

The Internet as a Tool for Policy Understanding: Investigating the Influence of Internet Use on Public Opinion in Japan and the U.S.

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Abstract

I used the survey data from the Japanese Election Study (JES3) and Pew Internet & American Life Project to conduct research on the effect of Internet use on political information exposure. Previous studies have stressed the relative selectivity of information exposure via the Internet compared with other media, such as newspapers or television. Internet users can simply choose political information that is consistent with their political attitudes. This selectivity in information exposure via the Internet might have serious consequences on the democratic social system, such as the fragmentation of shared information and a decrease in political tolerance by cyber-balkanization (Sunstein, 2001). The following research questions were empirically investigated based on this concern: the presence of selective exposure in web-browsing for political information, the effect of web-browsing for political information on political tolerance, and the contingencies on which the selective exposure takes place.

Multivariate quantitative analyses show that web-browsing, as a form of

Internet use for seeking information, facilitates exposure to homogeneous arguments that are consistent with one's attitudes. However, selective avoidance, which suppresses the exposure to heterogeneous arguments, is not empirically supported. Moreover, although Internet use as a source of information facilitates the exposure to homogeneous arguments under certain conditions, it does not have a negative effect on political tolerance. This is because the selective exposure to homogeneous arguments takes place if and only if the perceived issue's importance is high. That is, even if selective exposure has an effect on a few issues perceived as highly important, there is no such bias in other numerous less-important issues, which attenuates the effect of selective exposure on the homogeneity of the entire information environment surrounding each person. By and large, it can be concluded that the fear of a fragmented society due to the selectivity in using the Internet seems to be empirically groundless.

Keywords

Internet use, Selective exposure, Homogeneity/Heterogeneity, Political tolerance

1. Social consequences of Internet use

More attention than ever is being paid to how people use the Internet as a source of political information and as a media for political communication, and how these uses contribute to the efficient operation of democracy (Bimber, 2003; Iyengar, Hahn, & Prior, 2001; Borgida et al., 2002; Davis et al., 2002; Katz and Rice 2002a; Katz and Rice 2002b; Norris 2003; Quan-Haase et al., 2002; Horrigan, Garrett, & Resnick, 2004; Kobayashi, Ikeda, & Miyata, 2006).

With the use of the Internet as a source of political information, electorates have been exposed to detailed information that is outside the coverage of the mass media. This leads to the expectation that the Internet contributes to smooth and widespread flow of political information (Bimber, 2003; Sakaiya, 2006: 87-120). In other words, people have been able to get political information that matches their own

interests at a lower cost (Chaffee & Metzger, 2001), and this in turn leads to the anticipation of higher quality public opinions and better social decision making.

Based on these previous arguments, this article investigates the impact of the Internet, especially as a source of political information, on the democratic system. The use of the Internet in this article does not refer to that for personal communication but to that for information exposure mainly by web-browsing.

There are two opposing theories about the effect of Internet use as a source of information on the democratic system. The first focuses on the massive diversity of information on the net and expected positive consequences of it. It is easy to search for information on the net and to be exposed to even minor opinions that are supported by only a few people (Ikeda, 2005). The use of the Internet is thought to promote the recognition of a diversity of opinions and political deliberations, which bring about desirable social consequences, making it possible to be exposed to minor opinions and information that has been outside the coverage of the mass media. These arguments have been repeated from the dawn of the diffusion of the Internet and they have expected that with the increasing number of people using the Internet, the public sphere would be constructed as a place for discussion in which national power is controlled under the rationale of public opinion (Schneider, 1996; Gimmler, 2001; Yoshida, 2000; Hoshikawa, 1996). Although this argument has declined as the use of the Internet has become commercially popularized and information broadcasting on personal websites has declined (Shibanai, 2003), it is now again attracting attention due to the explosive diffusion of weblogs, which has made information broadcasting by individuals much easier (e.g. Coleman, 2005).

There is an assumption in this argument, however, which is the expectation that Internet use facilitates the recognition of diverse opinions and political deliberation. That is to say, it is assumed that by using the Internet people are exposed to more heterogeneous information and opinions that oppose their own predispositions. The validity of this assumption, however, suffers greatly from the viewpoint of social psychology, that is to say, “selective exposure”.

Based on the findings of previous researches that people selectively expose

themselves to the information that is consistent with their predispositions (Lazarsfeld, Berelson, & Gaudet, 1948; Klapper, 1960), another argument can be derived about the impact of Internet use on the democratic system. That is, by its technological characteristics, the Internet exposes people to information that is consistent with their predispositions much easier than the traditional mass media. In other words, although there are numerous and diverse information available on the Internet, the exposure to heterogeneous information and opinions is paradoxically suppressed due to the facilitation of selective exposure. This, in turn, leads to a concern that the Internet makes an individual's information environment more homogeneous and decreases the political tolerance of heterogeneous others (Sunstein, 2001; Ikeda, 2005). Sunstein (2001) pointed out that political websites are highly clustered with linking structures that connect politically homogeneous websites to each other and does not provide chances of encounters with heterogeneous opinions. Therefore, Sunstein (2001) warns that the Internet creates a so called "Daily Me" information environment in which people are heavily exposed to information consistent with their own interests in a homogeneously biased way. This kind of argument expresses the anxiety that the use of the Internet might bring about negative consequences by homogenizing the information environments that surround people.

After putting these opposing arguments into perspective, I investigated the effect of Internet use as a source of information and its social consequence using representative survey data from Japan and the U.S.

In study 1, in which I used the Japanese data, I investigated the selective exposure with the use of the Internet and political tolerance as its consequence. As empirical evidences, I show that Internet use facilitates the selective exposure to homogeneous arguments among people whose perceived issue importance is high, and that Internet use is not so powerful as to affect political tolerance. In study 2, in which the U.S. data on multiple issues is used, it is shown that the condition in which selective exposure comes in to play is limited to when the perceived issue importance at the aggregated level is high.

2. Biased information environment brought about by the Internet use

One of the most prominent characteristics of Internet use is its high customizability (Ikeda, 1997). Customizability in this context refers to the degree of freedom in media usage in which people can choose the information that they are exposed to. For example, the RDF site summary (RSS) and the Social Networking Service (SNS) make it easier to be exposed to homogeneous information and to filter out indifferent information or uncongenial heterogeneous information that threatens one's beliefs and values. This characteristic possibly accelerates the selective exposure to information on the Internet.

