Siblings' Interactions and Shared Interests on Twitter: Analyses of A Selected Sibling Sample Based on Archived Twitter Data

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Background

- Siblings play important roles in one another's development (McHale et al., 2012). Research on sibling relationships has used global questionnaires and focused on their relationship characteristics and day-to-day exchanges.
- We know much less about how siblings interact *online*, despite of the expansion of social media that may provide unique opportunities for their connectedness (LeBouef & Dworkin, 2017).
- Open source data from Twitter allow us to examine sibling interaction patterns on a social media platform. A model comes from research showing that Twitter data can capture connectedness in romantic relationships (Garimella et al., 2014).
- Global questionnaire data show that sister-sister dyads are closer than other sibling dyads (Kim et al., 2006). We tested dyad sex constellation differences in siblings' interactions via tweeting and their shared interests via following accounts to see if this pattern replicated on Twitter. **(Questions 1 and 2)**
- We tested a social learning (Bandura, 1978) hypothesis of a positive association between the frequency of siblings' tweeting and their shared interests. **(Question 3)**
- We also examined whether Twitter serves as a forum for communication for geographically distant siblings to stay connected. **(Question 4)**

Sample

Approximately **4.8 million tweets** in total (13.4 GB)

All geo-tagged tweets in the U.S. posted from 12-16-2015 through 12-31-2015. (Archived by Chi, Van Hook, & Yin, 2017)

filter

Christmas fun with my little brother @johnashleyclay..... #bc #fam #uglysweaterparty…

I'm at @HarkinsTheatres North Valley 16 for Sisters in Phoenix, AZ

4,722 tweets grepped

Those that contained one of the following keywords, "sister(s)" "brother(s)" "sis" "bro(s)" "sissy" "sibling(s)," and in which the user (User 1) tagged another user (User 2).

filter

Rare photo of me and my big (little) sister in the same room. Merry Christmas! @aaronezell @ Town…

477 sibling dyads identified

Independent coders classified the tweeters' (User1 and User 2) relationship as sibling versus other based on the tweet content, with a 92% agreement rate; discussions among all coders resolved inconsistencies. Each sibling user's biological sex was also tagged in this process.

filter

279 sibling dyads for analyses

We eliminated dyads in which at least one sibling's Twitter account was protected, suspended, deleted, or inactive (i.e., 0 following accounts).

558 Twitter users for analyses

Using Twitter's API, we extracted all available tweets of these users over a year from 12-25-2015 to 12-25-2016.

→ We counted the total number of each user's tweets over the year and the number of each user's tweets that mentioned their sibling.

We extracted the users' following accounts at the time of our preliminary analysis, 1-11-2018.

→We identified each dyad's shared following accounts.

We extracted the users' profile locations at the time of further analyses, 4-2-2018.

→ Based on the users' locations, we coded whether for each dyad, the two sibling users were in the same vs. different geographical locations.

Descriptives

Individual Users

- *Sex:* 211 male, 347 female
- *Frequency and proportion of tweets mentioning the other sibling user during the year*

Frequency = # of tweets mentioning the sibling
Proportion = (# of tweets mentioning the sibling)/(total # of tweets over the year)

Measure	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
Total tweets	1	78	267	900.50	781	22470
Sib mention-Frequency	0	0	1	16.17	5	2543
Sib mention-proportion	.000	.000	.003	.023	.015	1.000
Following accounts	1	181	421	775.60	865	25050

Sibling Dyads

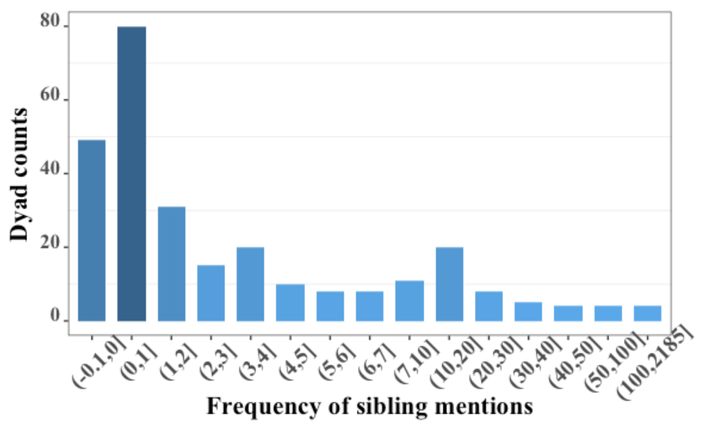
- *Sibling sex constellation*

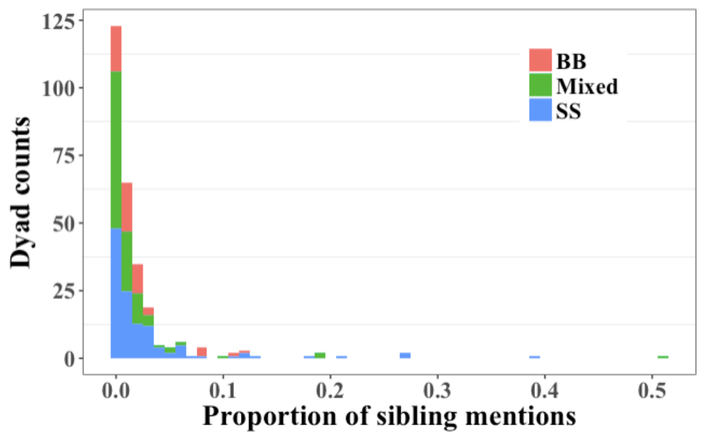
54 brother-brother dyads, 122 sister-sister dyads, 103 mixed-sex dyads

