#thighgap to #thyghgapp: Incrementation of orthographic variation on Instagram

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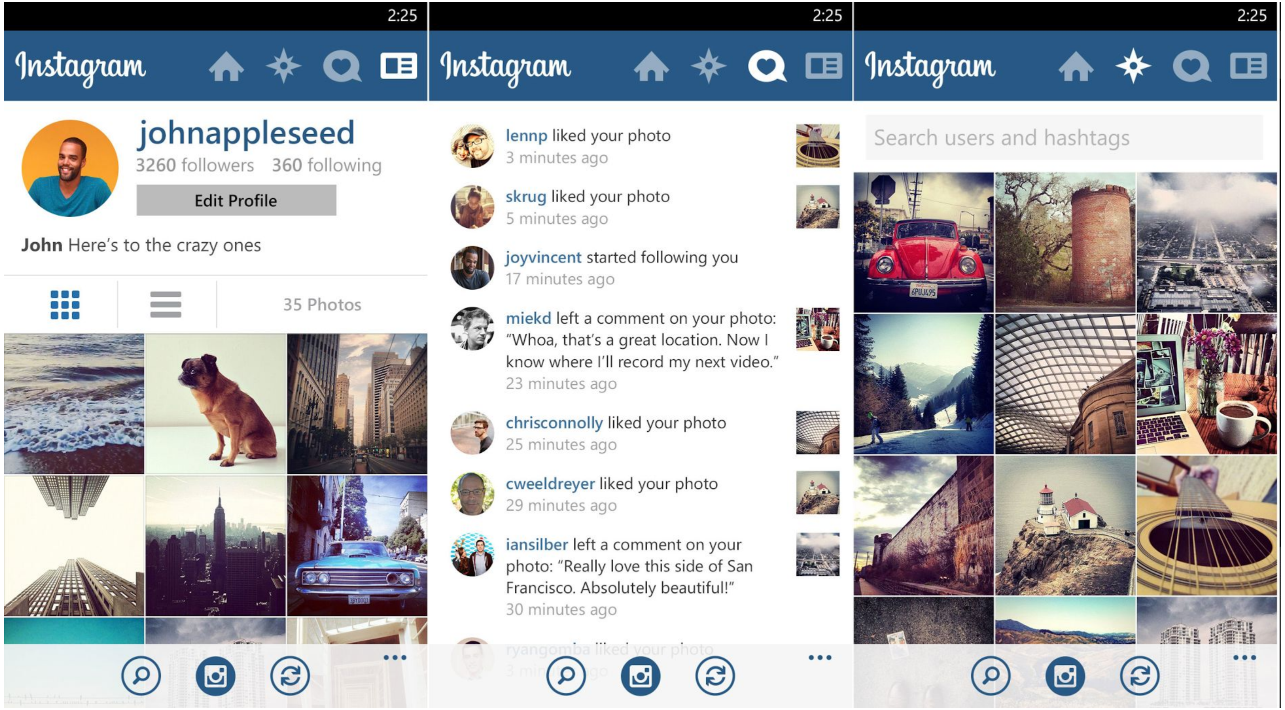
Content warning: eating disorders

Instagram



http://aworldofapps.com/wp-content/uploads/2015/07/Profile-how-to-use-Instagram.jpg

Pro-ED Instagram

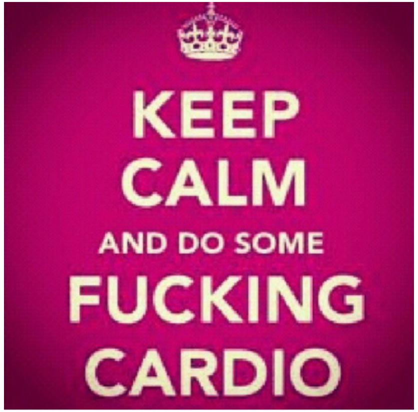
- Community that “share[s] content, advice and provide[s] social support for disordered or unusual eating choices” (Chancellor et al. 2015)

Pro-ED Instagram

7 likes

[redacted] Todays total : 906 calories today was horrible #Ana #anorexia #staystrong #fat #ugly #disgusting #nothappy #sad #strong #ed #eatingdisorder #girl #cutting #losingweight #weight #wishweight #clean #horribleday #horrible #selfharm

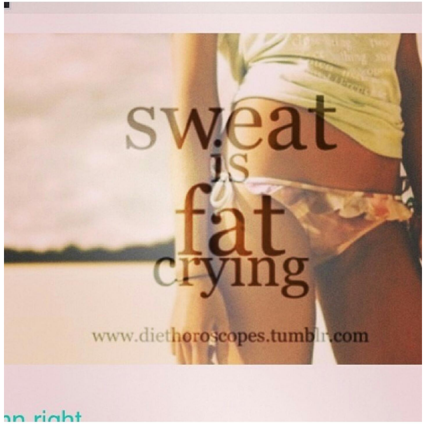
[redacted] Great



6 likes

[redacted] Feeling a little better..if i want to reach my goal i have to be patient and work harder. I hope you are doing the same :) #cardio #excercise #loseweight #workout #skinny #thin #thighggap #collarbones

