

# **Social Networking Service in the Crisis and Immediate Post-Catastrophe Response Processes**

Masahiko Shoji, International University of Japan

Tomoaki Watanabe, International University of Japan

Counterpart PI:

Eiko Ikegami, New School for Social Research

# Objective

- The Great East Japan Earthquake was an internationally rare experience in terms of disaster in a developed country with advanced ICT network in usage.
- This joint research aims to clarify how information sharing and community development through social networks influenced the actual disaster response after the Great East Japan Earthquake.
- Another aim is to recommend measures for preparation of earthquakes and other disasters that may occur in the future in other regions at home and abroad.

# Hypothesis

1. Personal attributes, skill, and human relations will greatly affect the way of human connection on social media. Therefore, roles and meanings of social media will vary greatly from person to person. Then, it is possible to identify internet usage patterns (clusters) of several characteristic types.
2. Depending on internet usage patterns (clusters), people use different media for different purposes in different ways during the time following the disaster.
3. Activities that have been deployed on the social media are influenced by the Internet usage patterns of people who make up the community.

Iwate, Miyagi, Fukushima, Ibaraki, Chiba

# **STATUS OF ICT BEFORE THE EARTHQUAKE**

Source: MIC “Information and Communications in Japan 2011 “

# Internet and Mobile Phone

Prefecture	Internet			
	(1)	(2)	(3)	(4)
	Internet penetration rate	Ratio of the number of household broadband subscribers (FTTH,DSL)	Ratio of the number of household FTTH subscribers	Ratio of the number of household DSL subscribers
Iwate	68.5%	46.1%	25.8%	18.2%
Miyagi	75.0%	59.9%	36.1%	18.3%
Fukushima	71.9%	48.6%	30.7%	17.7%
Ibaraki	76.7%	58.9%	30.6%	21.4%
Chiba	77.5%	69.6%	40.1%	17.0%
Average	78.2%	64.8%	37.1%	16.1%

- Less penetration ratio of Internet
  - especially Iwate, Fukushima
- Speeding-up of internet is not advanced in this area.
  - Chiba is different from others.

Prefecture	Mobile Phone	
	(5)	(6)
	Mobile phone penetration rate	Mobile Internet penetration rate
Iwate	65.3%	57.6%
Miyagi	77.8%	64.4%
Fukushima	69.1%	58.5%
Ibaraki	76.5%	63.7%
Chiba	81.1%	64.8%
Average	84.6%	65.1%

- Mobile phone penetration rate and mobile internet penetration rates were less than national average in this area.
  - Especially Iwate, Fukushima

# Broadcasting

Prefecture	Broadcasting		
	(7)	(8)	(9)
	Household penetration rate of digital TV	Ratio of the number of households BS broadcasting contract	Ratio of the number of households of CATV subscribers
Iwate	93.3%	39.6%	16.3%
Miyagi	90.7%	36.1%	23.0%
Fukushima	93.9%	33.3%	1.3%
Ibaraki	92.2%	27.9%	20.2%
Chiba	97.2%	25.9%	59.6%
Average	91.1%	27.6%	48.8%

- TV was essential for people in this area
- Digital TV and BS broadcasting were more penetrated than national average.
- CATV was not major.
  - Except Chiba

Prefecture	Business
	(10)
	Percentage of the employees of the ICT industry
Iwate	1.2%
Miyagi	2.2%
Fukushima	0.9%
Ibaraki	1.5%
Chiba	1.3%
Average	2.7%

## Information Industry

- Proportion of the ICT industry workers in these prefectures were less than the national average.
  - ICT industry includes telecommunication, broadcasting, information service, internet related service, and "movie, sound, text producing".

# Education, School

Prefecture	Education, School				
	(14)	(15)	(16)	(17)	(18)
	Number of students per computer for education	Rate of school Internet connection (optical fiber)	Internet connection rate of school (more than 30Mbps)	LAN deployment rate of ordinary classrooms	teachers who can take advantage of ICT in school affairs
Iwate	5.3	41.4%	53.6%	59.0%	76.0%
Miyagi	7.7	57.3%	67.4%	75.1%	69.2%
Fukushima	6.4	84.2%	73.8%	76.3%	67.4%
Ibaraki	6.5	73.5%	55.6%	79.2%	80.9%
Chiba	7.7	71.8%	46.6%	73.0%	60.8%
Average	6.8	67.4%	65.9%	72.2%	69.4%

- Schools are hub of local area where can be shelter etc..
- Policy factors would be larger in education than other items.
  - Iwate did not have enough infrastructure, but they had more talented teachers.
  - Fukushima had more high-speed access to the Internet.

# **SURVEY QUESTIONNAIRE ON THE USE OF SOCIAL MEDIA IN DISASTERS**



# Online survey of 2600 sample on Dec 2011.

## Allocation of survey respondents

	Severely affected area	Disaster area	Quasi-disaster area	. Non-disaster area
where he/she is at the time	Iwate, Miyagi, Fukushima, Ibaraki, Chiba	Iwate, Miyagi, Fukushima	Chiba, Tokyo, Saitama, Kanagawa	Western from Aichi-Fukui
age distribution	NO	Equivalent	Equivalent	Equivalent

		Ages					Total
		20's	30's	40's	50's	Ove 60's	
Disaster area category	Severely affected	129	150	105	77	54	515
	Disaster area	139	139	139	139	139	695
	Quasi-disaster area	139	139	139	139	139	695
	Non-disaster area	139	139	139	139	139	695
Total		546	567	522	494	471	2600