In the context of Internet use, the researches on selective exposure correspond to those on the selective exposure to homogeneous information in web-browsing. These researches are based on the idea that it is difficult for people to fully examine the massive amounts of information on the web due to the cognitive limitations of humans, and thus they inevitably have to exert some selectivity to filter out and choose information. Typically, the "selective exposure hypothesis" (Lazarsfeld, Berelson, & Gaudet, 1948; Klapper, 1960), which was derived from mass communication studies, has been applied to these previous researches.

3. Internet use and selective exposure

As noted above, the Internet is characterized by its various functions, which facilitate the exposure to homogeneous information that is consistent with our predispositions and to filter out heterogeneous or indifferent information. This leads to a concern that, with the increasing number of people using the Internet, the balkanization of society and fragmentation of shared information would emerge (Sunstein, 2001; Ikeda, 2005). However, rigorous empirical researches that verify this concern have not yet been adequately accumulated and the presently sparse findings are not consistent.

Iyengar, Hahn, & Prior (2001) sent CDs to samples from Knowledge Network and collected the data that tracks the subjects' accesses to the information on the CD. Their analyses indicate that the partisan selectivity in information access is less salient

than the issue-based selectivity. In other words, party identification does not function as a predisposition that brings about selectivity, but rather selective exposure occurs according to each issue that is perceived as personally relevant to each subject, such as healthcare and education. This finding is consistent with the past researches that argue that selective exposure occurs only when people's commitment is high (Frey, 1986). However, as pointed out in the literature review of selective exposure by Iyengar, Hahn, & Prior (2001), the findings of selective exposure under controlled experimental settings are rarely duplicated in social survey researches under natural settings. Therefore, this article focuses on whether that conditional selective exposure is duplicated in social survey data.

Based on the above arguments, I derive the following hypotheses.

Hypothesis 1: Internet use facilitates the exposure to arguments that are homogeneous with one's predisposition.

Hypothesis 1-1: The effect of Hypothesis 1 is stronger among those whose perceived issue importance is high.

Research question 2: Does Internet use suppress the exposure to arguments that are heterogeneous with one's predisposition?

A research question as to whether Internet use suppresses the exposure to heterogeneous arguments was investigated, because past findings on selective avoidance were not consistent.

4. Political tolerance and the Internet as source of information

In study 1, I focused on political tolerance as a consequence of Internet use. This is because the primary predictor of political tolerance is the exposure to heterogeneous opinions and arguments (Kinder, 1998; Lipset 1981; Gibson 1992; Mutz, 2002; Mutz, 2006; Ikeda & Kobayashi, 2007), and thus political tolerance would be one of the variables that are most susceptible to selective exposure brought about by the use of the Internet. In other words, because the homogeneity and heterogeneity of the

information environment are critical factors in determining political tolerance, it substantially necessary to investigate the use of the Internet for seeking information as a predictor of political tolerance.

Previous researches have investigated political tolerance defined as “putting up with” politically extreme groups mostly in United States (Sullivan, Piereson, & Marcus, 1982). In those studies, political tolerance was measured as the extent to which respondents can tolerate their self-anchored “hate groups”, such as the KKK and anti-democratic groups, who address their opinions in public spaces. Neustadl & Robinson (2002) studied the relationship between political tolerance measured as such and the use of the Internet. Using General Social Survey (GSS) datasets, Neustadl & Robinson (2002) found that Internet users are more politically tolerant than non-users even after controlling for basic demographic factors. However, their study is insufficient in that they do not differentiate between web-browsing and e-mailing and that they control the effect of only the basic demographic variables and do not investigate any mediating effects of such as the exposure to heterogeneous information and others. Therefore, the relationship between political tolerance and Internet use need to be further elaborated.

Past researches have discussed heterogeneity mainly as that of personal contact, which powerfully underpins political tolerance. However, not only heterogeneity in personal contact, but also the heterogeneity in information exposure is essential. Mutz (2002) conducted an experimental study which verifies a cognitive mechanism that political tolerance is enhanced by being aware of opposing arguments. As a result, she showed that political tolerance is not enhanced by mere exposure to political opinions, but is enhanced by the exposure to opposing (thus heterogeneous) opinions. Moreover, based on the survey data, Mutz (2002) concluded that the cognitive process that corresponds to the informative effect of heterogeneous encountering also contributes to higher political participation, although the magnitude of the effect is not as powerful as that of the affective process, which is based on personal relationships with politically heterogeneous others. Therefore, the homogeneity and heterogeneity of arguments that the Internet users are exposed to during web-surfing are supposed to

affect political tolerance through a cognitive process.

Based on the theorizing above, and if Hypothesis 1 (Internet use facilitates the exposure to arguments which are homogeneous with one's predisposition.) is supported, the following hypotheses are derived.

Hypothesis 2: Internet use has a negative effect on political tolerance.

Hypothesis 2-1: The effect of Hypothesis 2 is mediated by the exposure to homogeneous arguments.

I do not regard the selective avoidance of heterogeneous arguments as the theoretical foundation for Hypothesis 2 and 2-1, because I treated it as a research question. However, if Internet use hinders the exposure to heterogeneous opinions, Hypothesis 2 and 2-1 are more likely to be supported.

5. Study 1

5-1. Survey methodology

In September 2005, before and after the national House of Representatives election, personal-interview panel surveys were conducted for national electorates (20 yrs. old or older) who were extracted based on a two-stage stratified sampling method. These surveys were the 8th and 9th waves of Japan Election Study (JES3), which consists of nine waves¹. The potential respondents consisted of a panel sample (N= 2134) who were interviewed in the national House of Councils election (2004) without those who strongly refused to be re-interviewed. The response rate of the 8th wave was 71% (n= 1517) and that of the 9th wave was 87% (n= 1511; based on the number without respondents who strongly refused to be re-interviewed in the 8th wave)².

The national election of House of Representatives in September 2005 was held right after the dissolving of House of Representatives by ex-prime minister Jun'ichiro Koizumi. Koizumi strategically set postal reform as a single issue, saying that the election is about "whether or not to advance the reform by passing the postal privatization reform bill", and enjoyed a historical triumph against DPJ which tried to

set pension reform as a primary agenda.

5-2. Analysis

5-2-1. Hypothesis 1 and Research Question 2

Dependent variable

Number of homogeneous arguments on postal reform:

First, in order to operationalize the pro-con attitude on postal reform, I used the items below.

Regarding the issue of postal privatization, there are two opinions,

- A. To lower costs and make postal services more efficient, postal privatization is highly agreeable.
- B. Some areas may suffer from postal privatization; therefore, postal privatization is not recommended.