[redacted] #thighgap



22 likes

[redacted] #ana #mia #ed #bones #bonsepo #fitspo #thygap #thynsperation

11 likes

[redacted] #dinner today was some whole grain spelt bread with sunflower seeds (yummy) topped with humous, tomatoes, dried tomato spread and some cucumber... I also had some leftover sauerkraut ❤ #ed #anorexia #bulimia #vegan #dinner #veganrecovery #thisorhospital #edfamily #anawho #2fab4ana #recover #edfighter #edwarriors #edwarrior #edsoldier #edfree #eatingdisorderrecovery

Pro-ED Instagram

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Pro-ED Instagram

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[redacted] #thighgap

thighgap

(space between thighs)

Orthographic variation

- “Represent spoken and vernacular forms, simulate prosody or shorten the message” (Androutsopoulos 2011)
- Tied to social differentiation, identity marking (Sebba 2009)
  - Community may only allow certain variants (Herring 2012)

Phonetic	<just> → <jus>
Typographic	<leet speak> → <1337 5934K>
Syllabograms	<before> → <b4>

Dynamics of variation

- Writing conventions evolve over time (Sebba 2009)
- Communities are dynamic
  - Language change mirrors social dynamics (Danescu-Nicelscu-Mizil et al. 2013)
  - Locally-defined social categories: newcomers vs. regulars
- Changing practices of pro-ED community
  - Community of practice: “aggregate of people who come together around mutual engagement in an endeavor” (Eckert & McConnell-Ginet 1992)

Community change: hashtag ban

SOCIETY

Instagram Bans Thinspo Content

Instagram is the latest social media platform to ban thinspiration content. But are these policies effective?

By Heba Hasan @Heba__H | April 26, 2012

Share | Like 57 | Tweet | G+1 18 | Share 1 | Pin it | Read Later

Thinspo content will no longer be welcome on Instagram. Following in the footsteps of Pinterest and Tumblr, Instagram is the latest social media site to ban "thinspiration" photos — images that are meant to provide motivation for those who want to lose weight and which health experts say often contribute to eating disorders.

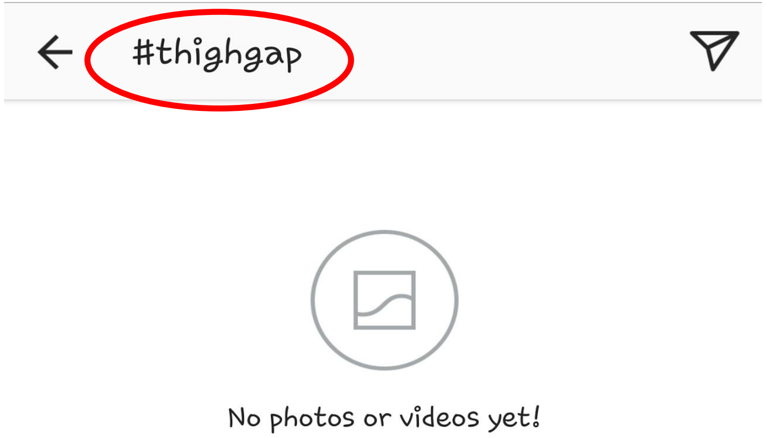
Instagram's new policy doesn't come as a surprise. The app came under scrutiny last week when celebrity and Instagram user Alexa Chung posted a photo of herself and was attacked by users for being too skinny.

