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An Investigation of One Sided Follow Relations between Twitter Users Concerned with Tweets Disclosing Submitters' Personal Information

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presenter information

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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

I will show
the SAME NUMBER of
my personal information
AS YOUR LIKES

likes

like like like like

OK!
1. 15 years old
2. woman

not fake

submitter

“like” users

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

self-replies disclosing submitters' personal info.

A Question investigated in HUSO 2022

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

I will show
the SAME NUMBER of
my personal information
AS YOUR LIKES

likes

like

like

WHO ?

friends?
acquaintances?
or strangers?

OK!
1. 15 years old
2. woman

not fake

submitter

“like” users

The research results in HUSO 2022

- 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

Watanabe, Nakano, Nishimura, and Okada:

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

IARIA HUSO 2022 (2022).

A New Question

Do self-disclosing tweets promote the process of acquintance between users ?

I will show the SAME NUMBER of my personal information AS YOUR LIKES

OK!
1. 15 years old
2. woman

not fake

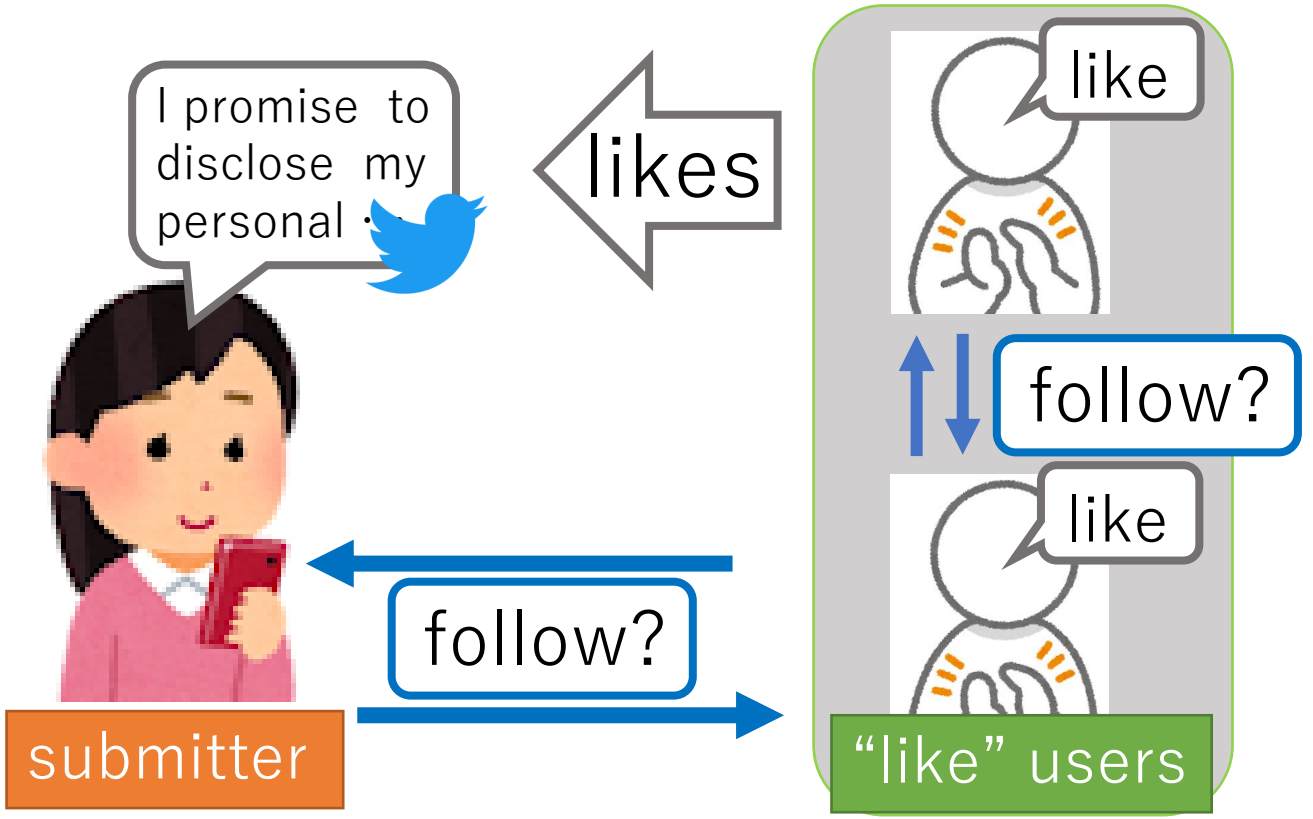
submitter

likes

Do strangers or acquaintances become friends?

“like” users

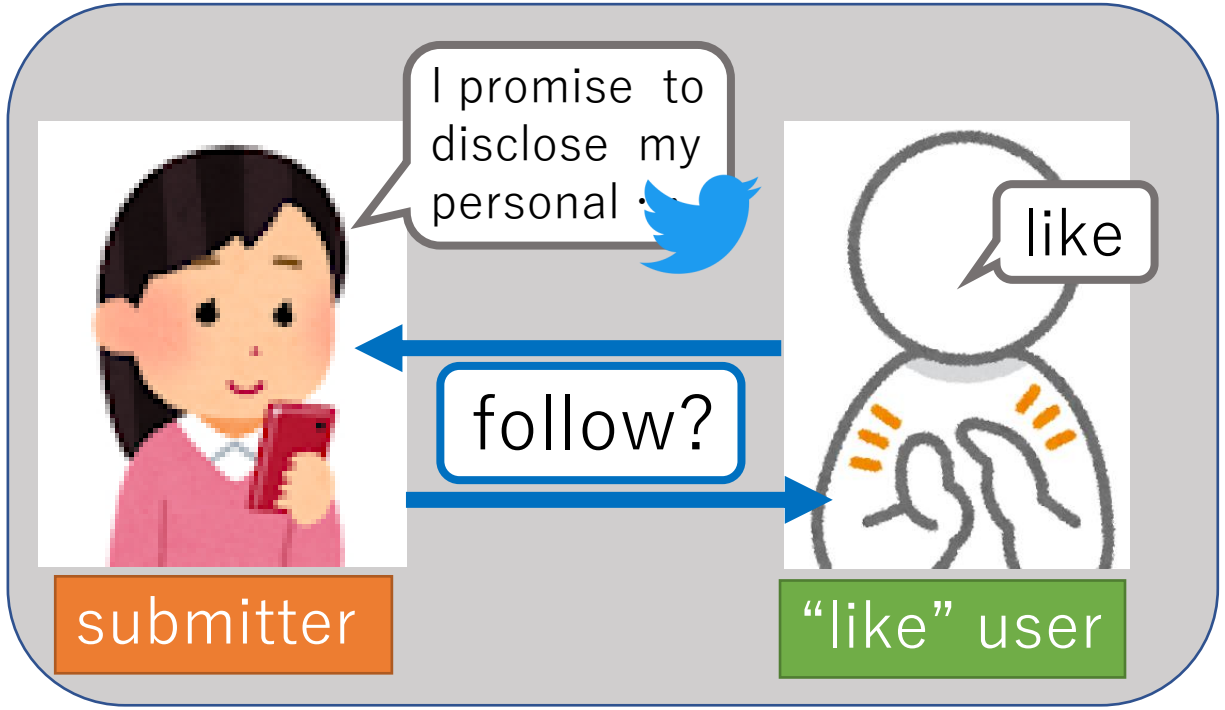
Our research points in HUSO 2023

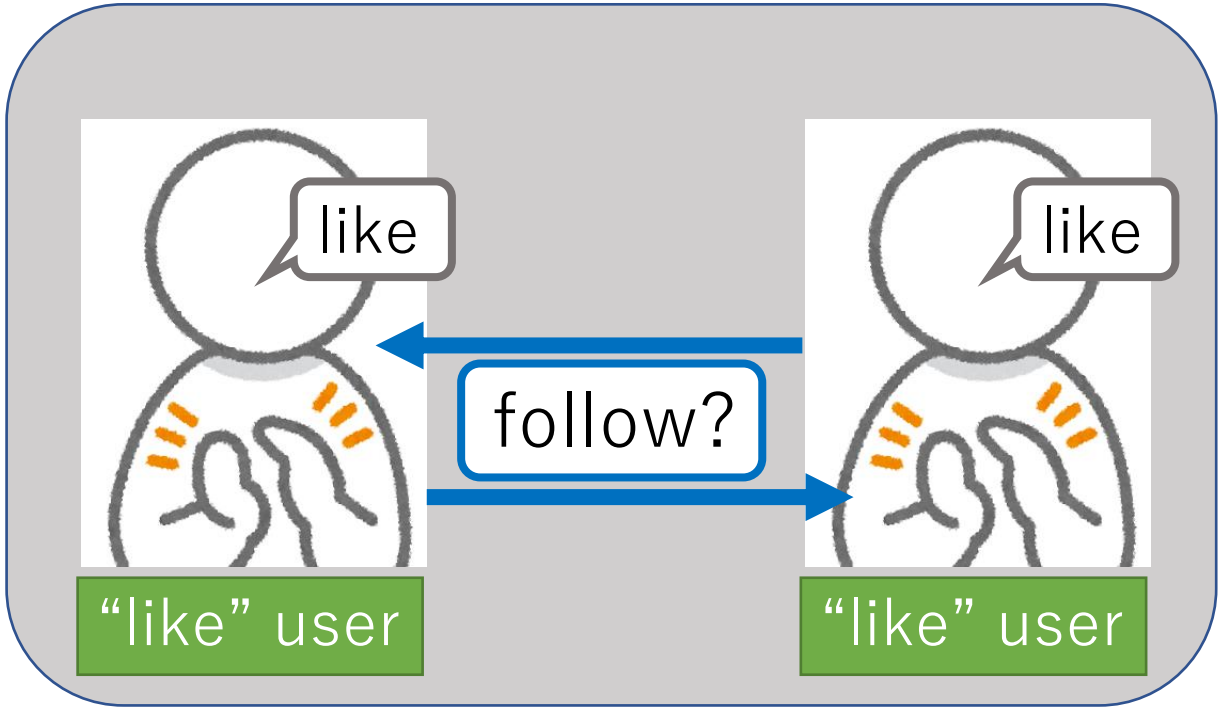


We investigate follow relations of

1. **submitters** promising to disclose their personal information in their tweets
2. **"like" users** who gave likes to these tweets

Why we investigate follow relations ?





