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An Investigation of Twitter Users Who Gave Likes to Tweets Disclosing Submitters' Personal Information

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presenter information

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Yasuhiko Watanabe

our research interest

- communications in SNS
- user behavior analysis
- trust and security in SNS

background

some SNS users willingly disclose
their personal information

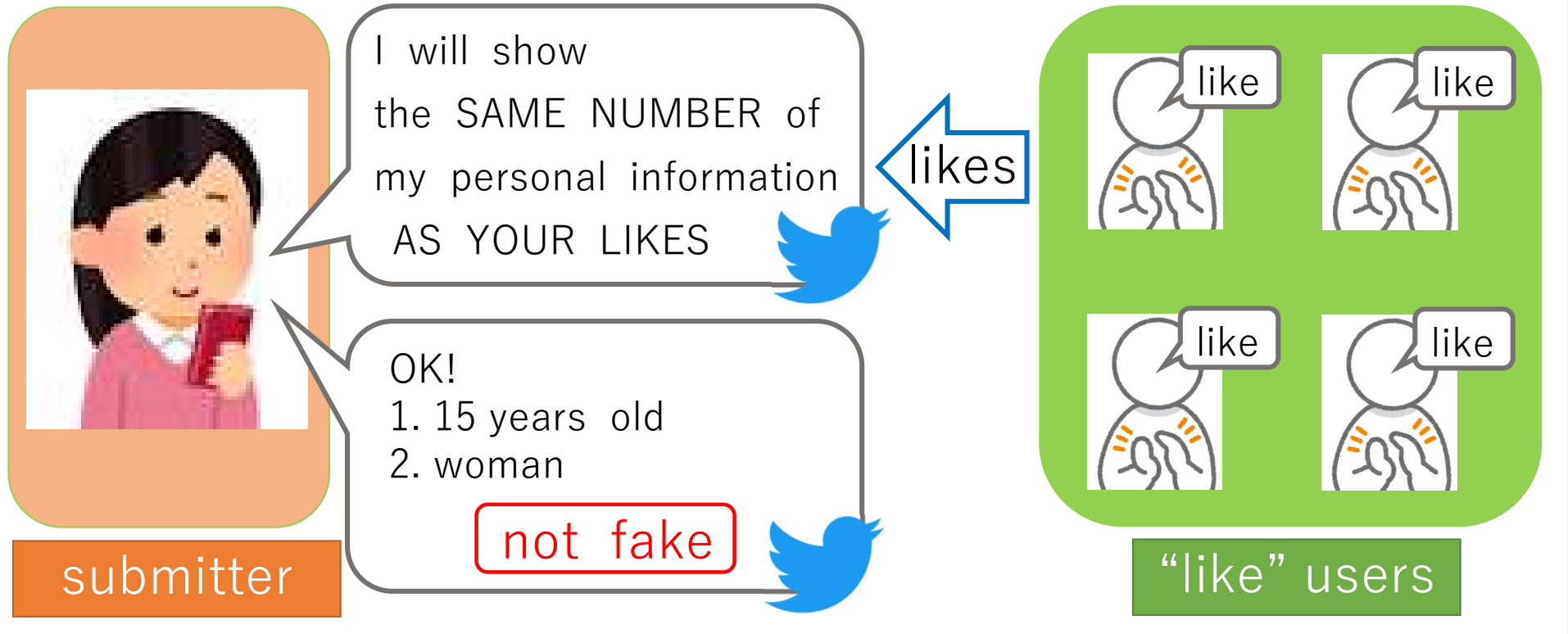
Many researchers discussed
the reasons why they willingly did it.

[Livingstone 2008] [Barns 2006]

[Viseu 2004] [Hirai 2012]

Our HUSO 2020 result showed
some Twitter users disclosed their personal info.

honestly



Our research result in HUSO 2020

many unreal name users disclosed
their personal information honestly.

Watanabe, Nishimura, Chikuki, Nakajima, and Okada:

An Investigation of Twitter Users Who Disclosed
Their Personal Profile Items in Their Tweets Honestly,

IARIA HUSO 2020 (2020).

Example Rina's self-disclosing tweets

tweets promising to disclose
submitters' personal information

Rina @ [redacted] · Sep 3, 2019
面白そうだからやるー！ (I will do it because it looks fun.)
#いいねの数だけ自己紹介する (# I will show the same number of my profile items as your likes.)

いいねの数だけ自己紹介する

- | | | |
|------------------------|-----------------|----------------|
| 1. 年齢 (1. age) | 26. 好きな人 | 51. Twitter垢の数 |
| 2. 性別 (2. gender) | 27. 彼氏・彼女いる？ | 52. 休日の過ごし方 |
| 3. 誕生日 (3. birthday) | 28. 告白した数 | 53. 起床時間 |
| 4. 星座 (4. zodiac sign) | 29. 与えられた数 | 54. 家出る時間 |
| 5. 身長 (5. height) | 30. 近のマイブーム | 55. 家帰ってくる時間 |
| 6. 足のサイズ ...etc. | 31. 日常生活で欠かせない物 | 56. 寝る時間 |
| 7. 性格 | 32. 好きな小説家 | 57. 1番楽しかったこと |
| 8. 眼鏡の有無 | 33. 最近見た映画 | 58. 1番幸せなこと |
| 9. 長所 | 34. 好きな歌手 | 59. 1番辛かったこと |
| 10. 短所 | 35. 得意料理 | 60. 1番悔しかったこと |
| 11. 趣味 | 36. 口癖 | 61. 1番驚いたこと |
| 12. 特技 | 37. 小さい頃の夢 | 62. 辛い時どうする？ |
| 13. 好きなタイプ | 38. 今の夢 | 63. ストレス発散方法 |
| 14. 嫌いなタイプ | 39. 今か昔やってたスポーツ | 64. リア友の数 |

1 1 37

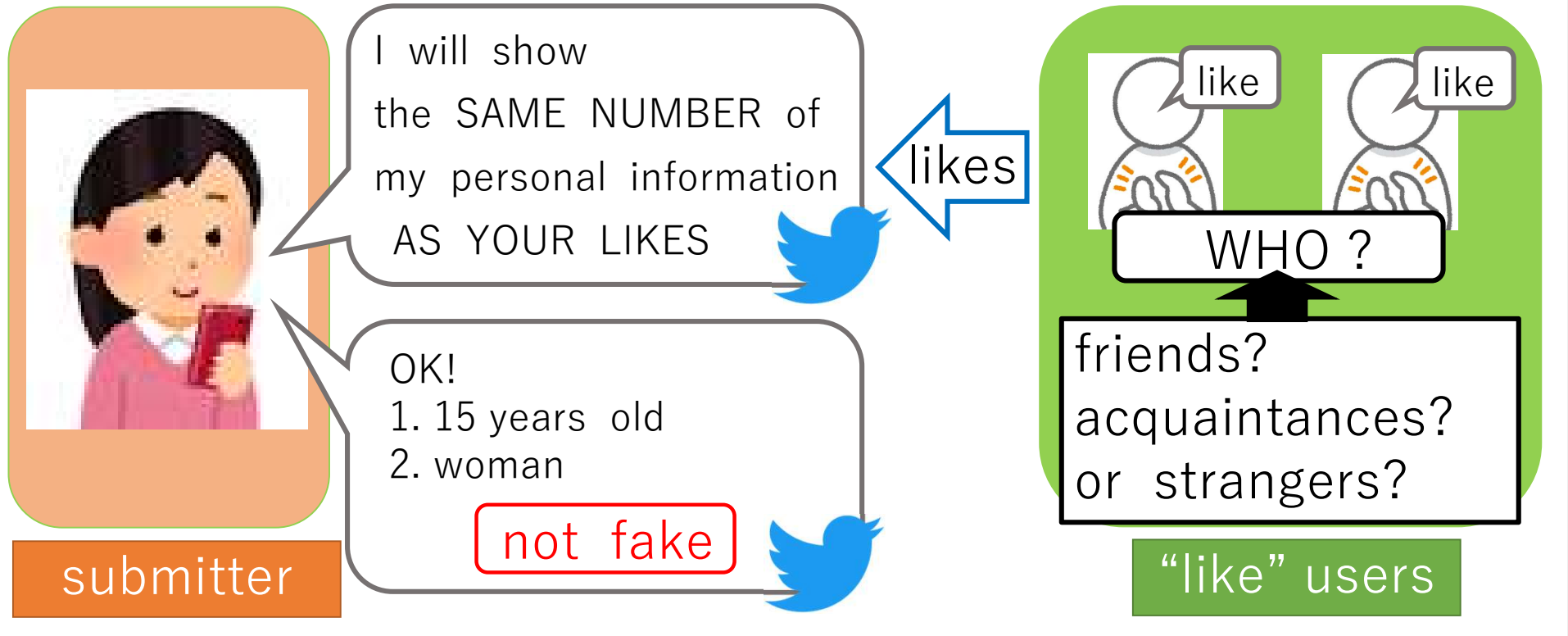
Show this thread

self-replies disclosing
submitters' personal info.