For these two opinions, the respondents' attitudes were measure by asking the question, "Choose the response that best reflects your opinion on each issue." I created a dichotomous variable that represents the pro-con attitude on postal reform by assigning a 1 (pro-postal reform) to represent, "Agree with A" and "Somewhat agree with A", and a 0 (against-postal reform) to represent, "Agree with B" and "Somewhat agree with B".

In addition, the following eight arguments on postal reform were presented as multiple answer questions. The four odd-numbered items represent the positive arguments on postal reform and the four even-numbered items represent the negative arguments on postal reform.

There are numerous opinions surrounding the issue of postal privatization. In your opinion, what would result from the privatization? List as many as you think are correct. (M.A.)

As a result of privatization...

- 1. The government will become smaller, but cost-efficient. (P)
- 2. It will become impossible to sustain a nationally standardized postal price scheme. (N)
- 3. Private firms will no longer be threatened/pressurized by government organizations. (P)

4. There will be fewer post offices – and a lot of inconvenience. (N)
5. Free market (competition) will bring economic vitality. (P)
6. Our safe postal banking scheme will be put to risk. (N)
7. A stop will be put to abusing funds for postal savings and life insurance enterprises. (P)
8. Privatization alone will not bring about fiscal and administration reform. (N)

(P); Positive arguments, (N): Negative arguments

For the respondents classified as pro-postal reform, the number of positive arguments selected is operationalized as homogeneous arguments on postal reform³. On the other hand, for those classified as against-postal reform, the number of negative arguments selected is operationalized as homogeneous arguments on postal reform. That is, the number of selected arguments that are consistent with the valence of respondents' pro-con attitude on postal reform is counted for all respondents and it is unified as a single measurement (Range 0 – 4, Mean 1.74, SD 1.24)⁴.

Number of heterogeneous arguments on postal reform

The number of heterogeneous arguments on postal reform is operationalized as that of the arguments that are inconsistent with the valence of respondents' pro-con attitude on postal reform. Because the distribution of unified scale was skewed (Range 0 -4; Mean 0.73; SD 1.02), it was re-coded into a dichotomous variable that represents a 1 for selecting at least one heterogeneous argument on postal reform, and a 0 for selecting none. This recoding can be a remedy for analytical redundancy, which would be referred to again in the total number of arguments on postal reform.

Independent variable

Web-browsing for political information:

Web-browsing for political information was measured by four items: "Read political news on the Internet", "Check websites of local self-governing bodies on the Internet", "Check websites related to politics owned personally or by private organizations", and "Check websites of the candidates and supporters". Each item was measured by using a 4-point scale: '1. Almost every day; 2. Often; 3. Sometimes; and 4.

Rarely'. For the distribution of each item being skewed, I created a dichotomous variable that indicates the users of web-browsing for political information who selected 1 or 2 or 3 for at least one of the items among the four. Therefore, web-browsing for political information was measured as a dichotomous variable and the proportion of users was 21.6%.

Newspapers:

From thirteen newspapers, including both national and rural papers, the number of newspapers that respondents subscribe to for “media to get political information” was counted as a single scale (Mean 1.12; SD 0.59).

TV news:

From the list of TV news programs broadcasted during the House of Representatives election in 2005, the number of programs that respondents watched as “media to get political information” was counted as a single scale (Mean 3.12; SD 1.92).

Political knowledge:

The number of government ministries that respondents could name was counted as a single measurement of political knowledge (Range 0-14; Mean 4.93; SD 3.69).

Total number of arguments on postal reform:

By taking the individual differences on the tendency to select arguments into account, I controlled the total number of arguments on postal reform whether positive or negative. It is very plausible that some respondents had a tendency to select many arguments regardless of their evaluation and others to have a tendency to select only a few arguments. Here, I include the total number of arguments on postal reform in order to control such individual differences. This enables it to eliminate the alternative interpretation that the effects of web-browsing on the number of homogeneous/heterogeneous arguments are spurious due to the tendency of users of web-browsing for political information to list up more (or less) arguments regardless of their evaluation.

This control is quite strong, because the number of homogeneous arguments on

postal reform is nested in the total number of arguments. By imposing such strong control, I can investigate the effect of web-browsing for political information more conservatively.

Furthermore, the sum of the number of homogeneous and heterogeneous arguments on postal reform is equal to the total number of arguments. Thus, when controlling the effect of the total number of arguments, the results from the analyses become redundant even if I analyze the number of homogeneous and heterogeneous arguments separately as a dependent variable. In order to cope with this redundancy, we use the number of heterogeneous arguments recoded as a dichotomous dependent variable (see the **Number of heterogeneous arguments on postal reform** section).

Demographic variables:

Gender, age, education, years of residence, and size of the city of residence were included in the analyses as demographic factors.

Buffer variable

Perceived importance of postal reform:

Previous studies have found that the occurrence of selective exposure is contingent on the level of personal commitment on an issue (Frey, 1986). In this study, I used perceived importance of issue as a proxy of personal commitment. In order to investigate the interactive effect between web-browsing for political information and perceived importance of the issue in Hypothesis 1-1, I created a variable that divides the sample into two groups: higher perceived importance of postal reform and lower perceived importance of postal reform. The perceived importance of postal reform was measured by a single item (“How important is the issue of postal privatization to you?”) on a four-point scale: ‘1. Very important; 2. Somewhat important; 3. Not very important; 4. Not important at all’. The respondents who selected number 1. or 2. were classified as a group that is high in perceived importance (64.77%), and those who selected 3. or 4. were classified as a group having low perceived importance (35.23%).

First, to investigate Hypothesis 1 and RQ 2, a direct effect of web-browsing for political information was modeled using a whole sample. The number of homogeneous arguments on postal reform was predicted by an OLS model. However, as mentioned before, the analysis on the number of heterogeneous arguments on postal reform should be redundant when the total number of arguments is controlled. Since I recoded the number of heterogeneous arguments on postal reform into a dichotomous variable to cope with this redundancy (and the skewed distribution), the number of heterogeneous arguments on postal reform was predicted by using a logistic regression model. Nevertheless, the partial correlation between the number of homogeneous and heterogeneous arguments on postal reform was -0.74 after controlling the effect of the total number of arguments, which indicates that redundancy is still high⁵. Therefore, while I focused on the analysis on the number of homogeneous arguments on postal reform, I regard that on the number of heterogeneous arguments as supplementary and avoided an excessive generalization from its result. The results of estimations are shown in Table 1.