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

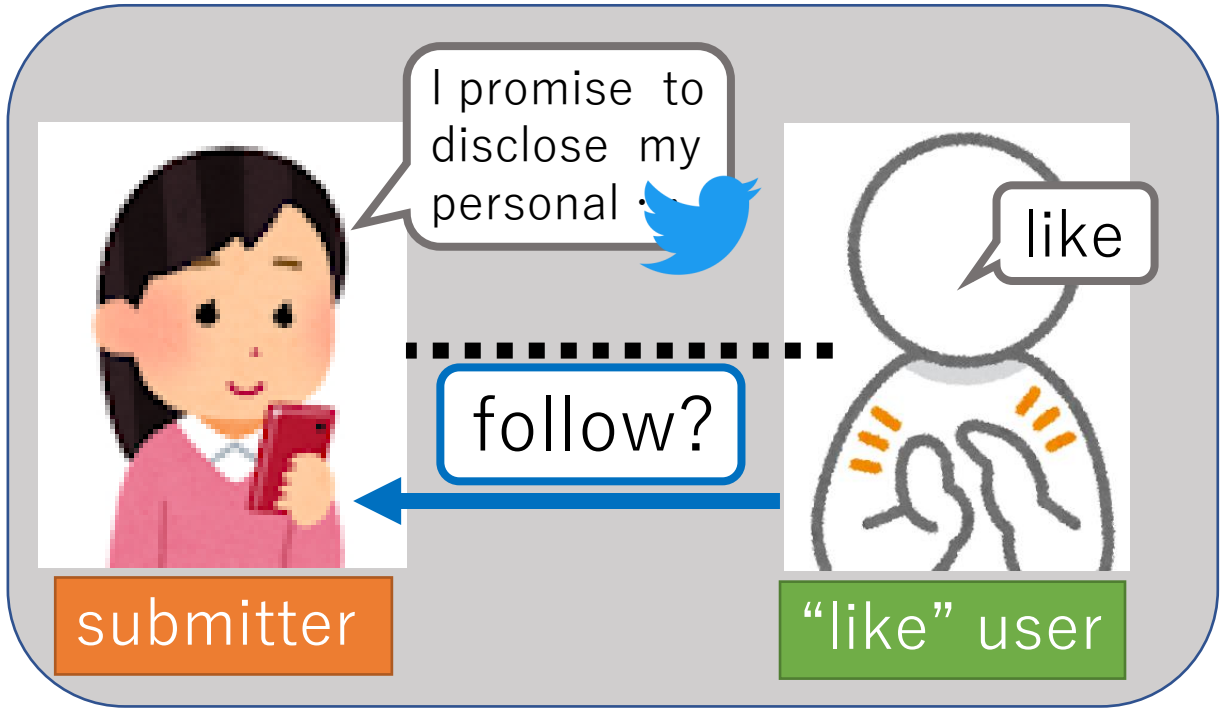
2. one sided follow relation

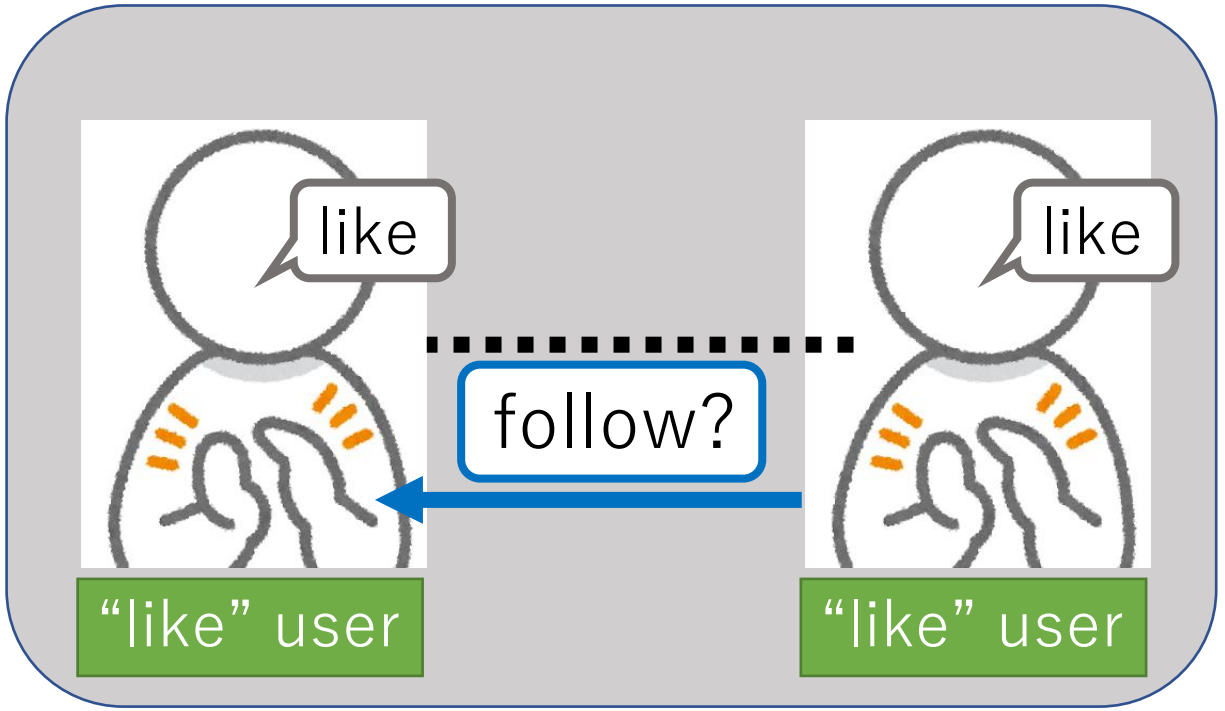
3. no follow relation

Relations which we investigate in this study

Relations which we investigated in HUSO 2022

Why we investigate one sided follow relations ?





one sided follow relations are bound to happen in the process of acquaintance between users

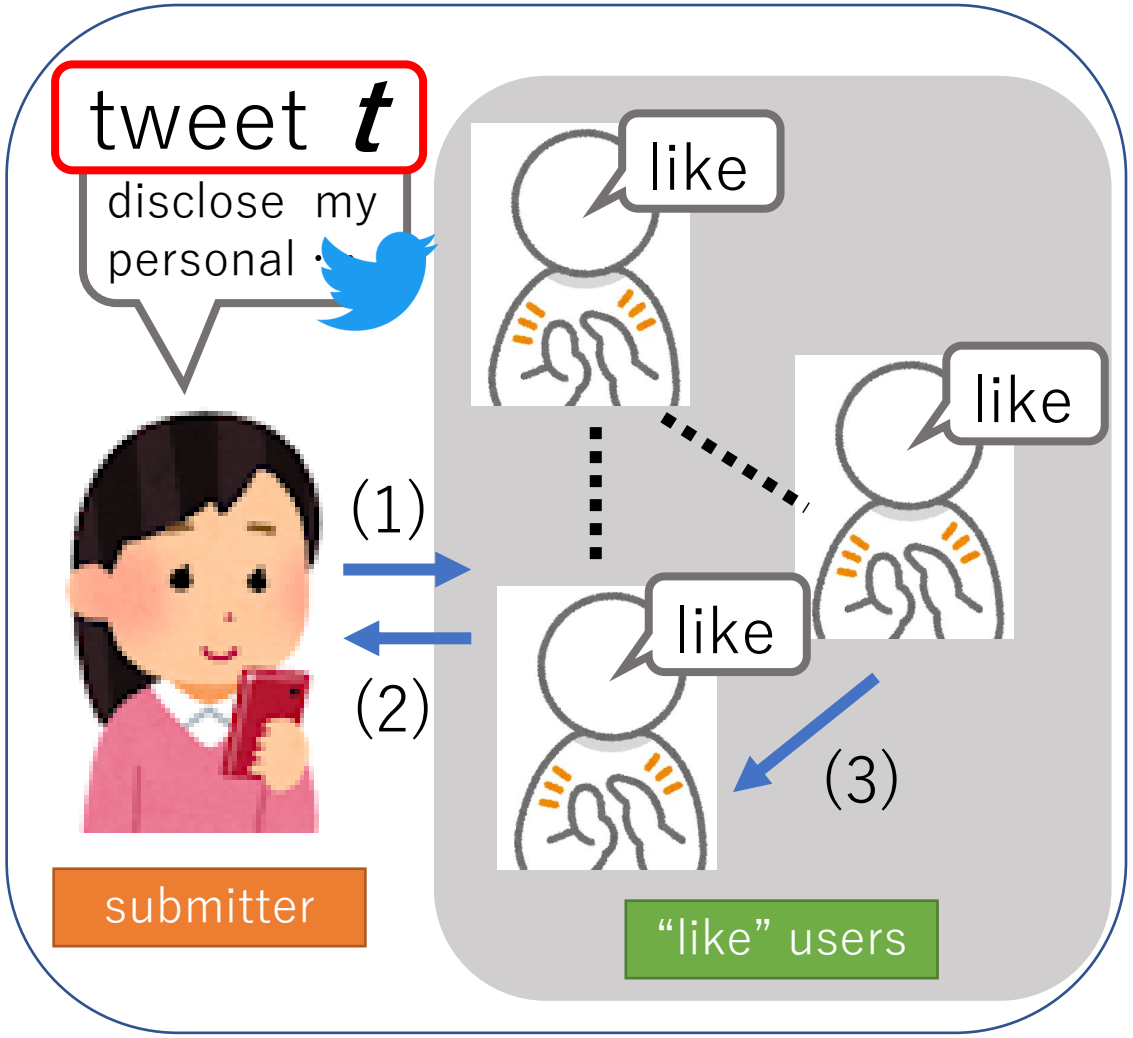
follow relation ..... no follow relation

Types of one sided follow relations

(1) submitters → “like” users
(from submitters)

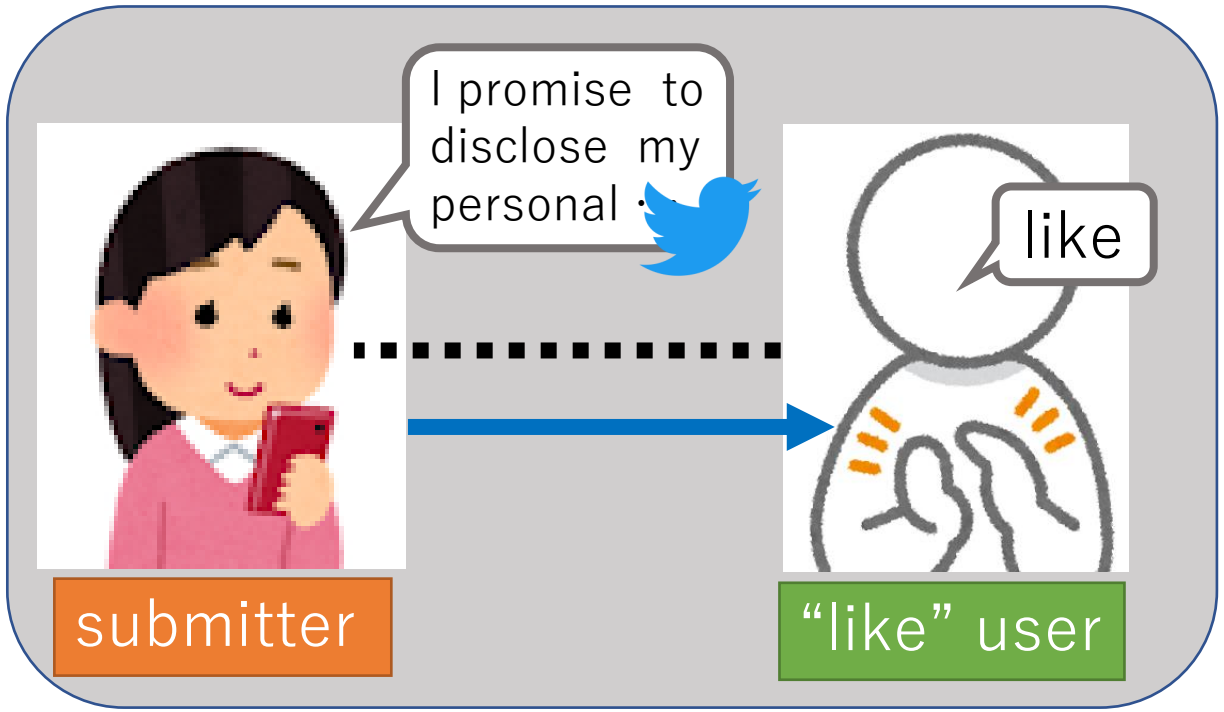
(2) submitters ← “like” users
(to submitters)

(3) “like” users → “like” users
(among users)

