Behavioural, Management and Social Sciences, University of Twente, Enschede, the Netherlands

Institute of Political Sciences, Westfälische Wilhelms-Universität Münster, Germany

Governing in the Information Age:

Outcomes of E-services in the Netherlands and How They Affect the Citizen's Satisfaction and Traditional Forms of Participation

BACHELOR THESIS

Alyn Schymanietz

Joint Degree Program B. Sc.

European Public Administration, Public Governance across Borders

Supervisor: Prof. Dr. Bas Denters, Prof. Dr. Norbert Kersting

Bachelor Circle: Smart and Dumb Cities: Understanding the Adoption of E-democracy and E-governance

6/7/2017

Abstract

In recent years information technologies have gained importance in municipal administrations and local governments have made use of e-services to facilitate and ensure the communication and information exchange between institutions, politicians, citizens and firms and provide all sorts of services. This research paper will look at the outcomes of online services that are provided online by Dutch municipalities. How do they affect the satisfaction of citizens with local services and does this have an influence on the traditional forms of participation, in particular, voting. Additionally, the question will be answered whether participation is only determined by satisfaction or - as previous studies emphasize (Verba, Schlozman, Brady, 1995) - if certain individual resources are also relevant. All data was gathered from panel members of LISS and websites of Dutch municipalities. Data analysis is conducted through a statistical analysis using SPSS and a conclusion is drawn on the basis of the results of multivariate regression analyses. The findings show that the number of online services do not affect the satisfaction of citizens with local services nor the participation in a municipal election. Results also demonstrate that the higher the satisfaction of citizens with local services is, the more likely it is that a citizen will vote in a municipal election. Resources determine electoral participation. Both, education and political efficacy, have a statistically significant positive effect on the participation in a municipal election. While only political efficacy weakens the relationship between satisfaction and participation, education does not affect this relationship significantly.

Keywords: E-government, online services, satisfaction, local services, participation, voting, Dutch municipalities, Dutch citizens, individual resources, Multivariate Regression Analysis

Table of Contents

List of Tables

List of Figures

Introduction

Governments all over Europe have pushed for development in the provision of online services by governments, especially on a local level. The Netherlands, with the "National Action Program on Electronic Highways" initiated in 1994, was one of the first to launch an e-government initiative in Europe. The country takes up a "dominant international position […] in the area of ICT" (Rossum, Dreessen, 2007). Recently, the Dutch government stated their goals to improve online services in the "Programma Digitaal 2017". The aim is to make government more transparent, improve online service delivery and information exchange. Through the reduction of burdens, accountability and responsiveness, the satisfaction of citizens with these services should improve. (Dutch Ministry of Interior and Kingdom Relations and Economic Affairs) But the question that needs to be addressed is: Do online services really have a positive effect on satisfaction? And do changes in service satisfaction also lead to more support for local government in the form of for example, increased participation in municipal elections? These questions are very important.

"Politics without participation, (…) is self-contradictory and democracy without participation is absurd." (Parry, 1972) Political participation plays an important role for a democratic political system. One of many definitions of political participation is the one by Van Deth (2009) who states that it comprises all activities of citizens that aim at influencing the political decision-making process. This does, according to him, not only include voting, but also demonstrating, collecting signatures or for example boycotting products. The most applied, conventional form of public participation however is voting. Much research has been done to explain the participation of citizens in elections and other forms of political participation. Verba and Nie found out that citizens have to show certain skills and capabilities in order to participate. They call this the socioeconomic standard model. (Verba, & Nie 1972) In 1995, Verba, Schlozmann and Brady extended their earlier model. In addition to skills and capabilities, motivational factors such as engagement and recruitment are seen as determinants for political participation (Verba, Schlozmann, Brady, 1995). The focus of this research are the motivational factors, in particular satisfaction. Satisfaction and dissatisfaction are assumed to have an immense impact on participation behavior, expressed through voter turnout. If the investments of Dutch municipalities were successful in their aim to increase the number of online services in local administrations and thereby satisfaction with local services increased, then this might affect participation. The question is also whether the effect of satisfaction on participation is positive or negative. If factors mentioned above lead to higher voter turnout, investments in online services can promote legitimacy of local governments and democracy. This paper is scientifically relevant, because it fills a gap in the literature. There is an extensive literature on the factors that explain the adoption of innovations on e-services and e-democracy (Jho, Song, 2015; Wagner, Vogt, Kabst, 2016; Soma, Termeer, Opdam, 2016; Alathur, Ilavarasan, Gupta, 2016). Previous

studies have also looked into how paper-based public services influence the relationship between citizens and governments (Lips, 2007). But not many scholars have so far looked at the consequences of online presence of local administration. This paper contributes to the existing research by examining the influence of online presence of local administration on participation in municipal elections through the intervening variable "Satisfaction with Local Services". Findings of this study on e-government benefit science of today and help to improve policy implementations in the future.

Research Question

In the following chapter the research question is introduced. Our main research question reads as:

> Is there a causal relationship between municipal e-services and participation in local elections?

It is not sufficient to test the mere correlation between online presence of local municipalities and the electoral participation of citizens. This study aims at finding out via what causal mechanisms the introduction of municipal e-services might affect electoral participation. In order, it is important to include other variables. "Satisfaction with Local Services" is the intervening variable. Besides the motivational factor satisfaction as a determinant of participation, previous studies indicate that resource-based factors also need to be taken into consideration. Hence, the sub-questions of this research paper are:

1) To what extent does the number of online services provided by a municipality have an effect on citizens' satisfaction with local services?
2) To what extent does satisfaction with local services affect the likelihood of citizens' voting?
3) Is the possible relationship between satisfaction and voting affected by the resources of citizens?