# Relationship between 6 clusters of Internet usage patterns and frequency of social media use

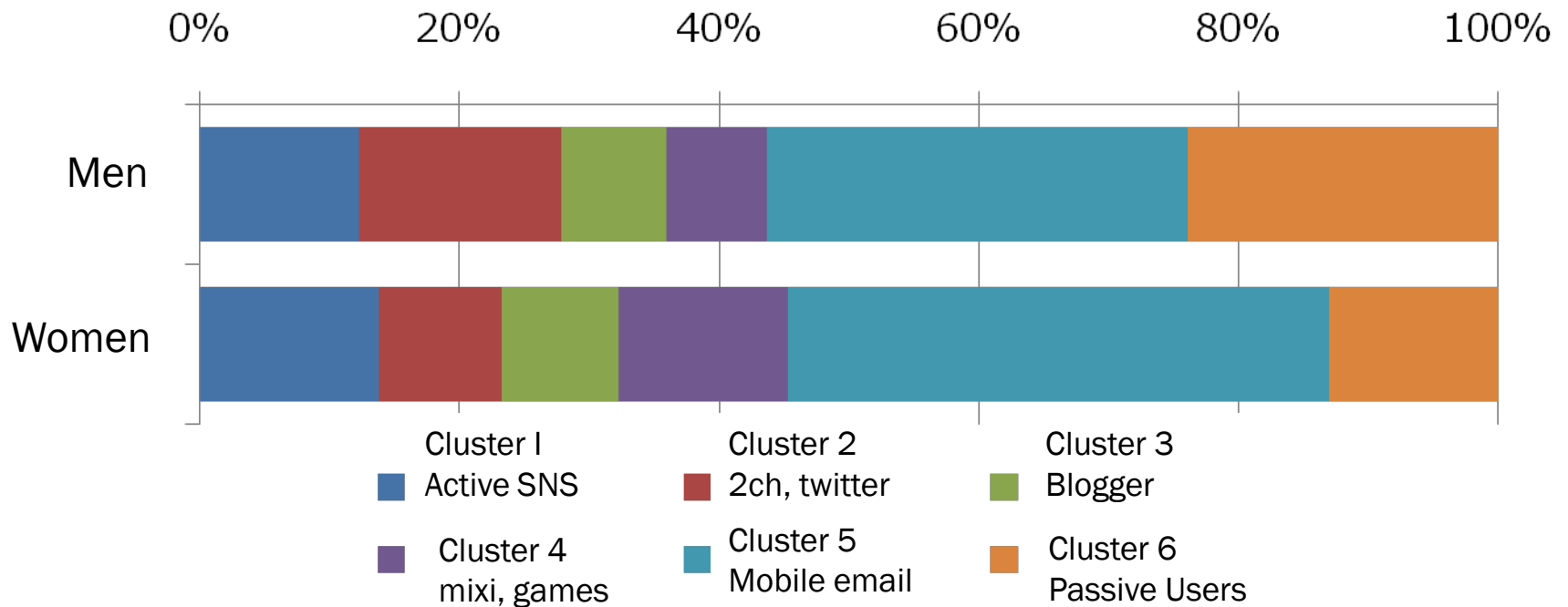
Social media service	Active SNS	2ch/twitter	Blogger	mixi/Games	Mobile email	Passive user	
	Cluster I	Cluster II	Cluster III	Cluster IV	Cluster V	Cluster VI	
Mobile email	3.95	3.48	3.29	3.78	4.06	1.70	3.45
PC email	3.69	3.93	3.65	3.13	3.40	2.86	3.40
twitter	3.56	2.64	1.75	1.31	1.16	1.12	1.71
mixi	3.61	1.41	1.28	3.00	1.11	1.07	1.68
2ch	2.73	2.63	1.69	1.46	1.24	1.19	1.66
Starting or restarting own blog	2.61	1.38	3.64	1.58	1.06	1.07	1.58
Facebook	2.99	2.00	1.22	1.13	1.09	1.07	1.46
Games	2.15	1.40	1.28	2.25	1.06	1.06	1.39
	3.16	2.36	2.23	2.21	1.77	1.39	

# the Special Characteristics of Each Cluster

- **Cluster 1 (Active SNS users):**
  - Represents 13% of the total.
  - Generally, the degree of using Internet services is high. The pecking order for social networking services (SNS) is mixi, Twitter, Facebook. Unlike Cluster II, there is no bias toward anonymous platforms for social media communication.
- **Cluster II (2ch, Twitter users):**
  - Represents 12.5% of the total.
  - The focus is on PC email and usage of Twitter and 2ch is high, while use of mixi, blogs and Facebook is low. If we read usage of 2ch as a special feature, we might consider social communication via anonymous bulletin boards as the base.
- **Cluster III (bloggers):**
  - Represents 8.5% of the total.
  - A group of users who use nothing but email and blogs.
- **Cluster IV (mixi, game users):**
  - Represents 10.4% of the total. Use of mobile email, mixi and games is high. We presume focus on mobile phone use.
- **Cluster V (mobile email users):**
  - This is the largest cluster comprising 37.1% of the total. They are users who exclusively use the email functions of mobile phones. Almost no use of social media.
- **Cluster VI (passive users):**
  - Represents 18.5% of the total. No use other than limited PC email. Almost no use of social media.

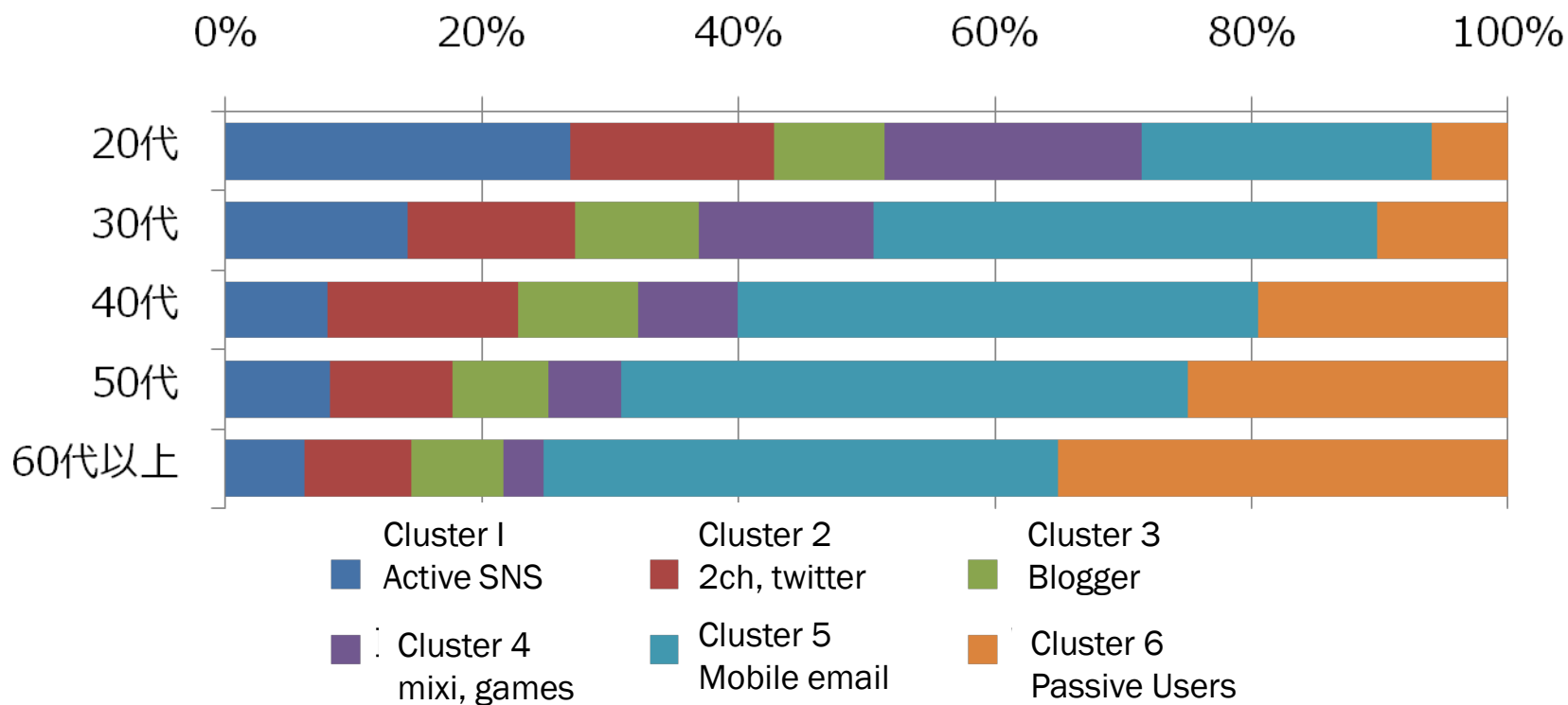
# Gender Distribution in Internet Usage Patterns