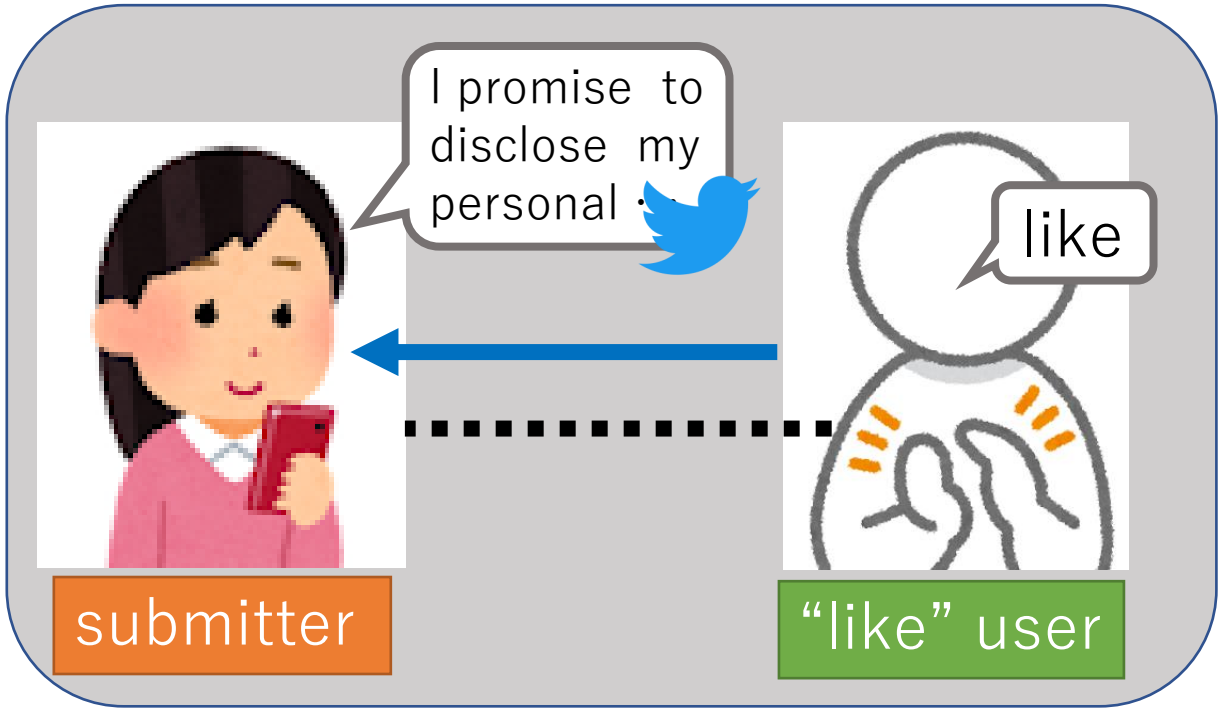


Types of one sided follow relations (1)(2)

submitters → “like” users



submitters ← “like” users

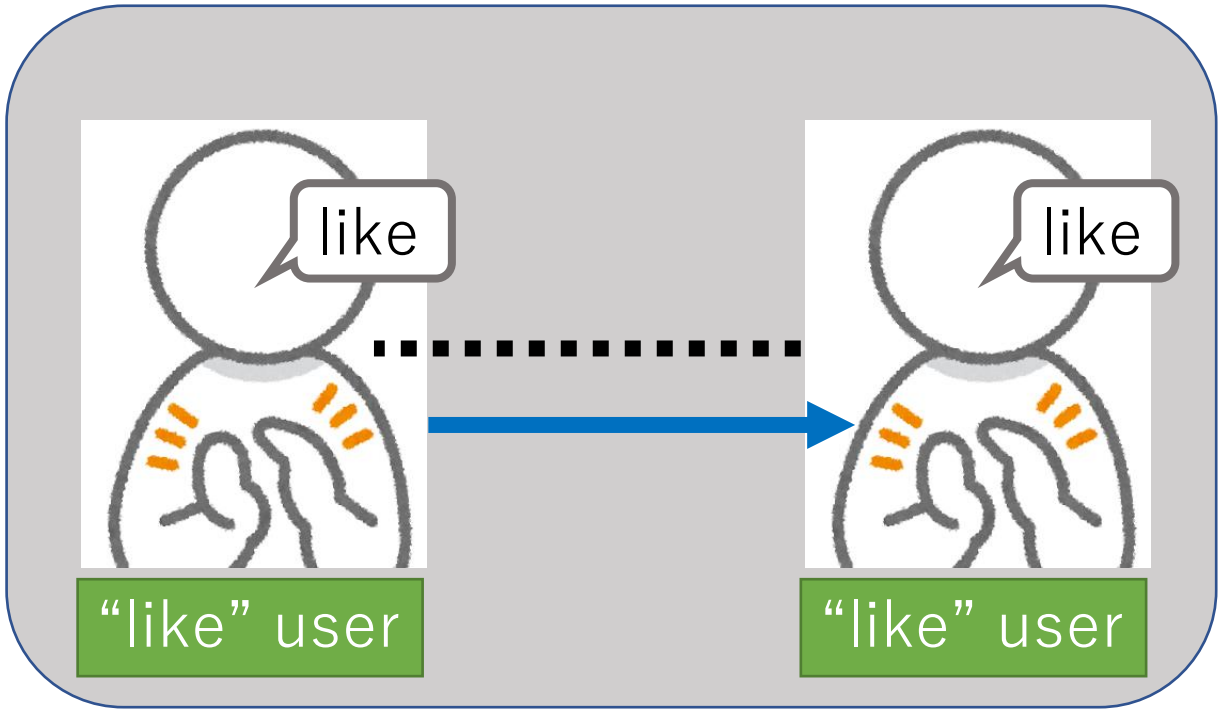


follow relation

no follow relation

Types of one sided follow relations (3)

“like” users → “like” users



follow relation

no follow relation

Investigation indicators

One sided follow ratio of

- from submitters to “like” users

- from “like” users to submitters

- among “like” users

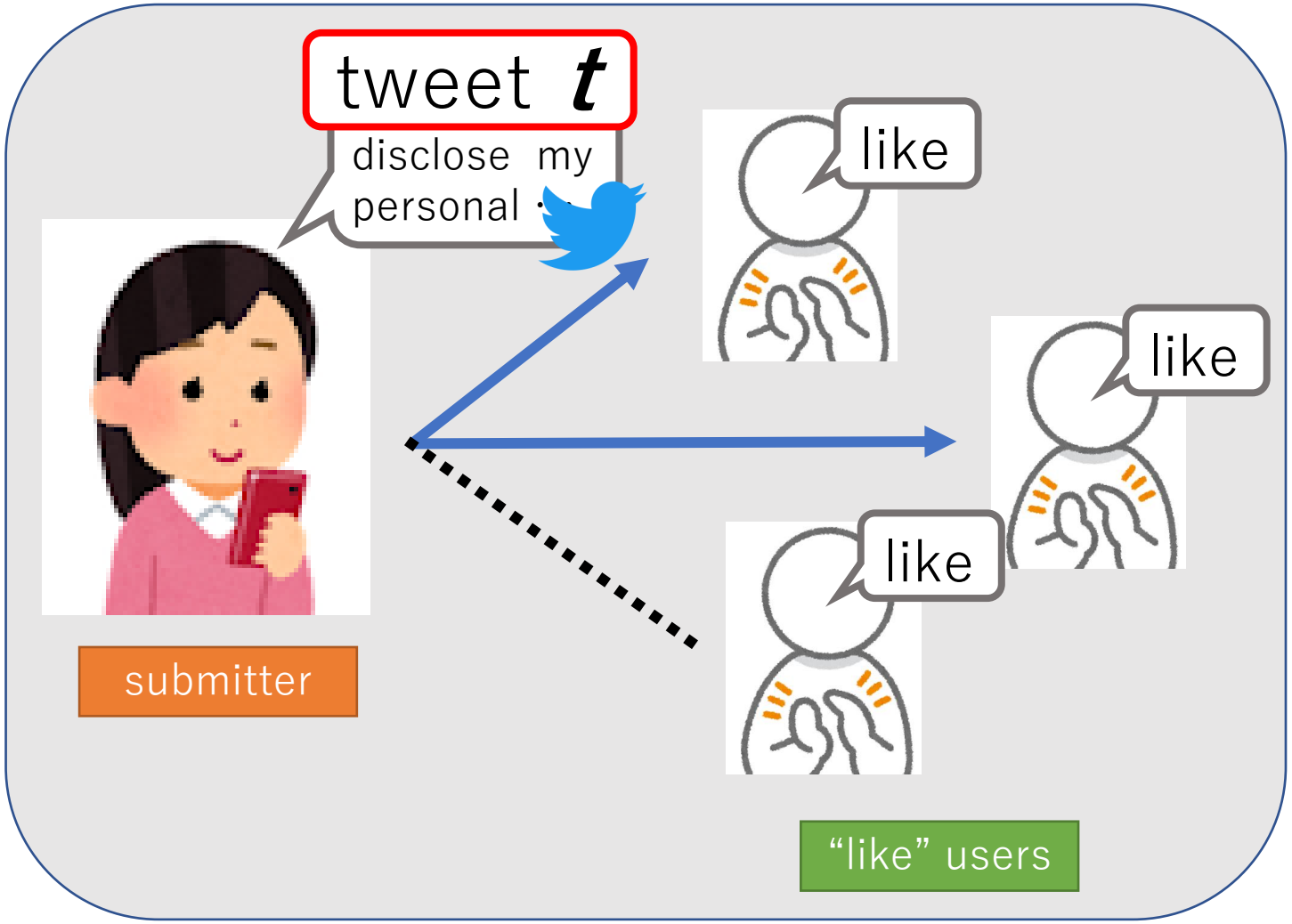
One sided follow ratio of submitters ➡ “like” users

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

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

n: # of “like” users

m: # of “like” users who do not follow the submitter of tweet t but are followed by him/her