The main research question is an explanatory research question. The independent variable is the "Number of Online Services" and the dependent variable is "Participation in a Municipal Election". Dutch municipalities are the primary unit of analysis and Dutch citizens the secondary unit of analysis. All sub-questions are explanatory research questions. In the first and second sub-question "Satisfaction with Local Services" is an intervening variable (defined as "the effect of one variable and a cause of another" by Dooley, 1995), that specifies the causal mechanism via which e-services affect voting. In the third sub-question suggested above, resources will consider the possibility of interactive causation (defined as "one variable that determines the effect of one variable on another" by Dooley, 1995). Resources are assumed to be a moderator variable, because as the study by Verba, Brady and Schlozman reveals, these are important determinants for participating in elections. The focus will be on the resources education and political efficacy. The explanation for the choice of the resource-based factor education that will be included in the analysis, is that regarding voting, it plays an important role. Other

resources, like money and time, are less important for explaining electoral participation. However, education is a determinant of voting, according to Verba, Schlozman and Brady (1995). The explanation for the choice of the determinant political efficacy that will be included in the analysis, is the extended view of Verba, Brady and Schlozman (1995) on determinants that serves as a theoretical basis of this paper. The concept of political efficacy will be discussed in detail later on.

Theoretical Background

In previous research on electronic administration, scholars write about e-government, e-governance, e-democracy. In order to be able to do research on online information services of municipalities it is important to know how the word is defined and where to allocate them. General definitions of these terms do not exist and different researchers work with different conceptualizations. There is a common agreement that e-government implies the use of information technology, in particular the Internet, to improve the access of government services to citizens, businesses and other agencies. (World Bank) This includes for example the provision of information by governments, making appointments online and being able to download application forms online. According to Keohane and Nye (2000), governance, besides formal institutions and processes, also includes informal ones such as private firms, associations, non-governmental organizations. With reference to this definition, e-governance implies managerial and administrative tasks using information and communication technologies in the public and also private sector. E-democracy is a further development and builds on e-governance. It includes electronic voting, online discussion and consulting and other forms of engaging in the decision-making process electronically. (Palvia) With the variable "Number of Online Services" this research paper will focus on the earlier stages of the development, namely e-government.

During the 1960s and '70s participation-centered democracy theories developed which proponents see democracy as a process and ask for participation of many citizens on many decisions. The focus is on the input side of the political process. The goal is to solve problems of political apathy and low percentages of participation. In order to solve these problems, it is important to understand why citizens do not participate. One explanatory approach is the Civic Voluntarism Model by Verba, Brady and Schlozman (1995). In the academic discourse there is consensus on the socioeconomic background, demographic factors, political efficacy, education and income being factors that determine political participation. One model that includes these factors and expands the model by further determinants such as mobilization is the one by Verba, Brady and Schlozman (1995). Its origin is the SES-Model by Verba and Nie according to which citizens with a high socioeconomic status are likelier to participate than those with a low socioeconomic status. This model has a high explanatory power, however theoretical ties were not explained. Theories on rational choice in contrast presented plausible theoretical explanation, but these were not valid in practice. Verba, Brady and Schlozman combine previous findings successfully (Verba, Brady, Schlozman, 1995). The authors state that main reasons for not participating are resources, engagement and recruitment ("they can't, don't want to, were not asked"). Resources refer to the social

status, education, income, family background and civic skills. Engagement describes the individuals believe in having the chance to make a difference in politics and by voting for a politician, giving consent and thereby expressing satisfaction. It includes the interest in politics, a feeling of political efficacy and commitment to a political party and their programs. (Schlozman, Verba, Brady, 1995) Recruitment stands for the mobilization factor that a person received a request by usually friends or relatives to participate. (Verba, Brady, Schlozman, 1995) In the later conceptualization by Verba, Brady and Schlozman the focus is on "recruitment (asking) of citizens through non-political institutions of adult life (workplace, voluntary associations and the church)". (Denters, Wouter, 2014) With reference to an elaboration of the recruitment factor by Klofstad, who presents that "laws that facilitate registration also facilitate recruitment" (Klofstad, 2016), also online services can be seen as an additional mobilizing factor of political participation. The first factor (resources) is capability-based and the last two (engagement and recruitment) are motivation-based. With reference to the feeling of political efficacy, it can be differentiated between internal efficacy, which is the "beliefs about one's own competence to understand, and to participate effectively, in politics" and external efficacy, which describes "beliefs about the responsiveness of governmental authorities and institutions to citizen demands" (Niemi, Craig, Mattei, 1991). As the definition indicates, internal efficacy is a resource and external efficacy can be allocated in the engagement of a citizen. When testing for the moderating effect of resources on the possible relationship between satisfaction and voting, the focus will be on internal efficacy as a resource. In addition, Verba, Brady and Schlozman make the argument that a lack of resources, such as internal efficacy, is an explanation for no participation. Also, Huth states that if an individual does not see the opportunity for changing the political system through personal effort, this results in a clear aversion from the entire political system, which is political apathy (Huth, 2004).

