

Equity in Voting Accessibility: The Case of North Carolina

Yi-En Tso^{1#}, Dohyeong Kim², Chang Kil Lee³⁺

¹ Department of Public Administration, Soochow University, 70 Linshi Rd, Taipei City 111, Taiwan

² School of Economic, Political and Policy Sciences, The University of Texas at Dallas, 800 W Campbell Rd, Richardson, TX 75080, United States

³ Department of Urban Policy and Administration, Incheon National University, 119 Academy-ro, Yeonsu-gu, Incheon 22012, Korea

Abstract

Limited political participation in certain groups or areas could potentially lead to social and economic crisis. This paper examined whether or not voting accessibility have been equally distributed to different groups of citizens by race, gender, economic status, and distance to voting sites, focusing on the case of North Carolina in the United States. In particular, we discovered who were more likely to vote early as an absentee vote including Sunday and what factors affected their voting behaviors. We used the 2012 U.S. Presidential election data to examine socioeconomic characteristics of those who voted early and on Sunday. The findings from this research could be used as guidance to policy-makers and law-makers on how to enhance the level of equity in voting accessibility and reduce potential conflict and crisis within a society, not only in the U.S but also in other countries.

Key words: voting, equity, accessibility, social crisis

1. Introduction

Analyzing the voting behavior and the factors affecting the voting turnout has always been a hot issue in research field. From the institutional view, the design of voting mechanism may act as a critical role in affecting the voters' willingness to vote hence the turnout would be influenced as well. Among all the institutional design which may have impacts on voting turnout, issues regarding voter accessibility, in other words, the discussion about

how the voters vote on the Election Day or other days(as the absentee vote or the early vote) has gained increasing concerns of scholars nowadays.

The right to vote is constitutionally protected and is considered one of the "basic civil rights of man," one that grounds and preserves other fundamental rights (Blumenthal & Turnipseed, 2011). There are many factors that may affect citizens' voting behavior. For example, different arrangements of the voting may have impacts on voters' perception on certain policy issues

The 1st author: Yi-En Tso, Tel. +886-2-28819471, e-mail, yetso@scu.edu.tw

+ Corresponding author: Chang Kil Lee, Tel. +82-32-835-8739, e-mail, changkillee@inu.ac.kr

addressed in an election. Furthermore, the extent of voting, the so-called “voter accessibility” may affect the willingness to vote. The extent of accessibility to vote will determine the voters’ decision of voting. Such accessibility includes time, geographic, information, ballot design, and so on. Having a comparatively high accessibility may help to enhance the percentage of voting because the voters will have comparatively low barriers or costs to vote. For protecting the basic civil right to vote, policies and government actions are implemented in order to enhance the voter accessibility such as using facilities which help disabled voters to vote, or adopting the absentee vote to help citizens who may not vote on the Election Day.

Several researches dealing with topics about the possible impacts on the election results use the concept of voter accessibility. Different types of voting accessibility are the main themes in relating researches. Changes in time accessibility such as the changes in the day of week or time of year of the election and the length of time the polls remain open. The time issues are populous in accessibility researches. The distance from home or workplace to polling stations and the facilities within the polling stations (whether or not having disabled voting assistance facilities) are main issues relating to geographic accessibility (Haspel & Knotts, 2005). The information accessibility which refers to the easiness of getting necessary information about the vote (candidates, policies, date and time, location of polling station, voting assistances, and so on) are among the institutional factors that can affect the citizens’ likelihood of voting. Besides, the design of the ballot also has an impact on the voting turnout. Haspel &

Knotts(2005) argue that “The butterfly ballot used in the 2000 presidential election in the US may tell us how unequal access to modern voting equipment and purged voter lists prevented many citizens, particularly minorities, from voting.” Both the information accessibility and the design of ballot need to have more researches on such issues and they fall outside of the target of this research.

Based on the research findings above, this study focuses on who are the voters choose to vote early. The relationship between voting accessibility and several social factors is analyzed as well. In other words, this paper examines whether voting accessibility have been equally distributed to different groups of citizens by race, gender, party affiliation, and so on to see how such distribution has impacts on voters’ behavior. The 2012 U.S. Presidential election data from the State of North Carolina is used to see who are more likely to vote early and what and how the social and geographical factors affect their voting behaviors. As one of the “swing states” in the political election history in the U.S., the findings from this study can be used as guidance to policy-makers and law-makers not only in the U.S. but also in other countries such as Korea on how to enhance the level of spatial and temporal equality in voting accessibility when designing the voting locations and schedule, which could reduce potential conflict and crisis within a society.

