



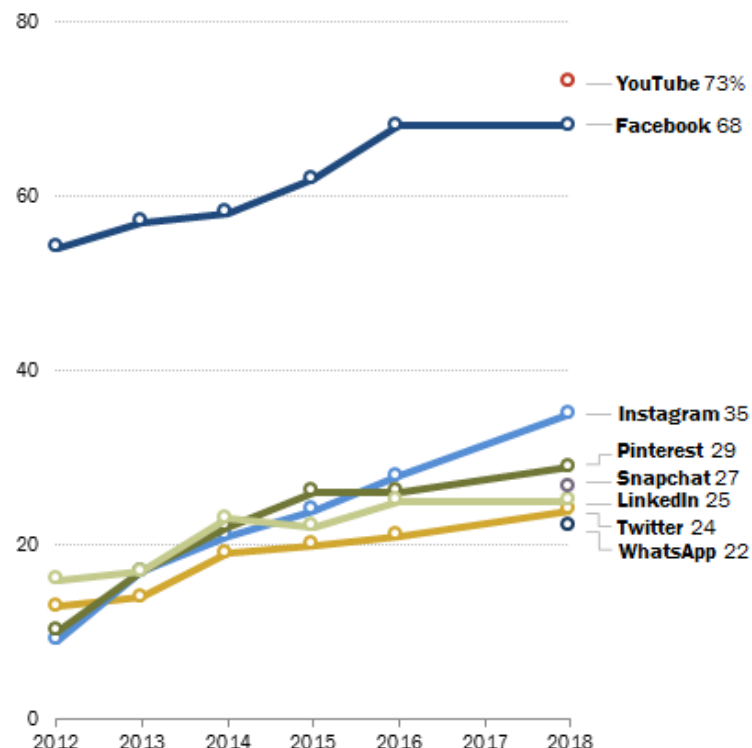
Opportunities and Challenges of Employing Social Media to Improve Mental Health

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Majority of Americans now use Facebook, YouTube

% of U.S. adults who say they use the following social media sites online or on their cellphone



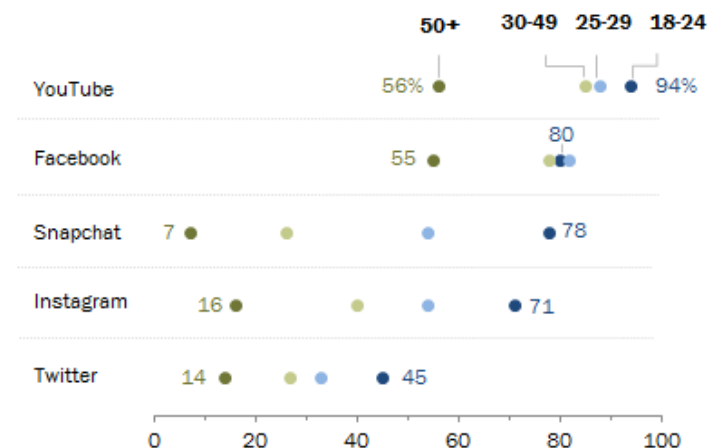
Note: Pre-2018 telephone poll data is not available for YouTube, Snapchat or WhatsApp.
Source: Survey conducted Jan. 3-10, 2018. Trend data from previous Pew Research Center surveys.

"Social Media Use in 2018"

PEW RESEARCH CENTER

Social platforms like Snapchat and Instagram are especially popular among those ages 18 to 24

% of U.S. adults in each age group who say they use ...

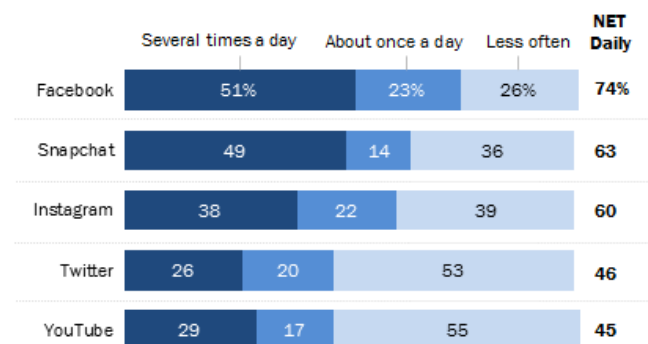


Source: Survey conducted Jan. 3-10, 2018.
"Social Media Use in 2018"

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A majority of Facebook, Snapchat and Instagram users visit these platforms on a daily basis

Among U.S. adults who say they use ___, the % who use each site ...



Note: Respondents who did not give answer are not shown. "Less often" category includes users who visit these sites a few times a week, every few weeks or less often.

Source: Survey conducted Jan. 3-10, 2018.