- There are many men in Cluster II (2ch, Twitter) and Cluster VI (passive users) while women are in the majority in Cluster IV (mixi, games) and Cluster V (mobile email).



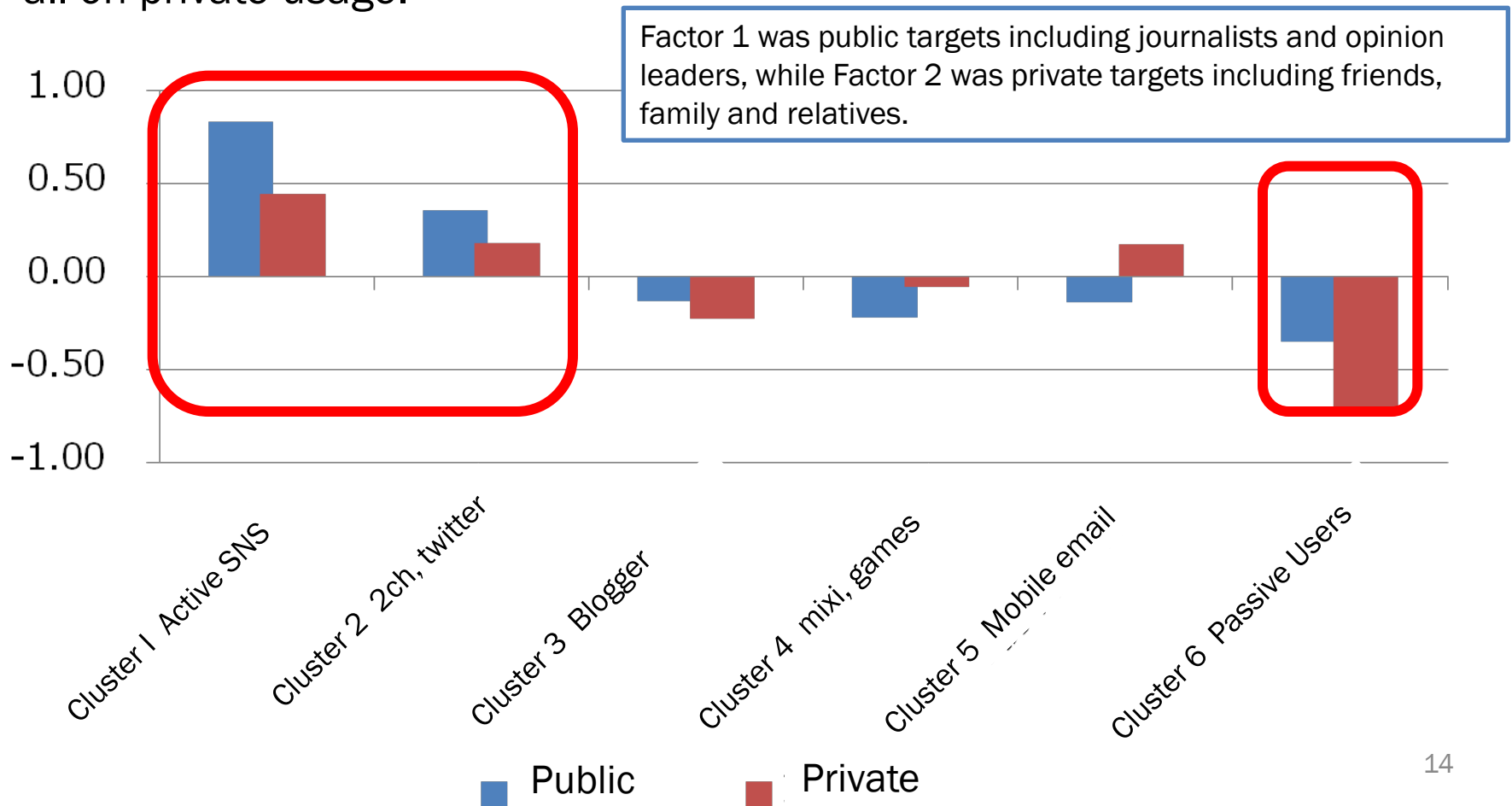
# Age distribution in Internet usage patterns

- The higher age group decrease in Cluster I (active SNS), and Cluster IV (mixi, games), and increase in Cluster V (mobile email) and Cluster VI (passive users).
- For Cluster III (bloggers), there is hardly any difference in the age groups.