- *Frequency and proportion of tweets mentioning the other sibling user*

Correlation (Kendall's tau-b) between two siblings:
- Frequency: tau = .43, $p < .0001$
- Proportion: tau = .17, $p = .0006$

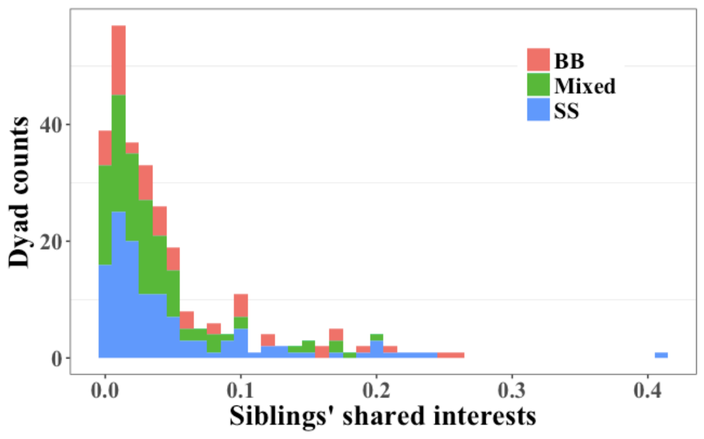
Frequency and proportion scores were averaged across the two siblings to represent the dyad's interaction intensity.





- *Shared Interests in Following Accounts*

Using *Jaccard similarity* as index of siblings' shared interests: |User1 ∩ User2|/|User1 ∪ User2|



➢ *Same vs. Different Locations:*
Same: 70, Different: 50, Missing 159

Some users do not report their locations on their Twitter profiles or report some places that do not make sense (e.g., space) or too vague (e.g., USA, earth)

Results

Analysis method. Due to the non-normal distribution of the data, we used the Kruskal-Wallis test, a non-parametric method for testing whether samples originate from the same distribution, to compare across sibling sex constellation groups, and the Dunn test for follow-up pairwise comparisons (Zar, 2010). We used Kendall's tau-b coefficient to index correlations between variables.

Question 1: Do frequency and proportion of sibling-mentioned tweets over a year differ by dyad sex constellation?

Results of Kruskal-Wallis test across three groups (Brother-Brother, Sister-Sister, Mixed-Sex):
- Frequency: $\chi^2(df = 2) = 5.56$, $p = .06$
- Proportion: $\boldsymbol{\chi^2(df = 2) = 9.27, p = .01}$

Comparison	*Z*	*p*	Adjusted *p*
BB - SS	-.45	.650	.650
BB - Mixed	1.92	.054	.081
SS - Mixed	**2.96**	**.003**	**.009**

Sister-sister dyads had a higher proportion of sibling-mentioned tweets than mixed-sex dyads.

Question 2: Do siblings' shared interests in following accounts differ by dyad sex constellation?

Results of Kruskal-Wallis test across three groups (Brother-Brother, Sister-Sister, Mixed-Sex):
- Shared interests: $\chi^2(df = 2) = 2.24$, $p = .32$

Question 3: Are frequency or proportion of sibling-mentioned tweets associated with siblings' shared interests?

Kendall's tau-b coefficient
- Frequency and shared interests**: tau = .22, *p* <.0001**
- Proportion and shared interests: **tau = .21, *p*< .0001**

Question 4: Do siblings' interactions and shared interests differ by whether they are in the same or different geographical locations?

Results of Kruskal-Wallis test across two groups (same vs. different locations):
- Frequency: $\chi^2(df = 1) = .09$, $p = .75$
- Proportion: $\chi^2(df = 1) = 1.00$, $p = .31$
- Shared interests: $\boldsymbol{\chi^2(df = 1) = 6.61, p = .01}$

Siblings have more shared interests in following accounts when they were at the same location.

Discussion

- Twitter can serve as a platform for siblings to stay connected through direct interactions (i.e., mentions) and shared interests in following accounts, though interacting with siblings on Twitter is not central to many users' Twitter usage.
- Sibling interaction proportion scores on Twitter were consistent with previous findings that sister-sister dyads are closer to one another compared to other dyads.
- Consistent with the social learning tenet, siblings who interacted more frequently on Twitter tended to have more shared interests measured by their following accounts.
- Siblings who were geographically closer tended to share more interests on Twitter, perhaps due to the existence of local Twitter public accounts (e.g., local restaurants) and/or shared social networks—a direction of future analyses.

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