"Social Media Use in 2018"

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Le-shaker.fr

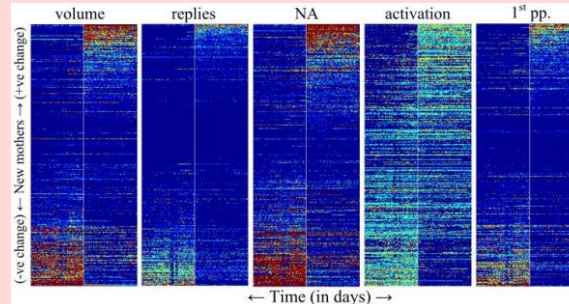
Social Dynamics and Well-Being Laboratory

diagnosis

Treatment/care

Social media as
a data source

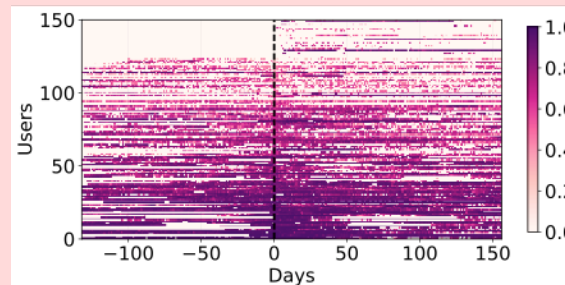
Social media to
intervene



[CSCW'13; CHI'13; ICWSM'13;
WebSci'13; CSCW'14; CHI'16]



[PH'13; CSCW'16; CHI'17;
IMWUT]



[ICWSM'14; WWW'15;
ICWSM'17; PACM]

9 Why does no one like me? (self.depression)
submitted 13 hours ago by [redacted]

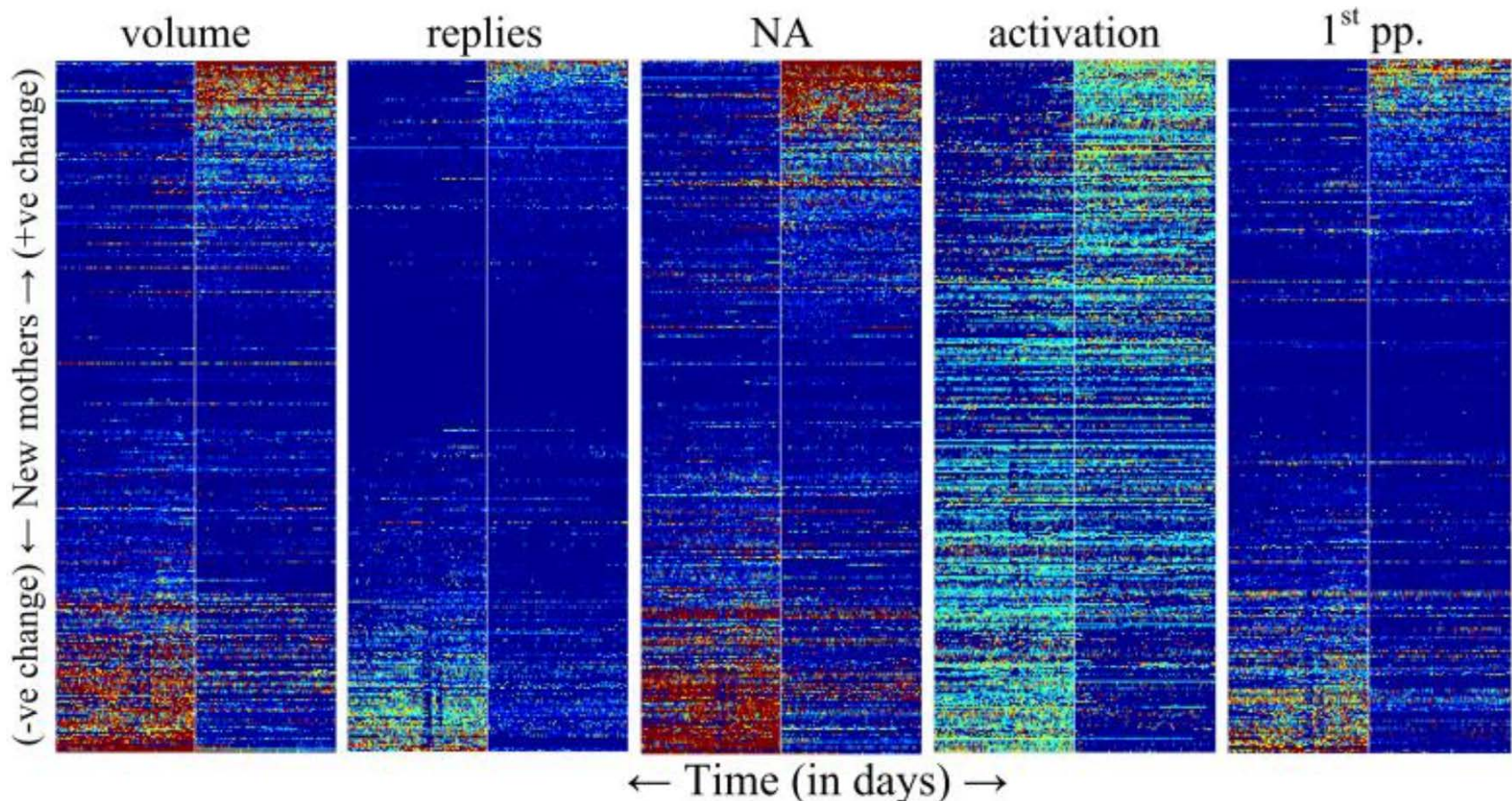
I feel invisible so often; like an extra in a movie, always on the sidelines. I don't have any genuine friends, just acquaintances. And not even just friends, I haven't had a genuine conversation with anyone of the opposite gender in years. The worst part is that I delude myself into thinking I have a chance with people who are out of my league. I just feel so alone.