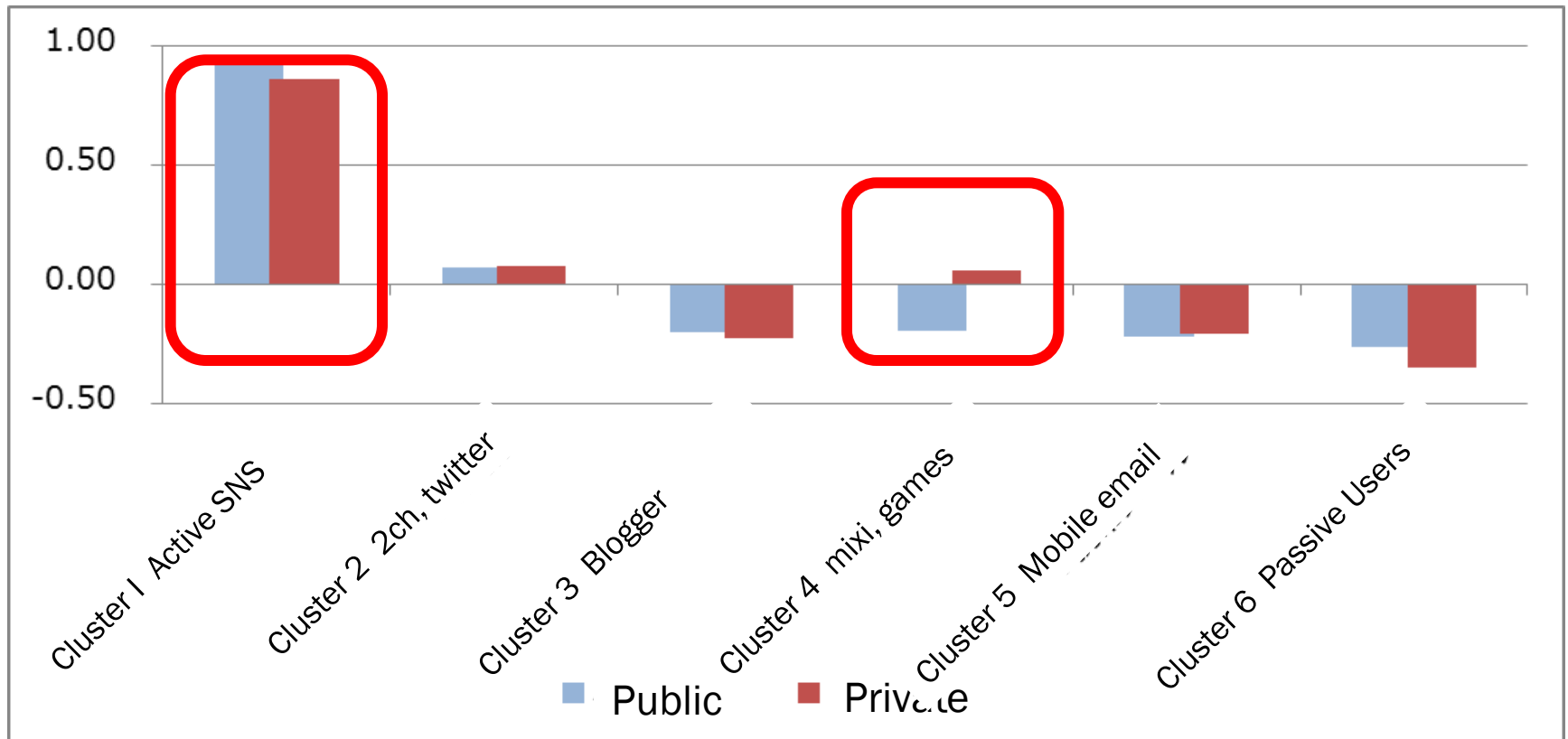
# Correlation between Internet usage pattern clusters and email communication factors

- Public usage was higher for Cluster I (active SNS), and private usage was higher for Cluster IV (mixi, games) and Cluster V (mobile email).
- Cluster VI (passive users) scored the lowest on public usage, and hardly at all on private usage.



# Correlation between Internet usage pattern clusters and SNS communication factors

- Cluster I (active SNS) communicates with both public and private targets.
- Cluster IV (mixi, games) is used exclusively for communication with private targets.