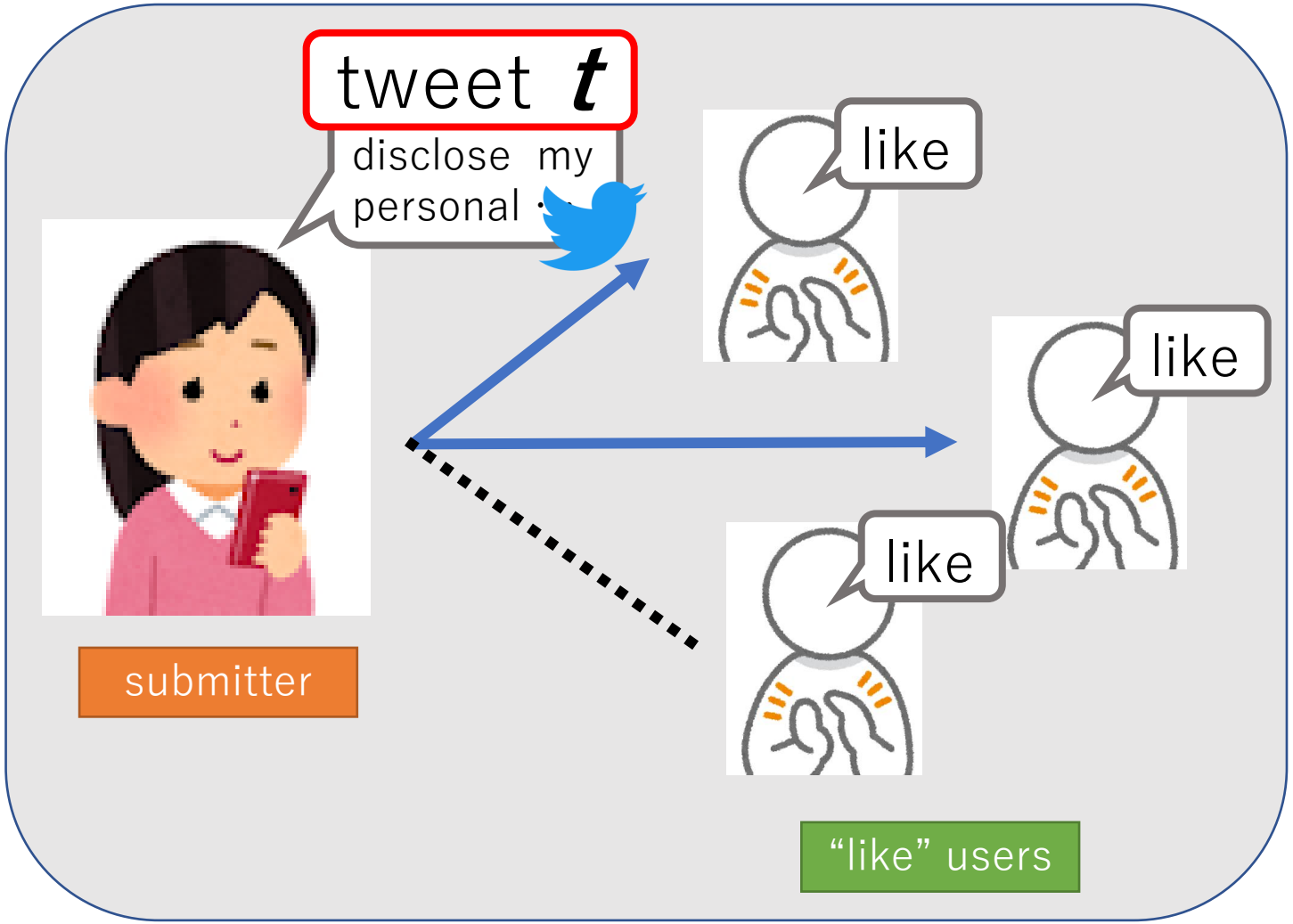


Example

One sided follow ratio of submitters → "like" users

from submitter

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



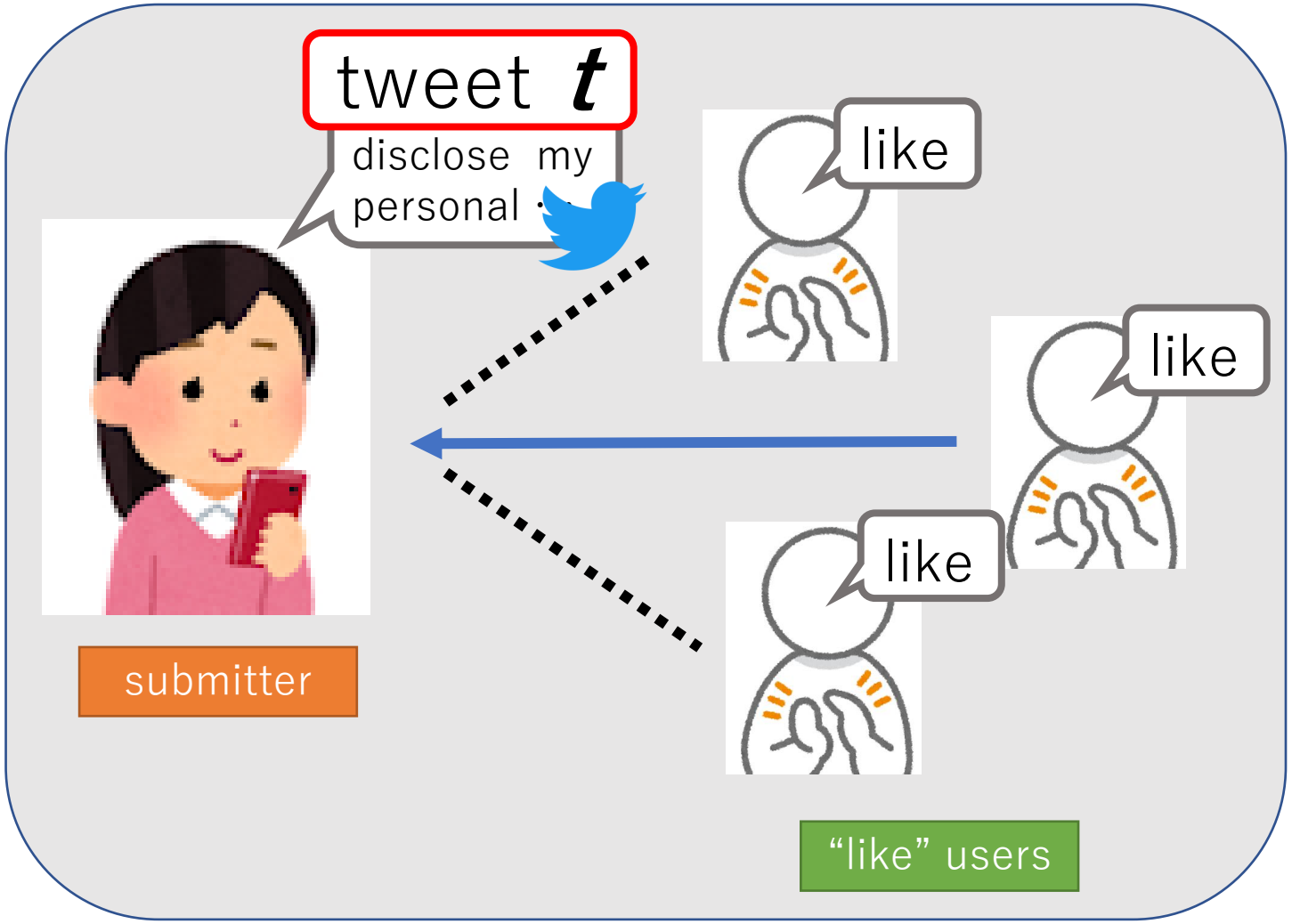
One sided follow ratio of submitters ← "like" users

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

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

n: # of "like" users

m: # of "like" users who follow the submitter of tweet t but are not followed by him/her

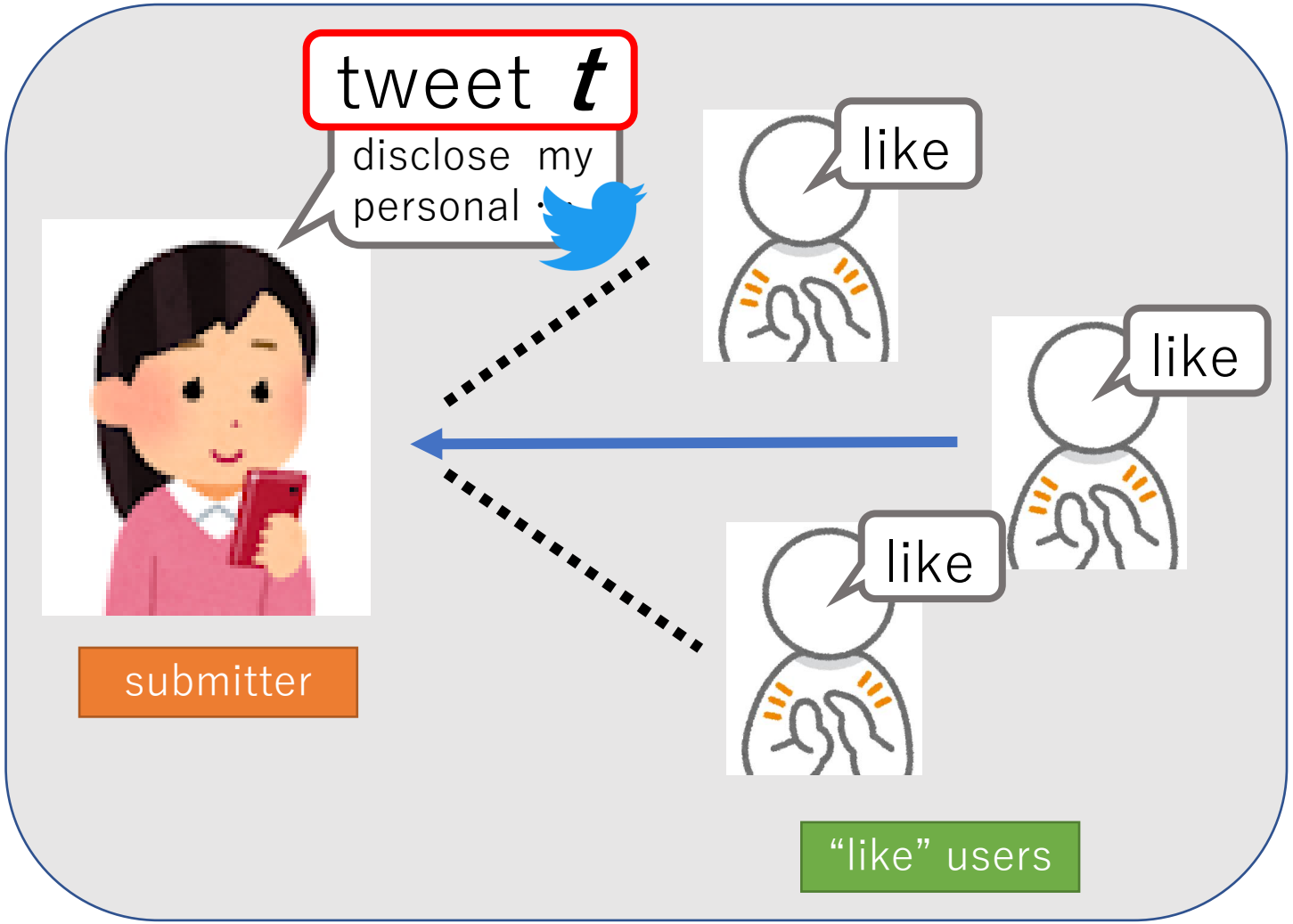


Example

One sided follow ratio of submitters ← "like" users

to submitter

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



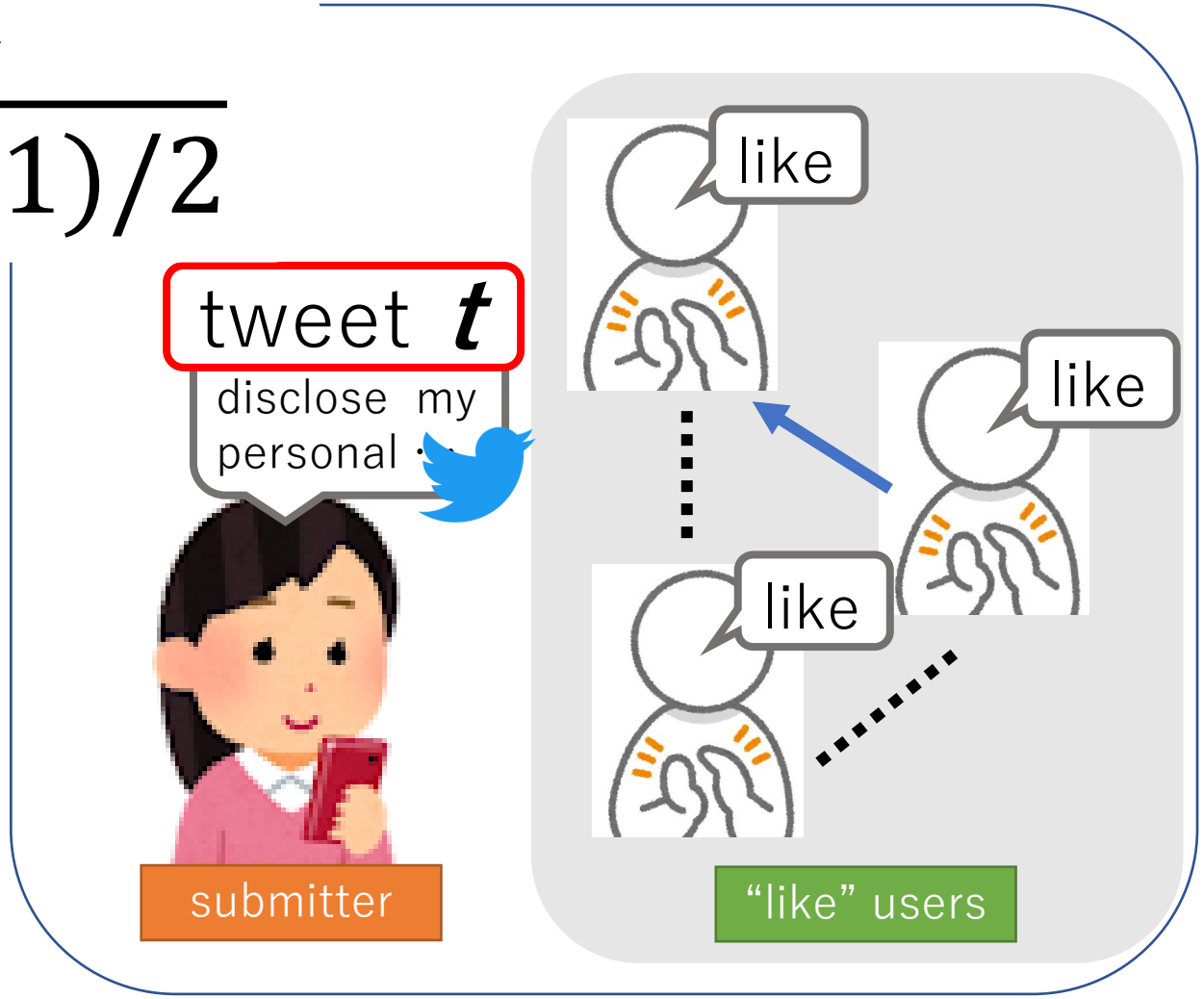
One sided follow ratio of “like” users → “like” users