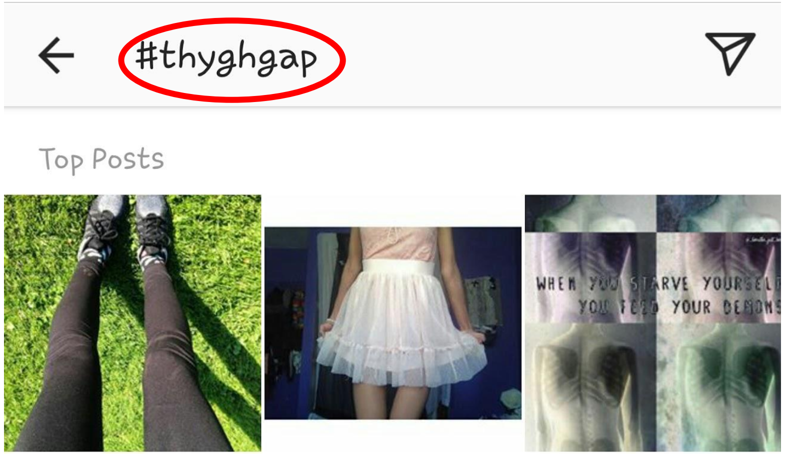
Michaela Begsteiger/Getty

Instagram bans thinspo content

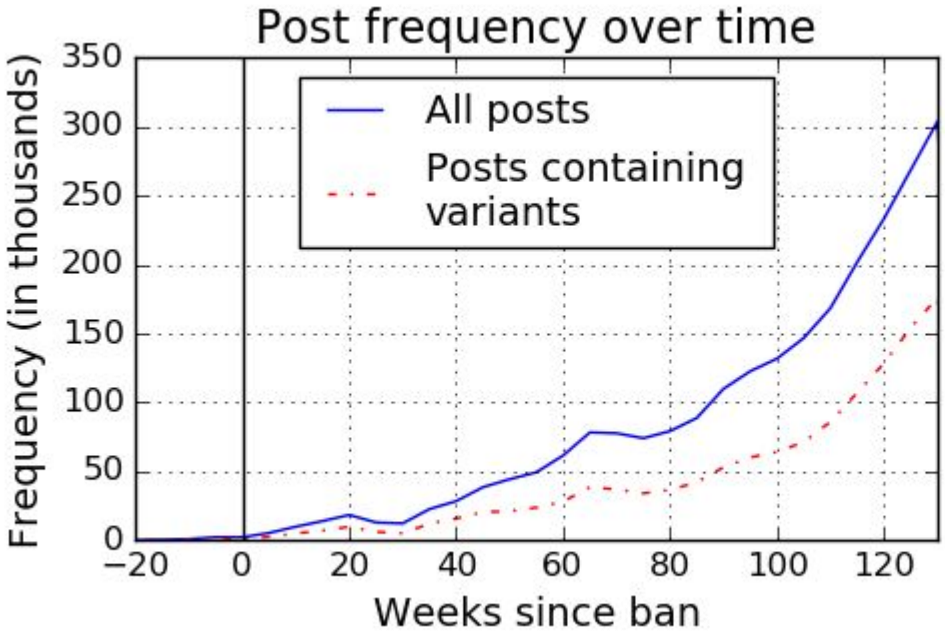
newsfeed.time.com/2012/04/26/instagram-bans-thinspo-content

Ban effect

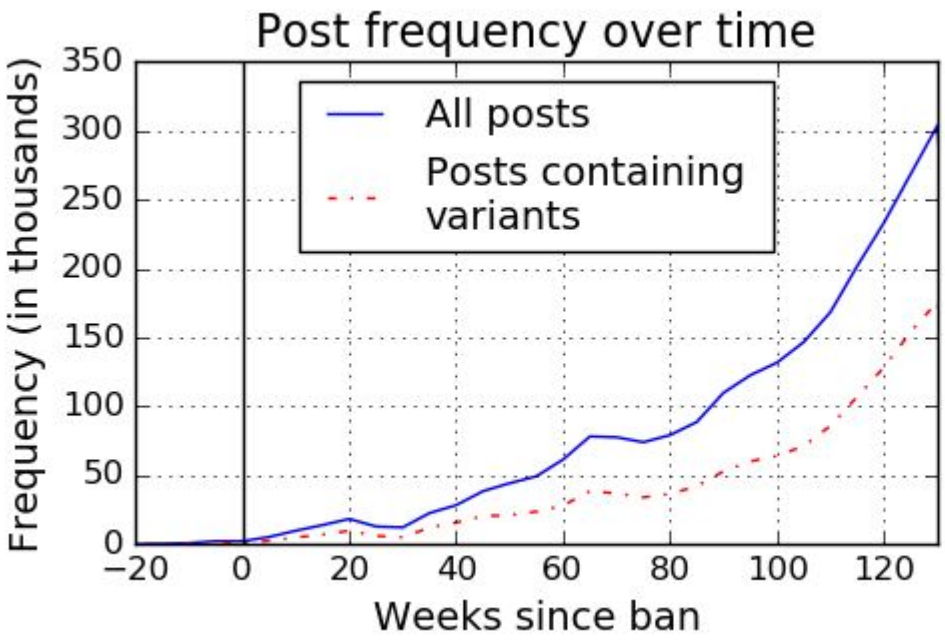


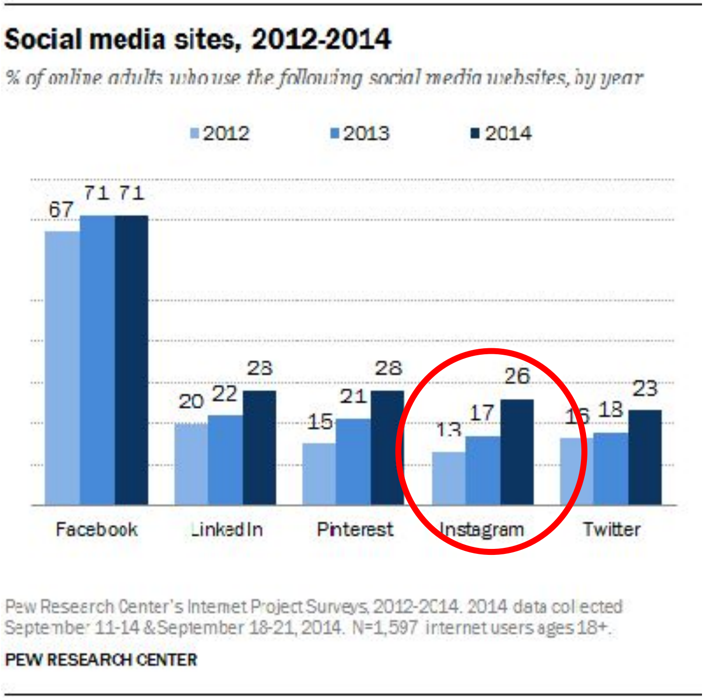


Ban response



Ban response





http://www.socialmediaexaminer.com/wp-content/uploads/2015/03/sd-pew-adult-user-stats.png

Research questions

RQ1: Which community members adopt more variants?