# Summary of Correlation between Internet Usage Patterns (Clusters) and Users of Each Service

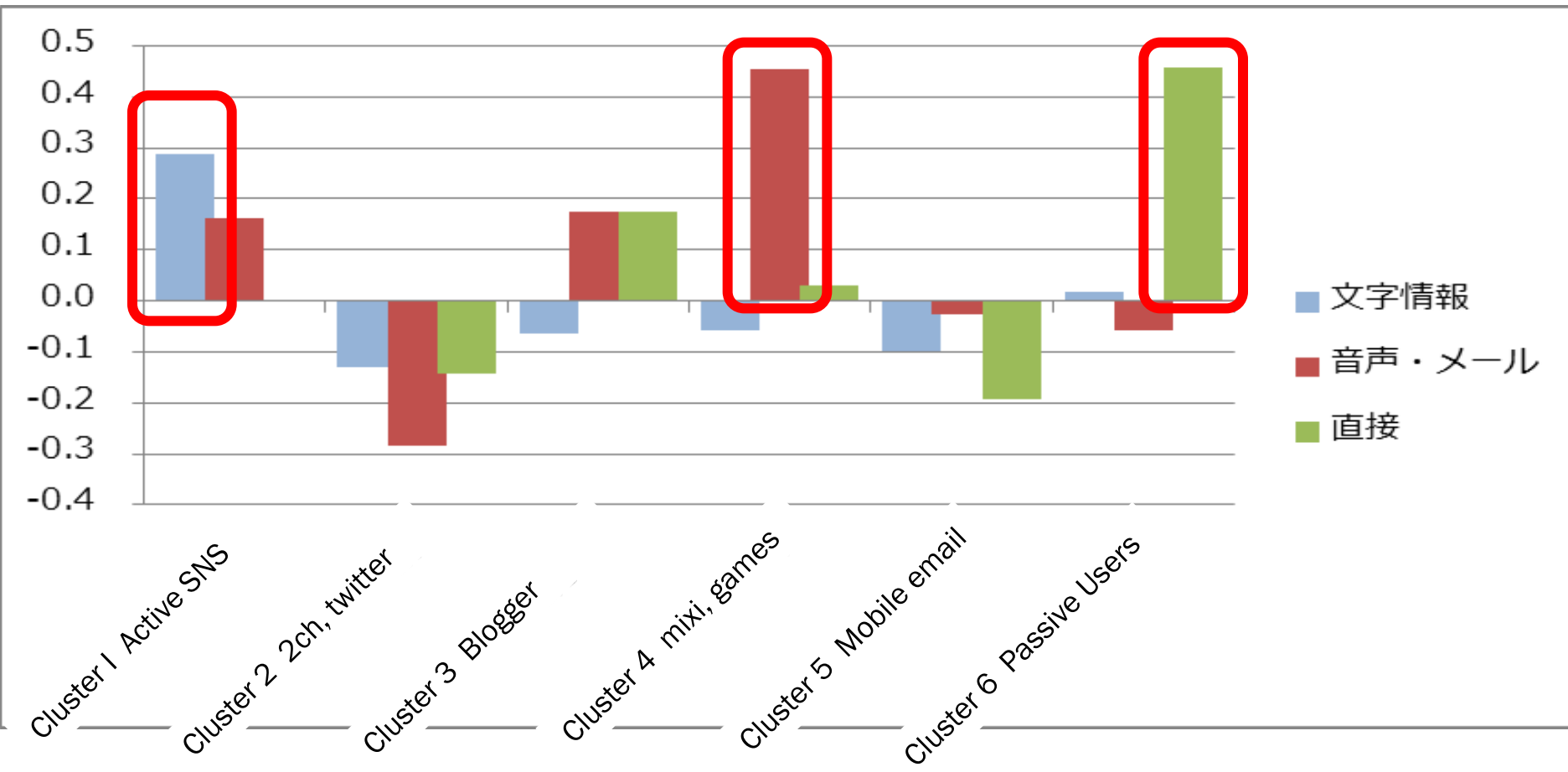
- Cluster I (active SNS), Cluster II (2ch, Twitter) and Cluster III (bloggers) show similar trends irrespective of target factor.
- Cluster IV (mixi, games) and Cluster V (mobile email) show a bias toward private target factors.
- On the other hand, for Cluster VI (passive users), the private target factor is extremely low.
- Cluster VI (passive users) use the Internet exclusively for work purposes, and not for private purposes.

		active SNS	2ch, Twitter	bloggers	mixi, games	mobile email	passive users
Cluster		1	2	3	4	5	6
E-mail	Public factor	0.776	0.121	-0.168	-0.207	-0.152	-0.297
	Private factor	0.482	0.090	-0.202	-0.001	0.197	-0.770
Twitter	Public factor	0.429	-0.029	-0.302	-0.344	-0.497	-0.526
SNS	Public factor	0.933	0.069	-0.202	-0.199	-0.220	-0.265
	Private Factor	0.857	0.074	-0.228	0.057	-0.209	-0.353



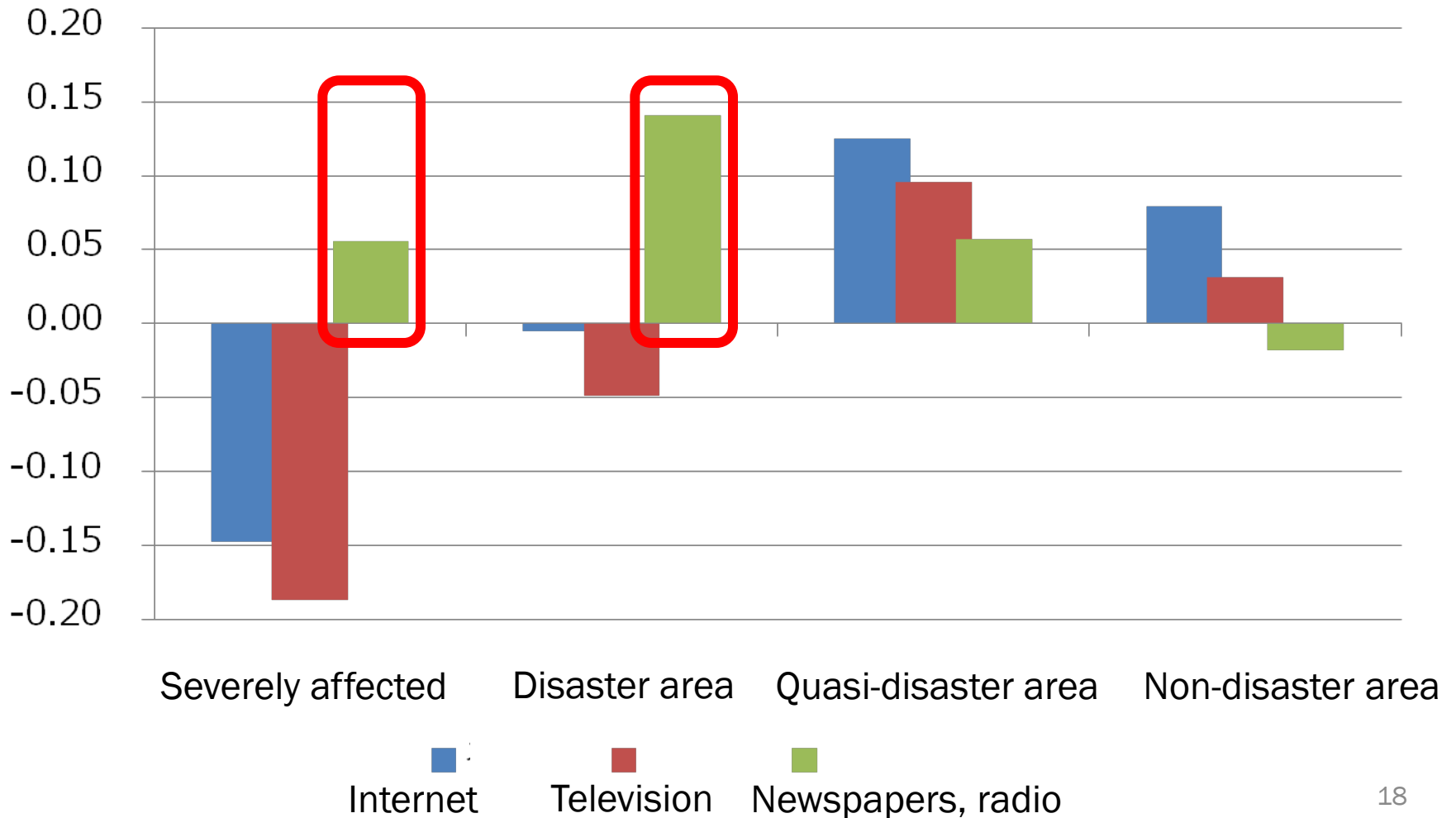
# Correlation between effectiveness factor of safety confirmation and Internet usage pattern clusters

- Depending on the Internet usage pattern cluster attributes of the respondents, there are big differences in whether a safety confirmation method is judged to be effective.
- In particular, the evaluations were remarkably high for Factor 1 (written information) in Cluster I (active SNS), for Factor 2 (voice, email) in Cluster IV (mixi, games), and for Factor 3 (direct contact) in Cluster VI (passive users).



