Trust, Ethics and Social Capital on the Internet: An Empirical Study Between Japan, USA and Singapore

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Abstract. Social capital is becoming increasingly important in the knowledge society. Most studies of the phenomena that are considered as social capital have, in the tradition of Robert Putnam's writings mainly focused on what can be called social capital in civil society in the real world - outside the virtual world, i.e. the Internet community. This paper tries to clarify the significance of trust as the element of social capital that relates ethics of the Internet community to theoretical and empirical approaches. Results indicate that studies on trust related to the Internet can be positioned in two dimensions – "studies on the system trust (especially, trust in the system infrastructure) – studies on the personality trust" and "studies with risk management approach – studies with trust management approach." Generalized trust has significant relationships with reciprocity, human interaction and cooperation on the Internet. However ethics does not simply correlate with trust.

1 Introduction

Trust plays an extremely important role as a lubricant of social relationships including politics and economic activities. This has been consistently argued by a lot of researchers in various fields of the social science such as economics (Akerlof, 1970; Frank, 1988), sociology (Simmel, 1900; Barber, 1983; Coleman, 1988; Luhmann, 1973; Giddens, 1990), politics (Hardin, 1992; Putnam, 1993), psychology (Rotter, 1980; Yamagishi&Yamagishi, 1994), and anthropology (Gambetta, 1988). Especially since 1990s, the trust research has remarkably developed in various fields of social science, while social situations and relations have been unstable as fluidizing in politics and economy.

In this paper, the author is aiming at the following three points related to trust focusing on the social space -the Internet, i.e. the integrated system with the social relationships. 1) The peculiarity and the pattern of the former research related to trust and the Internet including social capital are considered. 2) The elements of trust in the web community should be examined with survey data focusing on personality trust. 3) The relationship between trust and ethics in the web community is examined in detail.

2 The Peculiarities and Patterns of the Approach to Trust and the Internet

2.1 Concept of Trust

Trust that has been mainly treated in the area of social sciences seems to have the following three peculiarities.

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1. Trust is conceptualized on the premise that one's situation is in certain social uncertainty, i.e. it lacks certain information. It means trust is a concept connected to risk. In the situations that have no social uncertainty, there is no necessity to think whether the other party can be trustworthy or not. This idea distinguishes trust from "assurance" (= situation with no social uncertainty) (Yamagishi & Yoshikai, 2005).
2. Trust is divided into "personality trust" and "system trust." Both Luhmann and Giddens tried to grasp trust by two patterns of "personality trust (persoenliches Vertrauen) " and "system trust (Systemvertrauen)." Personality trust is the trust based on the observation and the experience to concrete "person". Society has been so complicated that it becomes impossible to cope with such complexity only by personality trust. Then, the system trust is needed. We trust the system that is institutionalized so that we cope with the complexity of society.
3. Trust is generated through the commitment to person(s) by person(s). People try to cope with the social uncertainty because trust contains both possibilities – the possibility to be betrayed and to gain profit when his/her trust pays off.

Since 1990's the Internet has been spreading rapidly, the research of the trust related to the Internet has been performed. Various studies are conducted not only in the fields of the social science but also in the standpoints of natural science like engineering.

Here the studies on trust related to the Internet are grouped according to the following two dimensions– "studies on system trust (especially, trust of system infrastructures) – studies on personality trust" and "studies with risk management approach – studies with trust management approach" (Figure 1). Common recognition among these four quadrants is that trust should be more important in the web community than in the daily life spaces, because on the Internet everyone can communicate with others easily with high levels of anonymity and invisibility. That means the Internet space has a higher uncertainty than the real world.

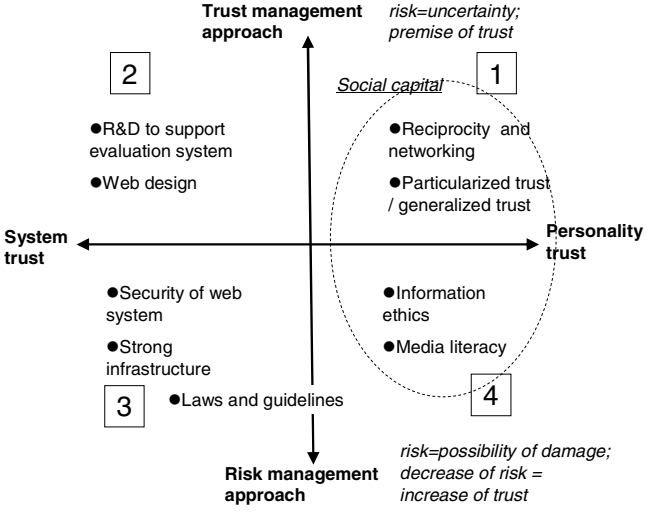

Fig. 1. Approach to Trust on the Internet

2.2 System Trust (Especially Trust in System Infrastructures) and Personality Trust: From the Viewpoint of Risk Management <The Third and Fourth Quadrants>