Example variants

thighgap

Example variants

	thyghgap	thyghgapp	thyygap	thyygapp
thighgap	thghgap	thiigap	thighgaappp	thygaps
	thightgap	thightgrap	thightpag	thygsp

Example variants

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Depth

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Depth

Incrementation of variation

- Orthographic variation as continuum
- Similar to phonetic incrementation
  - “Successive cohorts and generations of children advance a change beyond the level of their caretakers and role models” (Labov 2001)
- Do community members adopt deeper variants differently than shallow ones?

Research questions

RQ1: Which community members adopt more variants?

RQ2: Does a variant's depth influence its likelihood of adoption by these community members?

Methods

- Data collection
- Compute orthographic depth (language variables)
- Compute membership attributes (community variables)
- Building regression models

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Data collection (Chancellor et al. 2015)

- Collected in November 2014
  - Ban in April 2012
- 2.4 million posts
  - January 2011 to November 2014

Data collection (Chancellor et al. 2015)

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Identify pro-ED seed terms (not banned), mine Instagram
anorexia, ed, bulimia

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Extract 673 variants with regular expressions

th*nspo* => thynspoo

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2.4 million posts
176,000 users
51% variant posts
673 variants
17 sources

Methods

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- **Compute orthographic depth (language variables)**
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Compute depth: edit distance

- Operations needed to transform source → variant hashtag
  - Used in dialectology (Nerbonne, Heeringa & Kleiweg 1999)

thighgap ⇒ thyygapp

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thighgap $\Rightarrow$ thyygapp

thighgap $\xRightarrow{1}$ th**y**ghgap

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thighgap $\xRightarrow{1}$ thyghgap $\xRightarrow{2}$ thyyhgap $\xRightarrow{3}$ thyy gap $\xRightarrow{4}$ thyygapp

Compute depth: edit distance

- Operations needed to transform source → variant hashtag
  - Used in dialectology (Nerbonne, Heeringa & Kleiweg 1999)

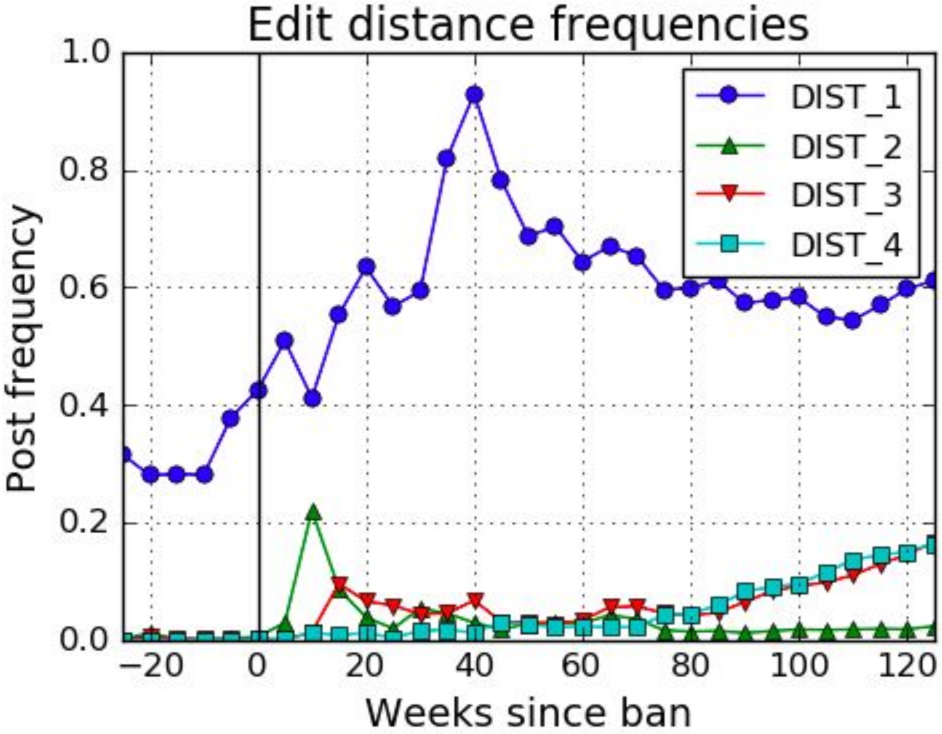
thighgap $\xrightarrow{4}$ thyygapp

thighgap $\xrightarrow{1}$ thyghgap $\xrightarrow{2}$ thyyhgap $\xrightarrow{3}$ thyy gap $\xrightarrow{4}$ thyygapp

Edit distance: Distribution of variants

Edit distance	Variants	Top 3 variants
1	253	anarexia, bulimic, eatingdisorders
2	221	anarexyia, thinspooo, thynspoo
3	108	secretsociety123, thinspoooo, thygap
4	50	secret_society123, secretsociety_123, thinspooooo