II. Literature review

Among all the possible factors that may have significant impacts on voting behavior, three main groups of factors, the geographical, time issues, and institutional design are discussed frequently.

Some scholars argue how the geographical arrangement (such as the location of voting stations) which determines the voter accessibility will have an impact on the voting behavior and the election results (Rutchick, 2010). Recent researches also find out some personal or socioeconomic characteristics such as age (Stein, 1998; Miller, 2015), gender(Stein, 1998), education(Monroe & Sylvester, 2011; Miller, 2015), race(Stein, 1998; Monroe & Sylvester, 2011), and income(Stein, 1998; Monroe & Sylvester, 2011; Miller, 2015) may have significant impacts on voters' willingness to vote early.

The environmental surroundings of voting station may also have impacts on voting behavior. The so-called "Polling Place Priming" Effect (PPP Effect) analyzed by Blumenthal & Turnipseed(2011) which indicates that such effect leads to a systematic, non-random bias in individuals' decision-making in voting behavior. For example, in Arizona's 2000 general election, people who voted in a school tended to support the state sales tax raising policy for increasing school funding, compare with voted in other places(Blumenthal & Turnipseed, 2011). Besides, the relatively conservative Republican who challenged a Democratic incumbent in the 2004 general election in South Carolina, received more votes when citizens voted in churches relative to when they voted in secular locations (Rutchick, 2010; Blumenthal & Turnipseed, 2011).

However, such researches do not make a clear point about whether the PPP Effect has different impacts on different groups of people. For example, Rutchick finds out that the priming effect has more impacts on the Christian than the non-Christian voters, however, Berger *et. al.* find out that such

effect both affect parent and non-parent voters' attitude toward tax raising issue as well(Rutchick, 2010). From an economic view, scholars argue that voters will come to vote when the perceived benefits are higher than the anticipated costs of voting (Haspel & Knotts, 2005). The distance of voting (from voter's home to the polling station) will determine the anticipated cost of voting for the voter. The change of the location of polling station may have a significant impact on the voter's willingness to vote(Haspel & Knotts, 2005).

Brady & McNulty's(2011) research in the Los Angeles County during California's 2003 gubernatorial recall election also supports the Haspel and Knott's finding. People choose whether or how to vote based on their perception of the possible voting cost. Changing polling places in Los Angeles County in its 2003 general election reduced turnout by a substantial 1.85% among those who had their polling places changed and the absentee voting has increased by 1.18% (Brady & McNulty, 2011). In this election, the geographical change interacts with political impacts on the turnout. A partisan effect on the election occurred that a constant reduction in vote affects more Democrats than Republicans because Los Angeles has more Democratic than Republican registrants: Democrats reduce their voting by 2.11%,and the Republicans reduce their voting by only 1.61% (Brady & McNulty, 2011).

Some scholarships focus on the timing of election. The timing issues in voter accessibility are about how the change on the date of Election Day or time to vote will affect the turnout. In order to improve the voter turnout, it is necessary to remove as many of the artificial barriers to voting as possible. The tradition of voting on Tuesdays

was initially implemented in the 18th century, when most of America was an agrarian society. Voting on Tuesday helped people to avoid travel on the Sabbath(Sundays) and landowners would typically travel to town from their farmsteads to conduct business starting on Mondays, which left Tuesday as the easiest day to cast a ballot(Promote Our Vote 2013). However, such tradition has created a barrier to vote nowadays. People who need to work on Tuesdays may not easy to vote in their work time or even in their lunch time at noon because many people who work far from their home or they may not have enough travel time from their working place to the voting location. Thus, to change the election date from Tuesday to weekend is used as a tool to enhance the election turnout.

It is believed that having more voting hours on the Election Day will affect the voting turnout(Blasi & Loewen, 2007). The conflicting working or living schedule is one of the main reasons why people do not vote. Thus, it is reasonable that with more voting hours, voters will have more opportunities to arrange their working or living schedule and have more opportunities to vote. However, some scholars challenge this assumption(Blasi & Loewen, 2007; Dropp, 2012) reduction of polling place hours has no influence on voter turnout. Nearly one sixth of Americans can vote only between 7 to 10 am, if the voting time is delayed after 10 am, the voters' turnout will be reduced(Dropp, 2012).