- Rina @ [redacted] · Sep 3, 2019
Replying to @Rina_lgm_201
1. 年齢 (1. age)
17
- Rina @ [redacted] · Sep 3, 2019
2. 性別 (2. gender)
おんなー (woman--)
- Rina @ [redacted] · Sep 3, 2019
3. 誕生日 (3. birthday)
2月1日 (February 1)
- Rina @ [redacted] · Sep 3, 2019
4. 星座 (4. zodiac sign)
みずがめ座 (Aquarius)
- Rina @ [redacted] · Sep 3, 2019
5. 身長 (5. height)
162くらいをさまよってるwww (around 162cm)

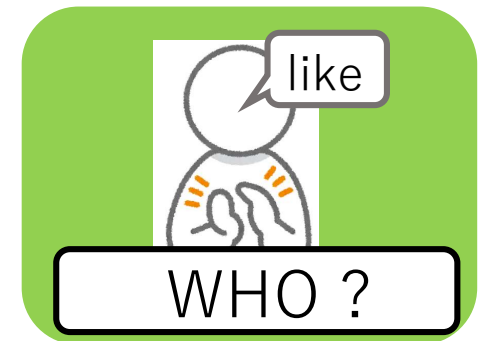
A New Question

Who gave responses (likes) to his/her tweet promising to disclose his/her personal info ?



Our research points in HUSO 2022

Who gave responses (likes) to tweets promising to disclose their personal information ?

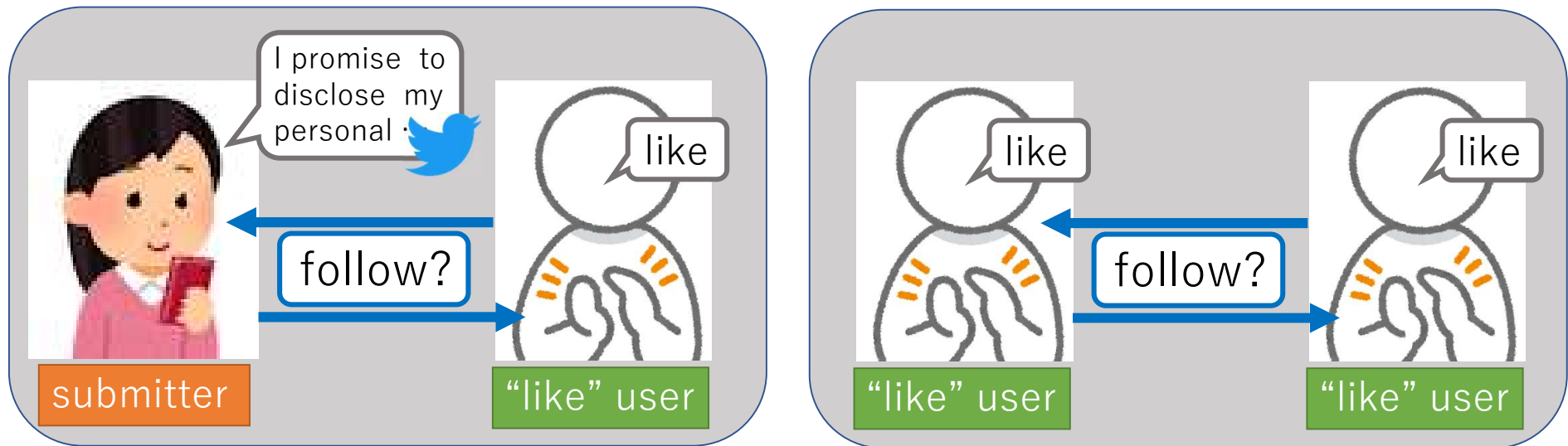


We investigate relations of

- ① **submitters** promising to disclose their personal information in their tweets
- ② **“like” users** who gave likes to these tweets

How to investigate their relations




whether users follow each other ?



based
idea

When an user follow someone on Twitter, he/she is not a stranger to the user.

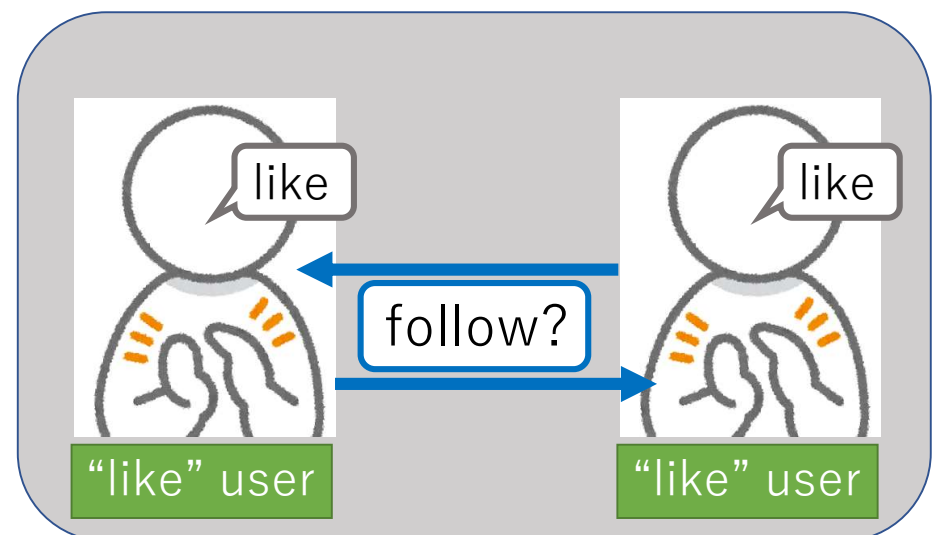
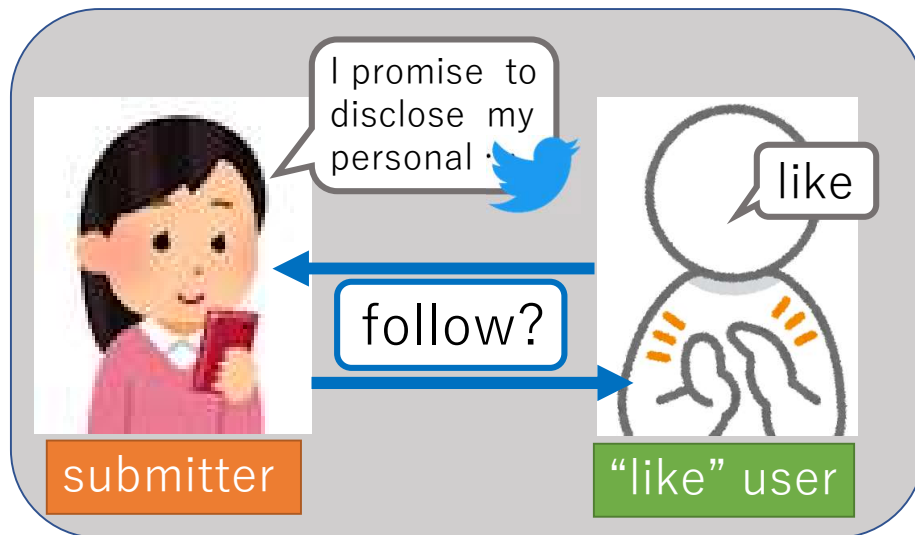
Types of follow relations

- ➡ 1. mutual follow relation 
- 2. one sided follow relation 
- ➡ 3. no follow relation 

➡ Relations which we investigate in this study

Investigation indicators

- Mutual follow ratio
- No follow ratio



Mutual follow ratio of **submitters** X **“like” users**

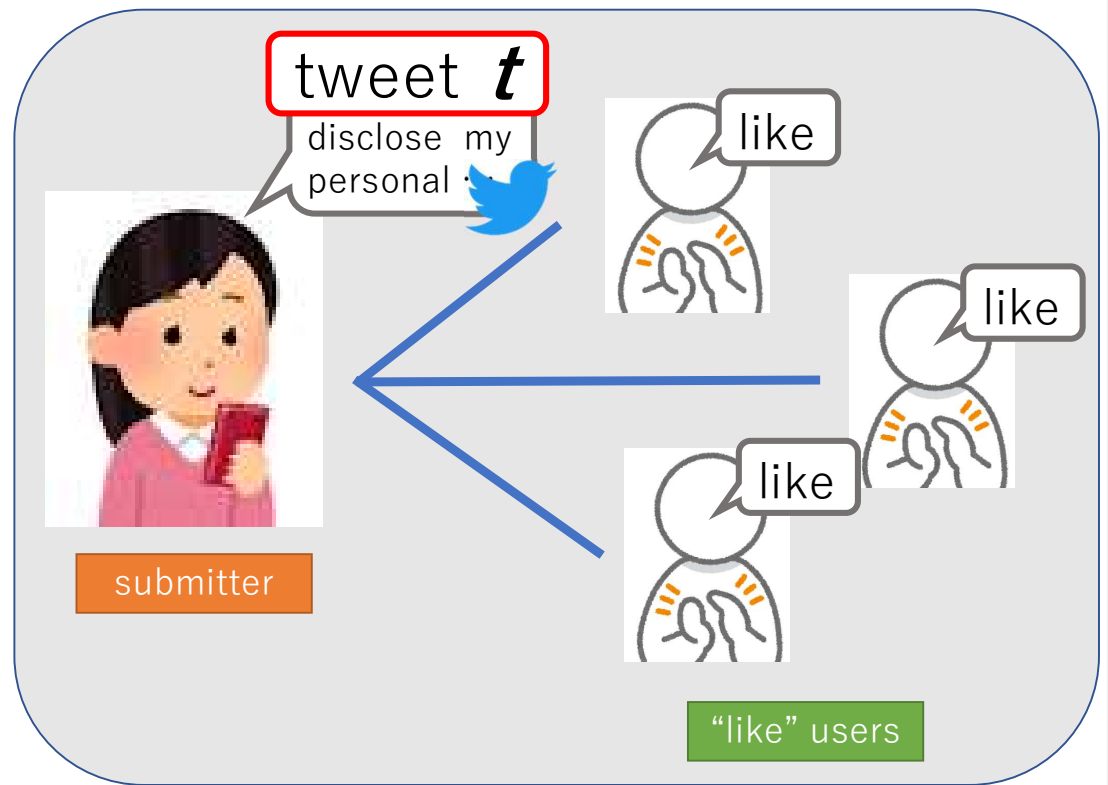
$$P_{MF1}(t) = \frac{m}{n}$$

t: a tweet promising to disclose submitter's personal info.

