HMC’s Approach to Understanding the Role of Traditional and New Media in a Rapidly Changing Media Environment

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April 16, 2013
IHRP Brown Bag
Roadmap: Overview and Highlights

• Background— A Brief History of HMC
• New Media Paradigm
• Descriptive Work
• Focus on Twitter—the Trifecta
  – E-cigarettes
  – CDC Campaign
• What CAN’T social media data tell us?
  – Survey
• Conclusions and Growth Opportunities

http://go.uic.edu/HealthMediaCollab
Conceptual Framework Pre-2011

Demographic Controls

Message Exposure

Attitudes Beliefs

Outcomes

Contextual/Policy Controls
Key Lessons about Tobacco-Related Ads

• **Tobacco and pharmaceutical companies are the largest smoking-related advertisers** (Wakefield, Szczypta, Emery et al., 2006. *Addiction*).

• **Anti-smoking ads are associated with smoking-related attitudes, beliefs, and behavior** (Emery, et al., 2005, *JPAM*).

• **Tobacco Industry ads anti-smoking ads have boomerang effect** (Wakefield, Terry-McElrath, Emery, et al., *AJPH*, 2006).

• **Anti-smoking ads are associated with less smoking; more quitting intentions among adults** (Emery, et al., *AJPH*, 2012)
Significant Interaction between Legacy and State Ads
But with Internet and Social Media...

- Patterns of media consumption have changed dramatically
  - Internet use nearly universal—in 2012 81% of adults went online
  - 66% of homes have broadband
  - 91% of Internet users Search for information
  - 69% are on Facebook
  - 18% on Twitter
  - Most dual-screen when watching TV
- Need to account for exposure, seeking, and exchange of tobacco-related information—and interaction of each!
New Paradigm ➔ New Conceptual Framework

Demographic Controls

Exposure ➔ Search ➔ Share

Contextual/Policy Controls

Health Behavior
But it’s so complicated!

First, describe....
Exposure: Tobacco Control Programs on the Internet

2011

- Text Only: 50
- Interactive SNS: 19
- Interactive Other: 12

Cessation Services
Cessation Referral
Prevention
Policy
Search: Tobacco Control Programs on the Internet

State Website Search (99)

Keyword Search (67)
Punchline:

• Content is very basic

• Sites are hard to find

• Opportunities for improvement 😊
Search Analysis

How did National Indoor Smoking Ban Affect Behavior in China?

Challenge: Generally poor surveillance system

Opportunity: Search volume as proxy for behavior
Punchline

• Search query analysis can provide timely feedback/surveillance

• Smokefree air laws associated with increased interest in quitting and e-cigs

• Similar findings with Google searches related to SCHIP cigarette tax increase in US
Social Media: the New Frontier
A Twitter Explosion

400 MILLION tweets per day

15% OF ALL INTERNET USERS ARE ON TWITTER

14% Men
15% Women

14% Hispanic
28% African American
12% White

TWITTER USE GROWTH

<table>
<thead>
<tr>
<th></th>
<th>Nov 2010</th>
<th>May 2011</th>
<th>Feb 2012</th>
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<tbody>
<tr>
<td>Daily Users</td>
<td>8%</td>
<td>13%</td>
<td>15%</td>
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<tr>
<td>All Users</td>
<td>2%</td>
<td>4%</td>
<td>8%</td>
</tr>
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</table>

52% OF TV VIEWERS USE PHONES ALONGSIDE TV CONTENT

THE CONNECTED VIEWER

Check their phones During Commercials 38%

Validate TV information using their phones 22%

Visit featured sites using their phones 20%

Text with others watching the same program 23%

Twitter Users Posting Video Content 28%

Dual Users IN THE UNITED STATES

<table>
<thead>
<tr>
<th></th>
<th>Cell Phone</th>
<th>Tablet</th>
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<tbody>
<tr>
<td>Several times per day</td>
<td>27%</td>
<td>26%</td>
</tr>
<tr>
<td>Once a day</td>
<td>14%</td>
<td>19%</td>
</tr>
<tr>
<td>Several times per week</td>
<td>23%</td>
<td>24%</td>
</tr>
<tr>
<td>Several Times per month</td>
<td>13%</td>
<td>13%</td>
</tr>
<tr>
<td>Once a Month</td>
<td>9%</td>
<td>7%</td>
</tr>
<tr>
<td>Never</td>
<td>14%</td>
<td>12%</td>
</tr>
</tbody>
</table>

Exposure-Search-Share: Twitter is Trifecta

• Since December 2011, Firehose Access
• Over 120 million smoking-relevant Tweets collected so far
• Several interesting challenges
• Several interesting findings
Every Tweet Matters

- Twitter API – 1% Sample

  - The volume of tweets about public health campaigns and policy issues are low when compared to tweets about pop culture
    - (Justin Bieber, Game of Thrones, Halo 4)