As for the Internet, it is set up on the social telecommunication infrastructure. In this sense, an information environment such as the Internet doesn't consist without the trust in the system infrastructure. From this viewpoint a considerable number of studies have been performed since the approval of the Internet; they are mainly conducted in the field of engineering. The main concerns are security countermeasures of the telecommunication network, strong web systems against accidents, countermeasures against unlawful computer access, etc. The mission of this research is to improve the reliability of the telecommunications system as the infrastructure. In other word, they grasp the Internet with the possibility to cause damage, so decreasing such damage may bring security and increase of trust. It means this type of approach recognizes risk as the possibility of loss/damage, and aims to minimize damage (Okamoto, 2001; Kawashima, 2001; Sugino, 2003: Yamamoto, 1996 etc). There are other studies from the standpoints of institutions like laws (eg. copyright law), politics and guidelines with the mission to improve system trust of the Internet.

The research on personality trust in the Internet has been conducted in the area of social sciences, such as information ethics, sociology, social psychology and so on. Trust functions as a certain kind of system management mechanism. Trust is also a concept that includes ethical and moral elements. Standing on this feature, studies in the areas of information ethics and information education have been developed, there is recognition that each user is a subject with responsibilities to generate trust on the Internet, so that it is necessary to deal with others morally (even though she /he is not identified). There is an awareness of the issues that users should not be victim/assailant on the Internet. In this quadrant, trust is discussed relates to the necessity to decrease risk as the possibility of the damage. Moreover, the research from the aspect with "improving trust = reducing risk" has been performed in the field of sociology (Endo, 2004), which indicates that internet literacy should include the ability and technology to construct an appropriate relation and cooperation with others in the Internet space (though counterparts' faces cannot be seen).

2.3 System Trust and Personality Trust on the Internet: From the Viewpoint of Trust Management <The First and Second Quadrant>

Trust and the risk have been addressed in the research described above with the intention to decrease damage on the Internet. From another viewpoint, i.e. intending to further develop the possibility of the Internet as a social device, various researchers have approached trust (system trust and personality trust) in the web community.

Technical system development to support trust formation in the web community has been realized in the engineering area. For example, systems that improve information reliability by addressing user reliability and information reliability, systems that calculate trust of information based on a "web of trust", and a method of trust evaluation with reputation systems have been developed (Nomura, 2005; Usui, 2002; Endo, 2003; Tomobe, 2005).

Some studies that treat trust on the Internet from the viewpoint of social capital have been published in the area of social science. Social capital is the concept that was

introduced in the 1970's. Sociology, politics, and economics, etc. have been mainly paying attention to it; especially the conceptualization by Coleman (1988) and the development by Putnam (1993) are well known. The meaning of social capital is that it makes the influence on society, economy, and politics to be "capital" which differs from other capitals with the aspect of relations between subjects, which cannot be seen. Trust is generally considered to be part of a larger concept of "social capital." Social capital has been defined to include trust, norms of reciprocity, and networks of civic engagement (Putnam, 1993).

Trust can be divided into particularized trust and generalized trust. Generalized trust is the perception that most people are part of your moral community (Uslaner, 2003). The difference between generalized and particularized trust is similar to the distinction that Putnam (2000) drew between "bonding" and "bridging" social capital. Yamagishi & Yamagishi (1994) formulated this distinction: generalized trust is trust in people who are different from yourself. Particularized trust is faith in people who are like oneself. Particularized trust can be formulated by her/his confidence that her/his counterparts are trustworthy though actual experiences of communication and interaction with them (the concerns and ascriptions are shared among them). On the other hand, generalized trust is formed without sharing any actual experiences.