n: # of “like” users

of “like” users

m: who are mutually following the submitter of tweet *t*



No follow ratio of **submitters** X **“like” users**

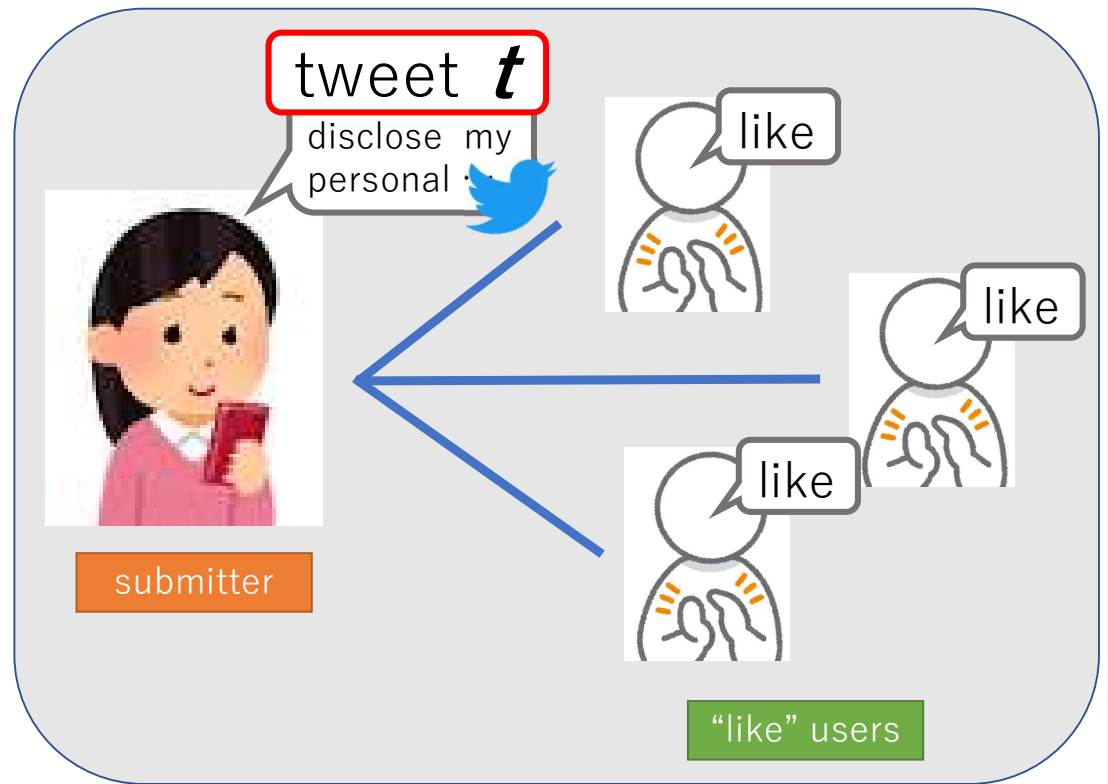
$$P_{NF1}(t) = \frac{l}{n}$$

t: a tweet promising to disclose submitter's personal info.

n: # of “like” users

of “like” users

l: who are not following the submitter of tweet *t*



Example

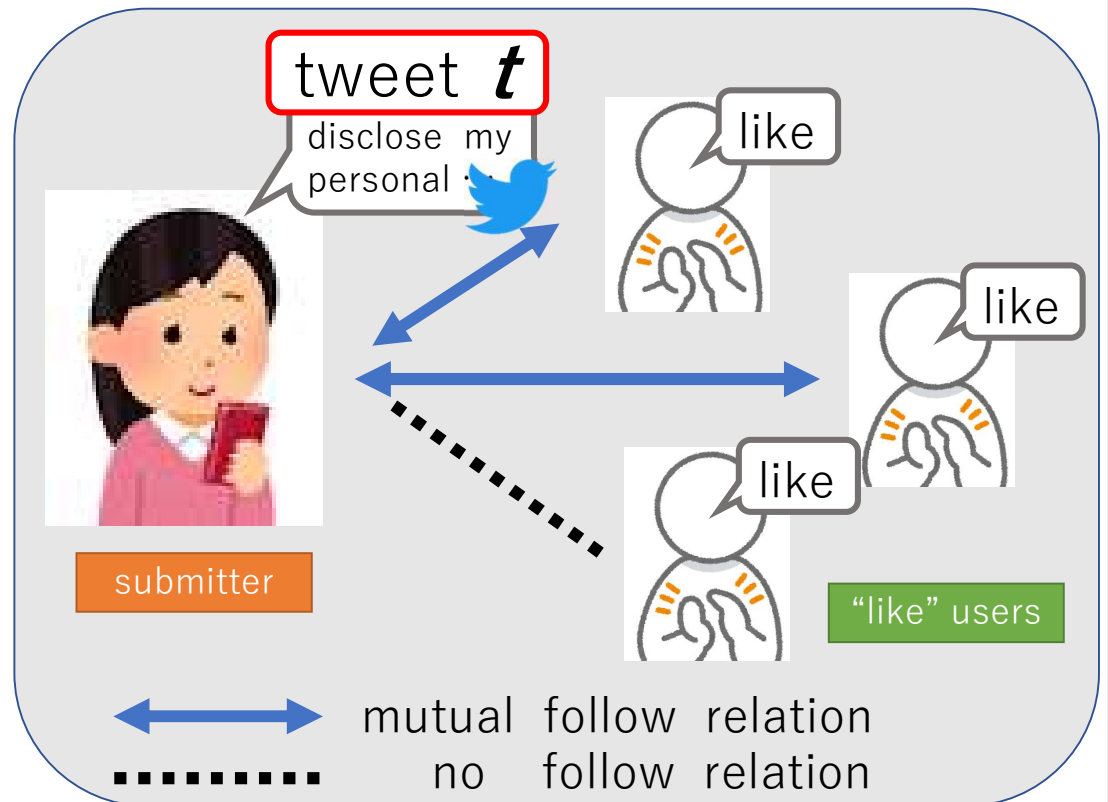
Mutual
No } follow ratio of **submitters** X **"like" users**

mutual follow ratio

$$P_{MF1}(t) = \frac{2}{3} = 0.67$$

no follow ratio

$$P_{NF1}(t) = \frac{1}{3} = 0.33$$



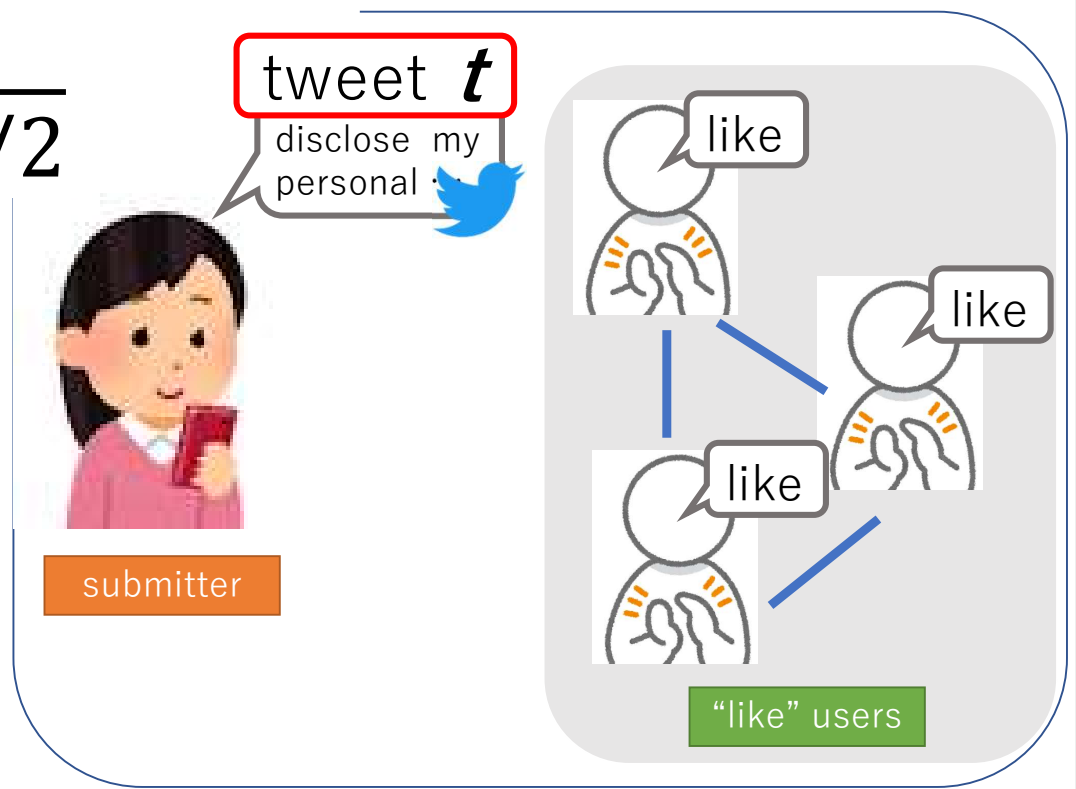
Mutual follow ratio of “like” users X “like” users

$$P_{MF2}(t) = \frac{m}{n(n-1)/2}$$

t: a tweet promising to disclose submitter's personal info.