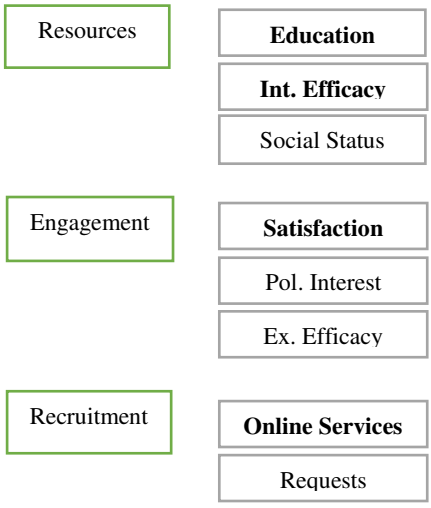


Figure 1: Determinants of participation on the basis of the Civic Voluntarism Model

As already touched upon in the introduction, participation is important for a democracy. We live in a world in which an increase of political apathy, dissatisfaction with participation tools and a decline in participation, measurable in low voter turnouts, is observable. (Kersting, 2015) To manage this participation crisis and in order to promote the survival of a democracy, local governments can implement reforms to improve responsiveness and delivery of public services (Kersting, 2009). The Dutch government has pushed for development in electronic government and digital progress and municipalities have invested in the provision of online services in order to ensure transparency, reduce burdens and be approachable in a simple and flexible matter to promote the satisfaction and trust of citizens with these

services and in their local government. In this study we will explore whether such efforts aimed at boosting citizens' satisfaction with services also have a potential for recruiting voters. Having in mind, what e-government is and what factors for not participating are, the relevant literature for the main question on a causal relationship between municipal e-services and participation in municipal elections, is outlined below.

Relevant for sub-question one, the following findings of previous research are presented. E-government gives citizens the opportunity to access government in a flexible, convenient way, and at any time. Through given information the transparency is increased and trust is created, according to research on electronic administration styles by Frias-Aceituno, Garcia-Sanchez, and Rodriguez-Dominguez. Not only European national governments have put e-government on the policy agenda, also the European Union focusses on improving e-government services from a citizen-centric or user-centric position, in contrast to the producers-centricity, which means that the aim is to improve the quality of life of citizens, downscale administrative burdens and especially "contribute towards citizens' trust in government and democracy" (Lips, 2007). A study by Mossberger and Tolbert (2006) revealed that if citizens make use of the local government's webpage, positive opinions towards the local government increase. This study will examine whether the number of online services provided by a municipal government lead to satisfaction with local services.

After having read about theoretical arguments for an influence of the independent variable on the intervening variable, in the following, the theoretical foundation for the second sub-question about the relationship between the intervening and dependent variable will be presented.

In the last decades the problem of lack of participation has evolved and terms like legitimacy crisis, trust crisis, cynicism, passivity and political frustration have been part of public and scientific debates. (Kersting, 2012) All terms are linked to political apathy, which describes the lack of interest in political activities. It is a behavior that can be clearly observed for example in the form of a declining number of members of political parties and low percentages of citizens that participated in an election. A low voter turnout is problematic, because it is a symbol for a decline in the legitimacy of a democracy. (Kersting, 2012) Scholars did research on reasons for political apathy and distinguish between negative and positive apathy. They found out that on the one hand citizens are apathetic due to a feeling of powerlessness, due to dissatisfaction and because they don't see an attractive reason to invest effort. The lack of interest in political activities due to negative feelings for the political system is termed as negative political apathy. Negative political apathy can take the form of not participating in elections. (Kersting, 2012) The hypothesis can be formulated that dissatisfaction with local services has a positive effect on not participating in a municipal election. Imaginable is also the situation in which citizens are dissatisfied and see a need for change. The consequence is that they do vote. It can be hypothesized that dissatisfaction with local services has a positive effect on participating in a municipal election.

On the other hand, a reason for citizens to be apathetic is contentment with politics. This type of political apathy is labeled as positive apathy. Citizens do not see a need for change, are satisfied and therefore see no need in participating. The consequence is that they do not vote. (Kushin, Yamamoto, 2013) In the latter case, political apathy is evidence for satisfaction. (Huth, 2004) With regard to sub-question two, there is theoretical plausibility that satisfaction with services has an effect on participation. The hypothesis is that satisfaction with services has a negative effect on participation in a municipal election. Further, there will be cases of citizens that are satisfied, but do go vote in municipal elections. Satisfaction is closely related to trust. Research by Keil and Gabriel (2013) reveals that people who trust politics are likelier to participate in elections than those who are citizens that do not trust in politics. The argument can be established that expressing support, trust and satisfaction takes the form of voting. Also Verba, Schlozman and Brady state that satisfaction can be seen as a mobilization factor: "A sense of satisfaction at having helped to make the community a better place to live do(es) […] well to explain participation" (1995). Then, the hypothesis is that satisfaction with services has a positive effect on participation in a municipal election.

We assume that online services in a municipality lead to satisfaction with local services. Therefore we need to test how the effect of satisfaction with services on the participation in municipal elections looks like: positive or negative? The last two hypotheses that are based on the concept of positive political apathy, will be tested.