The generalized trust becomes important in the Internet space. Mistrusters view dealing with strangers as taking big risks. Trusters see expanding their horizons as great chances. Generalized trust is useful in modern knowledge society, especially in the Internet space to interact with others whom she/he doesn't know, and to obtain an advantage mutually through the trust. On the other hand, particularized trust towards others with the same background has an advantage in the semi-closed communities with similar ascription of members. It is supposed that using the Internet with trust and reciprocity would achieve the formation of human networks and the sharing the resource. As for the use of the Internet, some studies have discussed and examined how the use of the Internet influences the formation of social capital (Uslaner, 2003; Miyata, 2004; Norris, 2003). Miyata (2004) tries to demonstrate that social activities in online communities increase social capital with keywords; trust and reciprocity. The study examined whether social capital offers benefits to individuals as well as the collective. The results suggest that the mobilization of social resources embedded in social networks in online communities increases psychological well-being and satisfaction in their decision-making. These results also show the possibility that activities in web space may lead to empowerment and social solution. Furthermore, research has referred to the possibilities of the information network, which generates mutual trust and the commitment from the standpoint of organization theory, emphasizing the importance of the trust management as a requirement for the paradigm shift from the web community to the knowledge community (Syozugawa, 1999; Atsuji, 2002).

3 The Structure of Personality Trust (Generalized Trust) on the Internet

3.1 Framework of Study

This section aims at the first and fourth quadrants of Fig. 1, i.e. the aspect of personality trust as a basis of the web community. A questionnaire-based social survey was

conducted in Japan, USA and Singapore; the main variables were generalized trust, reciprocity and human interaction in the web space, and information ethics and consciousness/behavior on the Internet.

The significance and possibility of trust focusing on the Internet as a new community has been clarified by using data of a questionnaire-based survey between Japan and the US (Nara, 2005); the findings suggest that people's positive attitude of taking information will influence their conditions of trust as a receiver (trust-examining of objective data, feeling of others' trustworthiness as the basis of subjective data) and as a sender (trust-generating of objective data, trust-generating of the basis for subjective data). Based on the former perspective, in this paper, the status of general trust should be examined, as well as the relationships with reciprocity, human interaction and cooperation in web communities from the viewpoint of social capital.

Furthermore, the relationship between trust and ethics is considered. Moralistic trust is a moral commandment to treat people as if they were trustworthy. The central idea behind moralistic trust is the belief that most people share our fundamental moral values (Fukuyama,1995) . Moralistic trust is based upon "some sort of belief in goodwill of the other" (Yamagishi & Yamagishi, 1994), and it is a value that rests on an optimistic view of the world and one's ability to control it. So it is supposed that the person with a high generalized trust has a concrete ethical and good consciousness and behavior on the Internet.

The analytical framework of the research is shown in Figure 2. Indexes of the main variables are shown below. Among these indexes, generalized trust is based on the pre-standardized scales, the others were made by the author specific for this study.

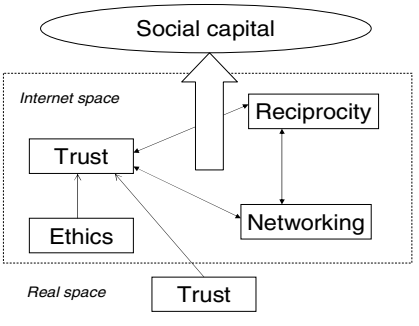

Fig. 2. Analytical framework of the research

Generalized Trust on the Internet

Question: What do you think about the Internet?

1. Strongly agree 2. Agree 3 Somewhat agree 4. Somewhat disagree 5. Disagree 6. Strongly disagree

- On the Internet, most people are basically honest.
- On the Internet, I tend to trust people.
- On the Internet, most people are basically innocent and kind.
- On the Internet, most people trust others.
- On the Internet, most people are trustworthy.

Information Ethics Consciousness

Question: What do you think of the following conduct done on the Internet? Please choose the most suitable number for each item.

1. Very problematic 2. Problematic 3. Somewhat problematic
4. Somewhat unproblematic 5. Unproblematic 6. Not problematic at all

- Circulating incorrect information knowingly
- Reading another person's e-mail without telling him/her
- Looking at pornographic web sites on a computer at work or at school
- Giving your password to another person
- Accessing a computer that you are not authorized to access
- Tampering with data on another person's computer through the Internet
- Sending a computer virus deliberately
- Circulating somebody's name and phone number to a large number of unidentified people without telling him/her
- Using pictures or texts on somebody's web site for your own web site without telling him/her (excluding cases in which permission has been obtained)
- Publicizing pornographic pictures or texts on your freely-accessible web site
- Speaking ill of others in a chat room or electronic bulletin board

Information Ethics Behavior

Question: How often have you done the following things on the Internet? Please choose the most suitable number for each item.

