

# Loneliness in a Connected World: The Relationship Between Loneliness and Social Activity on Twitter

Camille Ruiz, Kaoru Ito, Shoko Wakamiya, Eiji Aramaki

Social Computing Laboratory, Nara Institute of Science and Technology (NAIST), Nara, Japan

## TYPE=Long paper

Most people have felt lonely at least once in their lives. Through modern technology like the Internet, we can imagine that people would feel less lonely in general since social media sites like Facebook and Twitter can keep us connected with others. After all, the technology can allow individuals to express themselves and have their loved ones respond no matter how far apart they may be from each other. Nonetheless, people still express feelings of loneliness on social media. Given the connectivity available to many people today, expressions of being lonely in sites like Twitter are interesting to explore because it may give insight on the phenomenon of loneliness. An example would be the study by Kivran-Swain et al., where they analyzed the circumstances and communication practices involved in expressions of loneliness on Twitter [1].

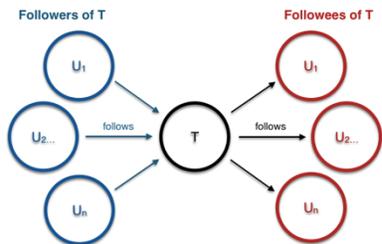


Figure 1: the relationship between users as followers and followees

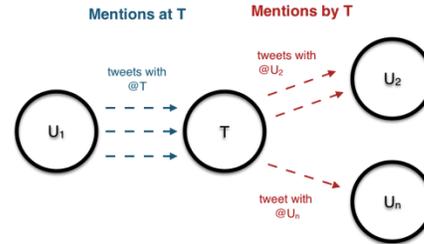


Figure 2: the way mentions can be made at the user and by the user through tweets

A particular angle to explore is the relationship of expressions of loneliness with the connectivity of the user. On Twitter, one simple way to quantify the connectivity of a user would be through the number of followers or followees<sup>1</sup> (Figure 1). The connection of following on Twitter can be seen as a way of passively listening or observing a user. Another possible basis of the connectivity of a user would be the number of direct communications on Twitter (Figure 2)—these usually appear with the ‘@’ symbol before a username. In light of this, our research examines the phenomenon of loneliness and connectivity on Twitter through exploring the possible relationship of the number of tweets expressing loneliness with the number of followers, followees, and mentions.

This research begins with the natural assumption that the use of social media—an avenue to connect people easily—can relieve people of loneliness to some extent. If the assumption is true, the number of connections would be negatively correlated with the number of tweets expressing loneliness. In other words, users that are more connected will have less expressions of loneliness while users that are less connected would express more loneliness.

## Material & Method

In this study, we first gathered 470 Twitter usernames that appeared from a query with the keyword “lonely”. We sifted through the last 3000 tweets of each user and collected only the tweets containing any of the following words: “lonely”, “alone”, “lonesome”, and “loneliness”<sup>2</sup> Although we regard the tweets as “lonely tweets” since each are estimated to express loneliness, only users with 10 or more lonely tweets are classified as lonely users (around 70 users) while the rest of the users are considered non-lonely users (around

<sup>1</sup><https://en.oxforddictionaries.com/definition/followee>.

<sup>2</sup>the set of keywords are obtained from the synonyms of “lonely” in WordNet (<http://wordnetweb.princeton.edu/perl/webwn>).

400). For collecting mentions by the user, we counted the number of mentions from the collected lonely tweets. For collection mentions at the user, we gathered public tweets that mentions the Twitter usernames, querying “@<username>” for every user.

### Result & Discussion

With this data, we drew various graphs that can depict the relationship of the expressions of loneliness with the connectivity the user. The first is a plot (Figure 3) depicting lonely and non-lonely users along their number of followers and followees. The second is another scatter plot (see Figure 4) showing lonely and non-lonely users along the number of lonely mentions by the users and mentions at the users.

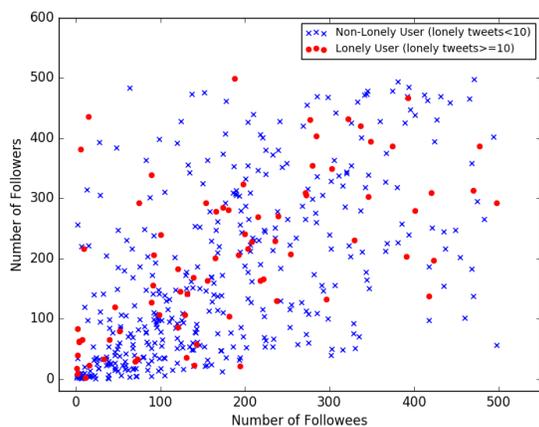


Figure 3: This graph shows that the loneliness of a user (based on the number of lonely tweets) is not correlated to the number of followers or followees of the user.

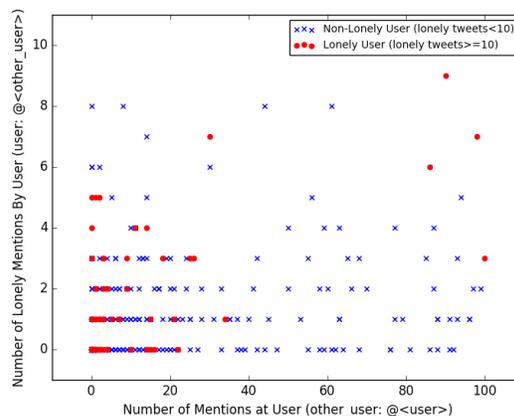


Figure 4: This graph seems to show that lonely users tend to have less mentions made at them.

Figure 3 and Figure 4 exhibit the preliminary results of our study. Figure 3 seems to show that for the case of connectivity based on followers and followees, our assumption of negative correlation is invalid. This means that loneliness is not related to the number of followers or followees—lonely users can be observed or listened to by a few or many users. However, Figure 4 depicts that most of the lonely have a few mentions made at them—making the number of mentions seem to be related to expressions of loneliness. Since mentions can be seen as a way to quantify communication, the result in Figure 4 may be showing that lonely users generally experience a small amount of communication from others.

This preliminary study suggests that relieving loneliness requires more active and personal communication—like talking to users through mentions—rather than just being passively listened to or observed—like following users. In other words, it requires the sense of communicating with a specific person instead of just speaking to a general group of people. Nonetheless, we would like to continue this study in order to collect more data and explore factors of connectivity. For instance, we would like to consider the number of mutual followers (where the user follows and is followed by another user) since this would exhibit a stronger connection. Another concern is to remove noisy tweets—such as tweets from machine generated tweets (bots)—to obtain more precise results.

### Reference

- [1] F. Kivran-Swaine, J. Ting, J. R. Brubaker, R. Teodoro, and M. Naaman, “Loneliness in Social Awareness Streams: Expressions and Responses,” in *International AAAI Conference on Web and Social Media: Proceedings of the Eighth International AAAI Conference on Weblogs and Social Media, ICWSM 2014, Michigan, USA, June 1-4, 2014*, pp. 256-265.