n: # of “like” users

m: # of cases where two of “like” users who are mutually following each other



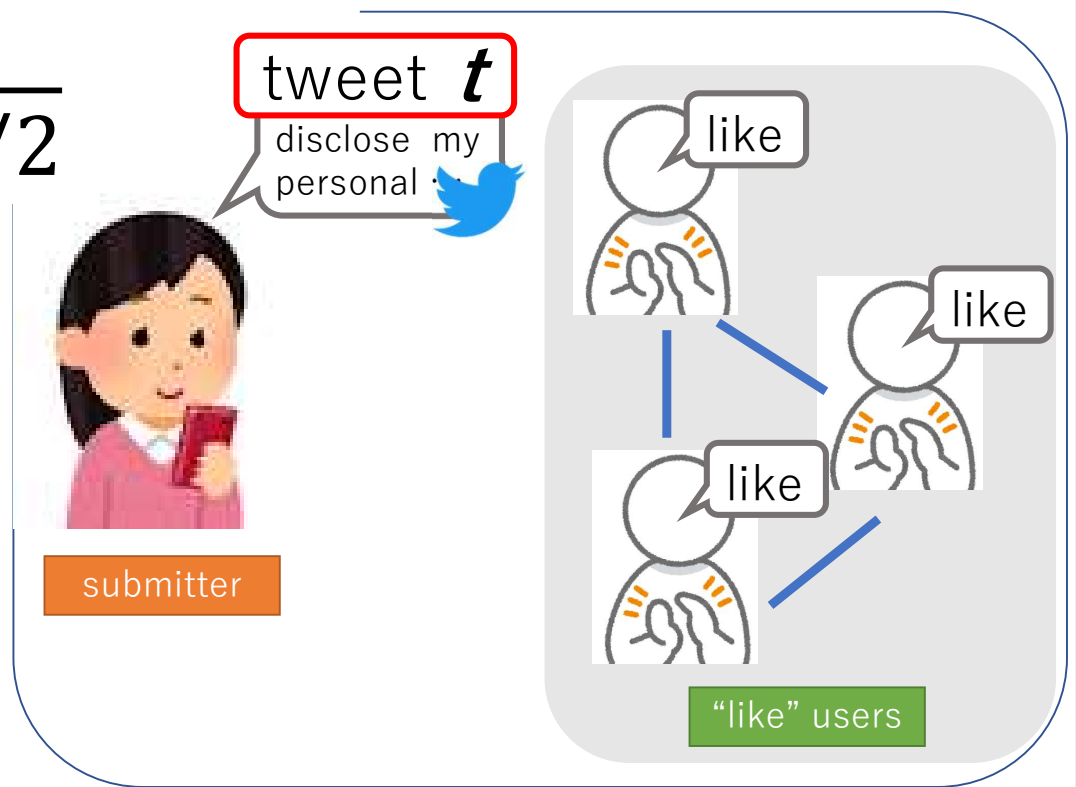
No follow ratio of “like” users X “like” users

$$P_{NF2}(t) = \frac{l}{n(n-1)/2}$$

t : a tweet promising to disclose submitter's personal info.

n : # of “like” users

l : # of cases where two of “like” users who are not following each other



Example

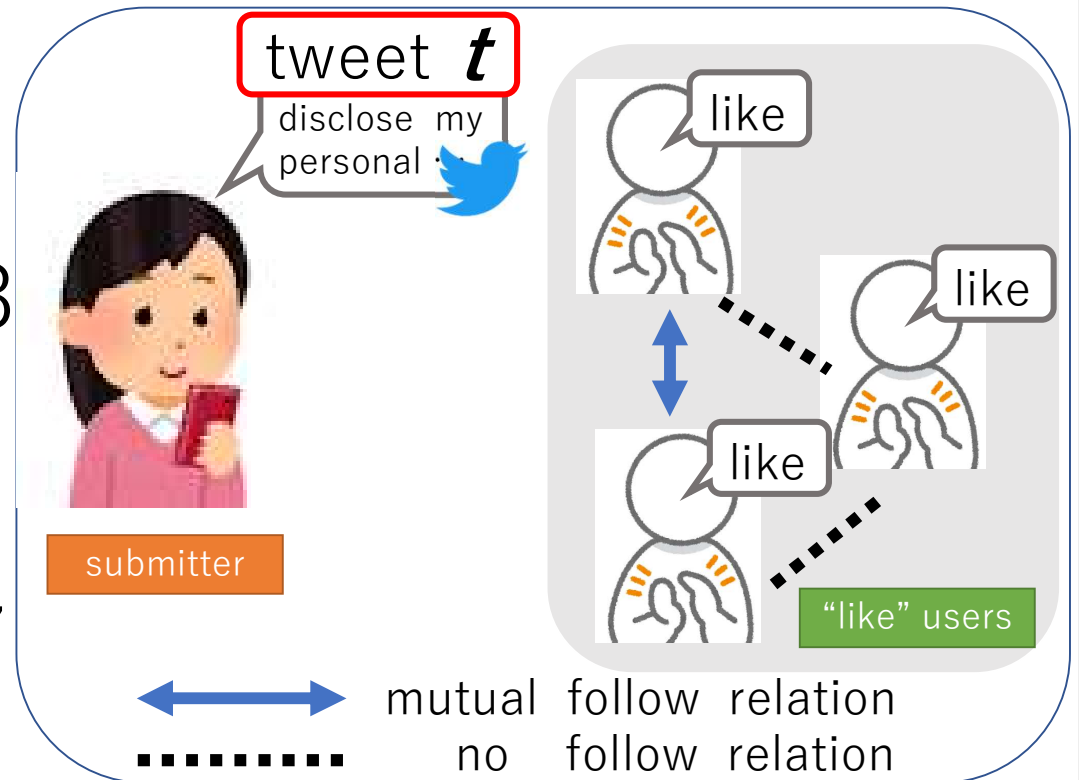
Mutual
No } follow ratio of “like” users X “like” users

mutual follow ratio

$$P_{MF2}(t) = \frac{1}{3 \cdot 2/2} = 0.33$$

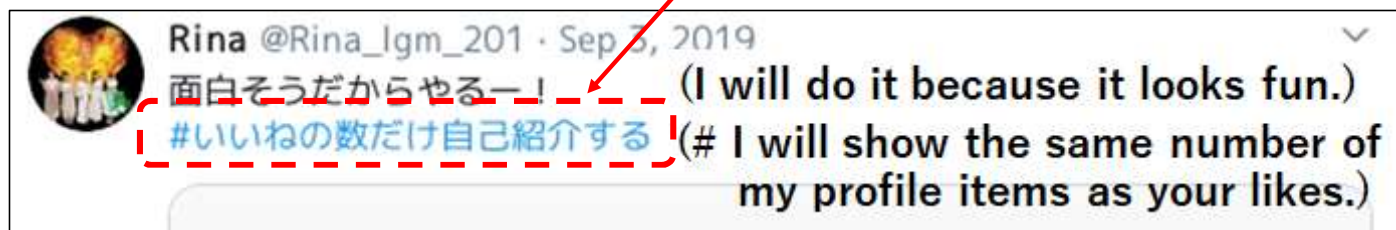
no follow ratio

$$P_{NF2}(t) = \frac{2}{3 \cdot 2/2} = 0.67$$



Our survey (1)

- 318 Japanese tweets promising to disclose submitters' personal information.
 - ✓ that were given one or more likes
 - ✓ that contained # いいねの数だけ自己紹介する
(# I will show the same number of my profile items as your likes)