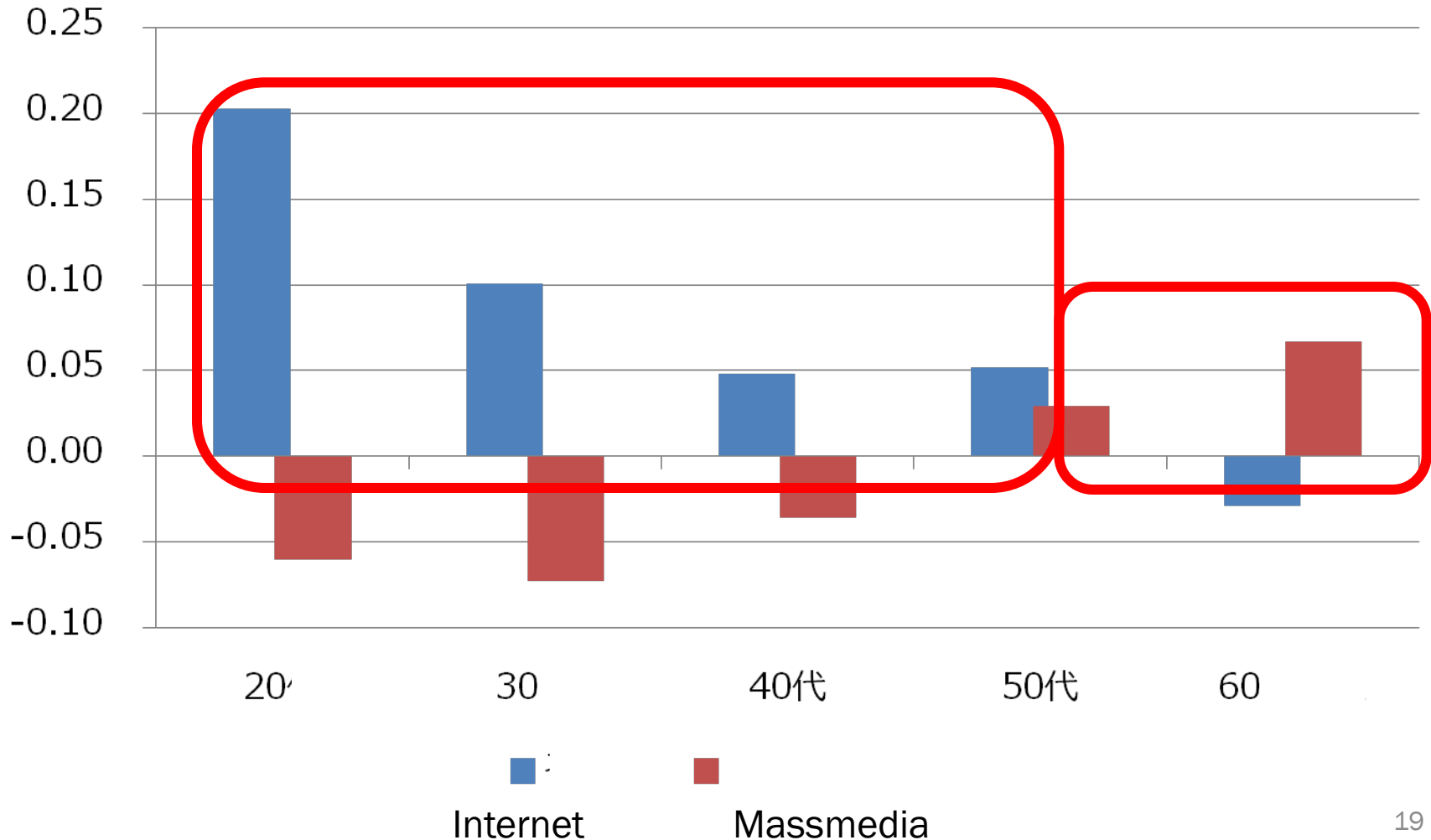
# Correlation between media contact factors and disaster categories

- In the severely affected and the disaster area, Factor 3 (newspapers, radio) is remarkably high.