Table 1. Regression models predicting number of homogeneous/heterogeneous arguments on postal reform

Dependent var:	number of homogeneous	number of heterogeneous
	arguments on postal reform	arguments on postal reform
	Coef.(B)	
gender	-0.01	-0.06
age	0.01 **	-0.02 **
education	0.11 **	-0.19 *
years of residence	0.00	-0.03
size of the city of residence	0.00	-0.01
political knowledge	0.00	0.01
newspaper	0.00	-0.09
TV news program	0.01	-0.02
web-browsing for political information	0.11 +	-0.24
total number of arguments on postal reform	0.60 **	0.78 **
constant	-0.41 +	-0.28
Number of obs	1232	1232
R-squared	0.60	-
Adj R-squared	0.59	-
Pseudo R-squared	-	0.18

**p<.01 *p<.05 +p<.10

Among the demographic variables, the age and education of the respondents

showed significant effects. The older and highly educated respondents listed up more homogeneous arguments than the younger and less educated ones. Although there were not any other significant control variables, the total number of arguments on postal reform that were included to control the individual tendency to select arguments had a strong effect as expected, which leads to a high R-squared. The focus of these analyses lies in whether web-browsing for political information shows any evidence of selective exposure even after these conservative controls.

Web-browsing for political information has a marginally positive effect on the number of homogeneous arguments, which supports Hypothesis 1. With regard to RQ2, web-browsing for political information does not have any significant effect on the number of heterogeneous arguments, which means there no empirical evidence of selective avoidance was seen in web-browsing.

Next, focusing on the homogeneous arguments on which web-browsing for political information shows a marginally significant effect, I investigated Hypothesis 1-1 by dividing the sample by the level of perceived issue importance of postal reform. The results are shown in Table 2.

Table 2. Regression models predicting number of homogeneous arguments on postal reform (by level of perceived importance of postal reform)

Dependent var:	number of homogeneous arguments on postal reform	
	perceived importance of postal reform	
	low	high
	Coef.(B)	
gender	-0.03	0.01
age	0.01 **	0.01 **
education	0.17 **	0.07 +
years of residence	0.00	-0.01
size of the city of residence	0.00	0.01
political knowledge	0.00	0.00
newspaper	-0.02	0.00
TV news program	0.01	0.01
web-browsing for political information	-0.05	0.17 *
total number of arguments on postal reform	0.57 **	0.60 **
constant	-0.54	-0.33
Number of obs	409	756
R-squared	0.60	0.55
Adj R-squared	0.59	0.55

**p<.01 *p<.05 +p<.10

The results clearly support Hypothesis 1-1. That is, the positive effect of web-browsing for political information on homogeneous arguments is limited to those who perceive postal reform as important. Although the effect of web-browsing for political information was marginal in Table 1, it is now significant (5%) when divided by the perceived issue importance. In other words, if people perceive an issue as important for themselves, selective exposure for homogeneous arguments comes into play in web-browsing. Therefore, as a result, a larger number of homogeneous arguments is referred to in the survey interview. This result is consistent with the one from Iyengar et al. (2001). Iyengar et al. (2001) contended that although the use of the Internet facilitates selective exposure, the selectivity by party identification or ideology is weak and the selectivity by personal relevance is rather strong. That is, whether an issue is perceived as personally important or not is a crucial contingency for the occurrence of selective exposure in web-browsing.

5-2-2. Hypothesis 2 and 2-1

Dependent variable

Political tolerance:

Political tolerance has been measured as the extent to which respondents can put up with the opinions and advocacy of politically extreme groups that the respondents hate the most (Sullivan, Piereson, & Marcus, 1982). Criticizing the previous measurements that had a content bias that measured political tolerance mainly on ideologically left groups, Sullivan, Piereson, & Marcus (1982) proposed a new measurement of political tolerance that adopted a self-anchoring strategy to pick up the most hated groups by each respondent. This new measurement of political tolerance worked well and most of the past researches on political tolerance in the U.S. have been dependent on their measurement.

However, on the political context on which it is very difficult to name one's most hated group, the measurement strategy of Sullivan, Piereson, & Marcus (1982) is less effective. In Japan, political cleavage is not as clear as in the U.S. and most respondents are unaware of their most hated political groups in daily life. In such a situation, the

measurement of political tolerance depending on the self-anchoring method is unlikely to be effective. Therefore, I measured a single item that validly taps the general concept of political tolerance, which is asked regardless of the respondents' most hated groups: "When anti-democratic organizations request the use of public halls (facilities in general) for their rallies, the city hall must give permission, so long as they meet other requirements set by the rule". A five-point scale was used to construct a scale of political tolerance: '5. Yes, I agree; 4. I agree to a certain extent; 3. I can neither agree, nor disagree; 2. I do not really think so; 1. I disagree' (Mean 3.76; SD 1.24).

Independent variable

All the independent variables are identical with Hypothesis 1 and Research Question 2.

All the models are estimated using an ordered logit regression model. It was appropriated to deal with the dependent variable as measured by an ordered scale, because the dependent variable is measured by a discrete five-point scale. The results of the analyses are shown in Table 3.

Table 3. Ordered regression models predicting political tolerance

Dependent var:	political tolerance	
	model 1	model 2
	Coef.(B)	
gender	-0.12	-0.12
age	0.01	0.01
education	0.11	0.11
years of residence	0.03	0.03
size of the city of residence	0.04	0.04
political knowledge	0.02	0.02
newspaper	0.19 +	0.19 +
TV news program	0.01	0.01
web-browsing for political information	0.08	0.08
number of homogeneous arguments on postal reform		0.00
cutpoint 1	-1.47	-1.47
cutpoint 2	-0.61	-0.61
cutpoint 3	0.53	0.53
cutpoint 4	1.62	1.62
Number of obs	1103	1103
Pseudo R2	0.01	0.01

**p<.01 *p<.05 +p<.10

As you can see from the table, there was no direct negative effect from web-browsing for political information on political tolerance. This does not support Hypothesis 2. Moreover, although I added the number of homogeneous arguments on postal reform in model 2, it also does not show any significant effect, which does not support Hypothesis 2-1. In other words, although web-browsing for political information facilitates the selective exposure to homogeneous arguments when perceived issue-importance is high, it does not have a negative implication for political tolerance. This can be a counterargument against some pundits who warn that fragmentation of shared information caused by selective exposure in web-browsing brings about cyber-balkanization or manifestation of antagonism between in-groups and out-groups.