Relevant for sub-question three is a reference to the Civic Voluntarism Model. Satisfaction with services is an important determinant that leads to political participation. Either the citizen is satisfied and wants to participate or the content of the webpage motivated him/her to engage in the decision-making process by voting. The question remains what role resource-based factors play. Verba, Schlozman and Brady (1995) assume that resources are fundamental determinants of participation and if a citizen does not have a distinct minimum of resources, other determinants such as satisfaction cannot develop their full effect on political participation. Even if a citizen is satisfied and has motivation to participate, are the preconditions for participating in municipal elections still the resources, skills and capabilities of a citizen such as education and political efficacy? Some scholars argue, education and knowledge on political issues, are associated with the feeling of low political efficacy, and are determinants for not participating (Kersting, 2013). Additionally, the argument is made, that higher education has lowered the identifiability with classical milieu structures and thereby weakened the determinant for participation. (Kersting, 2004) Others say, that education and the feeling of political efficacy are preconditions for participation. Keil and Gabriel (2013) state that "education level is the most powerful determinant of political participation levels". The more educated a person, the likelier it is that he/she participates through voting, in comparison to a person with a lower education level. Resources of a citizen will be one further variable. It can be hypothesized that resources of a citizen have a moderating effect on the relationship between satisfaction with services and participation in municipal elections.

The hypothesis that will be tested in this study have already been mentioned and touched on in the theory section above. Here you find the clear formulations of the hypothesis:

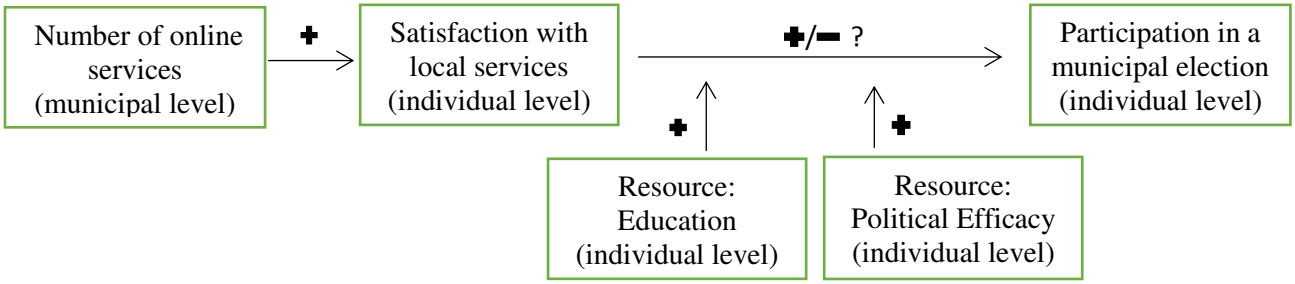
H1: The more online services are provided by a municipal government, the higher the satisfaction of citizens with local services.

H2+: The higher the satisfaction of citizens with local services, the more likely it is that a citizen will vote in a municipal election.

H2-: The higher the satisfaction of citizens with local services, the less likely it is that citizens will vote in a municipal election.

H3: The more resources a citizen has, the more likely it is that the effect of satisfaction with services on the participation of citizen municipal elections is strengthened in a positive direction.

Figure 2: Causal Model



Methodology

Research Design

To test the hypotheses a cross-sectional correlational research design is used, since the research employs quantitative measures, no manipulation and data on all variables is collected at one point in time.

Internal validity

It is important that the study is valid. Therefore, this paper aims at being as internally valid as possible. Internal validity describes "the truthfulness of the assertion that the observed effect is due to the independent variable in the study" (Dooley, 1995). There is a need for causal linkage between variables. Conditions that determine causality between variables are: an association, the appropriate time order and no influence of a third unseen factor. Possible threats to causality and with that to internal validity are time threats and spuriousness.

This study tries to rule out the threat of reverse causation and other time threats, by detecting the direction of the causal relation through measuring the variables at different times. The independent variable "Number of Online Services" refers to the present number of 2015 and data for the intervening, dependent and moderating variable were collected in March 2016. This research design with a measurement at delayed times allows to say that the presumed cause came before the presumed effect and with that the threat of reverse causation is ruled out. Additionally, in order to test for the effect of online services on satisfaction with local services, the citizen has to have had time to recognize and make use of these services. In addition, findings from theory reveal that there is no reverse causation between the independent and intervening variable ("Number of Online Services" and "Satisfaction with Local Services"): Citizens were not consulted and did not play a role in the implementation and reformation of e-government and online services. This process is rather driven by the supply-, not demand-side (Lips, 2007), which means that the possible satisfaction or dissatisfaction cannot have affected the implementation of e-services. The theory provided by Verba, Brady and Schlozman (1995) on satisfaction being one of the motivating factors for political engagement leads to the assumption, that there is no reverse causation between the intervening variable and dependent variable ("Satisfaction with Local Services" and "Participation in a Municipal Election").

To avoid that the observed association stems from a third variable, the assumed relationships between variables are likely according to the theory and literature review. The research design allows us to include additional variables such as the resources "Education" and "Political Efficacy", as well as the control variables "Age" and "Gender" in our analysis and with that reduces the threat of spuriousness.

To sum up, the conditions for causality are met.

External validity

External validity describes the "generalizability of the study's findings to other populations, places, or times" (Dooley, 1995). This study aims at being as externally valid as possible. Through a large sample of Dutch citizens and the large sample possible of Dutch municipalities, the observed participants and subjects are as representative as possible. However, it needs to be taken into consideration that the data for the intervening, dependent and moderating variable were retrieved from a sample of panel members. This specific sample might not represent the entire population, because it is already interested in social science or is motivated through the incentive of financial rewards. To rule out that only citizens with internet access can participate, a computer and Internet access is provided (https://www.lissdata.nl/lissdata/about-panel). In addition, a problem with working with data from a panel is that in the analysis it cannot be accounted for possible omitted variables and possible influences on the participants during the process of data collection that were not observed and noted. Further it is not possible to account for measurement errors, if responses are wrong due to memory errors, unclear statements and interviewer effect. Since all data was collected in the Netherlands, for further research it would be interesting to take a look at other populations to expand the generalizability to other countries.