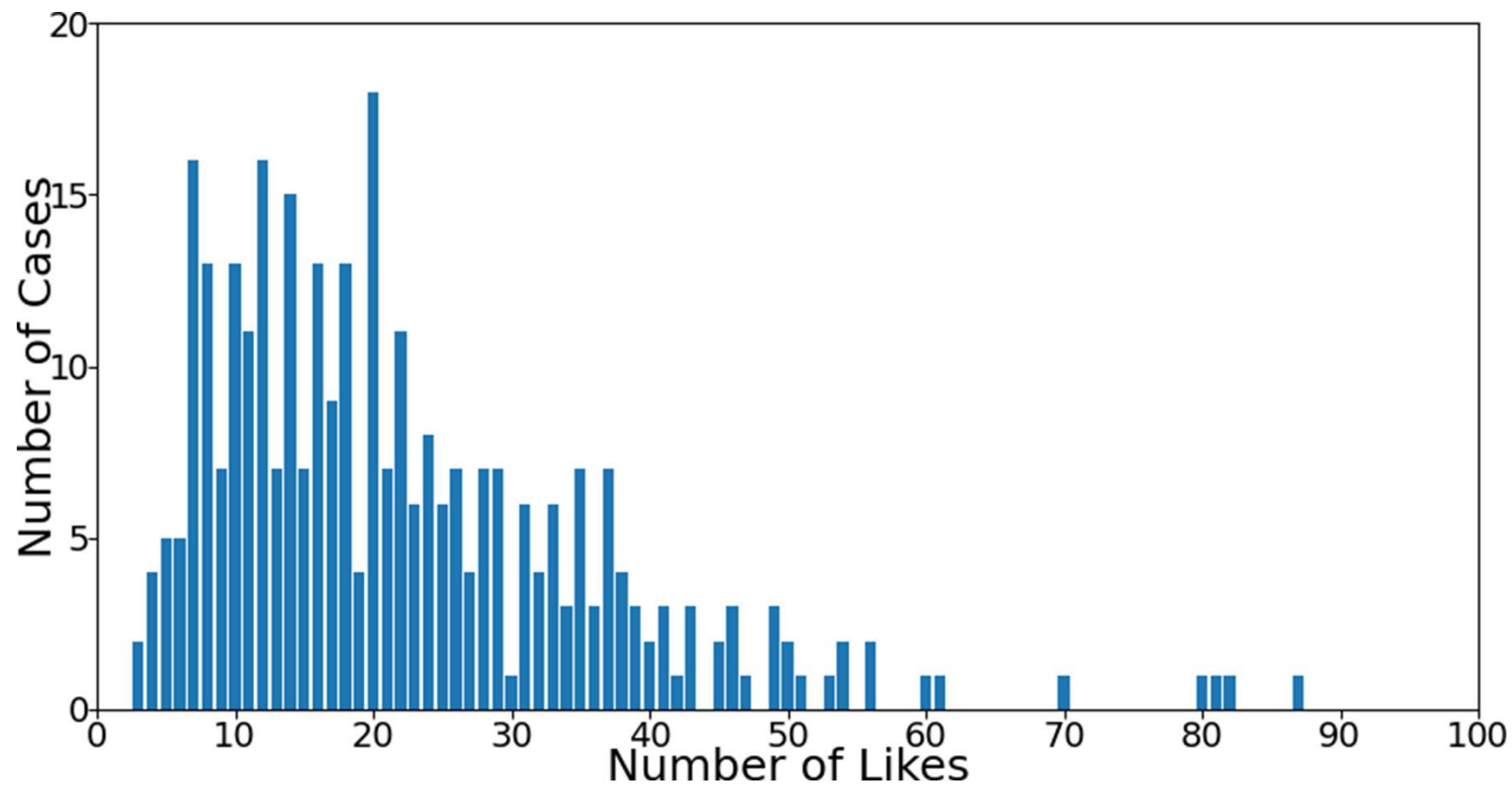


- submitted from Dec. 30, 2021 to Jan. 31, 2022.

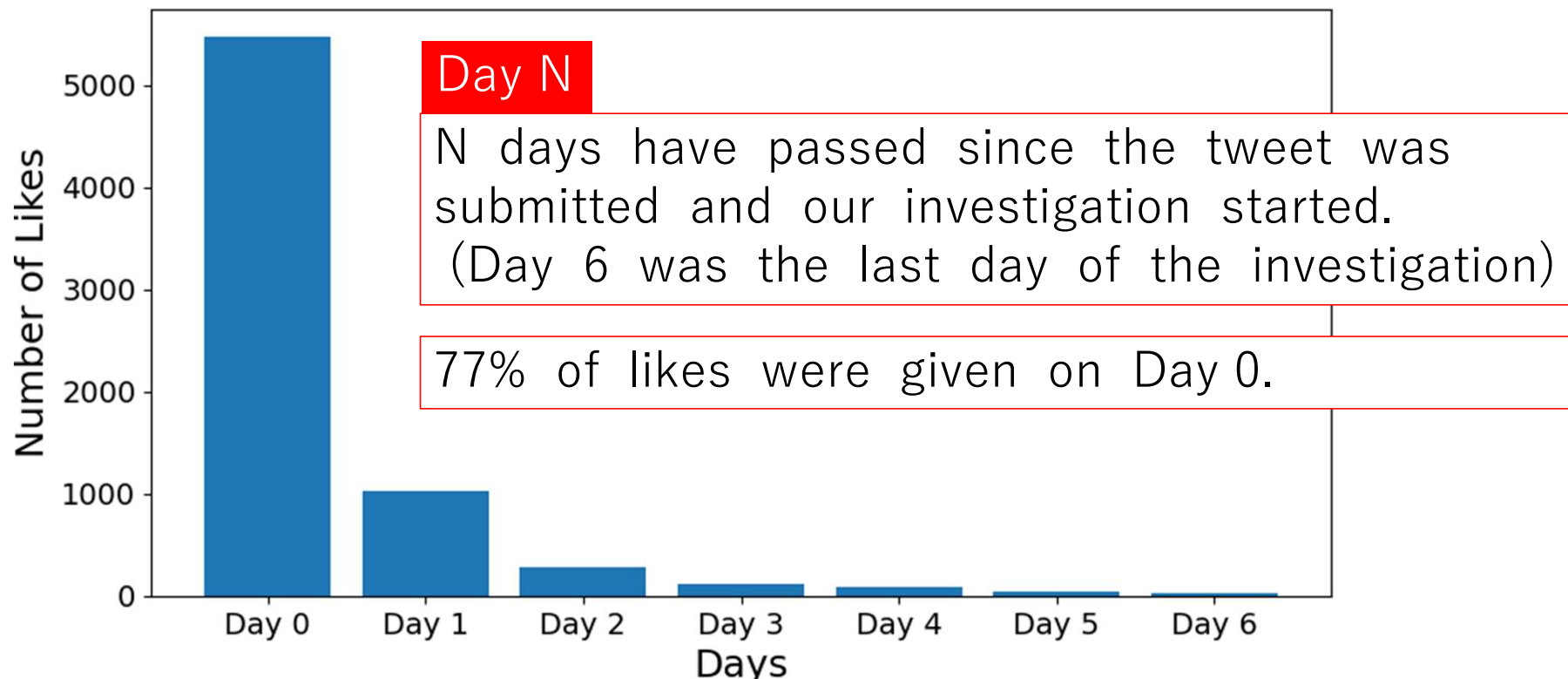
Our survey (2)

- the 318 tweets were given 7060 likes by 6325 users within a week after they were submitted.
- “like” users and their follow relations were surveyed for a week since the 318 tweets were submitted.
- surveyed by Twitter API v2 every 10 PM.

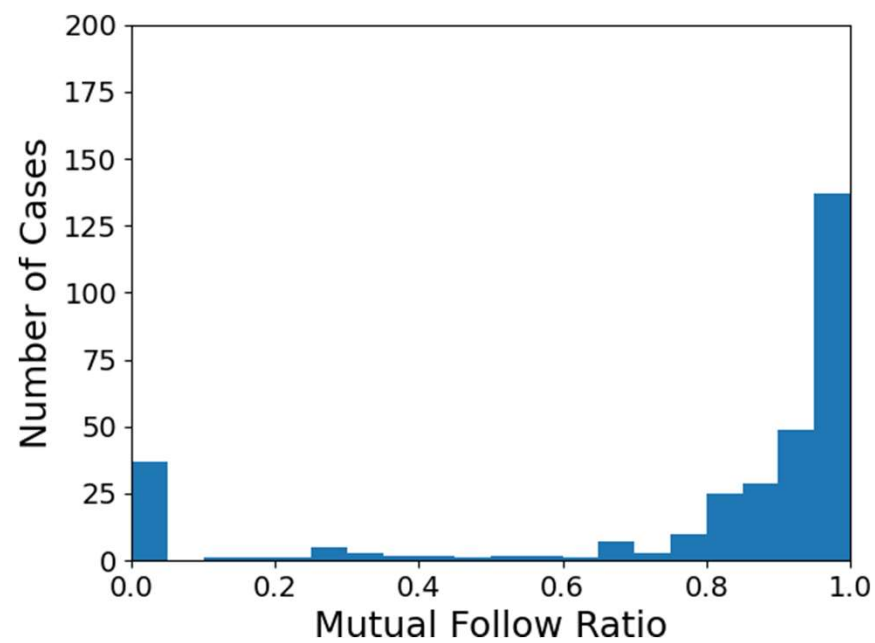
The number of likes given to the 318 tweets promising to disclose personal information



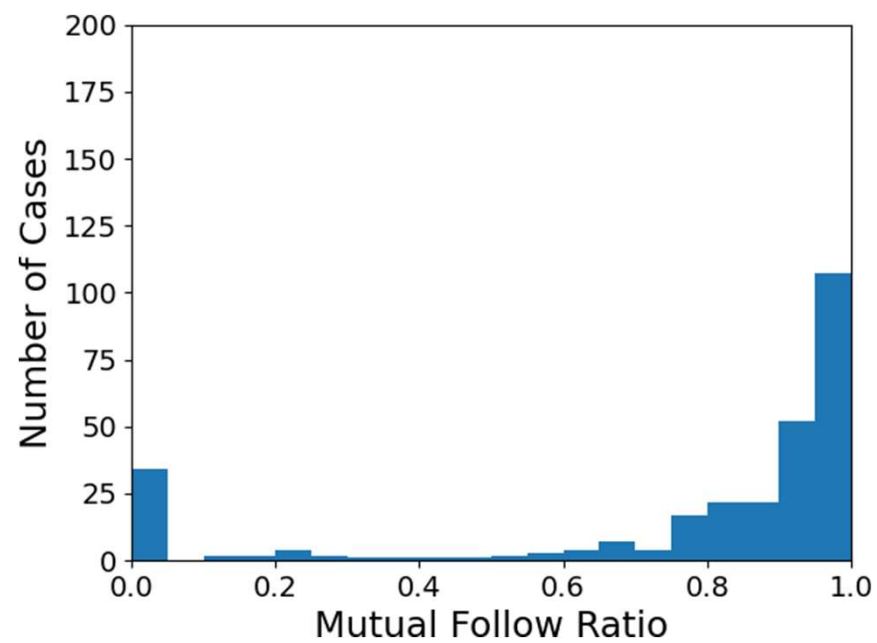
The daily number of likes given to the 318 tweets since they were submitted