There are two possible interpretations of the null effect of web-browsing for political information on political tolerance. The first possibility concerns the quality of measurement. Web-browsing for political information is recoded into a dichotomous variable, because the original distribution is severely skewed. This is a quite rough measurement. Although there is no other way under the current situation, where web-browsing for political information is not so universal, it is plausible that theoretically derived hypotheses were not supported because of a large measurement error due to the roughness of the measurement. However, as is seen in Hypothesis 1, web-browsing for political information has a significant effect at least on the homogeneity of the information environment as hypothesized. This casts doubt on the validity of the interpretation that the null effect of web-browsing for political information is due to a measurement error. In other words, this suggests the possibility that, notwithstanding the measurement is successful, web-browsing for political information has a null effect on political tolerance for other reasons.

The second possibility, which is much more important than the first one, is the effect of differences among the issues. The issue investigated in Hypothesis 1 and RQ 2 was a single issue; postal reform. Although there could be a facilitating effect of web-browsing for political information on the exposure to homogeneous arguments among those who perceive the issue as important, it is unclear whether the same effect can be seen in other issues. If the facilitating effect of web-browsing for political

information on the exposure to homogeneous arguments with one's attitudes is in work universally across all issues, the homogeneity of the information environment will have a substantial impact on political tolerance by accumulating its effects. However, if the issues in which web-browsing for political information facilitates selective exposure to homogeneous arguments are limited to specific issues, then the selective exposure to arguments in other issues will not be facilitated by the web-browsing for political information and the negative impact on political tolerance will be attenuated.

The data used in study 1 measured arguments on only one issue (postal reform), and thus, I cannot investigate the difference between issues. In particular, since postal reform was a highly salient issue, it would be dangerous to generalize the findings based only on postal reform. Therefore, in study 2, I focused on the differences between issues.

6. Study 2

In study 1, it was indicated that the perceived issue importance is a contingency of the selective exposure in web-browsing for political information (Hypothesis 1-1). If this finding is applied to the difference between issues, it is predicted that the selective exposure to homogeneous arguments is promoted in issues that are perceived as highly important at the aggregated level, and that such effect is absent in issues perceived as less important. Therefore, Hypothesis 3 is derived as follows.

Hypothesis 3: Selective exposure to homogeneous arguments via web-browsing for political information takes place only in issues that are perceived as important at an aggregated level.

6-1. Survey methodology

In study 2, the survey data that was used was taken from Pew Internet & American Life Project and released publicly online⁶. This survey was conducted from June 14 to July 3, 2004, by RDD telephone interviews. There were 1,510 valid sample

out of accessible 4,374 household (Response rate 31.2%).

This survey was conducted before the presidential election in 2004 and purposed to investigate the electorates' information exposure via the Internet during the election campaign. In particular, this survey focused on the selective exposure via the Internet use and contains abundant items concerning the consistency and inconsistency between respondents' predispositions and information to which they are exposed, which makes this data appropriate for the secondary analysis in this study.

6-2. Analysis

This survey data contains items on four issues; presidential election in 2004, the war in Iraq, gay marriage, and free trade and its impact on American workers. Among the four issues, all respondents answered to the items concerning the presidential election ⁷. For the other three issues, it was designed so that each respondent answered the items concerning the issues that they perceived as important. For instance, if a respondent perceived the war in Iraq as important, s/he answered the items concerning the presidential election and the war in Iraq. That is, each respondent answered the items about the presidential election and one of the other three issues. In doing so, the numbers of respondents for each of the three issues were adjusted to be roughly equal. Table 3 shows the distribution of perceived issue importance within those who are allocated to each issue.

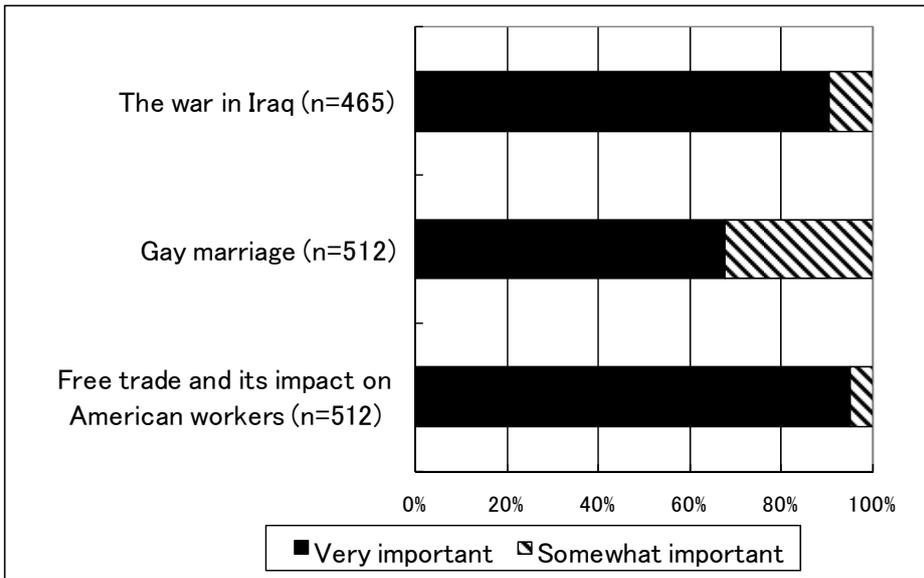


Table 3. Perceived issue importance (Within each issue)

The perceived issue importance among those who were allocated to gay marriage is lower than the other two issues. One-way ANOVA shows that there were significant differences between the war in Iraq and gay marriage and between free trade and gay marriage ($F_{(2, 1486)} = 91.05^{**}$)⁸. That is, within the issues to which each respondent was allocated, the perceived issue importance followed this order: Free trade = The war in Iraq > Gay marriage.

6-2-1. Hypothesis 3

Dependent variable

Number of homogeneous/heterogeneous arguments on the war in Iraq:

In order to operationalize the attitude toward the war in Iraq, a dichotomous variable was created using the item (IRAQ1): “Do you think the U.S. made the right decision or the wrong decision in using military force against Iraq?” (Pro-Iraq war 53%; Against-Iraq war 39%; DK/NA 8%). The arguments on the war in Iraq were measured by the eight items listed below.

- (1) Iraq posed an imminent threat to American security (P)
- (2) Saddam Hussein was seeking weapons of mass destruction, which he might someday use against the United States (P)

- (3) Saddam Hussein had connections with Al-Qaeda and may have played a role in the September 11th terrorist attacks on the Pentagon and World Trade Center (P)
 - (4) Saddam Hussein was a brutal dictator who murdered and tortured his own people (P)
 - (5) The Bush administration misled the American people about Iraq's weapons program and the threat it posed to the United States (C)
 - (6) We should not have gone to war with Iraq without the support of the United Nations and our allies (C)
 - (7) The President should have found a peaceful resolution to the conflict with Iraq, instead of risking lives through war (C)
 - (8) Going to war with Iraq will only increase anti-American sentiment in the Muslim world (C)
- (P) Pro-Iraq war argument; (C) Against-Iraq war argument

For the respondents who classified as pro-Iraq war, the sum of the number of agreed items from (1) to (4) AND the number of disagreed items from (5) to (8) was counted as a measurement of the homogeneous arguments. On the other hand, for the respondents classified as against-Iraq war, the sum of the number of disagreed items from (1) to (4) AND the number of agreed items from (5) to (8) was counted as a measurement of the homogeneous arguments (Mean 4.31; SD 2.41).