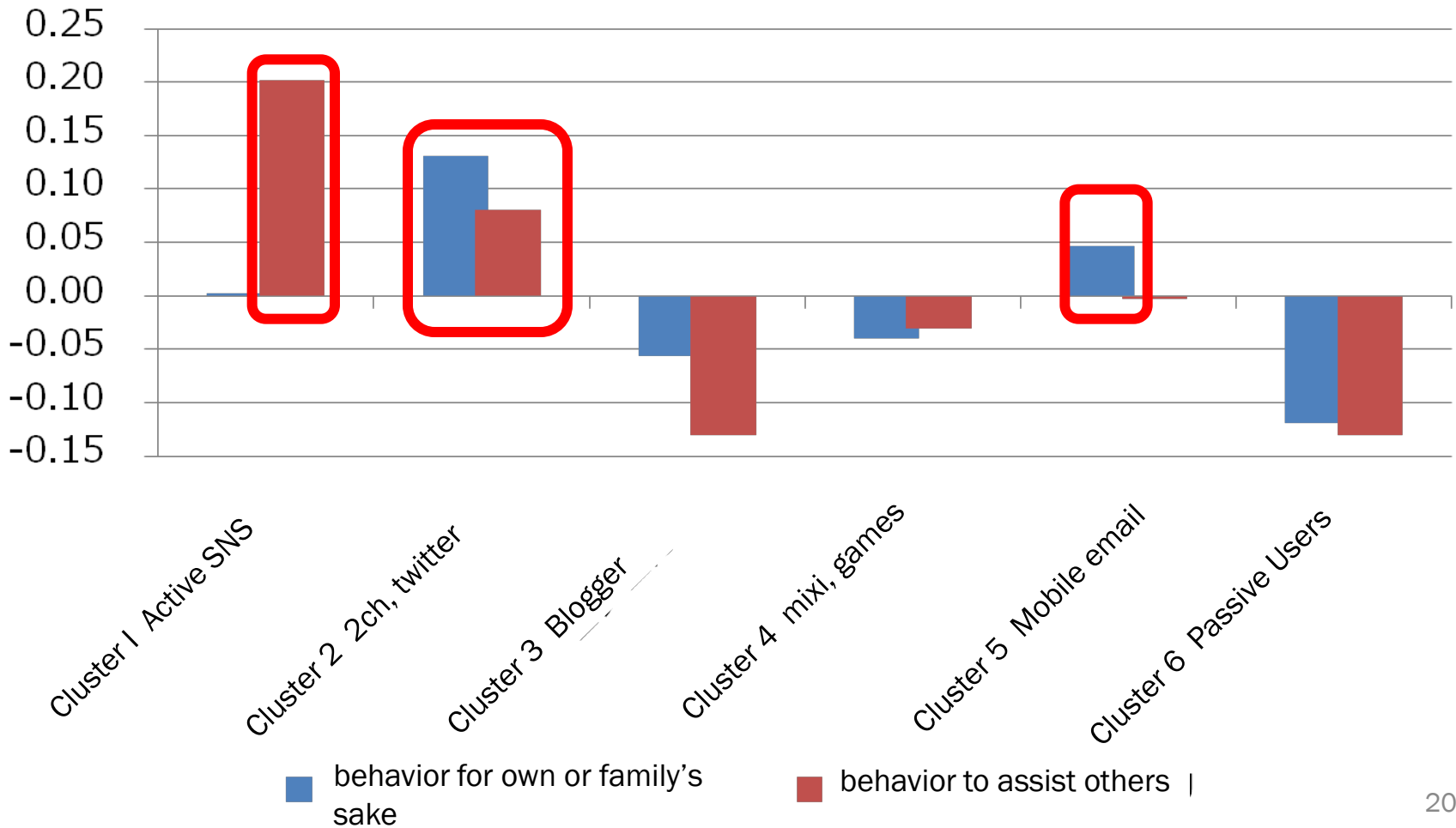
# Correlation between media credibility factors and age ranges

- In terms of age ranges, credibility with the 20 – 50 age range is higher for Factor 1 (Internet services) than for Factor 2 (mass media).



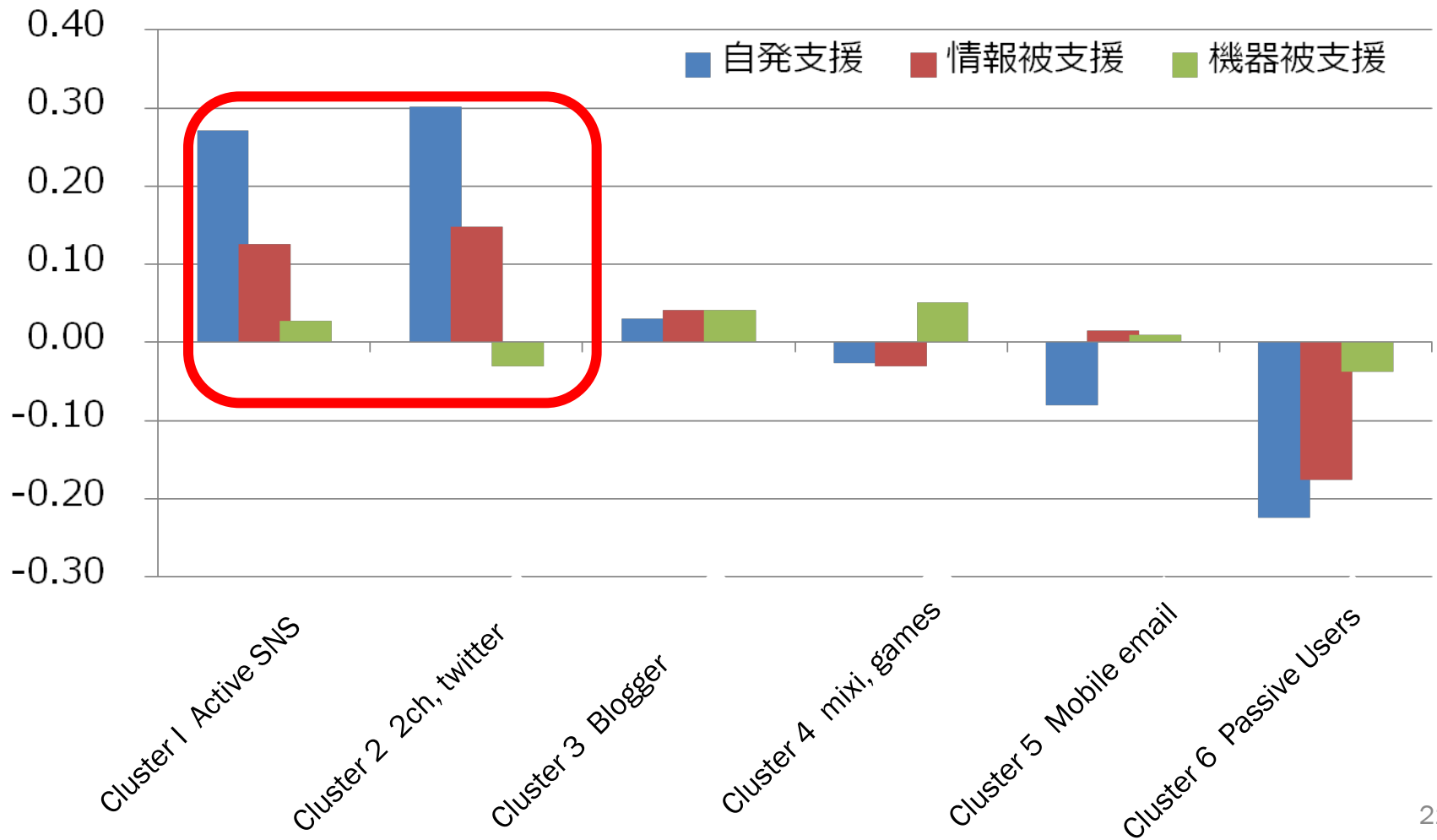
# Correlation between behavior change factors and Internet usage pattern clusters

- For Cluster I (active SNS), Factor 2 (behavior to assist others), in particular, is conspicuously high.
- For Factor 1 (behavior for own or family's sake), Cluster II (2ch, Twitter) and Cluster V (mobile mail) are relatively high, but Cluster III, IV and VI are low..