The extended voting hours is not the only way to enhance the voting turnout, to increase the voting dates has been adopted as another method which may have impacts on the voting behavior. With the use of "early voting," voters may have more choices on their voting date and means of voting.

For example, the absentee voting helps voters to vote in advance by mail or walking through the voting stations (the so-called "one-stop" early voting) so they do not have to vote on the Election Day. However, early voting may only facilitate voters who have higher willingness to vote or already decided to vote(Stein, 1998; Burden, *et. al.*, 2014). Besides, the early voting will reduce the total voting turnout. Comparing with some scholars' argument that early voting will encourage more participation thus increase the turnout, Burden, *et. al.*(2014)'s research result shows that it is the Election Day Registration (EDR) increase the voters' turnout, not the early voting. Early voting only encourages voters who already have decided to vote or who are mobilized by political parties. It does not attract voters who were not interested in joining the vote as much as others.

Why people choose to vote early? After analyzing five election results in 42 states, Karp & Banducci (2001) find out that the early voters tend to have some characteristics. Voters with a higher degree of education, elder, with disability, student, and already decide to vote tend to use absentee voting. However, Karp and Banducci's findings are different from Burden, *et. al.*(2014)'s arguments that party mobilization does not have a significant impact on absentee voting. Karp & Banducci(2001) find that Republicans are more likely to vote early than Democrats, suggesting a partisan element to early voting. Such findings are challenged by Blasi & Loewen(2007): the early voting will advance parties which have more ability to mobilize more voters. That is because people who are more interested in politics, have a stronger party identity, and have more linkages with political

parties tend to use early vote more often than others. Not just because they are affiliated with certain parties. The voters' personal party identification may have impacts on their willingness to vote. For example, the partisan effect may affect voter's willingness in early voting: people who have a strong party identification may tend to vote early (Stein, 1998; Karp & Banducci 2001; Miller, 2015). Voters who have a higher inclination to vote may have a higher possibility to use early voting as well (Monroe & Sylvester, 2011; Arceneaux, *et al.*, 2012).

Comparing the changing rates of early voting in US states, more states have a decreased rates of early voting from 2004 to 2006 (Gronke, *et al.*, 2003). In the Florida Senate's interim report written in 2008 and 2010, the early voting is viewed as having no impact on election turnout in 2004 and 2006 general elections. However, the Florida report also finds that slightly more Democrats use early voting but more Republicans use absentee voting (The Florida Senate, 2010). The institutional design may affect the impacts of early voting on voting turnout as well. For example, in State of Minnesota, the low impacts of early voting on turnout are resulted from the state voting regulations. Minnesota government requires the absentee voters offer an excuse to join in the absentee vote. Such mechanism reduces voters' willingness to choose absentee voting. Thus, we may need to care about the different geographic, social, and institutional settings in analyzing the possible impact on turnout of different voting mechanisms. In some states, Sunday voting has been included in the elections. Voters could vote on Sundays instead of rearranging their schedule

in their workdays. Some opponents argue that Sundays should be out of politics for a religious reason, however, there are also some people criticize that some politicians try to ban Sunday voting due to political interests. Banning on Sunday voting is believed to affect African-American's voting turnouts more than other ethnic groups in the US (Leslie, 2011; Roth, 2014).

Based on the research findings above, the possible impact of extending voting hours varies. Although most of voters tend to vote on the traditional Election Day, nonetheless, adopting extending voting hours as a method to enhance voting accessibility will give people who may not vote on the Election Day more opportunities to participate in politics through voting. But there is still a need for more empirical researches to examine the extending voting hours' impacts on disparity (gender, education background, income, ethnic groups, etc.). The existing researches have different findings toward the possible impact of time issues such as changing voting hours on voting turnout. Comparing with these researches, different social characteristics (e.g. gender and party affiliation, etc.) will be introduced in this research to see whether such factors may have significant impacts on voting turnout or they mediate the relation in part or in full or point to alternative explanations. However, other institutional designs such as the requirements of using absentee or early voting (like the Minnesota case mentioned before) and environment of voting stations (such as the "PPP Effect") will not be our main consideration as factors in analyzing the relationship between voting hours and voting turnout.

III. Method

In this research, the State of North Carolina is used as the target. As one of the presidential swing states, there may have no party domination in the Presidential Election, thus we may hold the possible partisan effect on the election turnout in control.