1. very often 2. often 3. sometimes 4. rarely 5. never

(Eleven items are same as those of "Information ethics consciousness.")

Cooperation to Generate Trust in the Web Community

Question: Regarding your attitude in using the Internet, how much is the following description applicable to you? Choose the most suitable one.

- I try cooperating with others on the Internet, so that the Internet society functions smoothly.
- On the Internet, I actively seek to build cooperative relationships with others when they seem trustworthy.

Reciprocity in the Internet Community

Question: Regarding your attitude in using the Internet, how much is the following description applicable to you? Choose the most suitable one.

- On the Internet, I think users are all in a give-and-take relationship.

Human Interaction on the Internet

Question: How often do the following things happen when you interact with others on the Internet?

1. very often 2. often 3. sometimes
4. rarely 5. never

- They tell you about themselves.
- They tell you about their personal trouble.
- You tell them about yourself.
- You tell them about your personal trouble.

3.2 Outline of Survey

The subjects of the survey were male and female Internet users, 20 to 39 years old from all parts of their countries. They were picked randomly from panels composed by survey facilities ([J] NOS list, [US] Greenfield Online list). Surveys were conducted in February and March of 2005, with slight differences in the survey period among two countries ([J] 2005 Feb7-28 and Mar11-12, [US] Feb9-20). For Japan, the questionnaire was sent and returned via ordinary mail; for the US, subjects logged on to a questionnaire website with a log-in-name and password. The sample size was 2412 (with 1175 usable samples) for Japan, 2461 (with 551 usable samples) for the US. Investigation implementation organizations were [J] Nippon Research Center (NRC) and [US] Taylor Nelson Sofres Intersearch (TNS).

Basic attributes of respondents are as follows; Gender: female 68.0% and male 32.0% in Japan, 50.6% and 49.4 % in US. Age: between 20-29 years old 47.0 % and between 30-39 years old 53.0% in Japan (average 30.37 years old), 48.1% and 51.9% in US (average 29.70 years old).

3.3 The Relationships Between Generalized Trust and Some Variables

In this section, the relationships among some variables, such as generalized trust in the web community, recognition of reciprocity in web, human interaction on the Internet as networking tendency and cooperation tendency, are examined.

Table 1 shows the frequency distribution of generalized trust on the Internet, and table 2 and 3 the result of the ANOVA among the three nations ([J], [US]and [S] in table mean Japan, USA and Singapore). The total score of generalized trust of each respondent, which is used in table 2 and 3 was calculated by adding the code numbers for the answer category for each question. So smaller the total score becomes, the higher the level of generalized trust becomes. These indicate that the level of

Table 1. Frequency distribution of generalized trust on the Internet

(%)

On the internet		1. Strongly agree	2. Agree	3. Somewhat agree	4. Somewhat disagree	5. Disagree	6. Strongly disagree	Total
Most people are basically honest	[J]	0.34	3.78	16.85	38.87	27.09	13.07	100.0
	[US]	1.27	7.08	35.75	25.59	17.06	13.25	100.0
	[S]	0.54	5.06	23.10	35.74	24.19	11.37	100.0
I tend to trust people	[J]	0.42	4.39	23.67	33.82	24.27	13.43	100.0
	[US]	1.63	4.36	25.77	29.58	22.87	15.79	100.0
	[S]	1.44	3.97	21.84	31.41	27.44	13.90	100.0
Most people are basically innocent and kind	[J]	0.34	1.98	24.44	36.92	23.58	12.74	100.0
	[US]	1.64	5.44	31.58	27.95	19.96	13.43	100.0
	[S]	1.08	2.53	19.31	32.13	29.61	15.34	100.0
Most people trust other	[J]	0.17	1.55	20.70	39.95	26.20	11.43	100.0
	[US]	1.63	7.08	35.93	28.32	17.42	9.62	100.0
	[S]	0.90	3.79	24.37	32.67	23.83	14.44	100.0
Most people are trustworthy	[J]	0.01	0.77	13.23	37.54	30.67	17.78	100.0
	[US]	2.00	4.17	30.31	30.31	19.42	13.79	100.0
	[S]	0.54	2.71	18.05	33.94	26.89	17.87	100.0

Table 2. Result of ANOVA (oneway) relation between generalized trust and nation

	sum of squares (SS)	d.f.	mean square (MS)	F
SS between	902.621	2	451.3105418	21.270***
SS within	47931.080	2259	21.21783093	
	48833.701	2261		