Mutual follow ratio of submitters X “like” users



submitters X “like” users Day 0

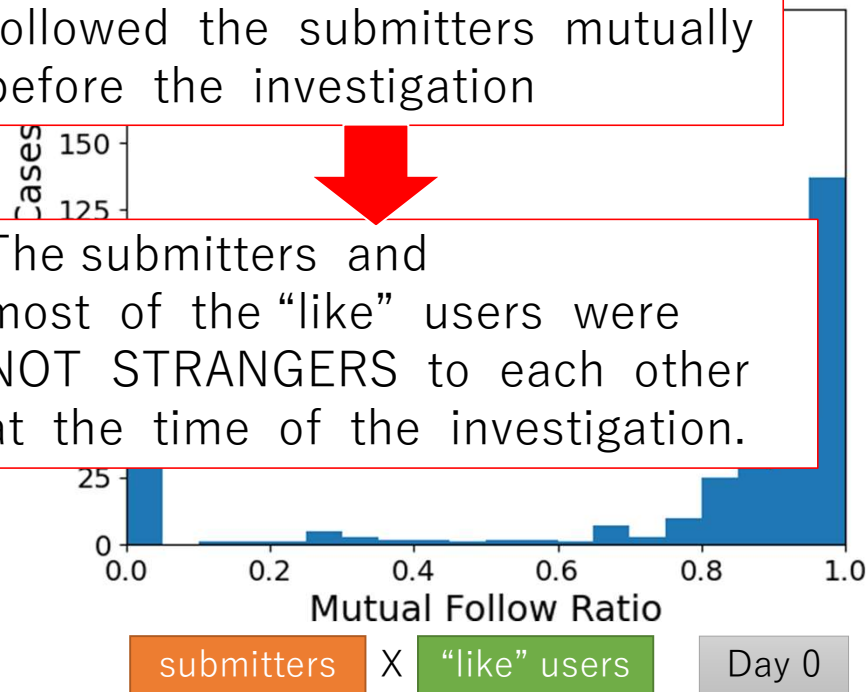


submitters X “like” users Day 6

Mutual follow ratio of submitters X “like” users

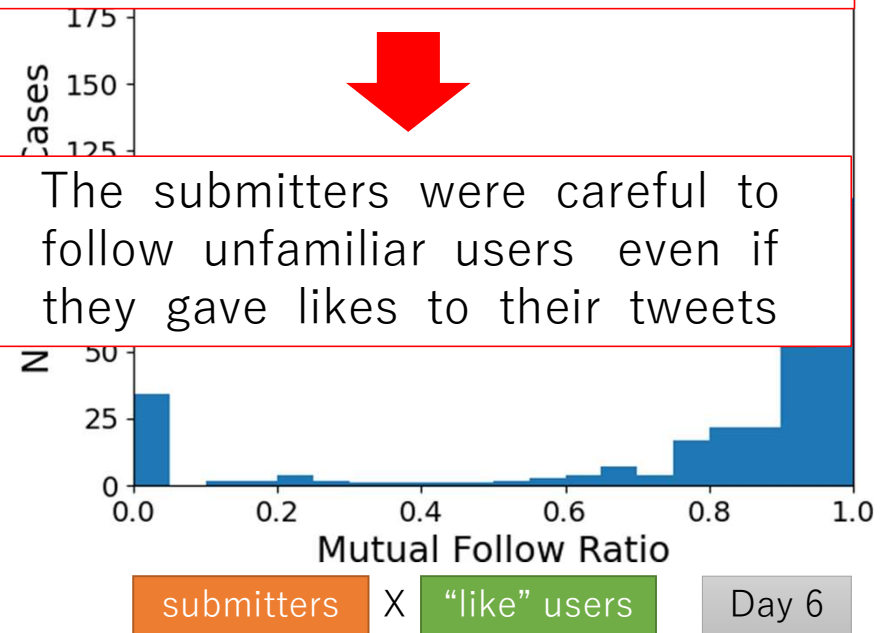
Most of the “like” users have followed the submitters mutually before the investigation

The submitters and most of the “like” users were NOT STRANGERS to each other at the time of the investigation.

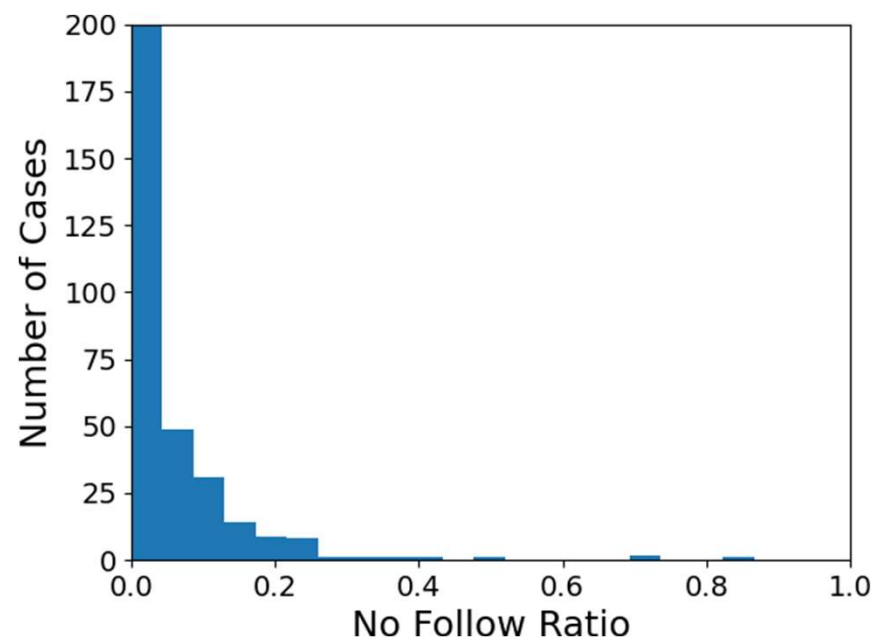


The distribution of the ratio on Day 6 moved to the left than Day 0

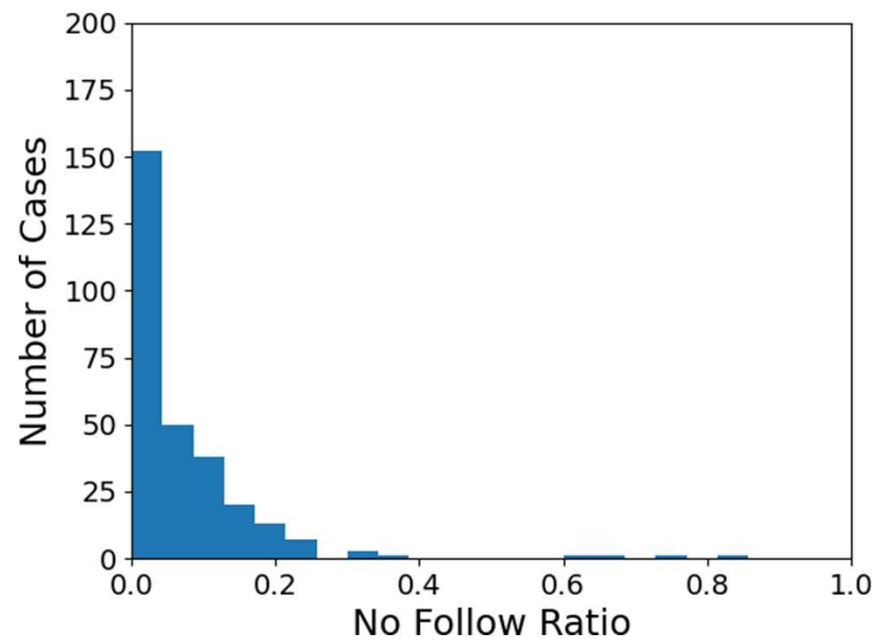
The submitters were careful to follow unfamiliar users even if they gave likes to their tweets