6 comments share

[JMIR; Psych Services;
PACM; CHI'17]

Diagnosis and Detection

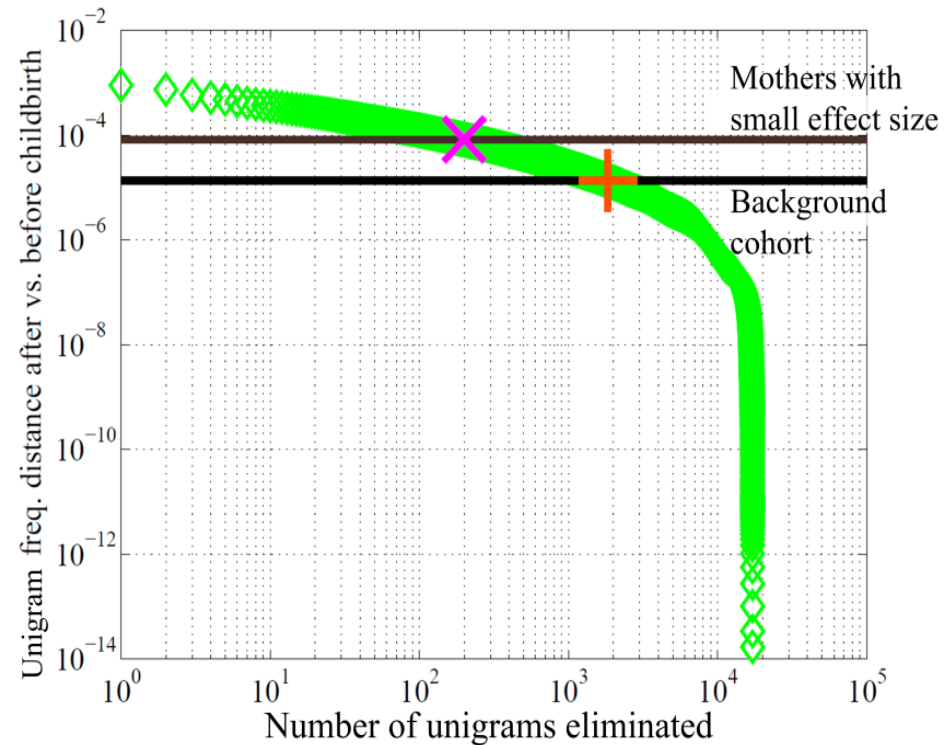
Social Media Derived Behavioral and Affective Markers Predict Postpartum Changes



376 users (new mothers); 40,426 posts between March 2011 and July 2012

Greedy Differencing Analysis

- o determine the number of unigrams whose change in usage frequencies renders the mothers with large effects significantly different
- o the deviations for certain new mothers captured by a rather small number of unigrams:
 - 1.16% compared to mothers with small effects
 - 10.73% with respect to the background cohort



Model Fitting/Prediction

Penalized logistic regression:

	Prenatal	+10d	+20d	+30d	Postnatal
Dev.	61.32	57.39	52.58	46.61	58.15
LL	-30.668	-26.3	-20.34	-17.24	-28.84
psd. R^2	0.355	0.383	0.439	0.484	0.372
S_{fit}	0.72	0.68	0.62	0.57	0.703
N	156	156	156	156	156
Error df	100	100	100	100	100

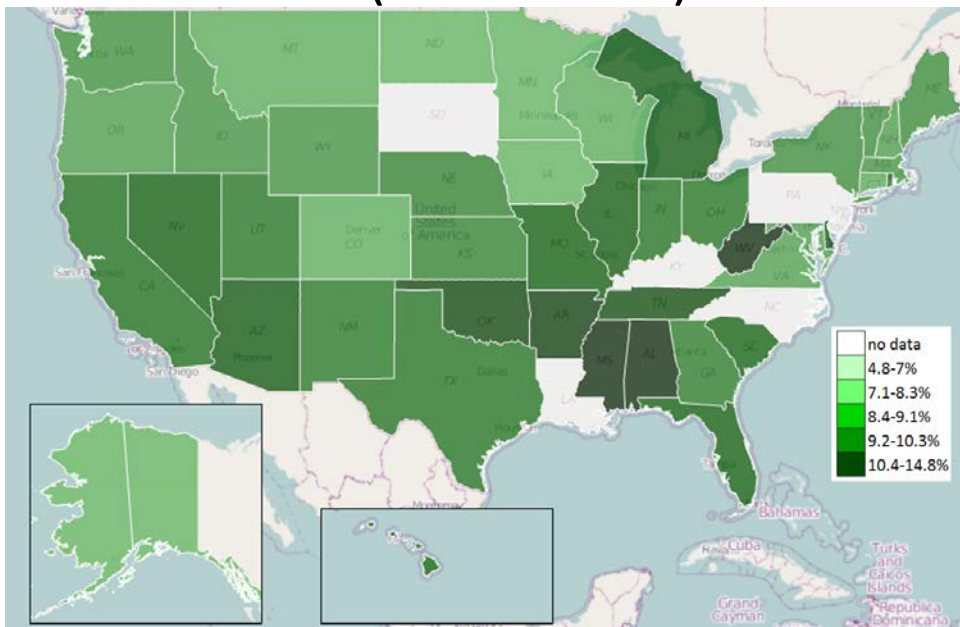
- The prenatal period *does* provide PPD-predictive information together with a brief period of postnatal observations.
- Aligns with findings in the clinical literature where prepartum depression is known to be a good indicator of PPD (Beck 2001).