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

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

n: # of “like” users

m: # of cases where one “like” user follows another “like” user but is not followed by the user

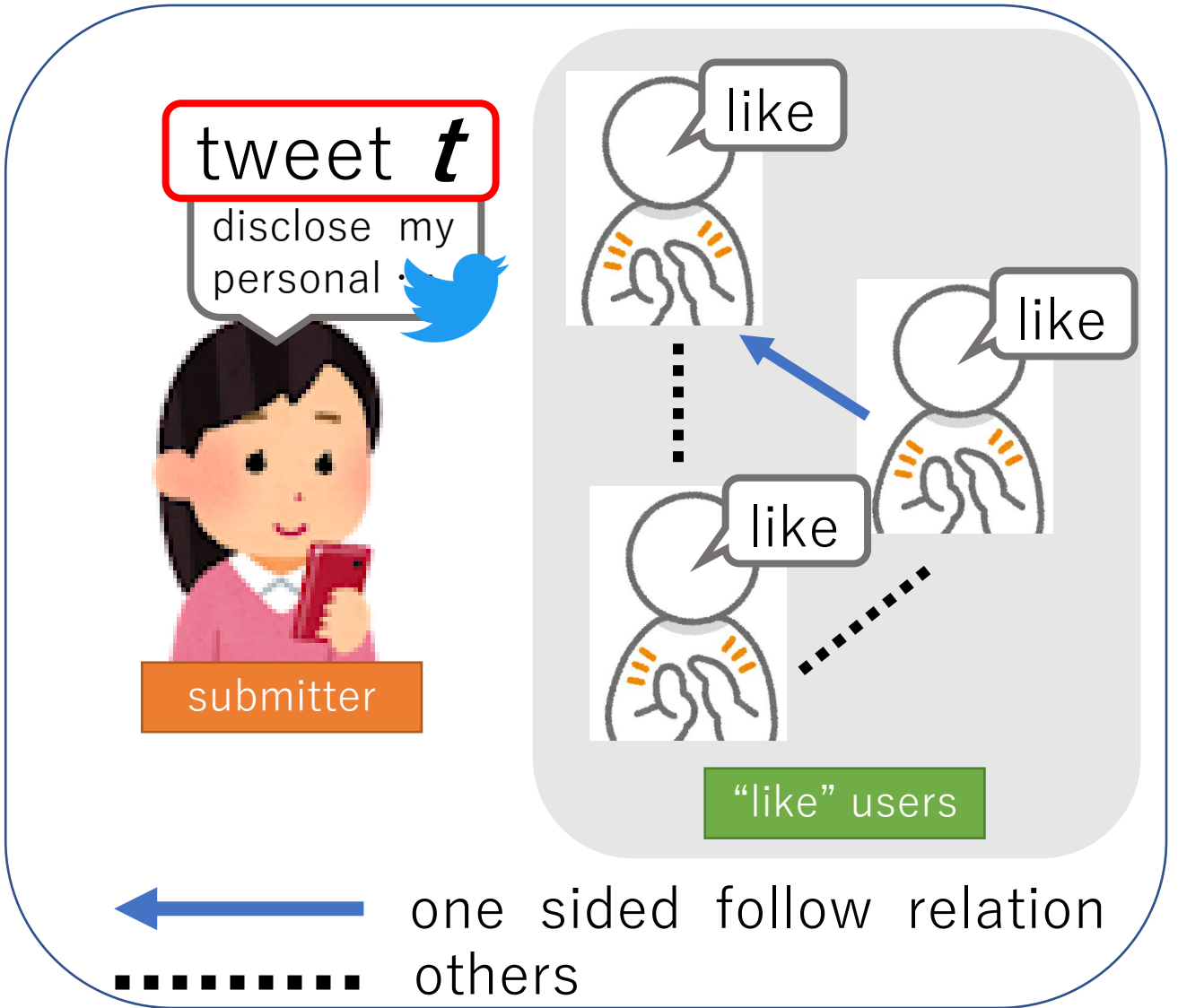


Example

One sided follow ratio of “like” users ➡ “like” users

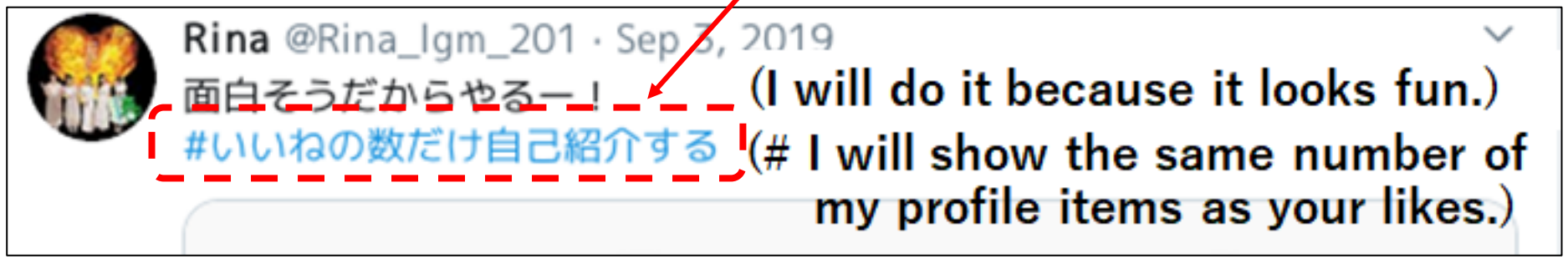
among “like” users

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



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)

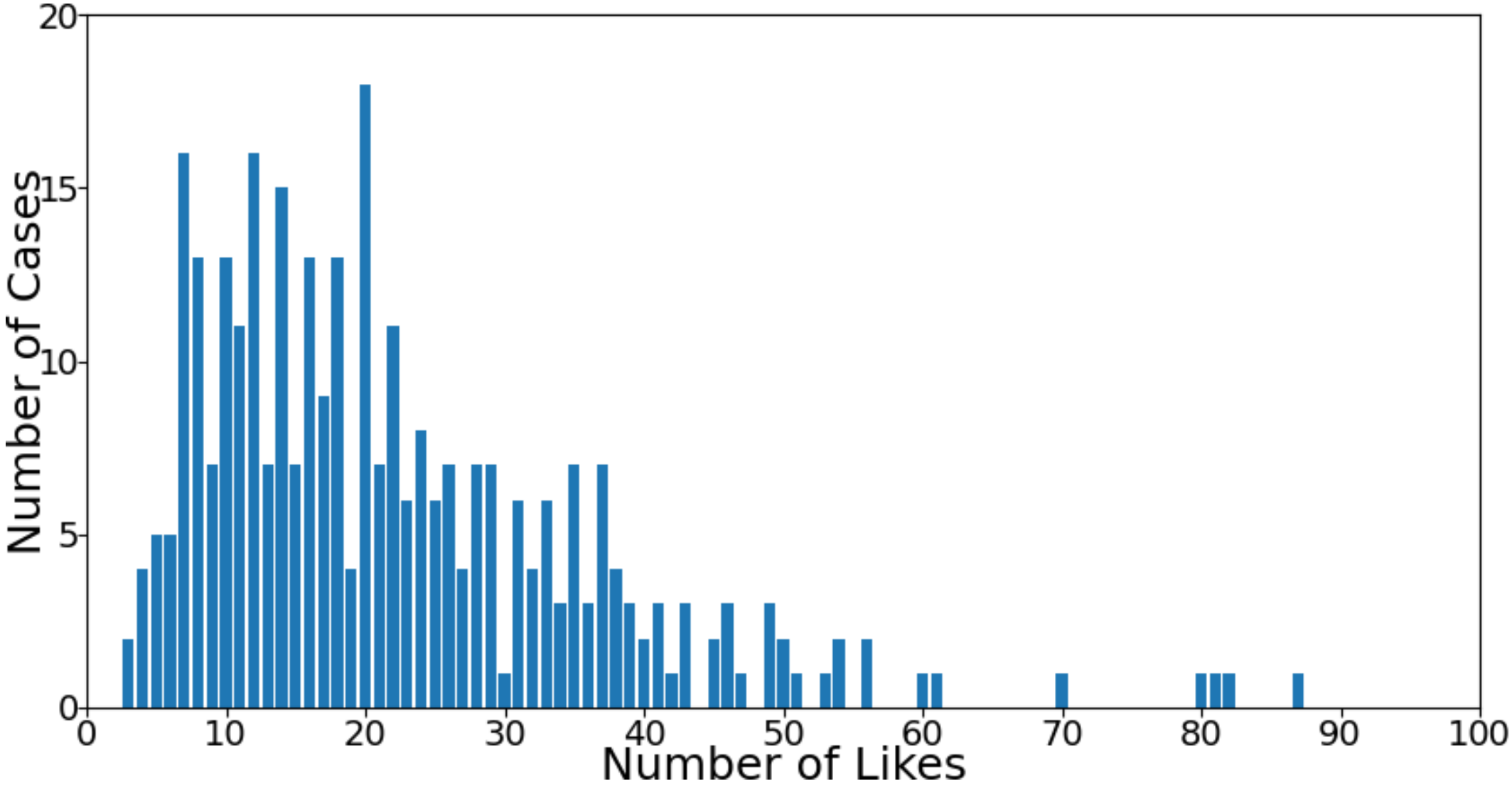


- submitted from Dec. 30, 2021 to Jan. 31, 2022.

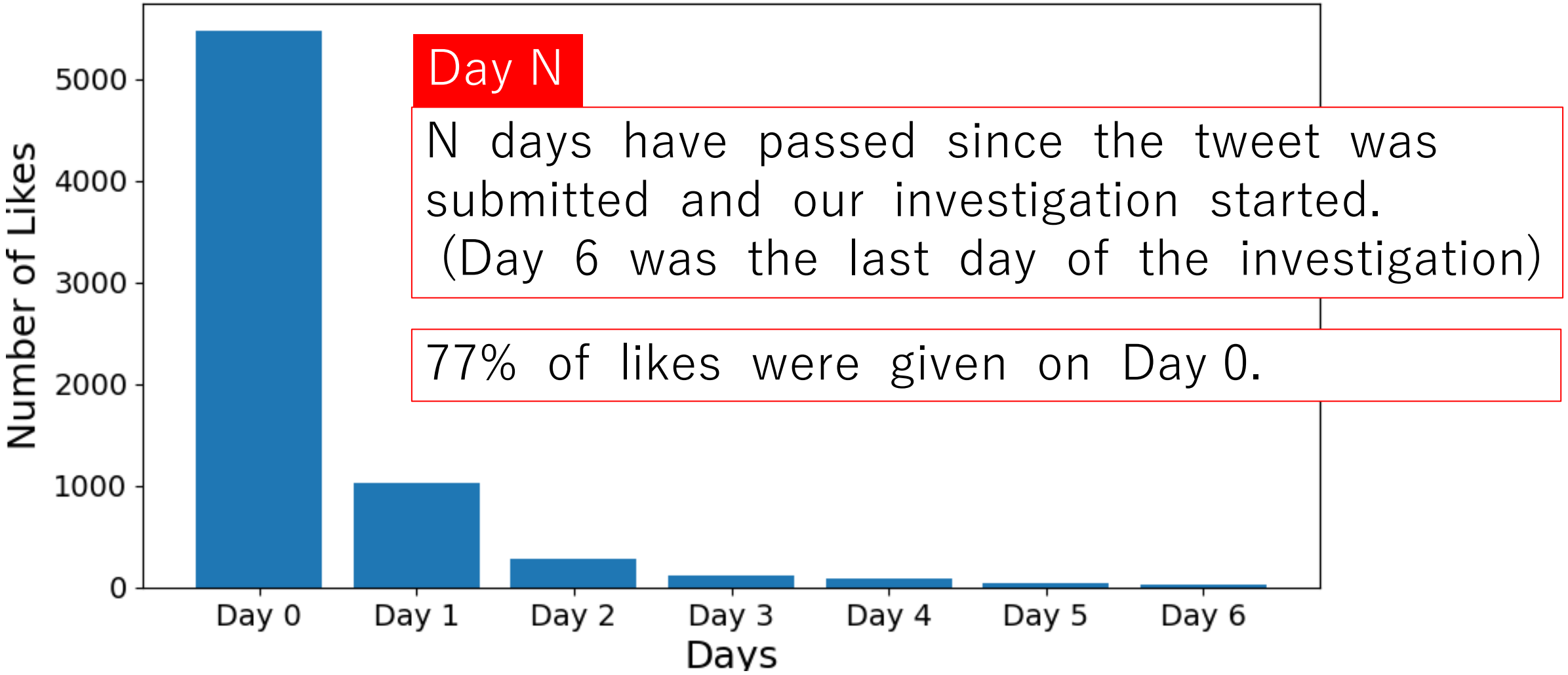
Our survey (2)