The data is collected from five neighboring counties such as Anson, Cabarrus, Mecklenburg, Stanly and Union. The City of Charlotte, the biggest city in the State of North Carolina, is included in Mecklenburg County, while the other four counties are mostly rural. Although slightly more Caucasians live in rural counties, these five counties are treated as one regional entity in our study since they all share many common socio-demographic and environmental characteristics. There are 991,651 registered voters in our sample counties. See Figure 1 for locations of the sample counties and Table 1 for the descriptive information of the voting data

in those counties in North Carolina. Table 1 shows that the Mecklenburg County had a much lower voting rate(18%) than the other four states (65–72%), which corresponds to the natural voting trend that the rate of voting in urban areas tends to be lower than rural areas.

Considering vast amount of the original election data, we randomly select 500 voters who voted in 2012 Presidential Election from each of the five counties as the sample in order to obtain the statistical significance of the outcome(Kern, 1997). We did not use a proportional sampling by population size of each county as we treated all five counties as one region in our study and intended to ensure sufficient sample size for each county. The dataset, retrieved from the North Carolina State Board of Elections as a secondary data source, offers the voter registration information such as the address, race, gender and party affiliation. In North



Figure 1. Sample counties in north carolina

Table 1. Descriptive information of the 2012 election data in sample counties

County	Total Voters	Total Votes	Voting Rate	Number of Absentee Votes	Absentee Vote Rate	Number of One-stop Voters	Number of Mail-in Voters
Anson	17346	11327	0.65	6562	0.58	6311	251
Cabarrus	119319	84482	0.71	41898	0.50	36996	4902
Mecklenburg	678318	125243	0.18	83037	0.66	74446	8591
Stanly	40419	29005	0.72	16854	0.58	15826	1028
Union	136249	95757	0.70	60554	0.63	55252	5302

※ Source: The North Carolina State Election Board(2014)

Carolina, all the voters who choose to vote early are required to vote in the designated voting station (most of the voting sites locate in county election offices or other alternative places). Thus the voters have limited freedom to choose where to vote. Besides, voters may choose to vote by mailing their ballots to county election offices (the so-called “mail-in” early voting) after finishing the application to county election offices. Thus in North Carolina, voters may choose to vote early in the designated voting sites or to mail-in their votes. The voting method (using one-stop early voting or mail-in voting) is the dependent variable we used in this research to see who tends to vote early and how. The distance between voters’ home address and voting sites, and some social factors such as gender, race, and party affiliation are used as the independent variables. These individual level data come from the North Carolina’s voter registration data. Data will be analyzed by the Logistic regression model to testify whether and how institutional design and social characteristics affect the voters’ behavior in choosing the method to vote. The GIS data which comes from the calculation of travel distance between voters’ home address and voting sites is added into the regression model to examine whether or not such geographical factor will affect the voters’ willingness to vote early.

In conducting the GIS-based spatial analysis, we firstly reorganize all the voters in our sample counties as three groups: voters who use “one-stop” early voting, voters who use “mail-in” early voting to send their votes to county election office before the Election Day, and others. We only discuss voters who use one-stop or mail-in early voting in this research. Then we use geocoding technique to locate

these two groups of voters’ home address and their designated voting sites for their early voting in the 2012 Presidential Election. For counties that have multiple voting sites, we both use voters’ zipcode and GIS web service such as Google Map to find out where is the nearest voting site for each voter. Then we use Google Map to calculate the travel distance (the shortest path from voter’s home address to voting site) of each voters. Thus, we may have a closer look about whether the travel distance will affect the voters’ choices in selecting voting method. Finally, the results from statistical regression and spatial analysis help us to have a more comprehensive view toward how the geographical and social factors will affect the voters’ turnout in election.

The early voting rule in North Carolina requires voters who willing to vote early could stop by the “one-stop” voting station to request the ballot. After filling and returning the ballot in the station, the early voting is done. However, voters may apply for mailing their ballots to county election office without walk by the voting sites during the early voting hours. Thus, we hypothesize that people who have longer travel distance from their home to voting stations will have a higher possibility to use the mail-in than the one-stop as their method to vote early. Such hypothesis is based on the argument that the mail-in early voting will make more flexibility in time scheduling to vote. Voters who have to spend more time in traveling to vote will have a higher incentive to use mail-in early voting because it helps to reduce their costs of voting than other methods (vote on Election Day or use one-stop voting).

H1: People who have longer travel distance to vote, the willingness to vote via mail will be enhanced.