*** p<.001

Table 3. Follow-up test (Tukey's HSD) relation between generalized trust and nation

	n	mean	S.D.	multivariate comparison
Japan	1157	21.406	4.1786	(USA)***
USA	551	19.884	5.149	(Japan)*** (Singapore)***
Singapore	554	21.215	4.878	(USA)***

*** p<.001

Table 4. Correlation coefficient among some variables (Pearson's R)

Japan (N=1113～1163)	generalized trust on the Internet	reciprocity	interaction	cooperation	generalized trust in the real space	Information ethics consciousness	Information ethics behavior
generalized trust on the Internet	1.000	0.287***	0.157***	0.246***	0.477***	-0.002	0.003
reciprocity		1.000	0.158***	0.570***	0.178***	-0.055	0.036
interaction			1.000	0.276***	0.064*	-0.048	0.114***
cooperation				1.000	0.137***	0.057	0.060*
generalized trust in the real space					1.000	0.074*	-0.013
Information ethics consciousness						1.000	-0.183***
Information ethics behavior							1.000

USA (N=551)	generalized trust on the Internet	reciprocity	interaction	cooperation	generalized trust in the real space	Information ethics consciousness	Information ethics behavior
generalized trust on the Internet	1.000	0.223***	0.048*	0.210***	0.465***	-0.128**	0.166***
reciprocity		1.000	0.12**	0.653***	0.189***	0.072	0.045
interaction			1.000	0.274***	-0.016	-0.086*	0.317***
cooperation				1.000	0.200***	0.133**	0.007
generalized trust in the real space					1.000	0.037	-0.01
Information ethics consciousness						1.000	-0.224***
Information ethics behavior							1.000

Singapore (N=554)	generalized trust on the Internet	reciprocity	interaction	cooperation	generalized trust in the real space	Information ethics consciousness	Information ethics behavior
generalized trust on the Internet	1.000	0.390***	0.216***	0.352***	0.557***	-0.132**	0.189***
reciprocity		1.000	0.215***	0.630***	0.354***	-0.019	0.088*
interaction			1.000	0.206***	0.115**	-0.112**	0.298***
cooperation				1.000	0.259***	0.057	0.075
generalized trust in the real space					1.000	-0.130**	0.045
Information ethics consciousness						1.000	-0.252***
Information ethics behavior							1.000

*** p<.001 ** p<.01 * p<.05

generalized trust of Americans is the highest among the three. The result of the ANOVA was highly significant (p<.001). Yamagishi & Yamagishi (1994) conducted surveys and found that Japanese rank higher on particularized trust and Americans on generalized trust in the daily life. In this study almost the same result was obtained even in the online community. That means the American people are used to social uncertainty since they have faced high migration. Singapore is a multiethnic nation as

well similar to the United States. However, more than 90% of the population consist of Chinese and Malay, and people's inclination to accept the others' decision is comparatively strong because the centralization tendency is higher in Singapore than in the US. Precisely the US society is characterized by a culture that allows putting trust in the good sense and the judgment of the common citizens and various opinions. This background can explain these results.

Table 4 shows the results of relationships among some variables related to generalized trust with correlation coefficient (Person's R). Table 4 indicates that trusters recognize high reciprocity in the web community, and interact with others often. This tendency has correlations with high cooperation to contribute to the Internet, it shows the possibility to formulate social capital of the online communities.

As for the relationships between generalized trust and information ethics consciousness/behavior, unexpected results are obtained. There is no significant correlation about Japanese data, yet in the US and Singapore there are results with negative correlations, i.e., the person with high trust (low score means high trust) tends to have immoral consciousness (high score means immoral consciousness) and immoral behavior (low score means immoral behavior). What does it indicate? Assumption for this problem will be discussed in the next section (3.4).

3.4 Relationship Between Generalized Trust and Ethics: From the Viewpoint of Rational Egoist Tendency

There are studies by Rotter (1980) and Kosugi & Yamagishi (1998) based on psychological experiment in the real space that provided the significant results – contrary to the common sense idea that trustful people are gullible and easily believe whatever other people may say, the idea was not necessarily valid. Trusters are sensitive to their counterparts, the situation and the information, so that rational judgments depend on counterparts, situation and information. The same tendency would be observed in the Internet, too. Therefore with this another hypothesis, the author examines the relationships between trust and ethics depending on one's level of "rational egoist tendency." Rational egoist tendency is an aspect of human behavior that examines whether external sanctions would be imposed. If such sanctions are not expected, the behavior will be immorally and egoistically. Since the internet space has high invisibility and anonymity, rational egoists easily behave immorally.