Case selection and sampling

The primary unit of analysis for this research are Dutch municipalities and the secondary unit of analysis Dutch citizens. The independent variable "Number of Online Services" is measured on a municipal level. In order, to be able to generalize findings to all potential municipalities and give precise estimates, it is important that the sample is as large as possible. This is constituted by data collected from the consultancy firm "Deloitte" in research commissioned by the Dutch Home Ministry for all Dutch municipalities, which is used for this study.

The intervening variable "Satisfaction with Local Services", the dependent variable "Participation in a Municipal Election" and moderating variables "Education" and "Political Efficacy", as well as the control variables are measured on an individual level and consequentially the population here are Dutch citizens. The selected units within that setting are 3238 members of the "Longitudinal Internet Studies for the Social Science" panel, which consists of 4500 households, including 7000 individuals. All panel members are of an age of 18 years and older. The sampling technique is a true probability sample (https://www.lissdata.nl/lissdata/about-panel). The existing data by "CentERdata" serve its purposes to answer the research question of this paper, because it provides very current information of a large N-study and represent the population fairly.

Operationalization and data collection method

For this research quantitative variables and multiple regression analysis are used to test the causation of variables. For this research data were not collected, but existing data sets were used. The data will be described in the following:

For the independent variable "Number of Online Services", data from "Deloitte", a large consultancy firm within the frame of research commissioned by the Dutch Home Ministry, are used. This includes 31 citizen-oriented services (such as for example registry in place of residence, civic status, births and deaths; various local taxes, housing and building permits, social services). The information given is how many online services out of the 31 municipalities offer. The data refers to the online services that were present in 2015. (Deloitte, 2015)

For the intervening variable "Satisfaction with Local Services", the dependent variable "Participation in a Municipal Election", the moderating variables "Education" and "Political Efficacy" and the control variables, data gathered by "CentERdata", a research and data collection institute located in Tilburg, is used. Tom van der Meer and Henk van der Kolk were the investigator of the process of data collection. The specific method of data collection was a questionnaire on local elections. The type of measure is verbal and obtrusive, because a questionnaire is a written measure and the participants being measured were aware of it. (Dooley, 1995) The data were collected in March 2016.

"Satisfaction with Local Services" will be operationalized with the question "How satisfied are you in general with the services that your municipality offers?" The answer categories of this variable "v21"

range from zero (extremely dissatisfied) to ten (very satisfied). The type of item is a position between extremes. The variable "v2" ("Would you go vote if there were elections tomorrow?") will serve as a basis for the dependent variable "participation in municipal election". The answer categories for V2 range from 1 "for sure not" to 10 "for sure yes" and the question is hence a "position between extremes"-item. The moderating variables need to be operationalized as well. With reference to the meaning of this concept, given in the theory section, time, political efficacy, education, money and civic skills are resources that determine participation. In this analysis, education and political efficacy will be taken into consideration. The variable "oplzon_new" will be used to measure the education and "v24v11" to measure political efficacy. The former asks for the "highest education irrespective of completion of training" with answer categories that range from "primary school" to "university". The latter asks if the participant agrees with the statement "I am well placed to play an active role in politics". The answer categories range from 1 "strongly disagree" and 5 "strongly agree" or 6 "do not know". Additional factors to control for, are age and gender retrieved from data gathered by "CentERdata".

Data analysis

In the following section the data will be analyzed by examining the descriptive statistics of the data and the results of the regression analysis in order to answer the overall research question and the sub-questions. The sub-questions will be answered sequentially and all essential regression models will be taken into consideration.

Descriptive Statistics

Table 1: Descriptive statistics of variables used in this study (N municipal data=389, N individual level=2038)

	N	Range	Minimum	Maximum	Mean	Std. Dev.
Number of online services	389	61,00%	25,00%	86,00%	58,83%	10,38%
Satisfaction with local services	2038	9,00	1,00	10,00	6,64	1,38
Participation in municipal election	2038	10,00	0,00	10,00	7,61	2,94
Education	2038	5,00	1,00	6,00	4,10	1,45
Political Efficacy	2038	4,00	1,00	5,00	2,68	1,10

In Table 1 an overview of the all variables used in this study excluding the control variables, is presented including the respective range, minimum and maximum value, the mean and standard deviation. The valid number of cases for the individual level data is 2038 and for the municipal level data is 389 (table 1). For some variables, answer categories such as "I don't know" and "else" are labeled as missing and