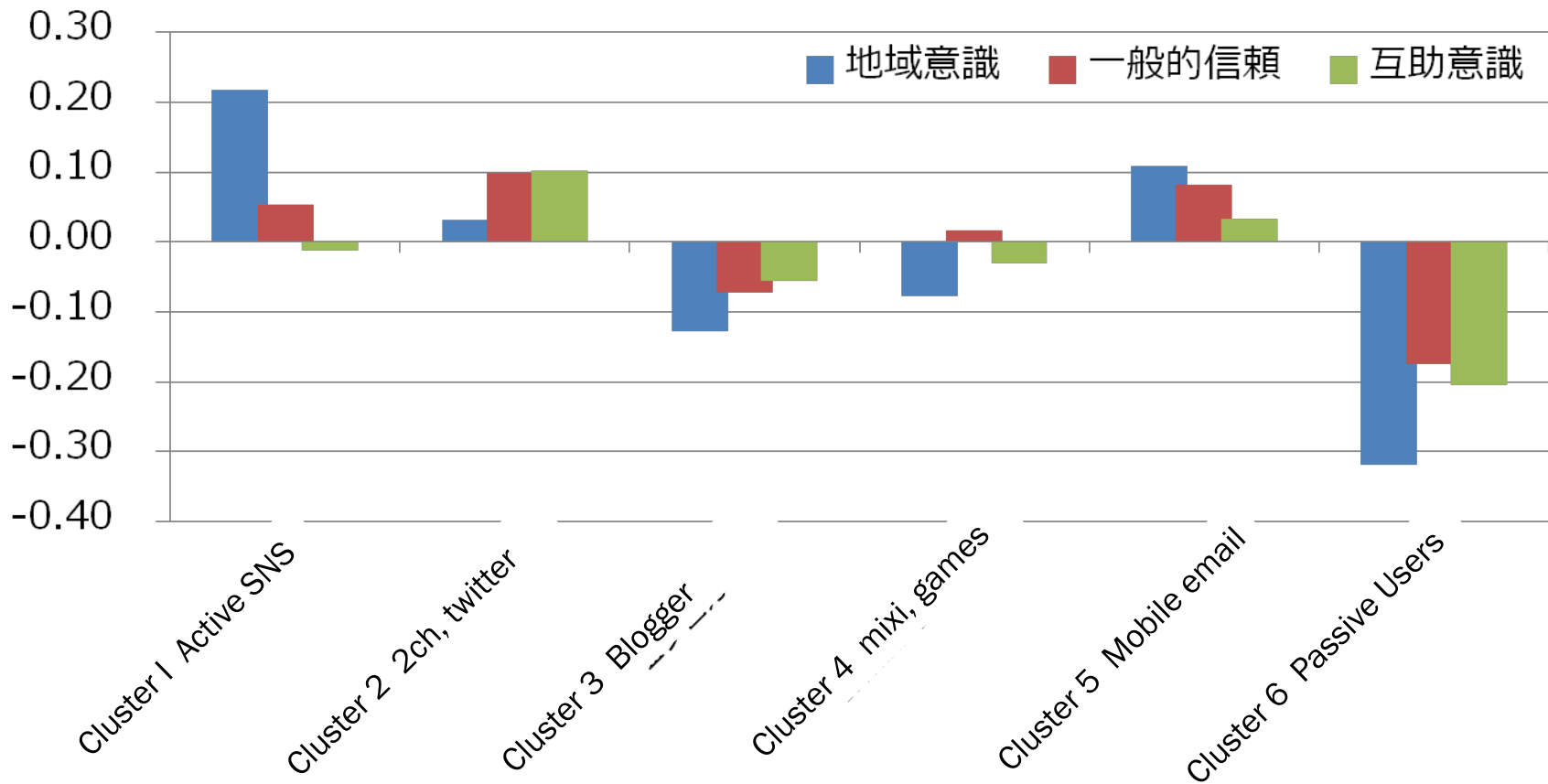
# Correlation between mutual assistance factor and Internet usage pattern clusters

- Factor 1 (spontaneous assistance) and Factor 2 (receive information assistance) are particularly high for Cluster I (active SNS) and Cluster II (2ch, Twitter).



# Correlation between social capital factor and Internet usage pattern clusters

- Factor 1 (regional awareness) is particularly high for Cluster I (active SNS) and Cluster V (mobile email).



# Spread of Tweet

- Miyabe, Aramaki, Miura (2011). “Analisis of the Usage Trend of Twitter in the East Japan Earthquake”
  - Tweets from Severely affected areas
    - Travels to outside areas
  - Affected areas
    - Direct exchange of messages
  - Less affected areas
    - Tweets spread wider

<http://luululu.com/paper/2011/GN.pdf>

# **FACTS AND RECOMMENDATIONS**



# Facts and Recommendations

- In ICT developed countries, diversification of media has been progressed. People use various kinds of media, including social media in daily life.
- Depending on the region, diffusion status of these various media is different.
- Moreover, depending on the media using every day, people are differentiated into many clusters.
- Government and people should understand usage characteristics of media. Effective means to convey information is different by areas. It is useful for considering priority of recover.
- People in the different cluster are different in terms of communication partner and behavior after communication. This difference affects the way information (including hoaxes) spreads in the society.

# Facts and Recommendations

- Lack of hyper-local information for daily life.
- Local governments are not good at dealing with uncertain information. On the other hand, private sector is faster and more flexible.
- Need to use multiple media
  - TV, Radio, Newspaper, Telephone, Mobile Phone, E-mail, Social Media, Face to Face
  - Community FM stations have great potential
  - Government should develop media strategies to reach everybody.
  - government and people should prepare appropriate systems, and make plans and conduct emergency drills to share essential information and help each other.
- Anxiety and communication need
  - Face to face communication is needed by some people to appease anxiety.