Social media depression index

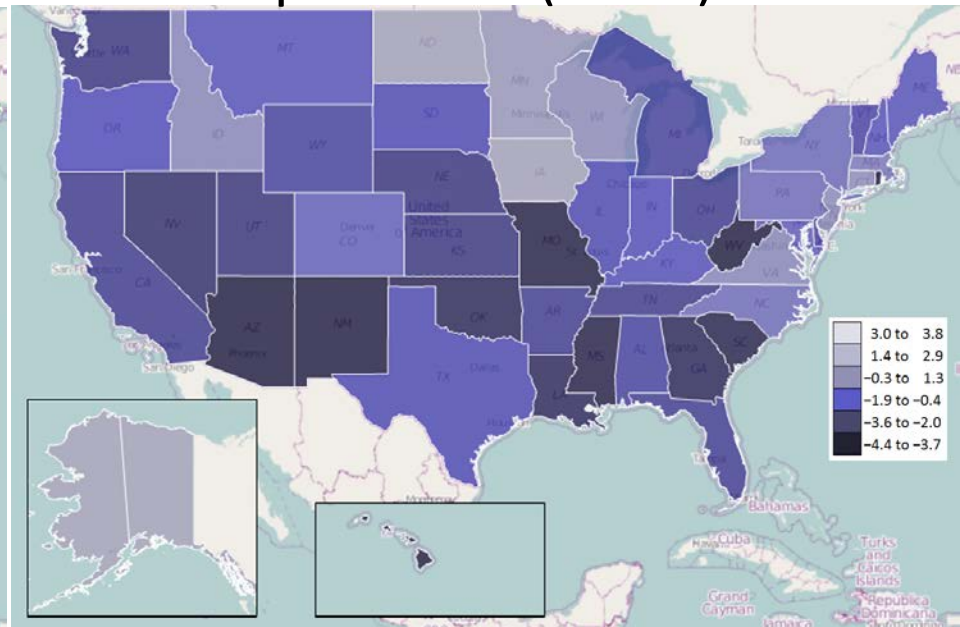
$$SMDI(t) = \frac{n_d(t) - \mu_d}{\sigma_d} - \frac{n_s(t) - \mu_s}{\sigma_s}$$

standardized difference between frequencies of depression-indicative and standard posts, compared to a period before between k and $t-1$ ($1 \leq k \leq t-1$)

actual (BRFSS data)