are not included in the number of valid cases due to reasons of inutility for the analysis. Taking a look at the descriptive statistics of the independent variable "Number of Online Services", it is interesting to note that the smallest data value is 25%. This means that all Dutch municipalities offer at least 7 out of 31 possible online services. There is a wide range (61%) and the highest number of online services a municipality offers is 27 out of 31. This is remarkable, because no municipality offers all 31 possible online services. Taking a look at the frequencies, most municipalities provide the citizens with 64% of the 31 given online services. Regarding the satisfaction with local services, the minimum is 1 and maximum 10, which means that all answers were given by citizens. On a scale from 1 (extremely dissatisfied) to 10 (very satisfied) the average of citizens expressed positive feedback with reference to the satisfaction with local services (mean=6.64). What stands out is that only 11 individuals (which are 0.5%) said that they are very satisfied with local services (table 7). For the variable "Participation in a Municipal Election" when asked if a citizen would vote if there were elections tomorrow, all answer categories (ranging from 0='for sure not' to 10='for sure yes') were given, too. Taking a look at the frequencies of the variable "Participation in a Municipal Election", it is interesting that 5.6% said they would for sure not go vote if there were elections tomorrow (table 8). However, most people tent to go vote (mean=7.61). The standard deviation of participation expresses that the variance in the variable is relatively extensive (2.94/7.61), which could possibly have a larger effect on the dependent variable than variables with a rather limited variance. For the variable "Education" the range is 5, which means that all categories were chosen at least once. Even though a mean of 4.1 indicates that the average of highest education irrespective of completion of training is a dual or technical education, it can be deduced from the frequencies of the variable (table 9), that 47.7% visit the university of applied science or the university. Further, a mean of 2.68 for the variable "Political Efficacy" expresses, that average of citizens neither agrees nor disagrees when being asked if they are well placed to play an active role in politics. The frequencies give a more precise indication: 45.4% disagreed or strongly disagreed with this statement, while only 24.1% agree or strongly agree (table 10).

Regression Analysis

Linear regression has been chosen to calculate the correlations of the variables and to find out what significant predictors of the dependent variable are. The aim is to answer the three sub-questions by testing the four hypotheses.

In total, four regression models have been used in this study (table 6). The first model calculates the direct relationship of "Number of Online Services" provided by a municipality and "Education" on "Satisfaction with Local Services". The first model serves to answer the first sub-question on the extent to which number of online services provided by a municipality have an effect on citizens' satisfaction with local services? In the second model, in a first step "Number of Online Services", "Age", "Gender" and "Education" are tested with "Participation in a Municipal Election". In a second step, "Political efficacy" and "Satisfaction with Local Services" are added to the model as further independent variables.

This model two is the basis for answering sub-question two ("To what extent does satisfaction with services affect the likelihood of citizens' voting?"). Additionally, a third model takes a look at the effect of "Number of Online Services", "Age", "Gender" on "Participation in a Municipal Election" in a first step. In the second step of model three "Number of Online Services", "Satisfaction with Local Services", "Age", "Gender", "Education" and a moderator variable (centered product term of satisfaction and education) are included as independent variables and "Participation in a Municipal Election" as the dependent variable. The model four contains "Number of Online Services", "Satisfaction with Local Services", "Age", "Gender", "Political Efficacy" and a moderator variable (centered product term of satisfaction and political efficacy) as independent variables and "Participation in a Municipal Election" as the dependent variable. While in model three the moderating variable is "education" in model four it is "Political Efficacy" that moderates the relationship of the independent variables on participation. The last two models (model three and four) serve to answer the third sub-question on the possible relationship between satisfaction and voting, affected by the resources education and political efficacy of citizens.

Additionally, to answer the last sub-question, graphs, created with the program "SPSS" and "Interaction!" (Soper, 2006), illustrate the relationship between "Satisfaction with Local Services" and "Participation in a Municipal Election" through the moderators "Education" and "Political Efficacy".

The included variables "Age" and "Gender" are control variables in each model.

In order, to be able to analyze results of the regression correctly, a sensitivity analysis was conducted. Thereby the focus is laid on the change of coefficients between the models that include and exclude potential influential cases. Cook's distance is used as the measure of influence. In the analysis the coefficients including influential cases are presented, because changes were overall not substantial. Additionally, a check on multicollinearity in the regression models was done by taking into consideration whether the variance-inflation-factor is close to one, which indicates that there is no multicollinearity. This is the case in all regression models and consequentially the estimates of the regression are reliable. Further, it was tested whether the assumptions for linear regression are met. When the results of the regression analysis are interpreted, limitations need to be taken into consideration, because not all assumptions are met. (see appendix)

In the following section the overall research question will be answered, by answering the three sub-questions sequentially. On that account respective hypotheses will be affirmed or rejected through analysis of multivariate regressions.[1]

[1] For the regression analyses we have used OLS estimations. Strictly spoken the structure of the data would require the use of multilevel regression modelling, because the "online services" variable - as against the other variables - is not an individual level variable. Hence the OLS standard errors for the effect of this variable are underestimated (and the significance levels of its effect overestimated). But despite this overestimation the effect of online services in our analyses is still insignificant (here and in subsequent analyses). Also possible effects of clustering (on for example the assumption of non-correlated errors) are likely to be limited because the number of respondents per municipality in the sample is small.
Since the other variables are all measured at the individual level (with a much larger N), we therefore decided to use OLS regressions rather than the more complex multilevel regressions.

Model 1

Table 2: Model 1 Summary

	Unstandardized Coefficient B	Standardized Coefficient Beta	Sig.
(Constant)	5.888		.000
Number of Online Services	-.003	-.022	.320
Age	.010	.120	.000
Gender	-.061[b]	-.027[b]	.225[b]
Education	.146	.153	.000

a. Dependent variable: Satisfaction with local services
b. Selecting only cases for which Cook's Distance <.00197
c. Adjusted R^2: .028

The first hypothesis ("The more online services are provided by a municipal government, the higher the satisfaction of citizens with local services") cannot be affirmed by the results of the regression analysis of model 1, because there is no statistical significant positive relationship between "Number of Online Services" and "Satisfaction with Local Services" as expected.