- FireHose – (GNIP) Real time search access to 100% of all tweets and metadata

- DiscoverText – (Textifter) Collect, archive, filter, sift and classify tweets
Strategic Decision About Data Collection

Key words are how we collect data
Key Word Selection

• Three Broad Constructs
  – Behavior: Smoking, quitting, etc.
  – Policy: Smoking Bans, Cigarette Taxes and evasion, regulation, etc.
  – Branding: State Campaigns, Tips from Former Smokers, Marlboro, Newport, etc.
SMOKING....
Come get a smoking hot jerk chicken wrap from us @jamiesfifteen @boroughmarket #NAW2013 pic.twitter.com/ONkiq8lwpl
"I JUST BOUGHT A BAG OF BROCCOLI YESTERDAY WHAT ARE YOU DOING WITH IT? SMOKING IT?"
That anti-smoking commercial with that Terrie lady is like the scariest thing ever! And I don't even smoke! #Ew
You're jus too hot

yur smoking .. Too hot to handle lol
What is a SQUARE, and why is it important?
Quiting Squares Don't Know Why I Even I Started Smoking In The First Place.
Marketing and Promotion of Electronic Cigarettes on Twitter

• Increasing sales and use of e-cigarettes in the US over the past several years

• E-cigarettes adoption may in part reflect online marketing efforts

• FDA’s regulatory procedures for e-cigarettes have yet to be determined
Methods

- For May and June 2012, Twitter Firehose to capture ALL e-cig tweets and metadata
- Used human and machine coding for:
  - Mentions of smoking cessation
  - Commercial vs. organic
- Used keywords to pull out mentions of health, safety, and price or discounts
- Coding algorithms highly consistent with a human coder (kappa =~ .9)
Key Words for E-Cigs

e cigarettes  blu cigarette e cigarettes  njoy cigarette e cigarettes  blu cig e cigarettes  njoy cig e cigarettes  ecig e cigarettes  e-cig e cigarettes  @blucigs e cigarettes  e-cigarette e cigarettes  ecigarette e cigarettes from:blucigs e cigarettes  ecigs e cigarettes  e-cigs e cigarettes  ecigarettes e cigarettes  e-cigarette e cigarettes  ecigarettes e cigarettes e-cigarettes green smoke e cigarettes  south beach smoke e cigarettes  cartomizer e cigarettes  (atomizer OR atomizers) -perfume e cigarettes  ehookah OR e-hookah e cigarettes  ejuice OR ejuices OR e-juice OR e-juices e cigarettes  eliquid OR eliquids OR e-liquid OR e-liquids e cigarettes  e-smoke OR e-smokes e cigarettes  (esmoke OR esmokes) sample:5 lang:en e cigarettes  eversmoke e cigarettes  joye 510 e cigarettes  joye510 e cigarettes  lavatube OR lavatubes e cigarettes  logicecig OR logicecigs e cigarettes  smartsmoker e cigarettes  smokestik OR smokestiks e cigarettes  v2 cig OR "v2 cigs" OR v2cig OR v2cigs e cigarettes  vaper OR vapers OR vaping e cigarettes  zerocig OR zerocigs e cigarettes  cartomizers e cigarettes  e-cigarette
Punchline

• E-cigarettes are marketed heavily via Twitter

• Most e-cig messages are marketing

• Analysis of metadata provides important clues about the nature of the marketing: who and how

• Evidence of potential regulatory issues
Can Twitter be utilized to evaluate media health campaigns?

Preliminary findings of a fear appeal analysis using organic tweets from the CDC Tips Campaign.

Significance of social media to drive awareness (search and exchange) of health media campaigns.
Curating Tweets for CDC Tips

Filtered by date and sifted for Ad, Commercial, Campaign

Tobacco Behavior (16.9m)
Tips Former Smokers (77k)
AntiTobacco (54k)

With no #hashtag used during advertising, it created a challenge to mine tweets for CDT Tips

107,569 Potential Tips Related Tweets

77,483 De-Duplication
Precision Test & Machine Classification

77,483
Potential Tips Related Tweets

Tips Campaign Relevancy
Random Sample of Tweets
3 Teams of 2 Coders
Average .9 Kappa
Machine Classifier (Bayesian)

Team A
350 Tweets

Team B
350 Tweets

Team C
350 Tweets

78 %

60,116
Tips Related Tweets

http://go.uic.edu/HealthMediaCollab
Twitter Engagement Metrics

• 54,502 Unique Users

• At least 5 million impressions (unique users plus friends)*

• 80% of users used a mobile device to tweet about campaign

* Friends metric began 5/28/12
That cigarette commercial with the lady who has a hole in her neck is very disturbing. If you keep smoking cigarettes you'll end up like those people on that commercial that have the hole in their neck.

Weezy sound like that old lady from the cigarette commercial with that thing in her throat.