- 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

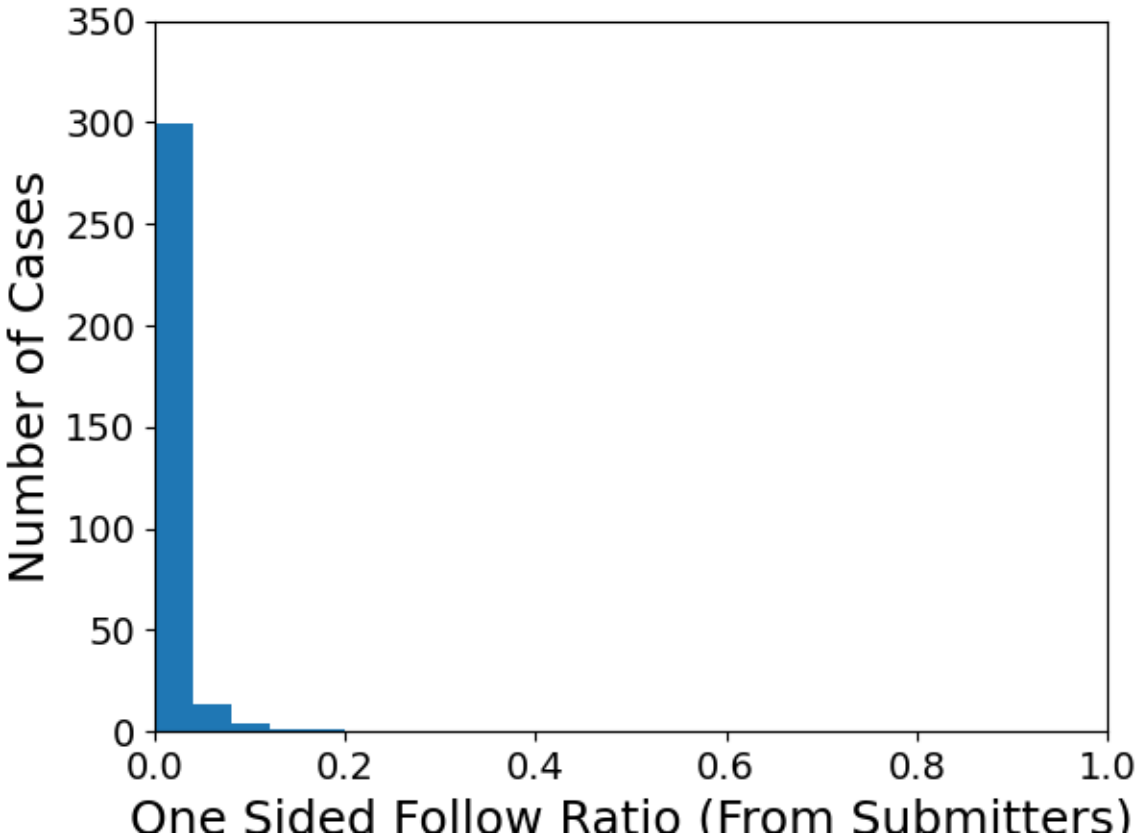


Day N

N days have passed since the tweet was submitted and our investigation started.
(Day 6 was the last day of the investigation)

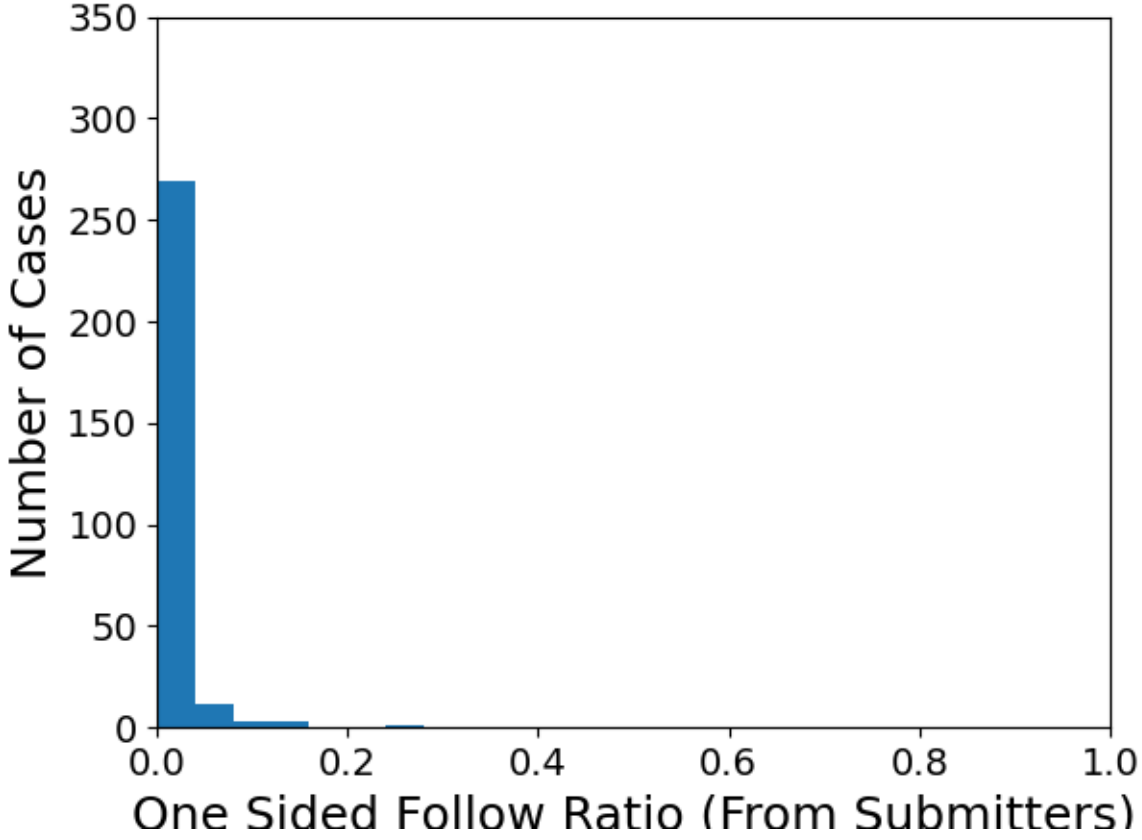
77% of likes were given on Day 0.

One sided follow ratio of submitters → “like” users



submitters → “like” users

Day 0

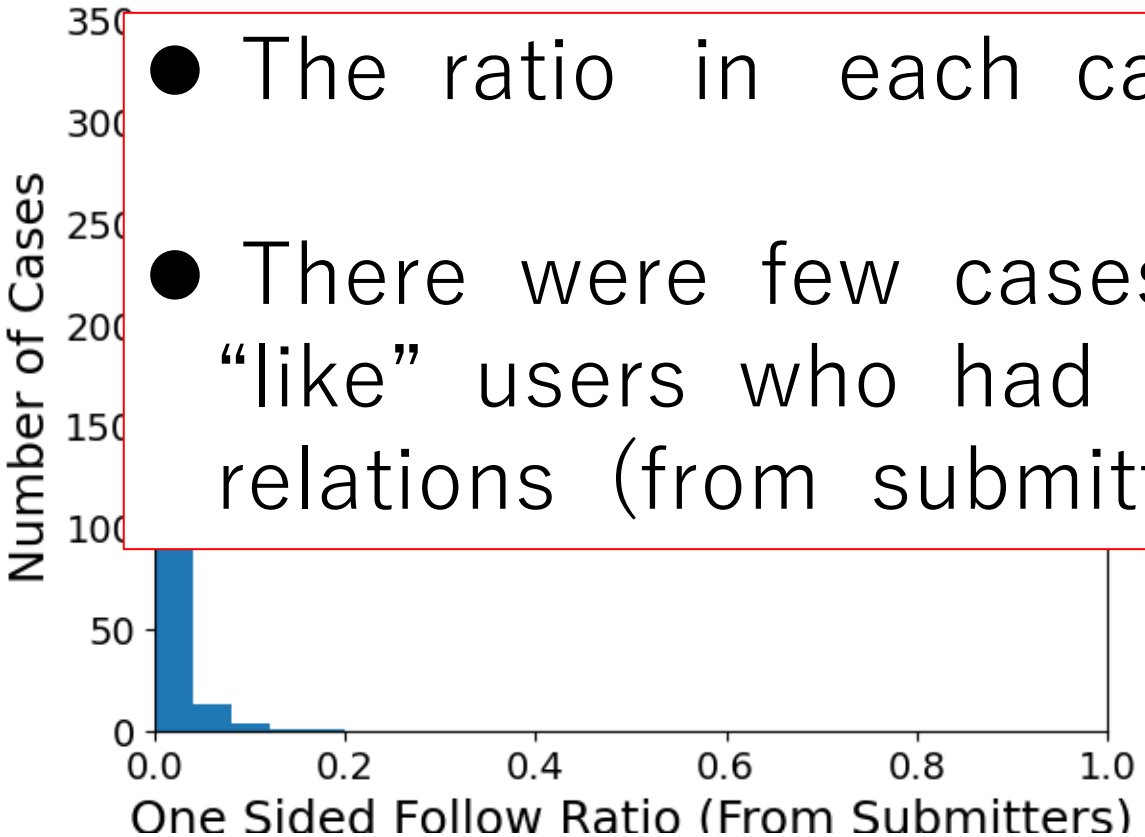


submitters → “like” users

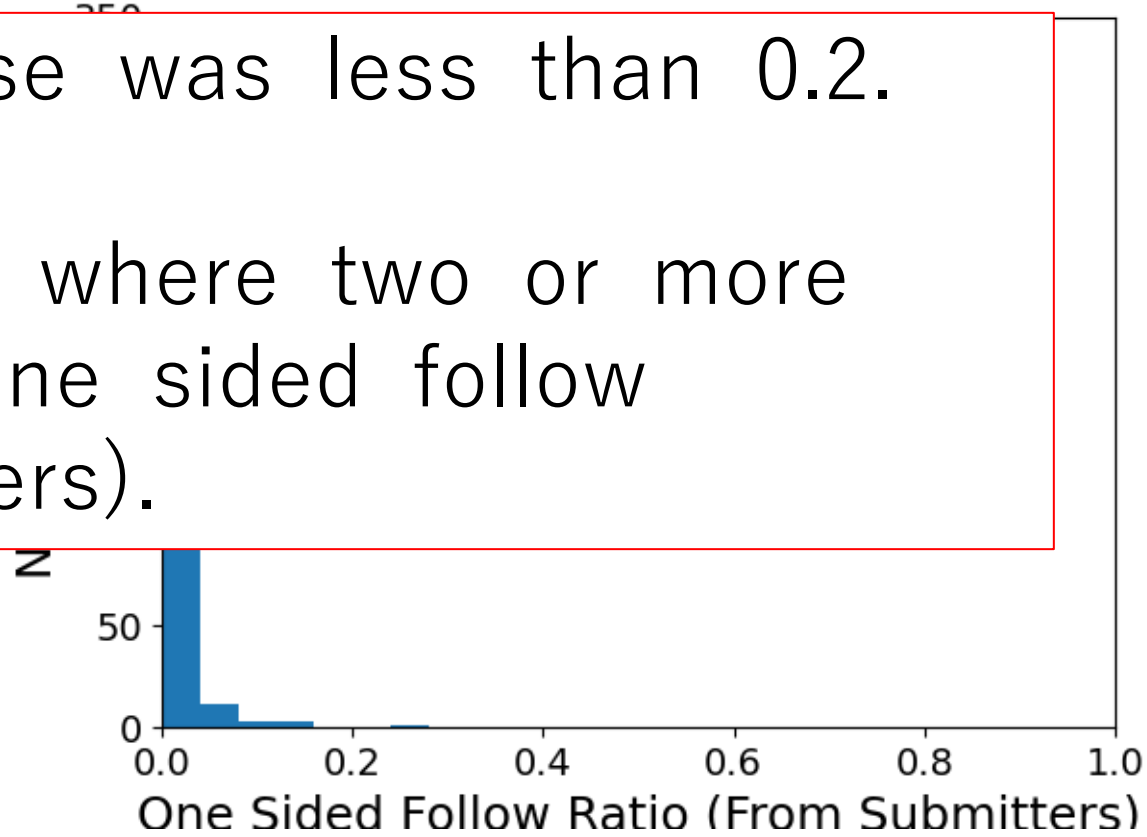
Day 6

One sided follow ratio of submitters → “like” users

- The ratio in each case was less than 0.2.
- There were few cases where two or more “like” users who had one sided follow relations (from submitters).