No follow ratio of **submitters** X **“like” users**

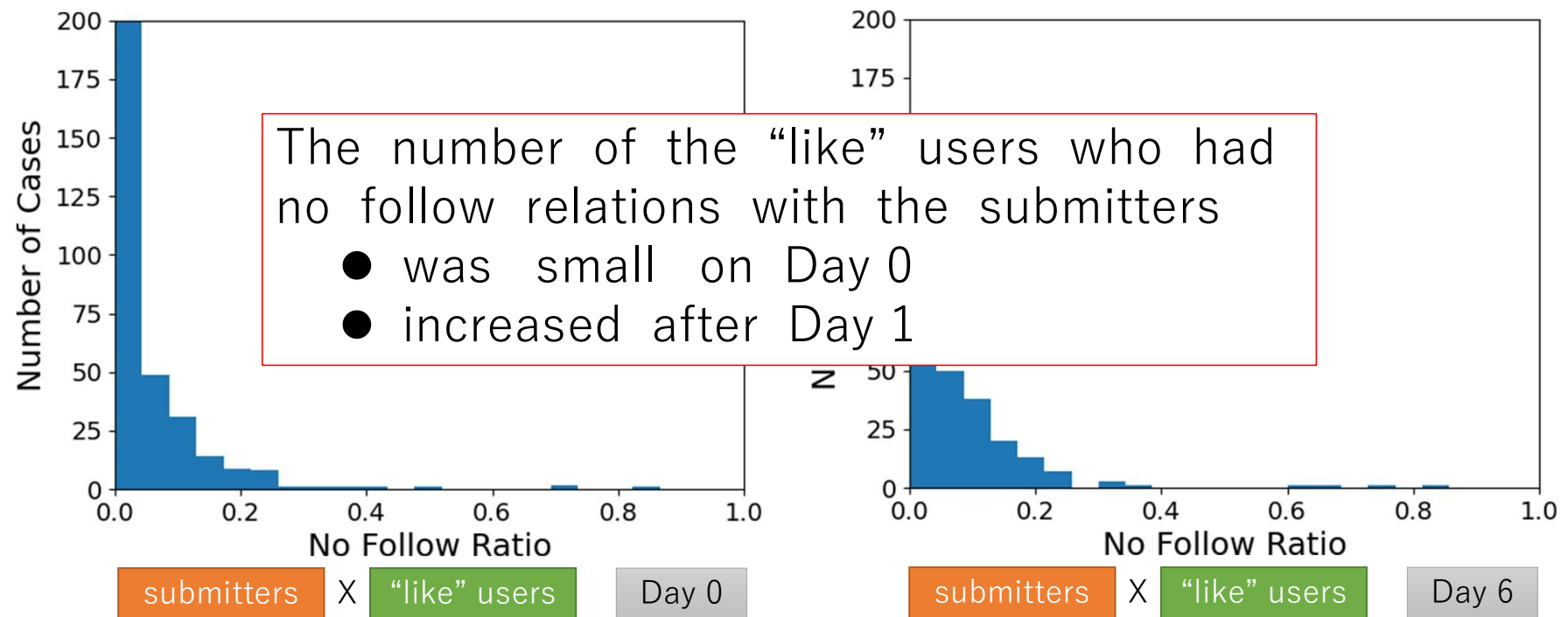


submitters X **“like” users** Day 0

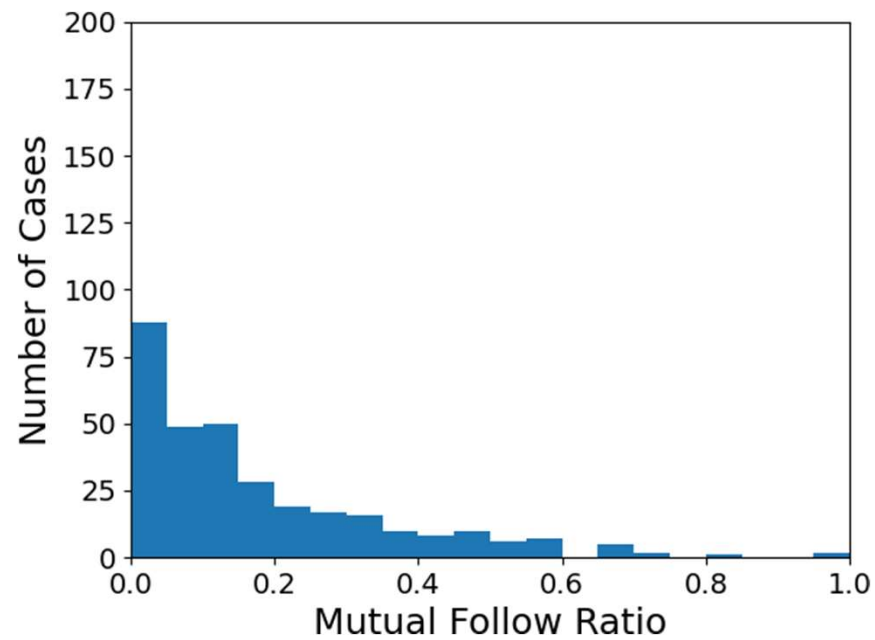


submitters X **“like” users** Day 6

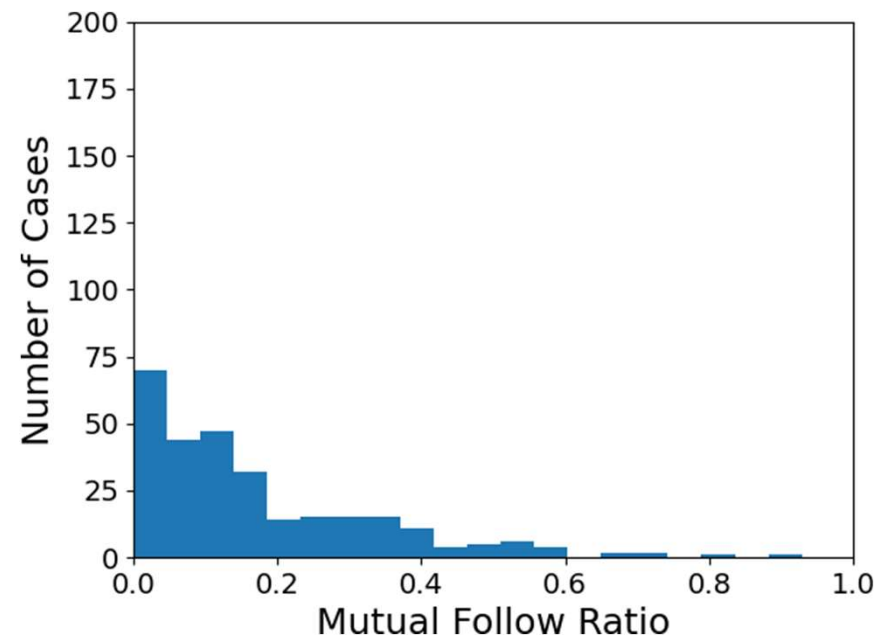
No follow ratio of **submitters** X **“like” users**