The measurement of the heterogeneous arguments is the reverse of that of the homogeneous arguments. That is, for the respondents classified as pro-Iraq war, the sum of the number of disagreed items from (1) to (4) AND the number of agreed items from (5) to (8) was counted as a measurement of the heterogeneous arguments. On the other hand, for the respondents classified as against-Iraq war, the sum of the number of agreed items from (1) to (4) AND the number of disagreed items from (5) to (8) was counted as a measurement of the heterogeneous arguments (Mean 1.48; SD 1.41)⁹.

Number of homogeneous/heterogeneous arguments on gay marriage:

In order to operationalize the attitude toward gay marriage, a dichotomous variable was created using the item (GM1): "Do you favor or oppose allowing gay and lesbian couples to marry legally?" (Pro-gay marriage 26%; Against-gay marriage 70%; DK/NA 4%). The arguments on gay marriage were measured by the eight items listed below.

- (1) Gay couples are entitled to the same legal rights as heterosexual couples when it comes to things like health insurance, inheritance, or pensions (P)

- (2) It is not the government' s role to tell people who they can and cannot marry (P)
 - (3) Legalizing gay marriage benefits everyone because it encourages long-term, monogamous relationships between two people who love one another (P)
 - (4) Legalizing gay marriage is an important civil rights issue, protecting a group of Americans who have been discriminated against in the past (P)
 - (5) Marriage is a sacred religious institution that should be between a man and a woman (C)
 - (6) Legalizing gay marriage sends the message that homosexuality is an acceptable lifestyle (C)
 - (7) Legalizing gay marriage would open the door to legalizing other forms of marriage, such as polygamy (C)
 - (8) Legalizing gay marriage would result in more gay couples raising children, and children should only be raised in households where there is a mother and a father (C)
- (P) Pro-gay marriage argument; (C) Against-gay marriage argument

The scales of homogeneous and heterogeneous arguments were created in the same way as with the Iraq war (Number of homogeneous arguments on gay marriage: Mean 2.84; SD 2.53, Number of heterogeneous arguments on gay marriage: Mean 1.00; SD 1.37) ¹⁰.

Number of homogeneous/heterogeneous arguments on free trade:

In order to operationalize the attitude toward free trade, a dichotomous variable was created using the item (FT1): “Which one of the following statements comes closest to your own view on free trade with other countries? A: Free trade has been mostly good for the US economy and American workers; B: Free trade has been mostly bad for the US economy and American workers” (Pro-free trade 31%; Against-free trade 41%; DK/NA 28%). The arguments on free trade were measured using the following eight items.

- (1) Free trade results in better products and better prices for American consumers (P)
- (2) Free trade creates demand for US products abroad, which stimulates economic growth and creates jobs here at home (P)
- (3) Free trade is good for the United States because it improves our relationships with other countries (P)
- (4) Free trade creates a strong global economy, which benefits everyone (P)
- (5) Free trade allows companies to exploit workers in developing countries with low wages, poor working conditions and no job security (C)
- (6) Because of free trade, corporations have laid off American workers and sent their jobs overseas (C)
- (7) Free trade is bad for the environment because a lot of countries have lower environmental standards than the United States (C)
- (8) Free trade widens the gap between rich and poor in the United States and in the world as a

whole (C)

(P) Pro-free trade argument; (C) Against-free trade argument

The scales of homogeneous and heterogeneous arguments were created in the same way as with the Iraq war (Number of homogeneous arguments on free trade: Mean 4.72; SD 2.15, Number of heterogeneous arguments on free trade: Mean 0.86; SD 1.02) ¹¹.

Independent variable

In order to estimate the comparable models to study 1, I used the following independent variables to match those in study 1 as much as possible ¹².

Web-browsing for political information:

Using the item: “Where have you gotten MOST of your news and information about the issue of the Iraq war/gay marriage/free trade? From television, from newspapers, from radio, from magazines, or from the Internet and email?”, I was able to measure “The most frequently used source of information” and “The second most frequently used source of information” ¹³. The respondents who selected the Internet and e-mail as “the most frequently used source of information” were coded as a 2, and those who selected the Internet and e-mail as “the second most frequently used source of information” were coded as a 1. The respondents who did not select the Internet and e-mail as a source of information were coded as a 0 ¹⁴. This coding strategy was identical across all three issues (the Iraq war: Mean 0.28; SD 0.61, gay marriage: Mean 0.23; SD 0.60, free trade: Mean 0.21; SD 0.57).

Newspapers:

Exposure to newspapers was measured in the same way as web-browsing for political information.

TV news:

Exposure to TV news was measured in the same way as web-browsing for political information.

Openness for diverse arguments:

In the same way as with study 1, in order to eliminate the alternative interpretation that users of web-browsing for political information are exposed to more arguments whether homogeneous or heterogeneous, the openness of diverse arguments was controlled in study 2. Although I coped with this by controlling the total number of arguments on postal reform in study 1, this, on the other hand, brought about a redundancy in the analyses of homogeneous and heterogeneous arguments. In study 2, by controlling such individual differences using other variables (“openness for diverse arguments”), the redundancy of analyses was avoided. Openness to diverse arguments was measured by using five items (Q2): “After I gather all the facts about something, I make up my mind pretty quickly”, “I like to read about a lot of different things”, “I find it difficult to make up my mind when I have too much information about something (Reversed)”, “Once I have my mind made up about something, I seldom change it (Reversed)”, and “I enjoy hearing about politics and world affairs”, using four-point scales. After summing up the scores of the five items, the scale was broken down into three categories, “high”, “middle”, and “low”¹⁵.

Following the null effect of web-browsing for political information on political tolerance in study 1, Hypothesis 3 was derived in order to support the interpretation that the issues in which web-browsing for political information facilitates selective exposure were limited. That is, Hypothesis 3 postulated that selective exposure to homogeneous arguments via web-browsing for political information takes place only for issues which are perceived as important.