Based on the hypothesis that the travel distance may have impacts on voters' behavior, we also would like to analyze whether the number of voting stations will have an impact on the decision of choosing early voting method. We hypothesize that in counties where have more early voting stations, voters may have a higher possibility to use one-stop early voting than in counties where have less voting stations.

H2: People who live in counties where have more voting stations will have higher possibilities to use one-stop early voting than in counties where have less voting stations.

Furthermore, this research try to find out whether or not there is a partisan effect on the selection of early voting methods. We hypothesize that there is a partisan effect on early voting. People who support particular political parties will tend to join or not to join in early voting.

H3: Voters who identified themselves as Democrats will tend to have more willingness to vote early.

Furthermore, this research would like to examine how the social characteristics will have significant impacts on voters' willingness to vote early and how such phenomenon will affect the voting turnout and election result. In recent studies, social characteristics such as race(Monroe & Sylvester, 2011) and gender (Stein, 1998; Miller, 2015) are pointed out as possibly having impacts on voters' willingness to vote early.

H4: Caucasian voters have a significant impact on the willingness to vote early.

H5: Voter's gender has a significant impact on the willingness to vote early.

It is worth to notice that in the existing research, the location of voting station as a critical geographical factor has been analyzed. Nonetheless, the location of voters' home has not been widely used in relating researches. Not only the travel distance, but also the location of both voters and voting stations need to be considered to enhance the existing researches. In this research, we would like to see the urbanization's impact on voting turnout and whether it may affect the relationship between voting hours and voting turnout. Thus, we hypothesize that voters who live in urban areas tend to use early voting because it facilitates their use of time schedule in working and living schedule, especially for workers who have to vote in their break time. Comparing with rural area, more working classes live in urban area. The population of urban areas tend to be higher than that in rural areas. With a higher number of population, the number of voting stations is higher as well. So the voting turnout in urban area which has introduced early voting will be higher than in other areas.

H6: Voters who live in urban areas tend to have more willingness to use early voting.

Still, we would like to test another institutional design's possible impact on absentee vote. Based on the research findings about the extended voting hours' impact on voting turnout (Blais & Loewen, 2007; Burden, *et. al.*, 2014), we hypothesize that having Sunday voting will enhance voters' willingness to use one-stop voting for having more flexibility and opportunities to vote at the designated one-stop voting sites.

H7: Voters who have Sunday voting will use one-stop early voting.

In order to testify these hypotheses, the method of absentee voting(1 for using one-stop early voting; 0 for using mail-in early voting) is used as the dependent variable. Several dummy variables are used as independent variables to testify the relationship between different types of early voting, voters' social characteristics and institutional design. The gender(1 for male; 0 for female), race(1 for Caucasian; 0 for others), party(1 for Democrats; 0 for others), urbanization(1 for living in urban counties;0 for others) and Sunday voting(1 for having Sunday voting; 0 for others) are the social and institutional factors used in this study. We only use a binary dummy variable to differentiate Caucasian and non-Caucasian voters in State of North Carolina because the number of Hispanic voters who voted in the 2012 Presidential Election is missed in our dataset offered by NC State Board of Elections. The number of voting sites(in county where the voter lives) is used as another independent variables to reflect the possible impact of institutional designs. The distance variable(the distance from voter's home address to the designated

voting site)is used to testify the possible impact of travel distance on the selection of early voting method. The number of voting sites in sample counties is used to analyze whether the enhancement of voting convenience may have impacts on voting behavior.

IV. Results

After collecting data from five counties in State of North Carolina, we testified our hypotheses with Logistic regression. We ran models for all counties as a whole rather than separately for each county as we were interested in the effects of the independent variables in the entire region. However, the "Urbanization" variable indicates indirectly how the voting behaviors are different between the Mecklenburg County and the others. <Table 2> represents the regression results. We may find that the distance variable has a significant negative impact on the selection of early voting method. Voters who have more travel distance from their home address to designated voting sites may have a higher possibility to use mail-in, instead of

Table 2. Logistic regression results

Independent variables	Coefficient	Z value
Male	0.559**	2.28
Caucasian	-0.924**	-2.34
Democrat	0.652**	2.06
Distance	-0.171***	-5.16
Urbanization	-0.768*	-1.94
# of voting sites	-0.0203	-0.71
Sunday Voting	-0.180	-0.50
Constant	4.626***	8.84

$N = 2500$

$LR\chi^2(7) = 69.31$

$Prob\chi^2 = 0.0000$

Pseudo $R^2 = 0.1075$

* $p < .1$, ** $p < 0.05$, *** $p < 0.01$

※ Source: NC State Election Board(2014).