It can be generally stated, that the number of online services that a municipality offers does not have a significant effect on the citizen's satisfaction with local services, to answer the first sub-question.

In addition, the results of the first model show a direct statistically significant positive effect of "Education" on "Satisfaction with Local Services". Further, the control variables "Age" and "Gender" were included in this model as independent variables to test their effect on "Satisfaction with Local Services". Both have a statistically significant effect. The unstandardized coefficient B expresses that for each additional year of age of an individual, the individual is 0.07 points more satisfied with local services if all other variables are held constant. To be aware of this relatively low impact: If a citizen matures 14 years, this would increase his or her satisfaction with local services by only 1 scale point. When excluding influential cases the presumed statistically significant negative effect of gender on satisfaction proofs to be not statistically significant (table 12).

Model 2

Table 3: Model 2 Summary

	Unstandardized Coefficient Step 1	Unstandardized Coefficient Step 2	Standardized Coefficient Step 1	Standardized Coefficient Step 2	Sig. Step 1	Sig. Step 2
Constant	3.590	.402			.000	.529
Number of Online Services	-.008[b]	-.009	-.026[b]	-.031	.225[b]	.127
Age	.053	.050	.302	.287	.000	.000
Gender	-.150	.034	-.026	.006	.232	.783
Education	.487	.352	.239	.173	.000	.000
Satisfaction with local services	-	.351	-	.165	-	.000
Political Efficacyc	-	.452	-	.168	-	.000

a. Dependent variable: Participation in a municipal election
b. Selecting only cases for which Cook's Distance <.00197
c. Adjusted R^2 Step 1: .099; Step 2: .151

The second hypothesis (H2+: "The higher the satisfaction of citizens with local services, the more likely it is that citizens will vote in a municipal election") can be affirmed and the third hypothesis (H2-: "The higher the satisfaction of citizens with online services, the less likely it is that citizens will vote in a municipal election") rejected. There is a statistically significant positive effect (unstandardized coefficient B: +.35, model 2 step 2) between the variable "Satisfaction with Local Services" and "Participation in a Municipal Election". The unstandardized coefficient indicates that for each unit that a citizen is more satisfied with online services, it is 0.35 points more likely that a citizen will vote in a municipal election (when all other variables are held constant). These results reveal that the second hypothesis is supported and the third hypothesis is rejected.

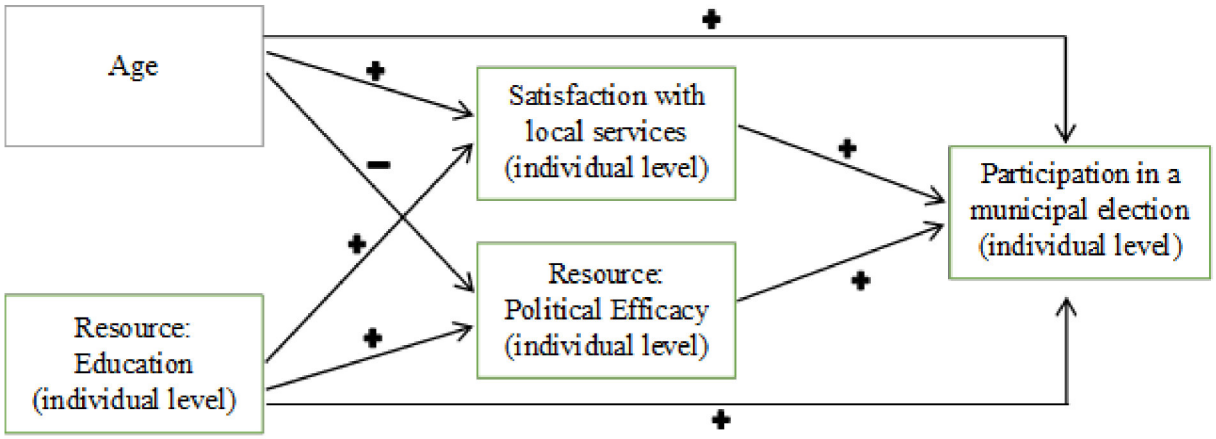
These results serve as a basis to answer the second sub-question on the extent to what satisfaction with services affects the likelihood of citizens' voting. It can be generally stated, that the satisfaction with services does have a significant positive effect on the likelihood of citizen's voting.

The second model, as described above, was run in two steps. The results of the first step reveal that the variable "Education" has a statistically significant effect on "Participation in a Municipal Election" with a standardized coefficient beta of 0.24. In the second step of model 2 this coefficient decreases by 0.07, which can be attributed to the explanatory power of the two added variables "Satisfaction with Local Services" and "Political Efficacy". The results reveal that there is a direct positive statistically significant effect of the resources "Education" and "Political Efficacy" on the voting behavior. When adding "Satisfaction with Local Services" and "Political Efficacy" in a second steps the standardized coefficient of education declines, which means that there is also an indirect effect which runs via satisfaction and

political efficacy. There is no direct statistically significant effect of the "Number of Online Services" on participation.

Further the control variables "Age" and "Gender" are included in model 2. Only "age" has a statistically significant positive effect with an unstandardized coefficient B of 0.05 (model 2 step 2) on the voting behavior. This model explains 15.1% variance in the dependent variable "Participation in a Municipal Election" (adjusted R^2: .151).