Mutual follow ratio of “like” users X “like” users



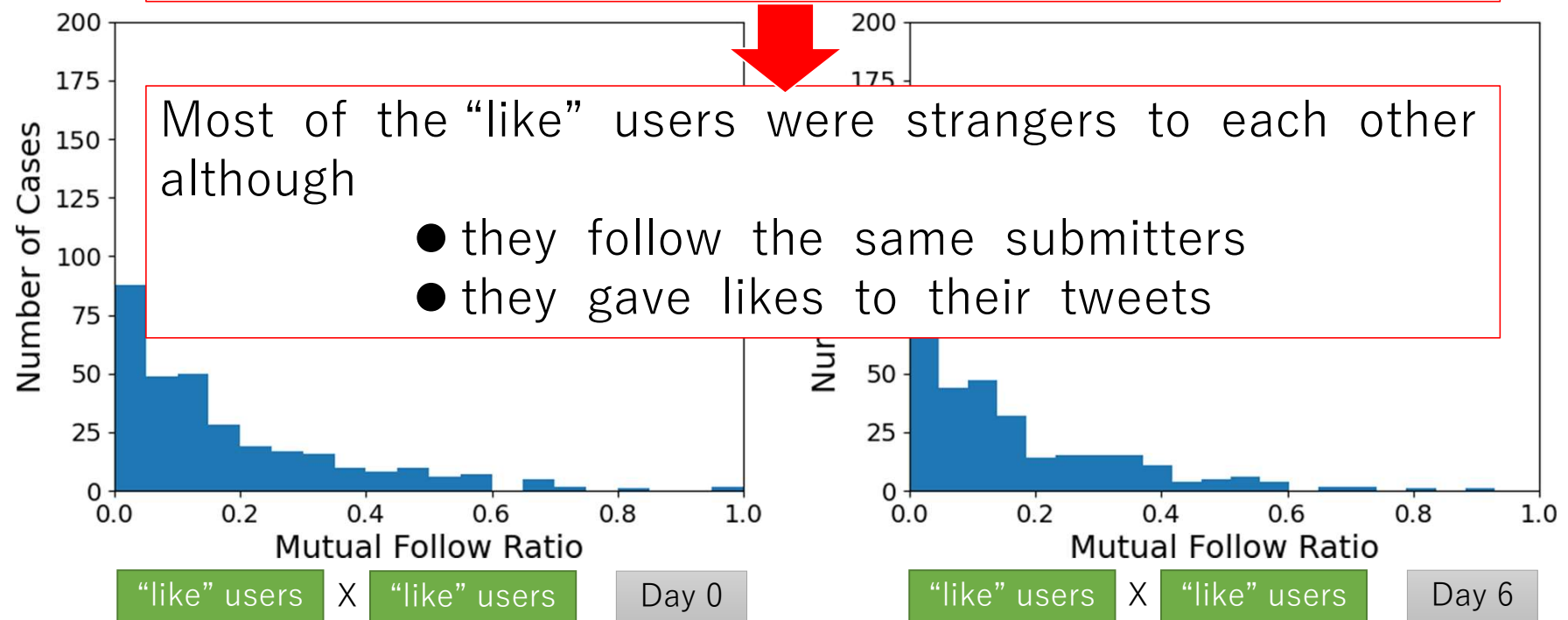
“like” users X “like” users Day 0



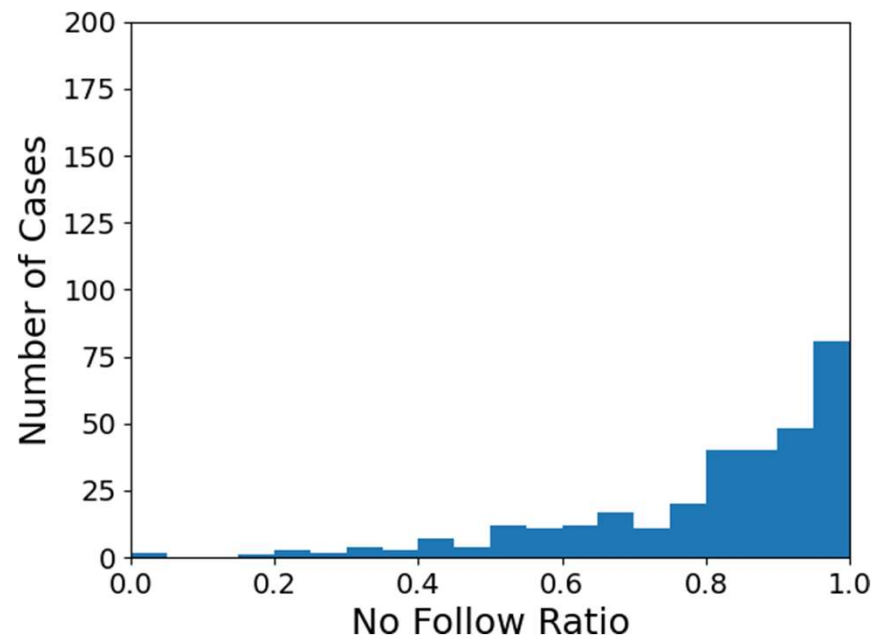
“like” users X “like” users Day 6

Mutual follow ratio of “like” users X “like” users

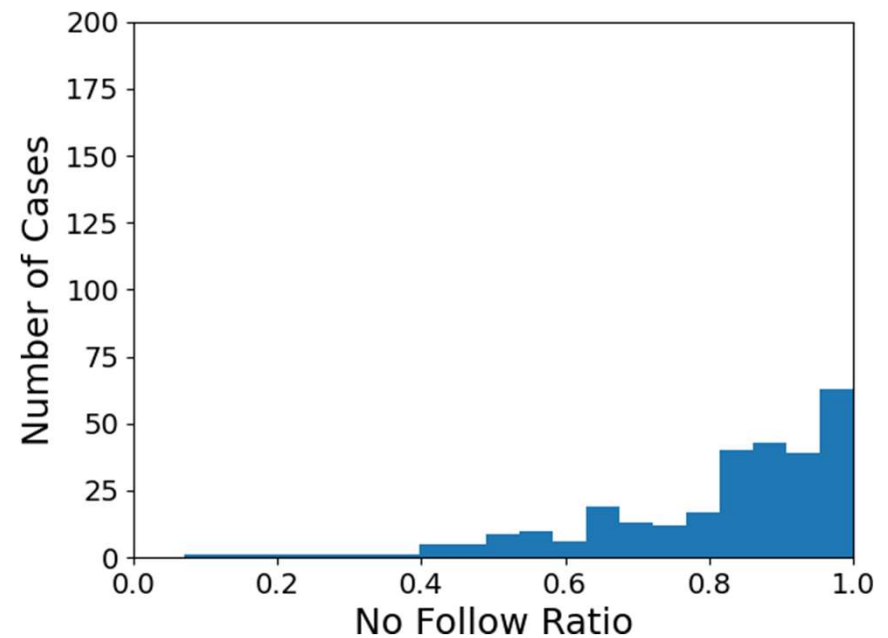
Most of the “like” users did NOT follow each other



No follow ratio of “like” users X “like” users

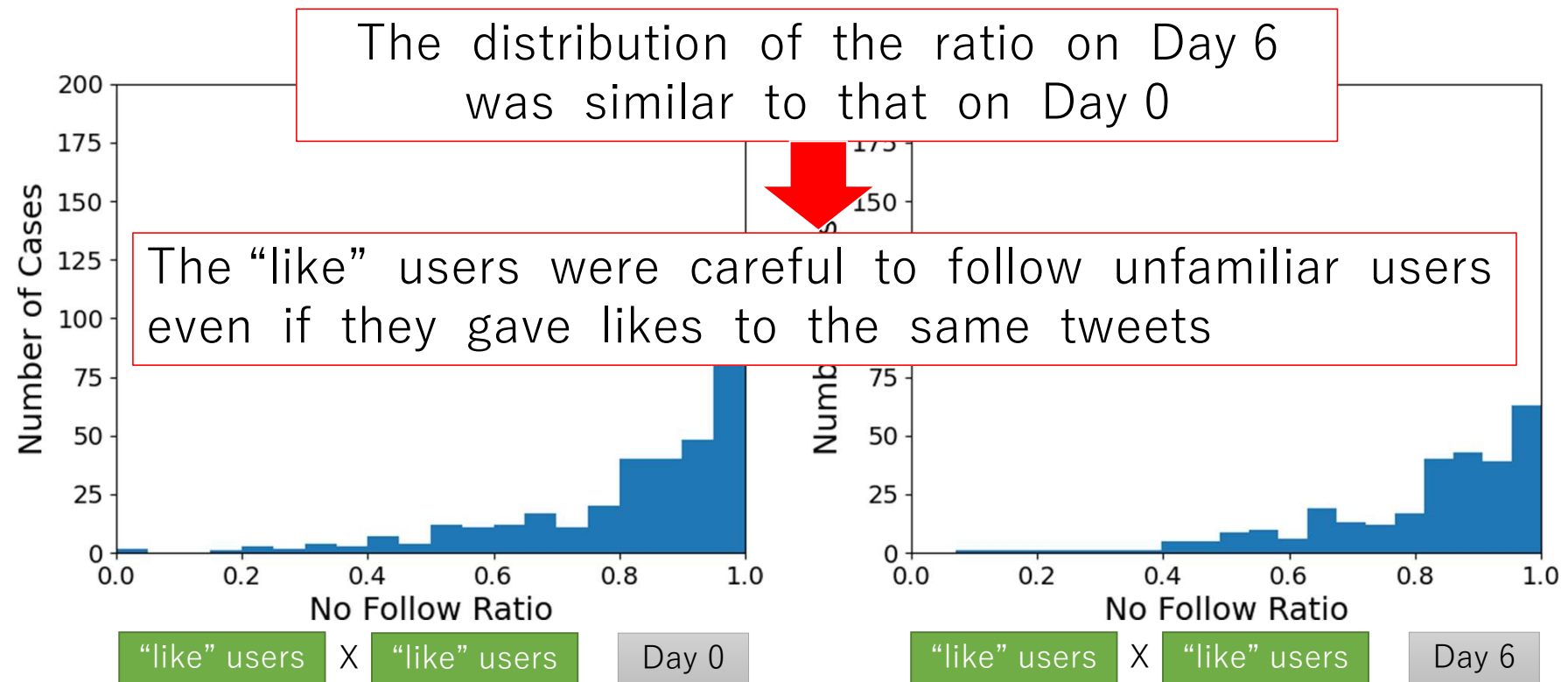


“like” users X “like” users Day 0



“like” users X “like” users Day 6

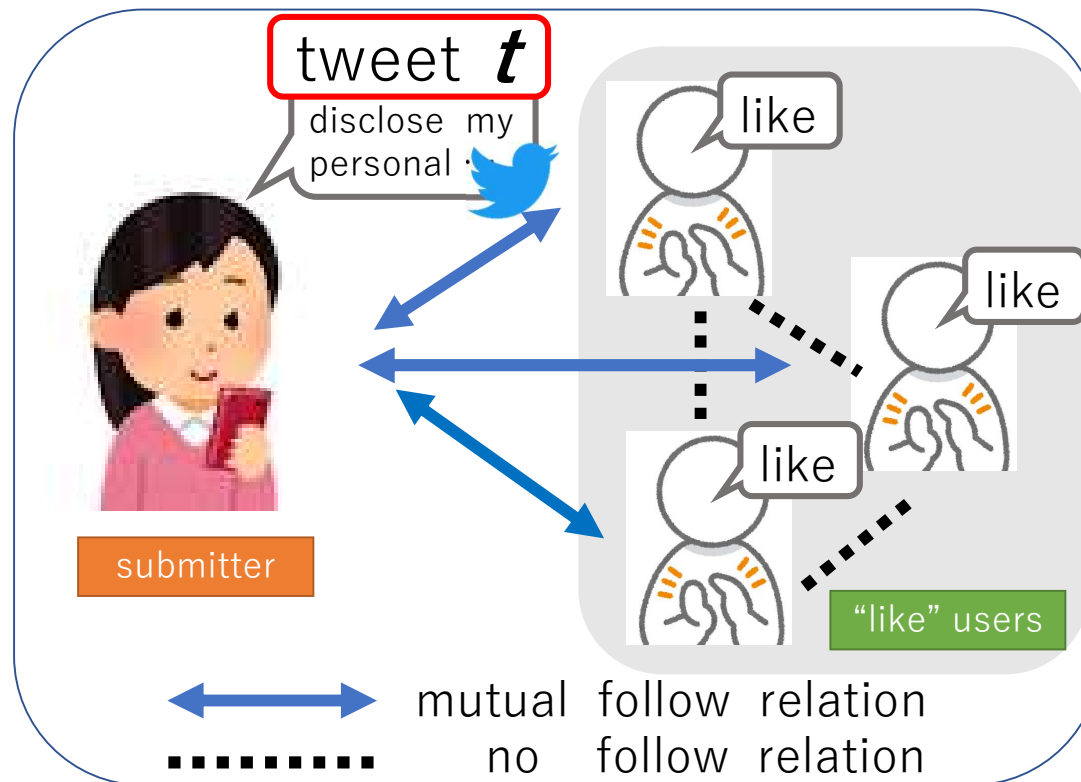
No follow ratio of “like” users X “like” users



The results of our investigation show

- at the time of our investigation,
 - ✓ most of **submitters** X **“like” users** were **NOT STRANGERS** to each other
 - ✓ most of **“like” users** X **“like” users** were **STRANGERS** to each other
- **submitters** and **“like” users** were careful to follow unfamiliar users

Typical relations of **submitters** and **“like” users**



future works

We intend to

- survey one sided follow relations

✓ only **submitters** follow **“like” users** or
✓ only **“like” users** follow **submitters**

- investigate tweets
in languages other than Japanese.