*Significant at $p < .10$, **Significant at $p < .05$, ***Significant at $p < .01$.

one-stop, as their absentee voting method. It supports the hypothesis that people who have to spend more time (in traveling) to vote will have a higher incentive to use mail-in early voting to help them save more time. Thus, the time issue is more important than others in their decision making about choosing voting method.

The enhancement of voting convenience(having more voting sites) may not have a significant impact on the selection of early voting method as well. Having more voting sites may not have a significant impact on voters' decision in choosing early voting method. The distribution of voting sites is mainly decided by the population of the election precinct. Counties have more population will have more voting sites. If the number of voting sites in a given area is decided based on certain criteria(e.g. a mathematical formula based on the population), such institutional design's possible impact on the voters' behavior will need more efforts to analyze.

In the model, both the gender and party affiliation variables have significant positive impacts on the selection of using one-stop early voting method. From the results, female or Democrat voters may have a higher possibility to use one-stop early voting than to use mail-in as their absentee voting method. This result supports the hypothesis that there is a partisan effect on voting behavior. However, this result also challenges Karp & Banducci(2001)'s finding that more Republicans than Democrats tend to vote early. Karp & Banducci collected data from 42 states in the US, this study only uses data from North Carolina in 2012 Presidential Election. Stein(1998) identifies there is a partisan effect among people who vote early, however, he did not find evidence

to identify the party identification's effect on early voters. Our research results may help to support the party identification's possible impacts on voters' choice of using early voting. We may need more samples from different election data in different states to have a more comprehensive understanding toward whether there is a partisan effect on voters' early voting behavior.

Both race and urbanization variables have significant negative impacts. In other words, the Caucasian or voters who live in urban counties may have a higher possibility to use mail-in than the one-stop as their absentee early voting method. In four of the sample counties, the number of Caucasian voters who voted in 2012 Presidential Election is higher than others. In one sample county(Anson), the number of African American voters who voted(3799) is higher than Caucasian voters(2200). Why Caucasian voters have a higher possibility to use mail-in than one-stop early voting may need more data to analyze. A possible explanation may exist in the travel distance. We do not analyze the average travel distance among different ethnic groups of voters in this study. In order to further our understanding toward the research results, we may need to take more actions to analyze the mutual relationship between our independent variables in the future studies. The hypothesis about the possible impact of urbanization is testified as well. There are two urban(Cabarrus and Mecklenburg) counties and three rural(Anson, Stanly and Union) counties in our sample. The urban counties have more registered voters who voted in the 2012 Presidential Election. But we use same sample size(500 voters) in all the five counties, thus the sample issue may not impact our

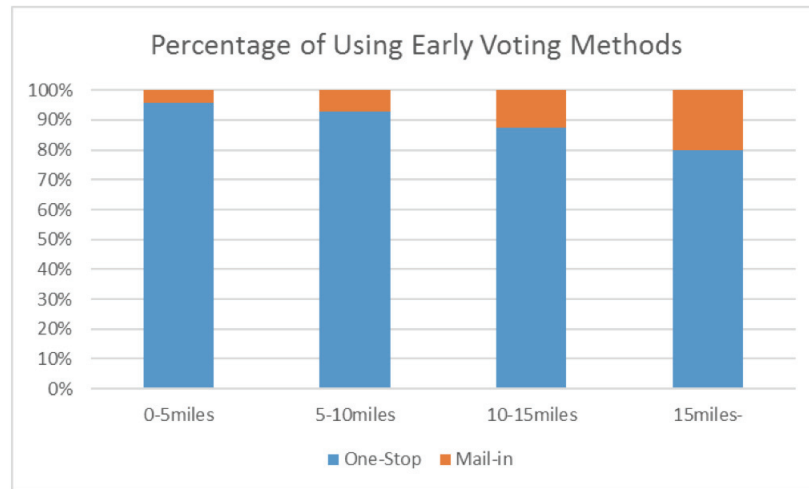


Figure 2. Percentage of using early voting methods

research result. One possible explanation about the urbanization's impact on early voting behavior relates to the working types. It is argued that more working class voters live in urban than the rural area. The working class voters may have to vote in their day-off or after duty time. In order not to disturb their working and family schedule, the working class voters thus have a higher incentive to use mail-in early voting to have less time consuming in voting.