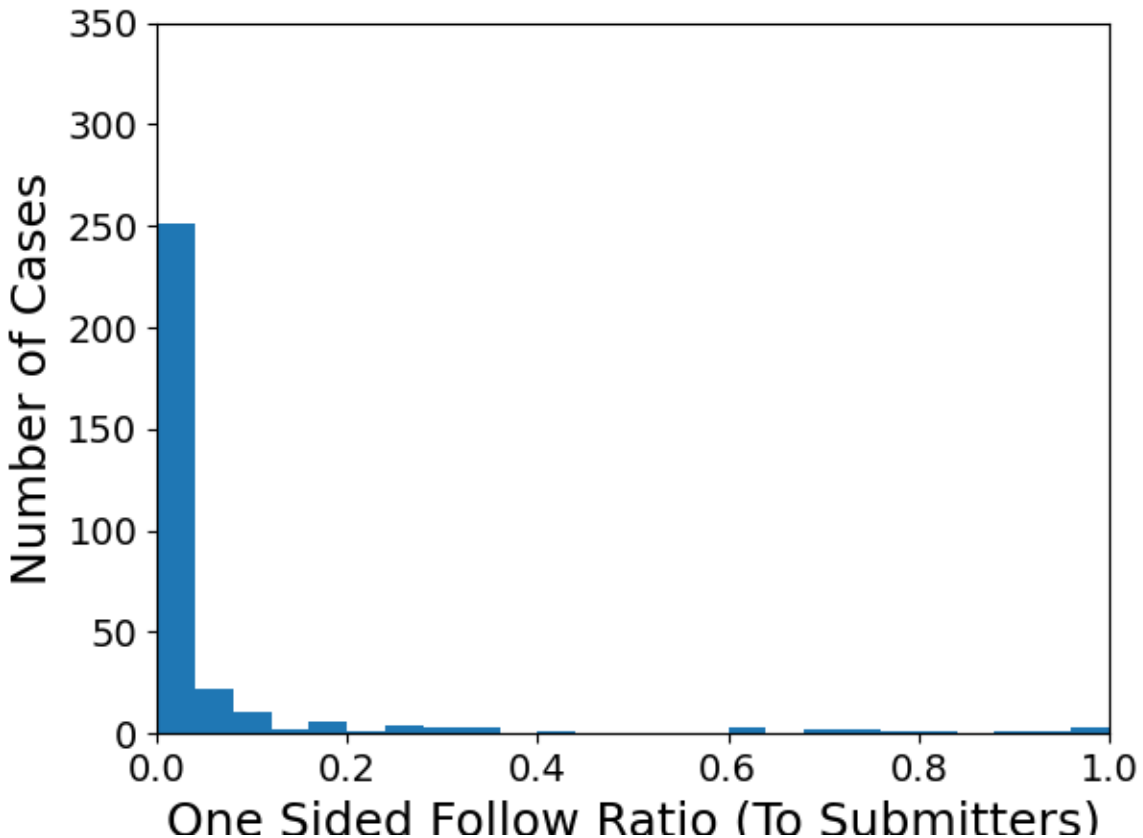


submitters → “like” users Day 0

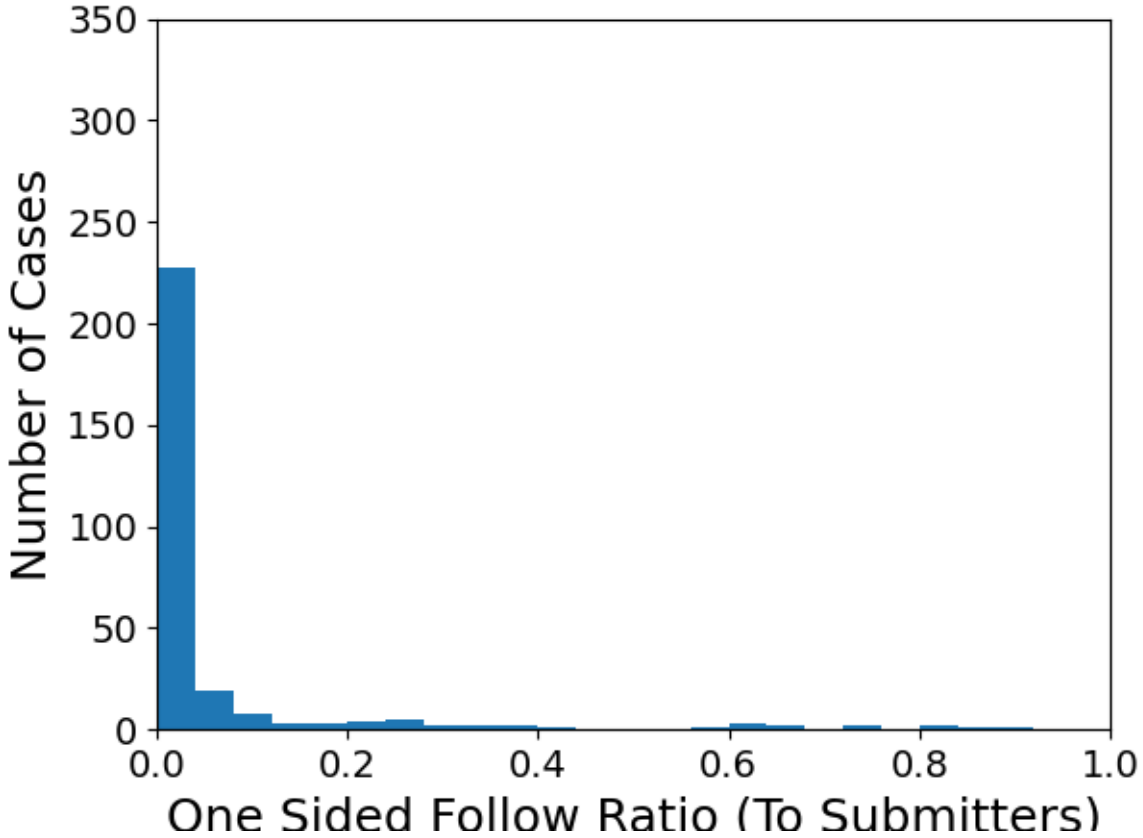


submitters → “like” users Day 6

One sided follow ratio of submitters ← “like” users



submitters ← “like” users　Day 0

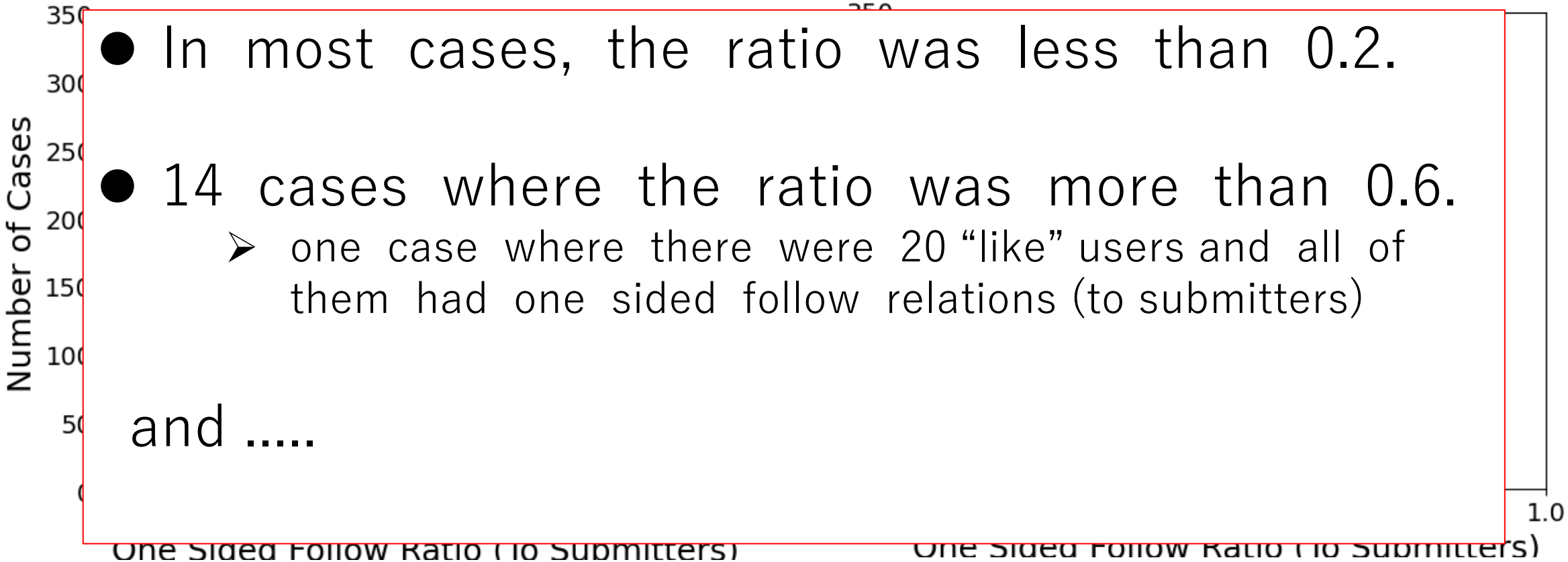


submitters ← “like” users　Day 6

One sided follow ratio of submitters ← “like” users

- In most cases, the ratio was less than 0.2.
- 14 cases where the ratio was more than 0.6.
  - ➢ one case where there were 20 “like” users and all of them had one sided follow relations (to submitters)

and .....