Edit distance: Adoption over time



Language variables

- per post:
  - TAGS, VARIANT, MAX_EDIT, DIST_1, DIST_4

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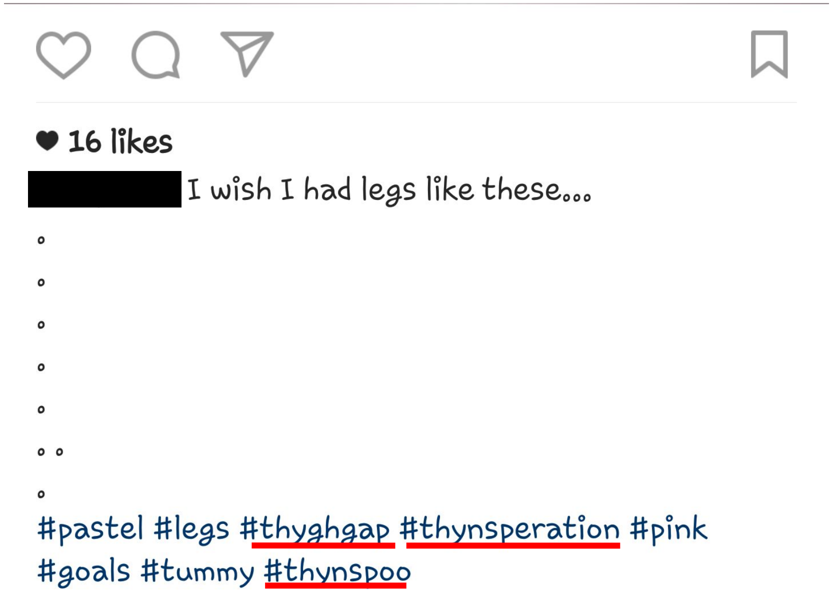


Language variables

- per post:
    - TAGS, VARIANT, MAX_EDIT, DIST_1, DIST_4

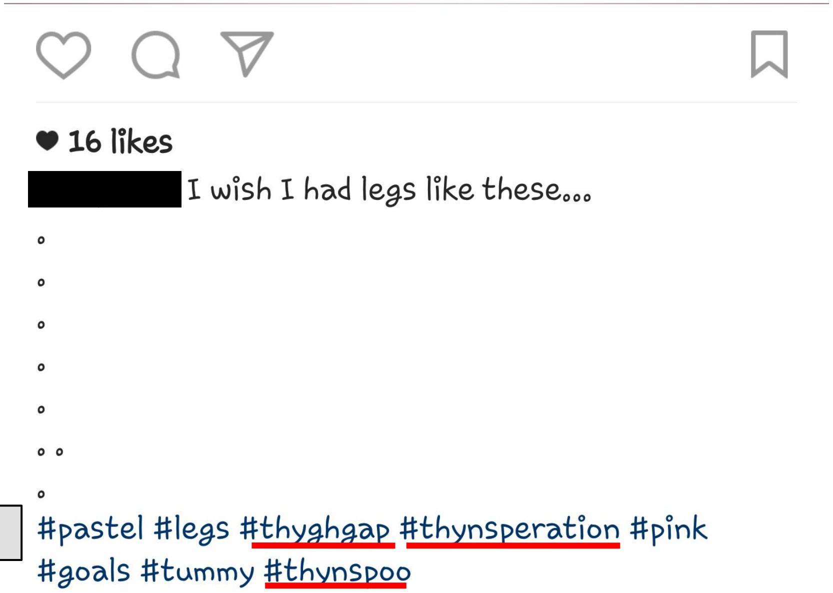
TAGS=3

VARIANT=1

MAX_EDIT=2

DIST_1=1

DIST_4=0



Methods

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Community data: membership attributes

- Locally-defined variables (within pro-ED community):
  - relative age
  - lifespan

Community data: membership attributes

- per post:
  - SINCE_START, TILL_END
- per user:
  - DATE_RANGE

Community data: membership attributes

- per post:
    - SINCE_START, TILL_END
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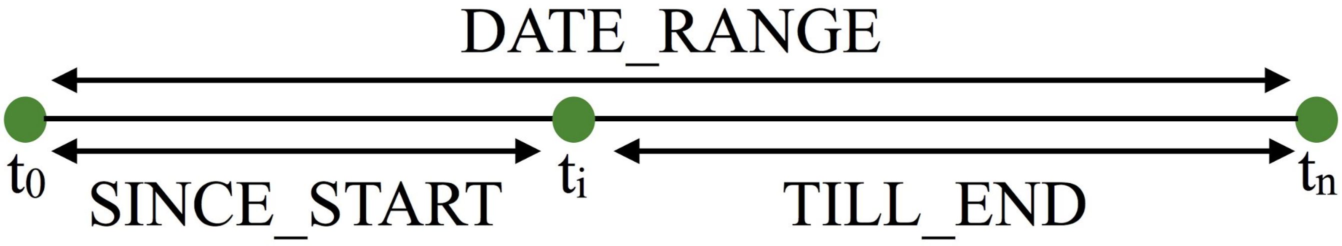
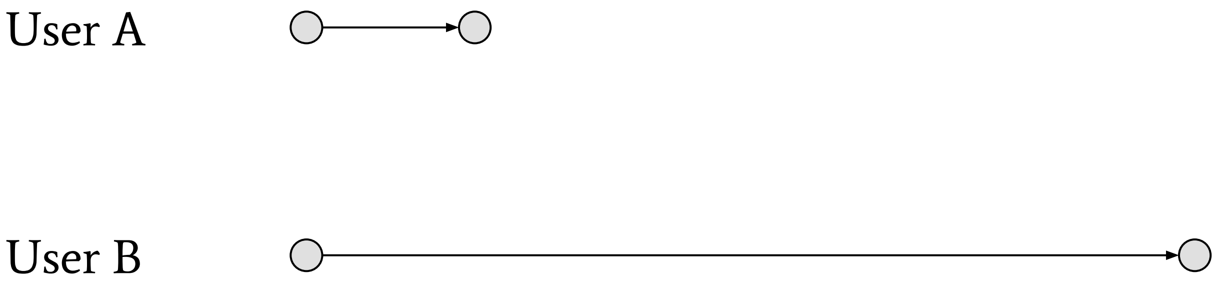