In issuing the extended voting hours' possible impacts on the early voting behavior, we hypothesize that having Sunday voting will have a positive impact on using one-stop early voting method. However, this hypothesis is not supported by the regression result. A possible explanation is that the extended voting hours will lower the competition of election, the prospect of positive social interactions at the polls is decreased, thus the stimulation of political motivation will be reduced and voters will have fewer incentives to vote. Since early voting has more impacts on people who already decide to vote (Blais & Loewen 2007), if political parties or candidates cannot attract more

social concerns, less motivated voters will not vote in order to save more time to do other business. It is possible that having Sunday voting equals to extending voting hours. Besides, another possible explanation may come from a religious reason. People may prefer to use Sundays for attending Church service or other family activities. Having Sunday voting may not offer higher incentives for voters who already decide to vote on other days or to have other schedules on Sundays. The dataset used in this study does not have information about when the voters voted in the 2012 Presidential Election. We may need such information to analyze the relationship between the early voting behavior and different dates of voting. Based on the data and analysis results, we argue that having Sunday voting does not have a significant impact on voters' choice of early voting methods.

When we analyze the relationship between distance to voting sites and method of early voting, we find that with the increase of driving distance from home address to voting sites, the possibility of using mail-in early voting will be increased. From (Figure 2), only 4 percent of early voters who

live within 5 miles to voting sites use mail-in as their method of early voting, when the driving distance is increased to 10–15 miles, 12 percent of early voters mail their votes. When the driving distance is more than 15 miles, 20 percent of early voters choose to mail-in their votes instead to vote at the designated one-stop voting site.

V. Discussion

From our analysis above, several of our hypotheses are testified. H1(distance to voting site), H3(political affiliation), H4(race), and H5 (gender) are found to be strongly associated with early voting behavior, while H2(number of voting sites within a voting district) and H7(voting on Sunday) have insignificant effects. In particular, from <Table 2>, a larger travel distance to voting site has a negative impact on using one-stop early vote. However, having Sunday voting does not have a significant impact on the selection of early voting method. The social factors such as gender, race and party affiliation has a significant impact on absentee voters. But how such factors impact the absentee voters' decision on the selection of voting method still need to be found out. Some theories are challenged in this research. The introduction of Sunday voting does not have significant impacts on absentee voters' selection in voting method. From our analysis results, we cannot assert which factor, timing or distance issue, has more power in affecting North Carolina voters' decision making in choosing what type of early voting in 2012 Presidential Election. So it is necessary to increase the sample size to enhance the reliability of the analysis results.

In order to have a more comprehensive look to

the research questions and try to find answers to why we have some vague findings above, we may take the following steps in the future research to increase the quality of research findings. First, we need to increase the sample size, especially for the GIS spatial analysis. Due to limited time, only five counties are sampled in the analysis, it is necessary to include more county data to enhance both reliability and validity in future research. We anticipate with a larger sample size, the goodness of fit of the spatial analysis results will be enhanced.

From this research, we not only have a closer look at how different institutional design, social and geographic factors affect the voting behavior, but also testify and challenge the existing theories of such issue. The different research findings do not pose a threat to the quality of research. Instead, these findings may represent the complex nature in explaining and predicting human behavior in the research field. They also make valuable suggestions for policy makers in designing the better voting institutions that may reduce the barriers of voters to exercise their political rights thus the quality of democracy could be enhanced as well.

We expect this study will provide a valuable insight to policymakers and lawmakers in South Korea since disparity in voting accessibility has been also a concern, particularly pertaining to electronic voting(Choi, 2006). The rapidly changing voting policies and mechanisms in Korea could affect some groups' voting willingness or behaviors either positively or negatively and its political outcomes could eventually generate certain level of social disparity and crisis across different regions or social classes. For instance, policymakers

in South Korea should be more cautious in adopting technology-based voting system and process as they may hamper voting rights significantly among certain groups including the elderly and low-educated populations in rural areas. The theoretical extension about voting rights and accessibility offered by this research could provide some insights on the best alternative for election policy enhancing political equitability and reducing social crisis in South Korea.

Acknowledgement

This work was supported by Incheon National University Research Grant in 2013.