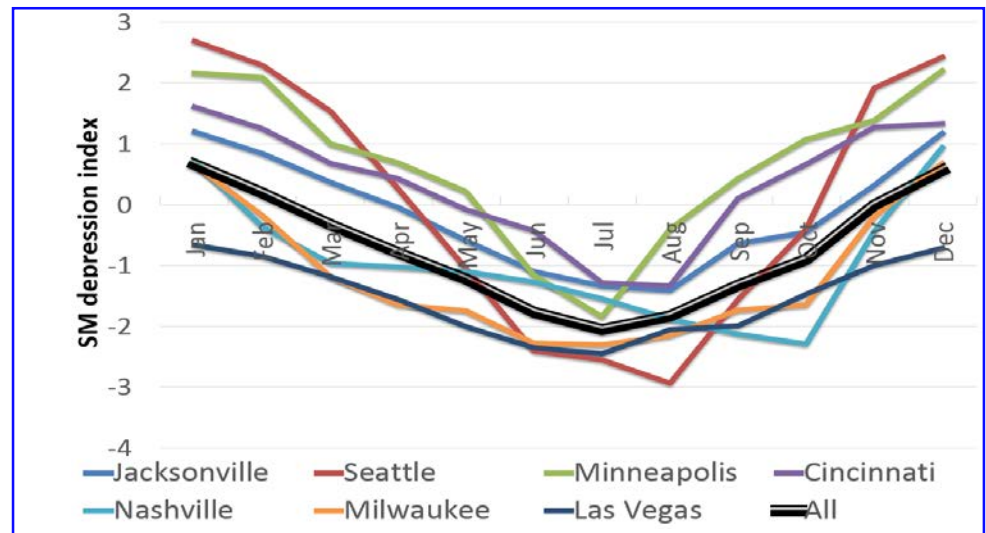
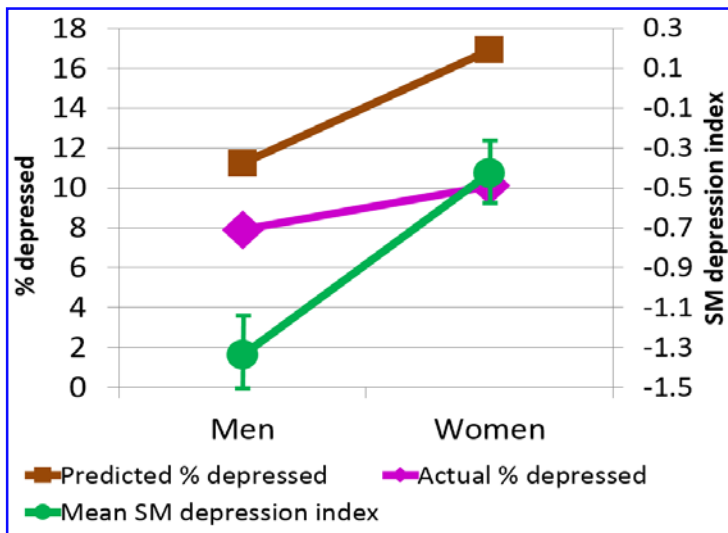
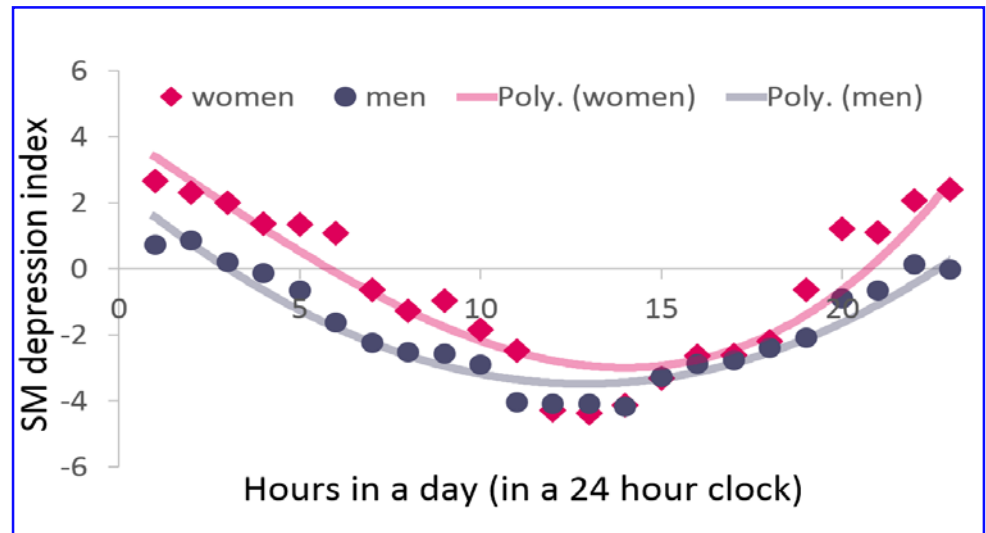
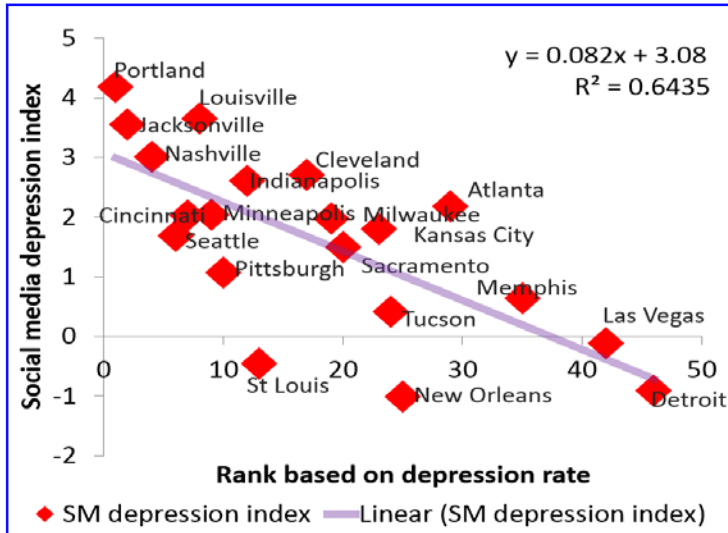


predicted (SMDI)