Community data: membership attributes

- newcomer = low SINCE_START (< 10 weeks)
- committed user = high DATE_RANGE (≥ 10 weeks)



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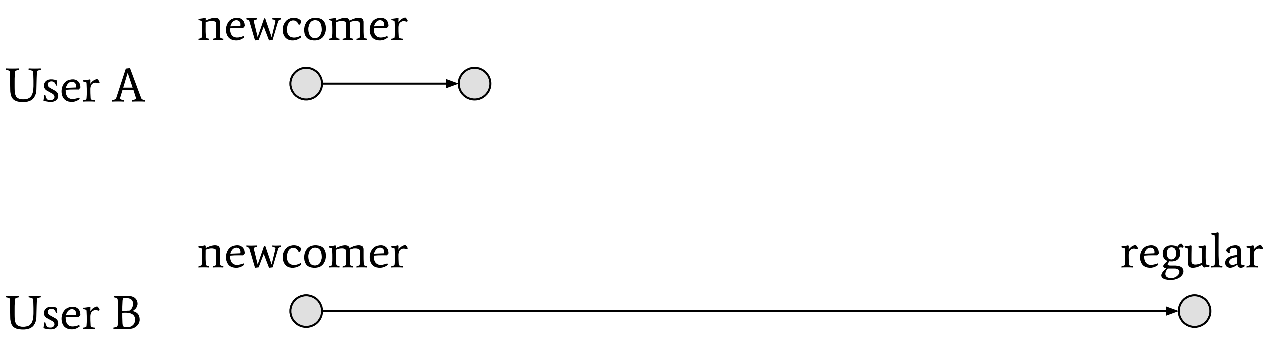

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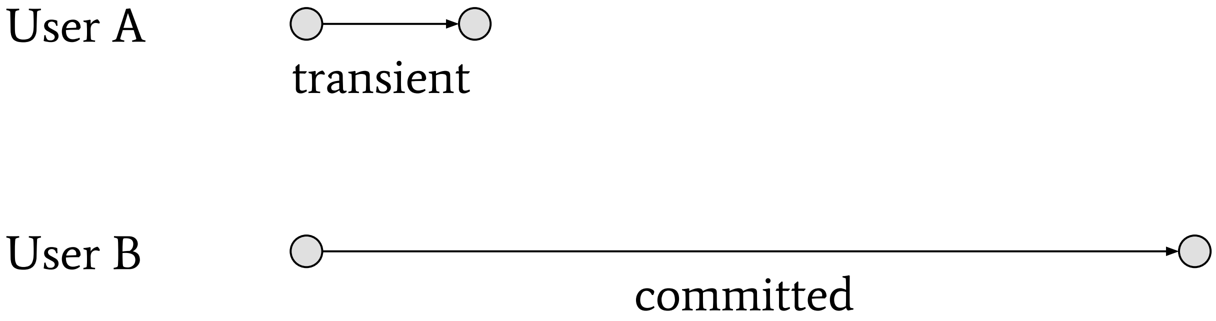

Recap: all variables

- per post:
  - **VARIANT**, **DIST_1**, DIST_4, **MAX_EDIT**, TAGS, SINCE_START, TILL_END, DATE
- per user:
  - DATE_RANGE

Methods

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- **Building regression models**

Questions

RQ1: Which community members adopt variants?

RQ2: Does a variant's depth influence its likelihood of adoption by these community members?

Regression: predictors

	RQ1	RQ2
Regression	Logistic	Logistic
Predicted	VARIANT	DIST_1 DIST_4
Predictors	**SINCE_START** **TILL_END** **DATE_RANGE**	**SINCE_START** **TILL_END** **DATE_RANGE**

Results

RQ1: Which community members adopt variants?