References

- Arceneaux, Kevin, Thad Kousser, and Megan Mullin. 2012. Get Out the Vote-by-Mail? A Randomized Field Experiment Testing the Effect of Mobilization in Traditional and Vote-by-Mail Precincts. *Political Research Quarterly*. 65(4): 882-894.
- Blais, Andre, Agnieszka Dobrzynska, and Peter Loewen. 2007. *Potential Impacts of Extended Advance Voting on Voter Turnout*. Working Paper.
- Blumenthal, Jeremy and Terry Turnipseed. 2011. Is Voting in Churches(or anywhere else) Unconstitutional? The Polling Place Priming(PPP) Effect. *Boston University Law Review*. 91: 561-599.
- Brady, E. Henry and John E. McNulty. 2011. Turning Out to Vote: The Costs of Finding and Getting to the Polling Place. *American Political Science Review*. 105(1): 115-134.
- Burden, Barry C., David T. Canon, Kenneth R. Mayer, and Donald P. Moynihan. 2014. Election Laws, Mobilization, and Turnout: The Unanticipated Consequences of Election Reform. *American Journal of Political Science*. 58(1): 95-109.
- Choi, J. W.. 2006. Deliberative Democracy, Rational Participation and e-Voting in South Korea. *Asian Journal of Political Science*. 14(1):64-81.
- Dropp, Kyle A. 2012. *Polling Place Hours and Voter Turnout*. Working Paper.
- Gronke, Paul, Eva Galanes-Rosenbaum and Peter A. Miller.2003. Early Voting and Turnout. *Political Science and Politics*. 40(4): 639-645.
- Haspel, Moshe and H. Gibbs Knotts. 2005. Location, Location, Location: Precinct Placement and the Costs of Voting. *The Journal of Politics*. 67(2): 560-573.
- Karp, Jeffrey A. and Susan A. Banducci. 2001. Absentee Voting, Mobilization, and Participation. *American Politics Research*. 29(2): 183-195.
- Kern, Montague. 1997. Social Capital and Citizen Interpretation of Political Ads, News, and Web Site Information in the 1996 Presidential Election. *American Behavioral Scientist*. 40(8): 1238-1249.
- Miller, Peter. 2015. Who Votes Early? A Comparative Study of Convenience Voting in Four Countries. Paper presented in ECPR(The European Consortium for Political Research) General Conference. University of Montreal, Aug 26-29, Montreal, Canada.
- Monroe, Nathan W. and Dari E. Sylvester. 2011. Who Converts to Vote-By-Mail? Evidence from a Field Experiment. *Election Law Journal*. 10(1): 15-35.
- Rutchick, Abraham M. 2010. Deus Ex Machina: The Influence of Polling Place on Voting Behavior. *Political Psychology*. 31(2): 209-225.
- Stein, Robert. 1998. Introduction: Early Voting. *The Public Opinion Quarterly*. 62(1): 57-69.
- The Florida Senate. 2010. *The Effect of Early Voting on Voter Turnout in Florida Elections; 2010Update*. Interim Report of the Florida Senate.
- The North Carolina State Election Board. 2014. *Voter Registration Data*.
- Leslie, Laura. 2011. Why Ban Sunday Voting. WRAL.com: <http://www.wral.com/news/state/nccapitol/blogpost/9737378/>
- Promote Our Vote.com. 2013. Voter Access Policies. Promote Our Vote.com: <http://www.promoteourvote.com/voter-access>

s.html

o-early-voting-cuts

Roth, Zachary. 2014. Ohio Cuts Early Voting Method Favored
by Blacks. MSNBC.com: <http://www.msnbc.com/msnbc/ohi>

Received: Oct. 15, 2018 / Revised: Nov. 21, 2018 / Accepted: Nov. 26, 2018

Profiles **Yi-En Tso** : He received his B.A. and M.A from National Taiwan University and received Ph.D. from the University of Texas at Dallas in 2016. He is an assistant professor of political science at Soochow University(yetso@scu.edu.tw).

Dohyeong Kim : He received his B.A. and M.A from Yonsei University and received Ph.D. from the University of North Carolina at Chapel Hill in 2007. He is an associate professor of public policy and geospatial information sciences at the University of Texas at Dallas(dohyeong.kim@utdallas.edu).

Chang Kil Lee : He received his Ph.D. from Yonsei University. He is an associate professor in the Department of Urban Policy and Administration at the Incheon National University. His research focuses on several aspects of public administration, including public human resource management, strategic planning, policy evaluation, performance management, crisis management, and urban studies(changkillee@inu.ac.kr).