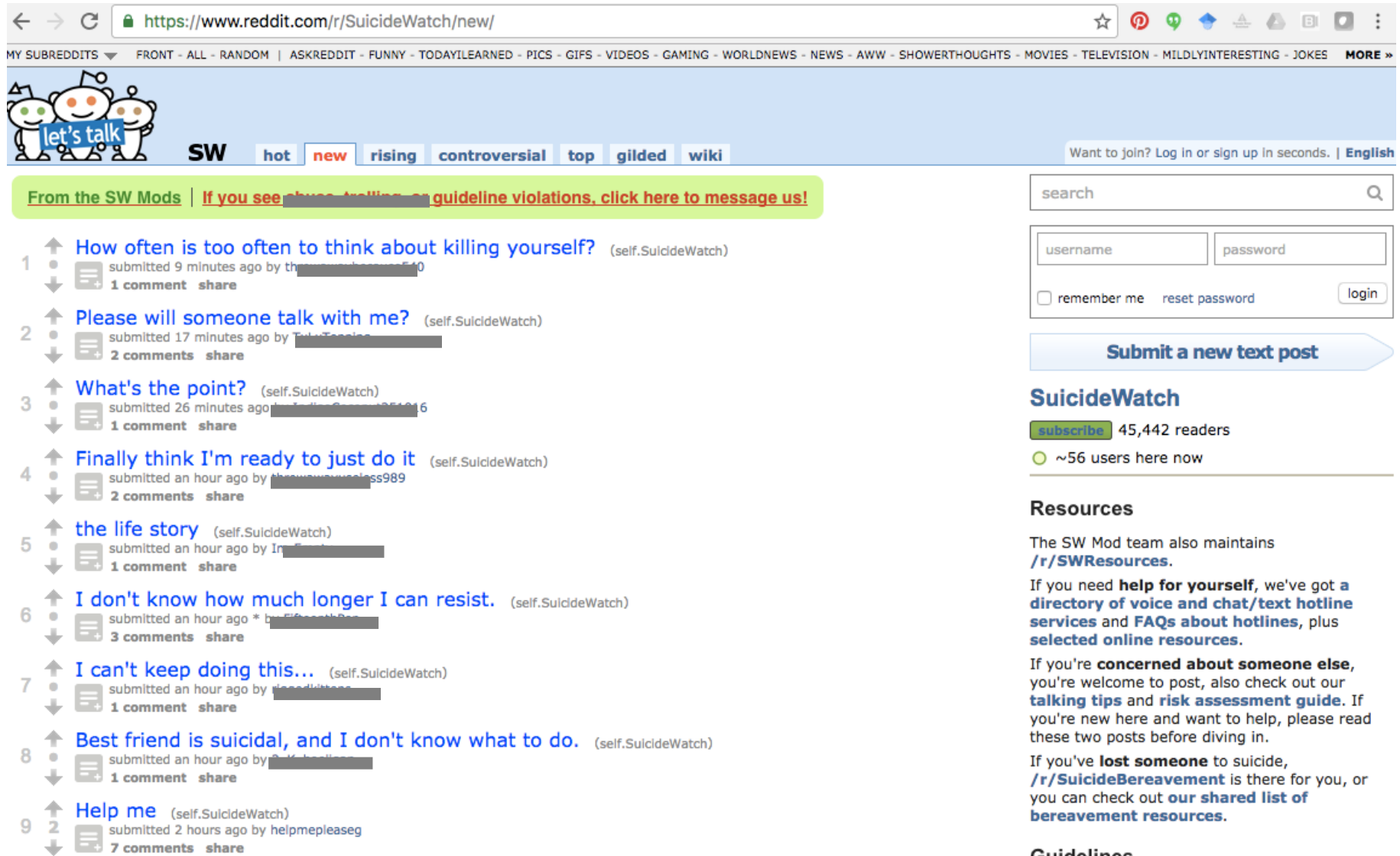
least squares regression fit yields correlation of 0.52

Social Media Language Predicts Prevalence of Depression in the U.S.



Beyond correlational methods...

Media Health Discourse in Social Media Predicts Shifts to Suicidal Ideation



The screenshot shows the front page of the r/SuicideWatch subreddit. At the top, there's a navigation bar with links to various subreddits and a search bar. Below this is a banner with the subreddit's logo and a list of sorting options: SW, hot, new, rising, controversial, top, gilded, and wiki. A green banner from the mods asks users to report guideline violations. The main content area displays a list of 9 posts, each with a title, a brief description, and a 'share' button. The posts are sorted by 'new'. On the right side, there's a login section with fields for username and password, a 'remember me' checkbox, and a 'login' button. Below the login section is a button to 'Submit a new text post'. Further down, there's a section for 'SuicideWatch' with a 'subscribe' button and a note that there are 45,442 readers and ~56 users online. At the bottom, there's a 'Resources' section with links to a directory of voice and chat/text hotline services, FAQs about hotlines, and a list of bereavement resources. The 'Guidelines' section is partially visible at the very bottom.

From the SW Mods | If you see abuse, trolling, or guideline violations, click here to message us!

1 How often is too often to think about killing yourself? (self.SuicideWatch)
submitted 9 minutes ago by [redacted]
1 comment share

2 Please will someone talk with me? (self.SuicideWatch)
submitted 17 minutes ago by [redacted]
2 comments share

3 What's the point? (self.SuicideWatch)
submitted 26 minutes ago by [redacted]
1 comment share

4 Finally think I'm ready to just do it (self.SuicideWatch)
submitted an hour ago by [redacted]
2 comments share

5 the life story (self.SuicideWatch)
submitted an hour ago by [redacted]
1 comment share

6 I don't know how much longer I can resist. (self.SuicideWatch)
submitted an hour ago * by [redacted]
3 comments share

7 I can't keep doing this... (self.SuicideWatch)
submitted an hour ago by [redacted]
1 comment share

8 Best friend is suicidal, and I don't know what to do. (self.SuicideWatch)
submitted an hour ago by [redacted]
1 comment share

9 Help me (self.SuicideWatch)
submitted 2 hours ago by helpmepleaseg
7 comments share

search

username password

☐ remember me reset password login

Submit a new text post

SuicideWatch

subscribe 45,442 readers

~56 users here now

Resources

The SW Mod team also maintains [/r/SWResources](#).

If you need **help for yourself**, we've got a **directory of voice and chat/text hotline services** and **FAQs about hotlines**, plus **selected online resources**.

If you're **concerned about someone else**, you're welcome to post, also check out our **talking tips** and **risk assessment guide**. If you're new here and want to help, please read these two posts before diving in.

If you've **lost someone** to suicide, [/r/SuicideBereavement](#) is there for you, or you can check out **our shared list of bereavement resources**.