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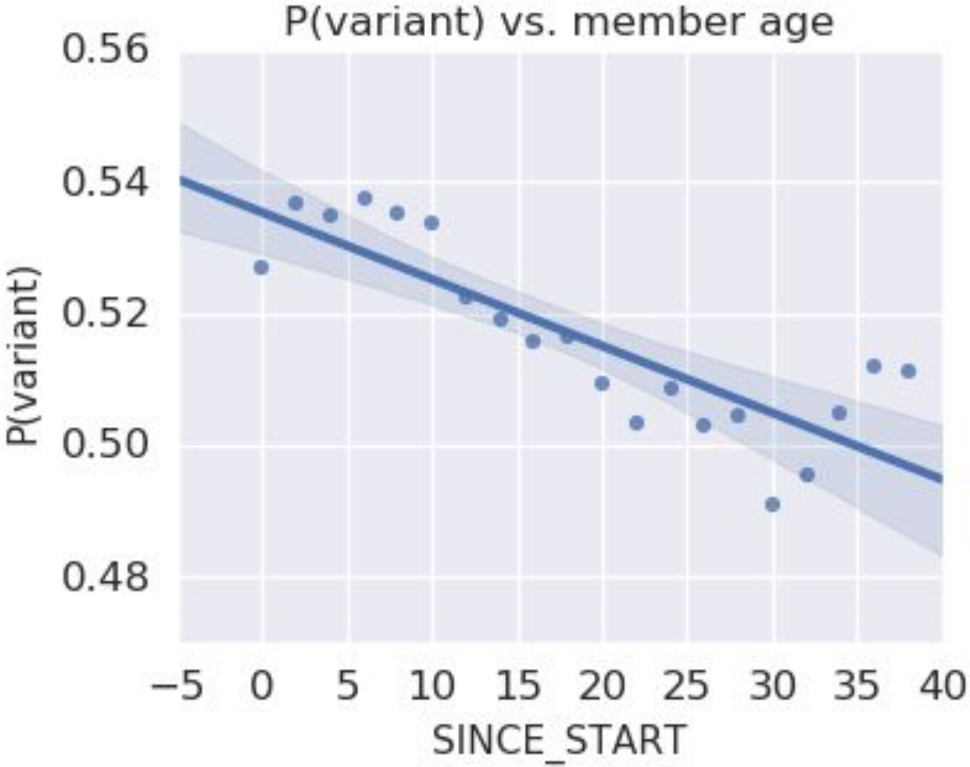
- Newcomers and committed (long-lifespan) users

RQ1: Which community members adopt variants?



RQ1: Which community members adopt variants?

- Regression results

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- Regression results
- Predicting VARIANT
    - SINCE_START negatively correlated ($\beta = -0.00456$, $p < 0.001$)
    - TILL_END positively correlated ($\beta = 0.00294$, $p < 0.001$)
    - DATE_RANGE positively correlated ($\beta = 0.00294$, $p<0.001$)

RQ1: Which community members adopt variants?

- Regression results
- Predicting VARIANT
  - SINCE_START negatively correlated ($\beta = -0.00456$, $p < 0.001$)
  - TILL_END positively correlated ($\beta = 0.00294$, $p < 0.001$)
  - DATE_RANGE positively correlated ($\beta = 0.00294$, $p<0.001$)
- Conclusion: variants adopted more often by newcomers and committed members

RQ2: Does a variant's depth influence its likelihood of adoption?

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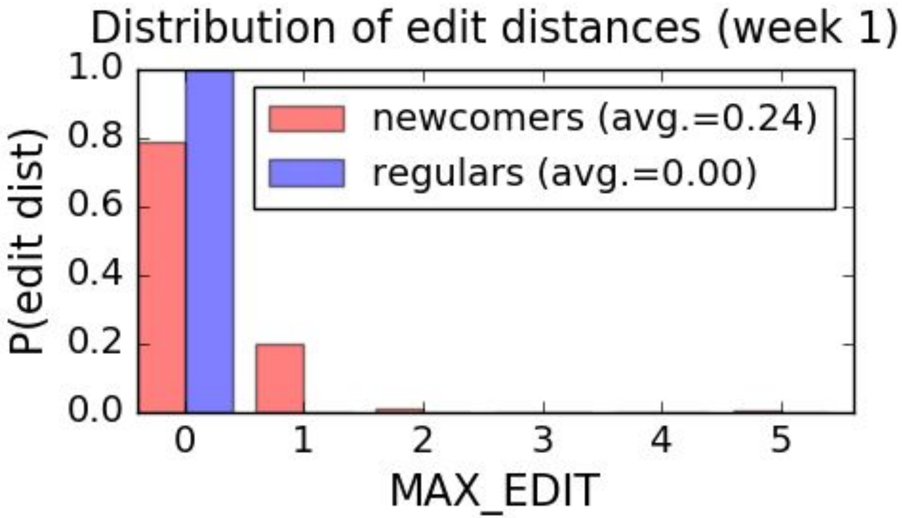
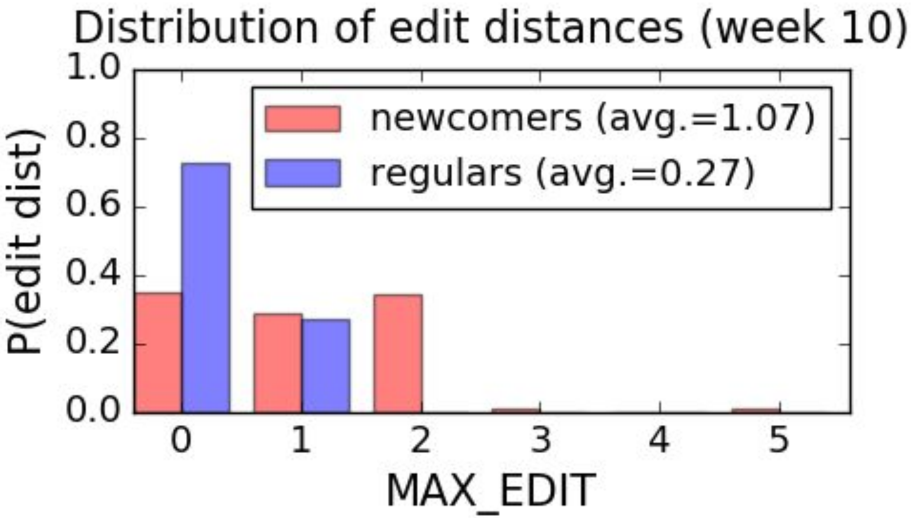
- Deeper variants associated with newcomers and committed members

RQ2: Does a variant's depth influence its likelihood of adoption?