The focal point of this analysis was whether there was any relationship between the levels of aggregated perceived importance for the three issues (the war in Iraq, gay marriage, and free trade) and the presence of a facilitating effect from web-browsing for political information on the selective exposure. As previously mentioned, the order of aggregated level of perceived issue importance for those who are allocated to each issue is Free trade = The war in Iraq > Gay marriage. With this order in mind, regression models predicting the number of homogeneous/heterogeneous

arguments were estimated for each issue, respectively (Table 6).

Table 6. Regression models predicting homogeneous/heterogeneous arguments on war in Iraq, gay marriage, and free trade



The results support Hypothesis 3. The issues in which web-browsing for political information has a positive effect on homogeneous arguments were limited to the war in Iraq and free trade. In gay marriage, which is the lowest in terms of the level of aggregated perceived importance, web-browsing for political information did not have any significant effect. Moreover, web-browsing for political information had no effect on heterogeneous arguments across all three issues.

The facilitating effect of web-browsing for political information on the selective exposure to homogeneous arguments can be seen only in the issues which are perceived as important. This finding cannot be derived from studying single and salient issues, such as postal reform or presidential elections. The finding that web-browsing for political information does not have a universal effect across all the issues supports the interpretation of the null effect of web-browsing for political information on political tolerance (unsupported Hypothesis 2 and 2-1). That is, although web-browsing for political information has a facilitating effect on the exposure to homogeneous information, which is consistent with predispositions, this effect is restricted to the issues that are perceived as important. In addition, since the number of issues perceived as important is limited, web-browsing for political information does not have a enough power as to distort the entire information environment in the homogeneous direction.

Therefore, web-browsing for political information does not have any substantial effect on political tolerance.

6. Discussion and future research

The focal points in this article were, (1) the presence of selective exposure in web-browsing for political information, (2) the effect of web-browsing for political information on political tolerance, (3) the contingencies on which selective exposure takes place. Let's consider each in turn.

First, as for (1), Hypothesis 1 was verified to be supported by and large. That is, web-browsing, as a form of Internet use as a source of information, facilitates the exposure to arguments that are homogeneous with one's attitudes. However, on the other hand, selective avoidance, which suppresses the exposure to heterogeneous arguments (RQ2), was not empirically supported.

As for (2), neither Hypothesis 2 nor 2-1 was supported. That is, although Internet use as a source of information facilitates the exposure to homogeneous arguments under certain conditions, it does not negatively affect the political tolerance by bringing a homogeneity bias into the information environment.

In regard to (3), by verifying Hypothesis 1-1, the perceived issue importance turned out to be a condition of selective exposure. In addition, from the results of Hypothesis 2 and 2-2, it was suggested that the differences in aggregated levels of perceived issue importance were the conditions for selective exposure, which led to the investigation of Hypothesis 3 by using multiple issues. The results showed that, while selective exposure to homogeneous arguments was facilitated in issues perceived as important at the aggregated level, such as the war in Iraq and free trade, such selectivity was not in effect in issues perceived as less important, such as gay marriage, which supports Hypothesis 3¹⁶. These results are consistent with the results of Hypothesis 1-1, which divided the sample according to the level of perceived importance on a single issue (postal reform).

The fundamental interest in this study lies in revealing how Internet use, which enables the access to massive and diverse amounts of information, contributes to

democracy. There had been two opposing contentions. One was based on an optimistic view that forecasts that political tolerance will increase in the long run through the exposure to heterogeneous arguments via the Internet. The other one was based on a pessimistic view that forecasts that political tolerance will decrease in the long run through the fragmentation of shared information caused by selective exposure via the Internet, which makes it difficult to maintain social consolidation.

This study has revealed that the present reality falls in the middle of those two competing arguments. That is, the effect of selective exposure in web-browsing is limited, although there is certainly a tendency to be exposed to homogenous arguments. This is because the selective exposure to homogeneous arguments emerges if and only if the perceived importance of the issue concerned is high. It is natural to assume that the number of issues one perceives as important is smaller than that of other issues s/he perceives as irrelevant or less important. Therefore, even if selective exposure is in effect for a few issues perceived as highly important, there is no such bias in other issues, which dilutes the effect of selective exposure on the homogeneity of the entire information environment surrounding each person. In addition, while a limited presence of selective exposure can be seen, there was no empirical evidence of selective avoidance from the heterogeneous arguments. This also works as a brake on the homogenization bias of the information environment.

That the context on which selective exposure takes place is limited corresponds to the null effect of the use of the Internet on political tolerance. It is interpreted that the effect of web-browsing for political information is not as strong as to affect political tolerance as a stable individual attitude, because the affect to homogenize the information environment is strictly limited. At the present, the anxiety that Internet use brings about negative social consequences by the homogenization of the information environment and a fragmentation of shared information has not realized.

Furthermore, if information exposure via the Internet facilitates the exposure to homogeneous arguments without decreasing the exposure to heterogeneous arguments and political tolerance, it can be regarded as a positive contribution to democracy. Iyengar, Hahn, & Prior (2001) argued that while the contents concerning

election campaigns on traditional mass media is severely biased to the entertainment like horse-race matters and scandals, issue-based selective exposure based on personal relevance via the Internet enables electorates to directly access substantial issue information, such as the contents of policies, which will eventually lead to the higher possibility of issue-voting. That is, Iyengar, Hahn, & Prior (2001) evaluated a positive aspect of selective exposure, which pushes back the increasing political apathy and indifference brought about by oversupplying peripheral information. To the contrary, it has the possibility of transmitting campaign information directly to electorates and enhances their involvement in politics.

Finally, this study contains some methodological limitations. First, because the number of homogeneous/heterogeneous arguments is operationalized by the combinations of peoples' attitudes and exposure to arguments, these attitudes and the exposure to arguments are not clearly differentiated analytically. This makes it difficult to make a causal inference between the attitudes and exposure to arguments. In other words, this study is unable to clarify whether peoples' prior attitudes causally facilitate the exposure to homogeneous arguments or if these attitudes are causally constituted through the preceding exposure to specific arguments.

This study focused on the effect of Internet use as a source of information and the scales were constructed in order to tap that effect using more parsimonious models. In future researches, more exogenous variables should be used to measure the prior attitudes, as well as the models have to be elaborated upon by introducing interaction terms between the attitudes and the Internet use.