Guidelines

Patterns of Mental Health Discourse on Social Media Predict Future Suicidal Ideation

depression +30%

useless +51%

suicidal +34%

medicine +52%

locked +51%

no friends +51%

loneliness +50%

alone I +34%

differences -57%

always a -56%

be working -56%

keep your -56%

preferred -56%

awesome I -56%

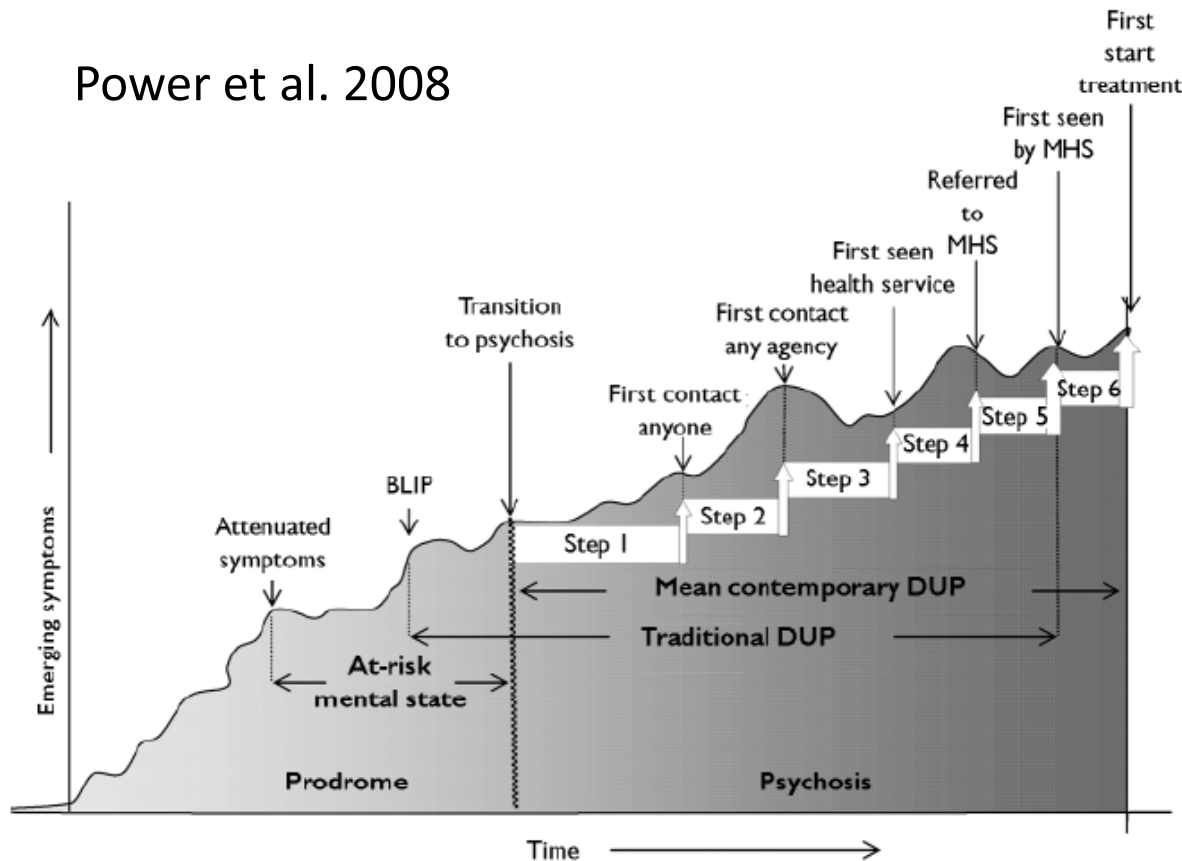
and enjoy -55%

it work -55%

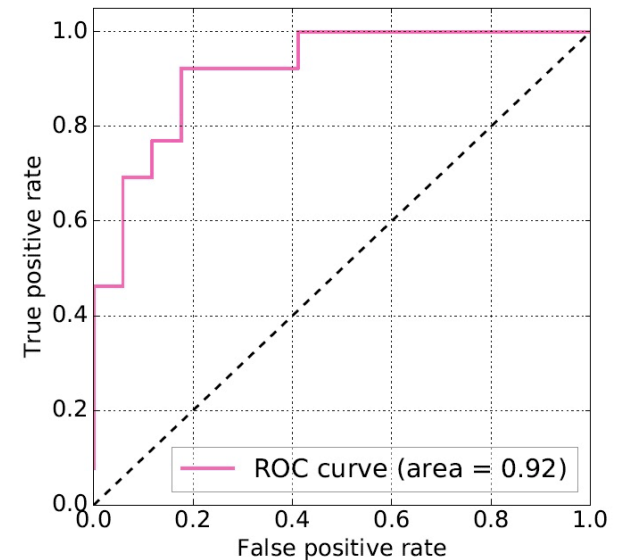
Treatment and Care

Reducing DUP (Duration of Untreated Psychosis) with Social Media

Power et al. 2008



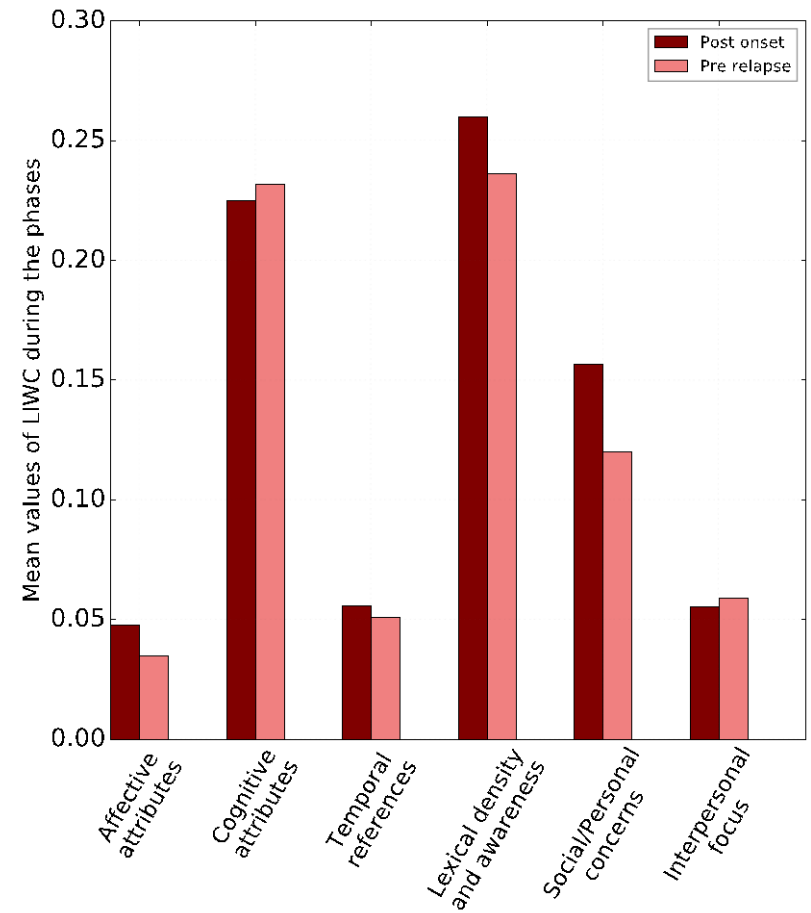
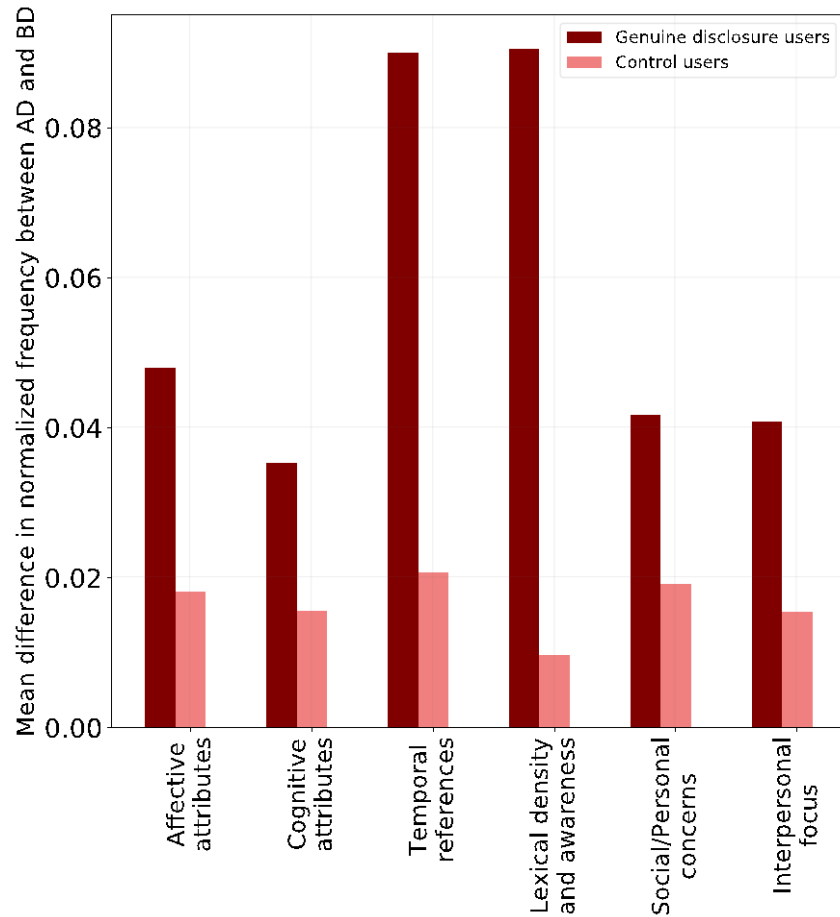
Machine
Learning
+
Clinical
Appraisals



Social Media for Relapse Prevention

- Facebook and Google data of young adult early psychosis patients (so far N =86).
- Relapse events/hospitalization information.
- Psychosis vs. healthy control – 5-fold cross validation
 - Average Precision (= 0.86), Recall (=0.83), Accuracy (=0.77), AUROC (0.81)
 - Significant predictors (PA, Sadness, Conjunction, 1st person plural, 2nd person etc.)
-
- Psychosis vs. mood disorder – 5-fold cross validation
 - Average Precision (= 0.78), Recall (=0.72), Accuracy (=0.75), AUROC (0.82)

Social Media for Relapse Prevention



Some Open Challenges

- Platforms' Terms of Service and other policies
- Data challenges
 - Different platforms, different affordances
 - Different usage
 - Usage evolves over time
- Modeling challenges
 - “Black box” models
 - Sensitive inferences from otherwise benign information
 - Usability/transparency/trust
- User expectations of privacy
 - Challenges of public data/consent/IRB
 - Who owns the data?
 - Data not created for health use

Thanks!

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