That smoking commercial with them people with holes in their throat is very disturbing. Iss funny!

When I had just hit the black, then that disturbing smoking, hole in their throat commercial came on, I was like ohhh >.
Hole in Neck Sift

Sifted: neck, throat, hole, stoma, trache, tracheotomy

Tips Relevant Bucket

14,137 Hole in Throat Bucket

24%

1 in 4 tweets referred to stoma ads

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Fear Arousal / Fear Rejection

**Fear Arousal**
A tweet that describes the mood of the tweeter as saddened, frightened, tense, nervous, anxious, uncomfortable or nauseous.

• Man that smoking commercial where the lady has a hole in her throat scare me every time

**Fear Rejection**
A tweet that describes a doubt, rejection, or avoidance of a fear inducing message.

• That smokefree commercial is bull sh*t. My grandma has been smoking cigarettes since she was 10 and she doesnt have a hole in her damn neck

http://go.uic.edu/HealthMediaCollab
Coding & Machine Classification

14,137
Hole in Throat Bucket

Team A
350 Tweets

Team B
350 Tweets

Team C
350 Tweets

Team D
350 Tweets

Random Sample 10%
4 Teams of 2 Coders
Kappa Average: Arousal (.9), Rejection (.6), Neutral (.3)
Machine Classifier

Fear Arousal
82 %

http://go.uic.edu/HealthMediaCollab
Top 100 Most Frequent Words for Fear Arousal

ad af anti antismoking ass bad bald bitch bout cancer cant chick

cigarette cigarettes cigs comes commercial crazy
creeps creepy damn dat day disgusting disturbing dont everytime ew
freaks free fuck fucking funny getting girl gotta gross hair hate hell
hole holes lady lmao lol makes mouth nasty neck omg oo
outta people ppl putting quit ready sad scare scared scares scary
seeing seen shit smh smoke smoked smokefree smoker smokers
smokin smoking stoma stop talk talking teeth terri terrie terry

tf tha thats throat tht time tobacco tv voice wanna watch
watching white wig wit woman women yall yo

http://go.uic.edu/HealthMediaCollab

generated by DiscoverText
Negative is Positive

Fear Appeals - Health risk messages that arouse fear

Contain both a threat component and a recommended response

CDC Tips Ads contained mostly threat and little efficacy
- Tagline “You can quit” plus .gov website

A threat ad needs the proper mix of threat and efficacy to be accepted.

Too much threat can cause a message to be rejected

*Extended Parallel Process Model (Witte 2000)*

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Top 20 Most Frequent #Hashtags for Fear Arousal

<table>
<thead>
<tr>
<th>Scary</th>
<th>Wtf</th>
</tr>
</thead>
<tbody>
<tr>
<td>NeverSmoking</td>
<td>Yuck</td>
</tr>
<tr>
<td>Gross</td>
<td>Disgusting</td>
</tr>
<tr>
<td>Creepy</td>
<td>ScaryShit</td>
</tr>
<tr>
<td>Sad</td>
<td>SmokeFree</td>
</tr>
<tr>
<td>Ew</td>
<td>Smoking</td>
</tr>
<tr>
<td>Sosad</td>
<td>Tragic</td>
</tr>
<tr>
<td>Ican</td>
<td>Disturbing</td>
</tr>
<tr>
<td>Nasty</td>
<td>DontSmoke</td>
</tr>
<tr>
<td>Nightmare</td>
<td>Dead</td>
</tr>
</tbody>
</table>
Punchline

1 in 4 tweets referenced stoma ads

A majority of tweeters (82%) accepted the threat appeal message of the stoma ads

If viewers are expressing fear then ads should significantly impact outcomes like increased calls to quitlines and quit attempts

Twitter data can provide important PROCESS evaluation information
But Secondary Data Leaves Gaps

• Not much information about individuals
  – Demographics
  – Geography

• Hard to establish causal link
HMC Survey

• Fielded in late February 2013

• Online administration

• 17,522 respondents
  ▪ Combined opt-in panel/representative sample
  ▪ 50% tobacco users

• Complex design to achieve representation at major media market level

• Allow us to describe individual behaviors and construct population measures
Survey Constructs

• Media consumption and access
• Exposure to, search, and exchange of tobacco-related information across media platforms
• Tobacco use
• Cessation behavior
• Attitudes and beliefs about smoking
• Exposure to tobacco promotions
Conclusions

• Highlighted only SOME of what we’re working on

• Team effort

• More data than people to analyze

• Can look at Obesity; Marijuana; Insurance Exchanges; etc....
Acknowledgments

• This research was funded by the National Cancer Institute (Grant No. U01CA154254) and the National Heart Lung and Blood Institute (Grant No. R01HL107345).

• This presentation is the work entirely of the authors and does not necessarily represent the views of the NCI or NHLBI.

• For more information about this research, visit http://www.healthmediacollaboratory.org.