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- ² Furthermore, by a follow up survey conducted after the post-survey, unreliable cases, which included for example the cases that had the possibility that other people than the target person might have answered, were eliminated. As a result, 1499 cases in the 8th wave and 1494 cases in the 9th wave were fixed as valid samples for the analyses.
- ³ The reason why the number of negative arguments that were not selected by respondents is not summed up is that the non-selection includes the possibility of DK/NA and non-attitudes on the arguments.
- ⁴ It should be noted that this scaling strategy makes it unable to evaluate the reliability of scales directly from the data, because different measurements are put together to construct a single scale; i.e. the number of positive arguments for those who are pro-postal reform, and the number of negative arguments for those who are against-postal reform. Although it is possible to estimate the model by assuming the scale as a count measurement, one conceptual construct is assumed here that represents the exposure to homogeneous arguments, and the agreement or disagreement of each argument is regarded as a measurement indicator of that conceptual construct. Therefore, rather than considering the measurement a counting of the number of events, it is more appropriate to evaluate its internal validity from the viewpoint that the correlations among the measurement indicators of one conceptual construct should be high. In this sense, the reliability of the scales cannot be directly evaluated and that is one of the limitations of this study. However, the Kuder-Richardson reliability coefficient (KR20), calculated from the whole sample, is 0.56 for positive arguments and 0.65 for negative arguments, which underpins the internal validity of each measurement to a certain extent. Furthermore, the correlation between the number of positive and negative arguments is $-0.22(p<0.001)$, which confirms the validity, which endorses the fact that these scales measure the pro-con standpoints on postal reform. Therefore, based on this supporting information, it was judged valid to construct a single scale of the number of homogeneous arguments by combining the number of positive arguments of those who are pro-postal reform and the number of negative arguments of those who are against-postal reform.
- ⁵ Due to the fact that the number of heterogeneous arguments on postal reform is recoded as a dichotomous variable, the bi-serial correlation was calculated between the number of heterogeneous arguments and the total number of arguments, and between the number of heterogeneous arguments and homogeneous arguments, to calculate the partial correlation coefficient.

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- ⁶ http://www.pewinternet.org/PPF/r/141/report_display.asp
Refer to Horrigan, Garrett, & Resnick (2004) for the report of this survey.
- ⁷ Besides the Hypothesis 3 analysis, I conducted analyses that duplicate the model of Hypothesis 1, 1-1, and RQ2 using the data from the 2004 presidential election (Tables not shown). The results were completely consistent with those in study 1. Web-browsing for political information significantly affected only the homogeneous arguments. That is, while web-browsing for political information has a facilitating effect on the exposure to arguments that are consistent with one's attitudes toward the candidates in a presidential election, it does not have any direct effect on the heterogeneous arguments, which is consistent with Hypothesis 1 and RQ 2. Furthermore, web-browsing for political information facilitates the selective exposure to homogeneous arguments only among those who are highly interested in the issue, which is consistent with Hypothesis 1-1. These results endorse the validity and robustness of the findings of study 1, because it is consistent across the data that were collected under different political cultures.
- ⁸ It is possible to regard the perceived issue importance among each issue as a binary variable, because it takes only two values; "Very important" and "Somewhat important". Proportion tests conducted between every pair of issues showed significant differences in proportions in all the combinations; the Iraq war and gay marriage ($z = -8.61^{**}$), free trade and gay marriage ($z = -11.20^{**}$), and the Iraq war and free trade ($z = -2.79^{**}$).
- ⁹ Among the pro-Iraq war respondents, the reliability coefficient of a scale (the number of homogeneous arguments) composed of agreed pro-Iraq war arguments and disagreed against-Iraq war arguments is 0.56, and that of a scale (the number of heterogeneous arguments) composed of agreed against-Iraq war arguments and disagreed pro-Iraq war arguments is 0.35. On the other hand, among the against-Iraq war respondents, the reliability coefficient of a scale (the number of homogeneous arguments) composed of disagreed pro-Iraq war arguments and agreed against-Iraq war arguments is 0.58, and that of a scale (the number of heterogeneous arguments) composed of agreed pro-Iraq war arguments and disagreed against-Iraq war arguments is 0.16.
- ¹⁰ Among the pro-gay marriage respondents, the reliability coefficient of a scale (the number of homogeneous arguments) composed of agreed pro-gay marriage arguments and disagreed against-gay marriage arguments is 0.60, and that of a scale (the number of heterogeneous arguments) composed of agreed against-gay marriage arguments and disagreed pro-gay marriage arguments is 0.34. On the other hand, among against-gay marriage respondents, the reliability coefficient of a scale (the number of homogeneous arguments) composed of disagreed pro-gay marriage arguments and agreed against-gay marriage arguments is 0.55, and that of a scale (the number of heterogeneous arguments) composed of agreed pro-gay marriage arguments and disagreed against-gay marriage arguments is 0.27.
- ¹¹ Among the pro-free trade respondents, the reliability coefficient of a scale (the number of homogeneous arguments) composed of agreed pro-free trade arguments and disagreed against-free trade arguments is 0.63, and that of a scale (the number of heterogeneous arguments) composed of agreed against-free trade arguments and

disagreed pro-free trade arguments is 0.25. On the other hand, among the against-free trade respondents, the reliability coefficient of a scale (the number of homogeneous arguments) composed of disagreed pro-free trade arguments and agreed against-free trade arguments is 0.48, and that of a scale (the number of heterogeneous arguments) composed of agreed pro-free trade arguments and disagreed against-free trade arguments is 0.23.

- ^{1 2} I cannot use a variable of political knowledge, because any corresponding variable is not included in the data. However, when considering the null effect of political knowledge on the number of arguments (see Table 1 & 2), it does not seem to invoke serious analytical problems.
- ^{1 3} Choices are TV, newspaper, radio, the Internet and e-mail, magazines, and others.
- ^{1 4} Strictly speaking, it is undesirable to measure “the Internet and e-mail”, which includes e-mailing for personal communication, because I only focused on web-browsing for political information. However, the proportion of e-mailing for personal communication, such as the exchange of evaluative opinions or mobilization for voting, can be assumed to be small, because in the leading sentence, the context of the question is restricted to, “Where have you gotten MOST of your news and information about the presidential election campaigns? (underline added)”, and thus an emphasis is on the aspect of information exposure for the Internet use, not on the personally communicative aspect.
- ^{1 5} The summed-up scale was broken down because the scale reliability was low ($\alpha=0.31$). After being broken down, the numbers of respondents in each category were high (19.7%), middle (53.1%), and low (27.3%).
- ^{1 6} This does not exclude the possibility that selective exposure occurs among the respondents who have a high personal relevance to gay marriage. From the findings of this study, it is plausible that selective exposure takes place during web-browsing for information on issues, which are perceived as highly personally relevant even if the aggregated level of perceived importance is low. It should be noted that the difference of perceived importance between the issues in study 2 lies at the aggregated level, not at the individual level.