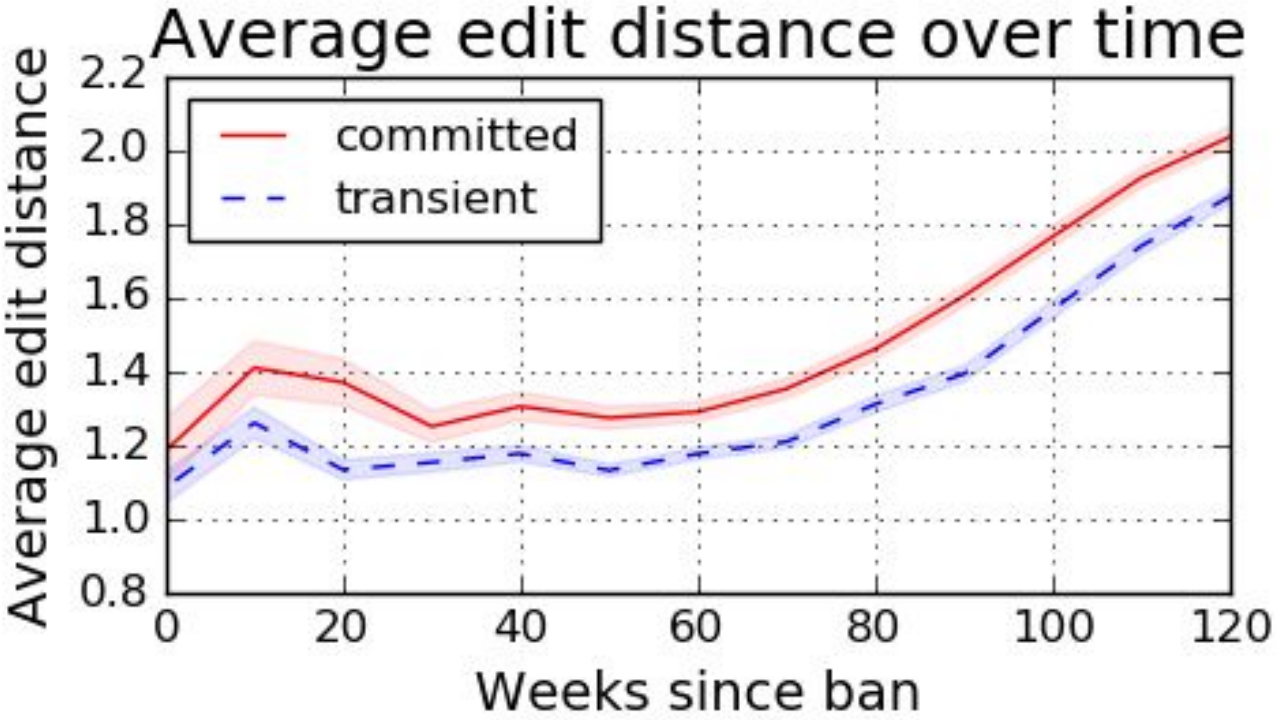
Newcomers versus regulars





RQ2: Does a variant's depth influence its likelihood of adoption?

Committed versus transient



RQ2: Does a variant’s depth influence its likelihood of adoption?

- Regression results

RQ2: Does a variant's depth influence its likelihood of adoption?

- Regression results
- Predicting DIST_1
  - SINCE_START $\beta = -0.00177$, ($p < 0.001$)
  - TILL_END $\beta = 0.00311$ ($p < 0.001$)

RQ2: Does a variant’s depth influence its likelihood of adoption?

- Regression results
- Predicting DIST_1
  - SINCE_START $\beta = -0.00177$, ($p < 0.001$)
  - TILL_END $\beta = 0.00311$ ($p < 0.001$)
- Predicting DIST_4
  - SINCE_START $\beta = -0.00450$ ($p < 0.001$)
  - TILL_END $\beta = 0.0133$ ($p < 0.001$)

RQ2: Does a variant's depth influence its likelihood of adoption?

- Regression results
- Predicting DIST_1
  - SINCE_START $\beta = -0.00177$, ($p < 0.001$)
  - TILL_END $\beta = 0.00311$ ($p < 0.001$)
- Predicting DIST_4
  - SINCE_START $\beta = -0.00450$ ($p < 0.001$)
  - TILL_END $\beta = 0.0133$ ($p < 0.001$)
- Conclusion: depth of variation correlates more strongly with adoption by newcomers and committed members

Summary of findings

- Newcomers use more variants, deeper variation
    - Supports prior findings (Danescu-Niculescu-Mizil et al. 2013)
- Committed members also use more/deeper variants
- Deeper variants → stronger effects
    - Depth may influence orthographic perception in pro-ED community
- Additional: unclear social reception
    - Mixed results (likes ≠ comments)

Implications and future work

- Implications
  - Online communities provide useful setting to study large-scale, long-term language variation
  - Orthographic variation as incrementation
  - Sociotechnical effect on language variation
- Future work
  - Different processes of orthographic variation: deletion, lengthening, metathesis

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Thank you!

Special thanks: Stevie Chancellor and Munmun De Choudhury (Georgia Institute of Technology)

Questions?