
<td>.25</td>
<td>.87</td>
<td>3.06</td>
</tr>
<tr>
<td>(n=1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Chats</strong></td>
<td>.34(.11)</td>
<td>.91 (.09)</td>
<td>1.97 (.36)</td>
</tr>
<tr>
<td><strong>Behavior</strong></td>
<td>.12 (.08)</td>
<td>.62 (.16)</td>
<td>2.15 (.54)</td>
</tr>
<tr>
<td><strong>Noncommercial community</strong></td>
<td>.35(.16)</td>
<td>1.11 (.10)</td>
<td>1.74 (.24)</td>
</tr>
<tr>
<td><strong>Commercial (all)</strong></td>
<td>.19 (.16)</td>
<td>.72 (.42)</td>
<td>2.17 (.81)</td>
</tr>
<tr>
<td><strong>Noncommercial (all)</strong></td>
<td>.23(.12)</td>
<td>.74 (.26)</td>
<td>2.43 (.84)</td>
</tr>
</tbody>
</table>

*p < .05*
Discussion points

- Health hashtags are ubiquitous on Twitter with 458,350 uses in 50 days across 30 selected hashtags.
- Hashtags have different meanings, ranging from behavior, community to chats.
- Mobile app hashtags might get fewer RTs, mentions and hashtags due to auto-tweets.
- Hashtags do not require commercial backing to spread.
- #girlsgonesporty company has 3900 followers, #myfitnesspal has 61,000
Intervention Research
Get Social Pilot Study

- Lifestyle interventions are effective but have not been widely disseminated due to high cost and intervention intensity.
- Social media is a way to communicate with patients thus it could provide a low cost means of delivering intervention.

Research question: Can we deliver a behavioral weight loss intervention almost entirely via an online social network?
12 obese adults enrolled in 12 week program

Intervention:
- Twitter social network with 3 lifestyle coaches
- My Fitness Pal
- 1 orientation visit to be trained on technology and receive goals
- 1 group visit at 6 weeks
- Assessment visit and focus group at 12 weeks
Intervention

- Coaches tweet:
  - Links to lifestyle intervention content ("Hit a plateau? Check this out")
  - Links to stories of people who’ve lost weight
  - Recipes
  - Advice ("@margie Try to pick out what you will order before you go to the restaurant so you have time to plan your choice")
  - Support ("Great job!")
  - Questions ("What are you all doing for exercise this weekend?")
Participants are tweeting...

- My Fitness Pal updates
- About their exercise
- Questions to coaches
- Goals
- Cheer each other on
- Problems they’re having
Future considerations...

- Social media is a tool
  - Recruitment
  - Assessment
  - Intervention

- Online social behavior is unique and should be studied in its own right
  - Theoretical models needed!

- Enormous potential for health behavior change