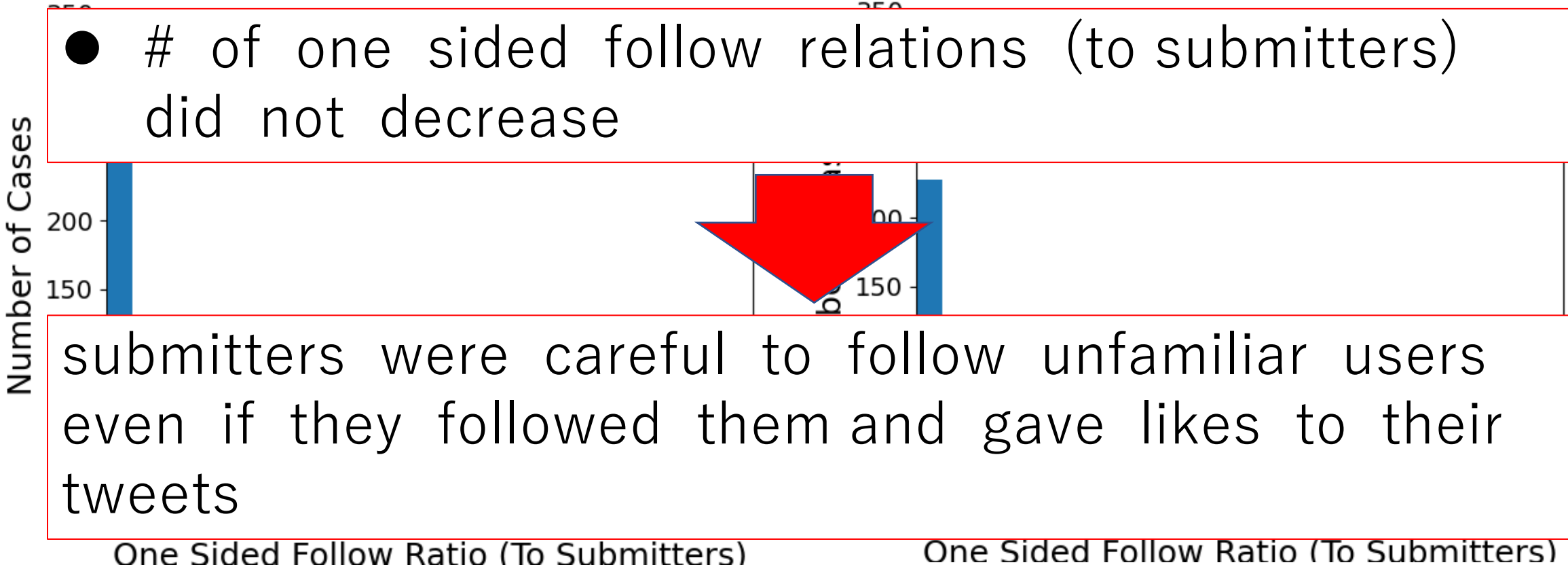


submitters ← “like” users Day 0

submitters ← “like” users Day 6

One sided follow ratio of submitters ← “like” users

- # of one sided follow relations (to submitters) did not decrease

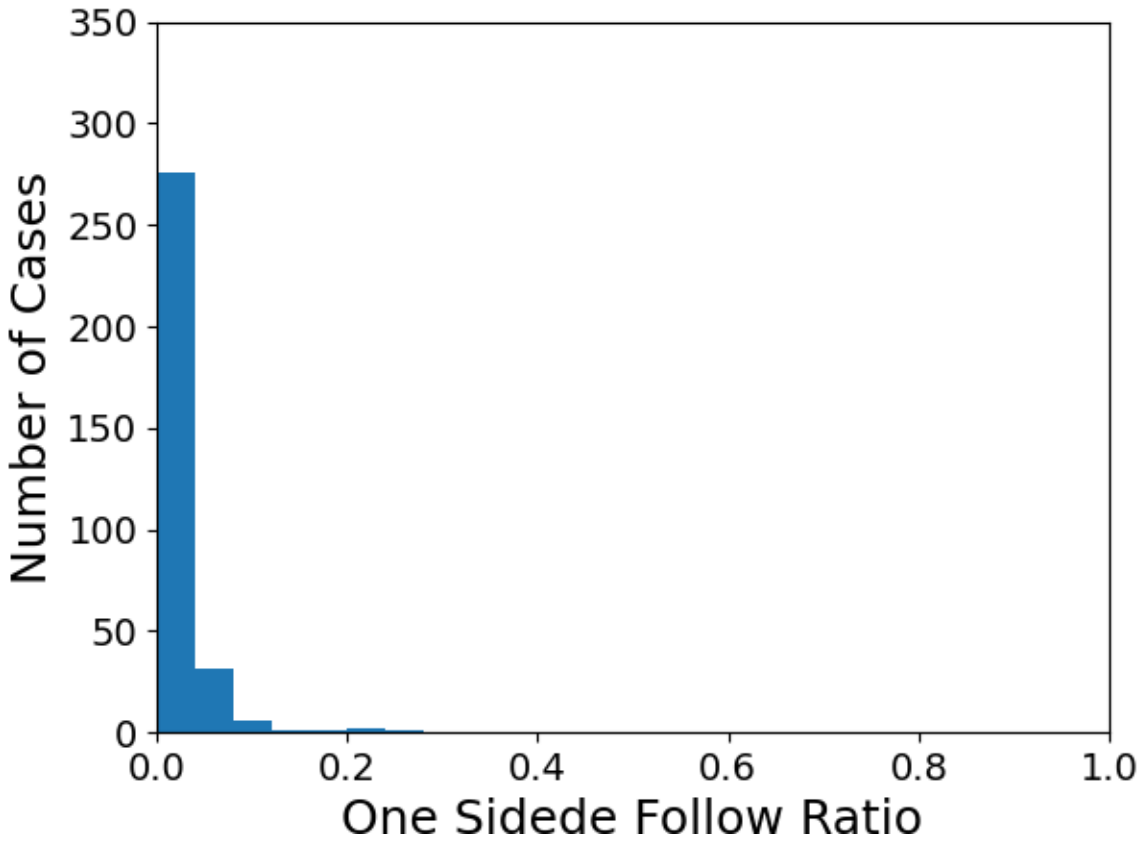


submitters were careful to follow unfamiliar users even if they followed them and gave likes to their tweets

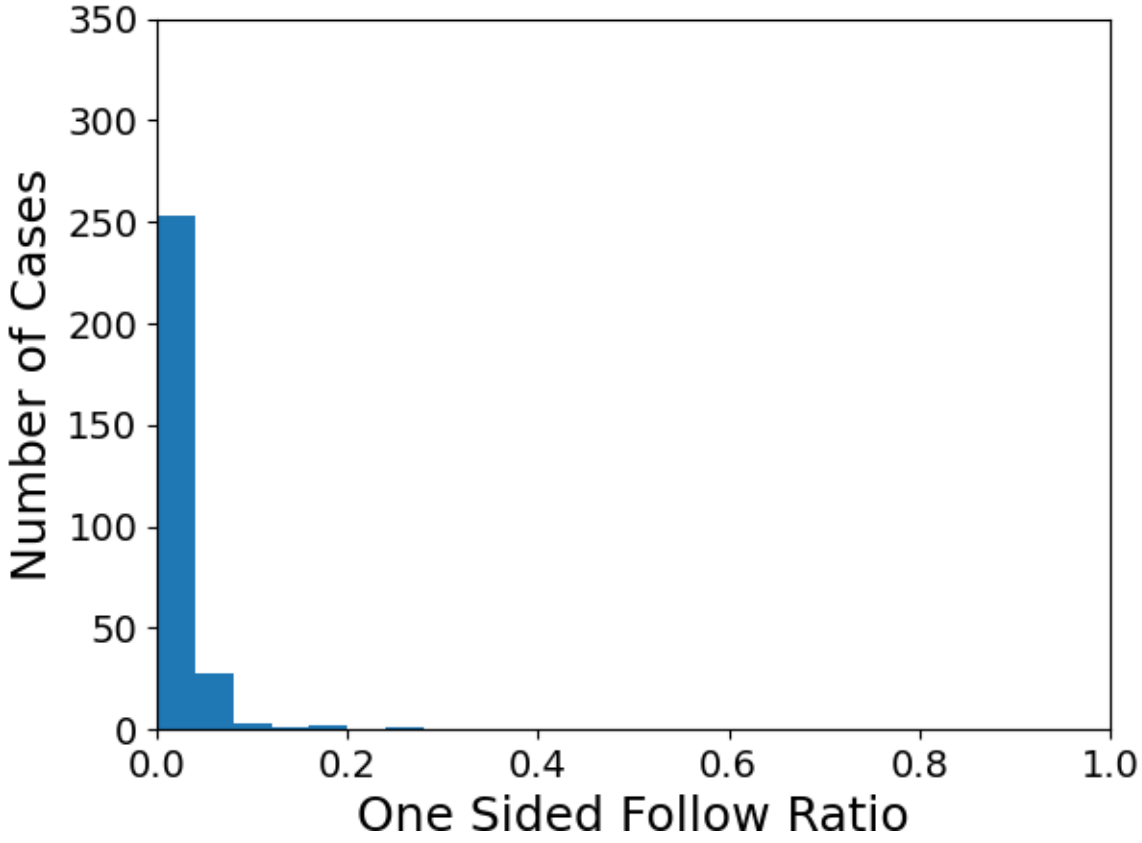
submitters ← “like” users Day 0

submitters ← “like” users Day 6

One sided follow ratio of “like” users → “like” users



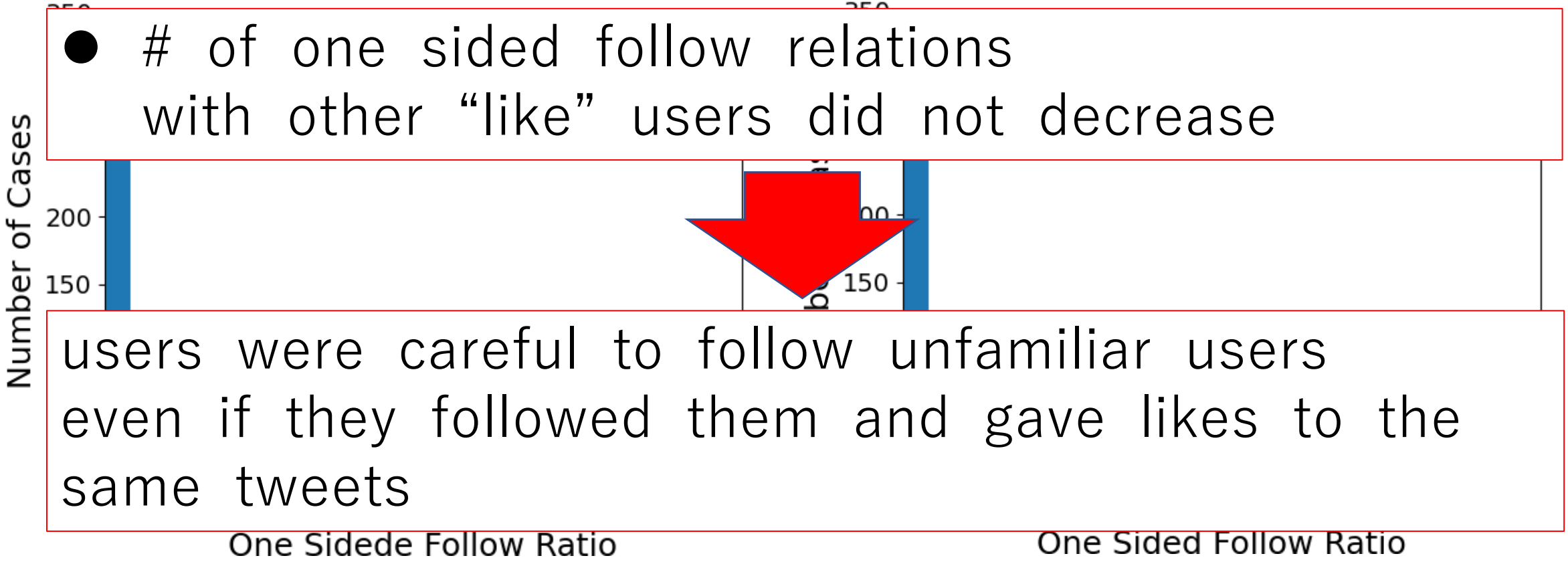
submitters → “like” users　Day 0



submitters → “like” users　Day 6

One sided follow ratio of “like” users → “like” users

- # of one sided follow relations with other “like” users did not decrease



users were careful to follow unfamiliar users even if they followed them and gave likes to the same tweets

submitters → “like” users Day 0

submitters → “like” users Day 6

The results of our investigation show

- Giving likes to self-disclosing tweets is not a sufficient trigger to get to follow users.
- submitters and “like” users were careful to follow unfamiliar users

future works

We intend to

- Investigate whether
  - mutual follow relation,
  - one sided follow relations, and
  - no follow relations

  change after a longer period of time (e.g., one year).

- investigate tweets
  in languages other than Japanese.