How does rational egoism influence the relationship between trust and ethics? The rational tendency and the egoist tendency were measured separately, using six-step scales which ranged from "applies very well" to "doesn't apply at all." Rationality here means instrumental rationality, namely choosing rational means for the end. The author used "To attain a goal, I assess the current situation carefully before acting" and two other questions to measure this tendency. Egoism is defined here as self-centeredness in relation to others and the society. Three questions were used for this tendency, including "I would like to live my life as it suits me even if that means that other people have to suffer".

Based on these measures, the respondents were divided into four groups for each country, to obtain correlation coefficient between generalized trust and ethics in each group.

Group 1: High Egoism, High Rationality
Group 2: High Egoism, Low Rationality
Group 3: Low Egoism, High Rationality
Group 4: Low Egoism, Low Rationality

The results of the correlation between generalized trust in the online communities and information ethics are shown in table 5. It is observed that relationships among these variables show different tendencies depending on the rational egoist tendency. In group 4 (low egoism, low rationality), trusters tend to have good moral consciousness and action. On the other hand, in group 2 (high egoism, low rationality), even though she/he has a high level of trust, the egoist tendency is supposed to supersede and the participant behaves immorally and egoistically. Others excluding herself/himself in the web communities are honest and trustworthy – this would be a recognition of counterparts and situation by rational egoists, which makes them behave immorally. This tendency is remarkable in the US and Singapore according to table 5.

Table 5. Correlation coefficient between generated trust on the Internet and ethics consciousness/behavior in four groups of rational egoist tendency (Pearson's R)

Japan	rational egoist tendency		generalized trust in the real space	Information ethics consciousness	Information ethics behavior
Grp.1 (N=321～331)	egoist tendency: high rationality : high	generalized trust on the Internet	0.467***	0.059	-0.113*
Grp.2 (N=310～317)	egoist tendency: high rationality : low	generalized trust on the Internet	0.474***	-0.066	0.038
Grp.3 (N=242～248)	egoist tendency: low rationality : high	generalized trust on the Internet	0.472***	-0.050	-0.078
Grp.4 (N=232～239)	egoist tendency: low rationality : low	generalized trust on the Internet	0.516***	0.092	0.129*

USA	rational egoist tendency		generalized trust in the real space	Information ethics consciousness	Information ethics behavior
Grp.1 (N=115)	egoist tendency: high rationality : high	generalized trust on the Internet	0.579***	-0.094	0.279**
Grp.2 (N=167)	egoist tendency: high rationality : low	generalized trust on the Internet	0.336***	-0.188*	0.217**
Grp.3 (N=157)	egoist tendency: low rationality : high	generalized trust on the Internet	0.473***	-0.144	0.132
Grp.4 (N=112)	egoist tendency: low rationality : low	generalized trust on the Internet	0.534***	-0.006	-0.212*

Singapore	rational egoist tendency		generalized trust in the real space	Information ethics consciousness	Information ethics behavior
Grp.1 (N=157)	egoist tendency: high rationality : high	generalized trust on the Internet	0.619***	-0.063	0.142
Grp.2 (N=154)	egoist tendency: high rationality : low	generalized trust on the Internet	0.482***	-0.244**	0.296***
Grp.3 (N=132)	egoist tendency: low rationality : high	generalized trust on the Internet	0.638***	-0.165	0.104
Grp.4 (N=111)	egoist tendency: low rationality : low	generalized trust on the Internet	0.400***	0.045	0.146

*** p<.001 ** p<.01 * p<.05

4 Conclusion

This study has tried to make clear the type of former studies on trust and Internet, and based on these categories, examined the significance and possibility of trust related to

social capital on the Internet with survey data. Results indicate that studies on trust related to the Internet are categorized according to two dimensions – "studies on the system trust (especially, trust in the system infrastructure) – studies on the personality trust" and "studies with risk management approach – studies with trust management approach." Among them the concept of social trust should be more important in the web community because of its higher level of uncertainty rather than the real world. Generalized trust has significant relationships with reciprocity, human interaction and cooperation on the Internet. However ethics does not simply correlate with trust. It is clarified that a truster does not always behave morally in the process of forming the web community. The features of the Internet space change consciousness and the actual behavior of an individual. Yet a truster actually helps and cooperates each other. We have to design web communities based on this result.

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