Figure 3: Model 2: Final Causal Diagram



Model 3

Table 4: Model 3 Summary

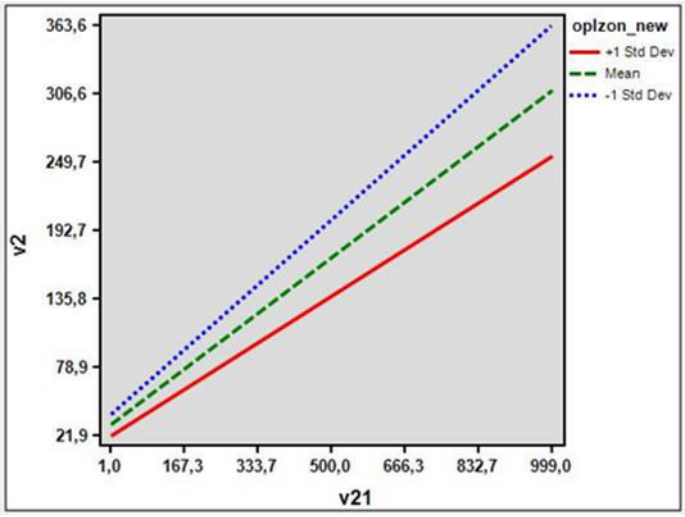
	Unstandardized Coefficient Step 1	Unstandardized Coefficient Step 2	Standardized Coefficient Step 1	Standardized Coefficient Step 2	Sig. Step 1	Sig. Step 2
(Constant)	6.668	5.617			.000	.000
Number of Online Services	-.009	-.009	-.030	-.032	.166	.123
Age	.037	-.052[b]	.213	.284	.000	.000
Gender	-.357	-.106	-.061	-.018	.000	.394
Educa-tion_cen-tered	-	.434	-	.046	-	.000
Satisfac-tion with local ser-vices_cen-tered	-	.357	-	.167	-	.000
Educa-tion_Satis-fac-tion_cen-tered	-	.028	-	.019	-	.356

a. Dependent Variable: Participation in a municipal election
b. Selecting only cases for which Cook's Distance <.00197
c. Adjusted R^2 Step 1: .051; Step 2: .125

In order, to be able to respond to hypothesis 3 ("The more resources a citizen has, the more likely it is that the effect of satisfaction with services on the participation of citizens municipal elections is strengthened in a positive direction"), it is necessary to have in mind the results of the second hypothesis, that "Satisfaction with Local Services" in fact has a positive effect on "Participation in a Municipal Election". Whether this effect is strengthened in a positive direction through the two resources, namely "Education" and "Political Efficacy", still needs to be tested.

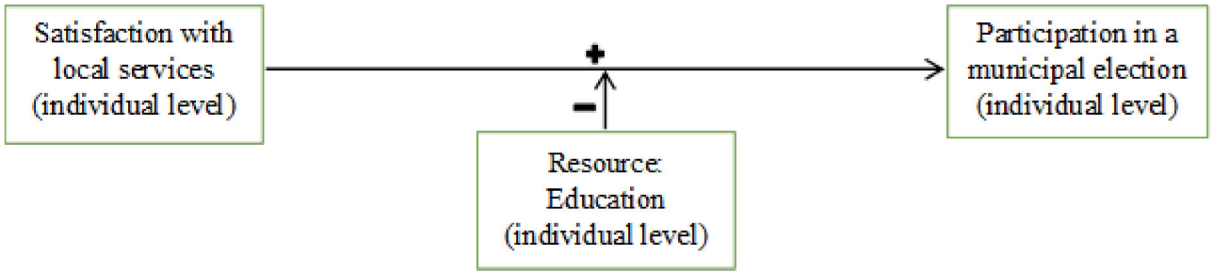
In order, to assess this hypothesis, two models (each in two steps) were run with "Education" and "Political Efficacy" as centered variables, which are expected to have a moderating effect, to avoid multicollinearity between the variables and to facilitate the interpretation of the coefficients. In addition, to the outputs from Interaction! (Soper, 2006), SPSS is used to analyze the relationships between the variables (figure 9).

Figure 4: Interaction effect with "Education" created with Interaction!



The first Interaction model includes "Satisfaction with Local Services" as the independent variable, "Education" as the moderator and "Participation in a Municipal Election" as the dependent variable. As the confidence intervals of the interaction lines of the mean of "Education", and of the two (+/-1) standard deviation express, only the bounds of the +1 standard deviation line and the -1 standard deviation line do not overlap, which means that the effect of "Satisfaction with Local Services" on "Participation in a Municipal Election" is different at different levels of education, and this difference is statistically significant. Taking a look at Figure 4, the -1 standard deviation line has a higher slope as the +1 standard deviation change, which means that if you have a higher education, the correlation between "Satisfaction with Local Services" and "Participation in a Municipal Election" is not as strong as if you have a lower education. What the regression lines in the Soper Interaction plot depict is that the strength of the relationship between the independent and dependent variable does not increase constantly with each additional education. With reference to these results the fourth hypothesis can be rejected, because the strength of the relationship between "Satisfaction with Local services" and "Participation in a Municipal Election" changes as a function of the variable "Education", but not as expected.

Figure 5: Model 3: Final Causal Diagram



Model 4

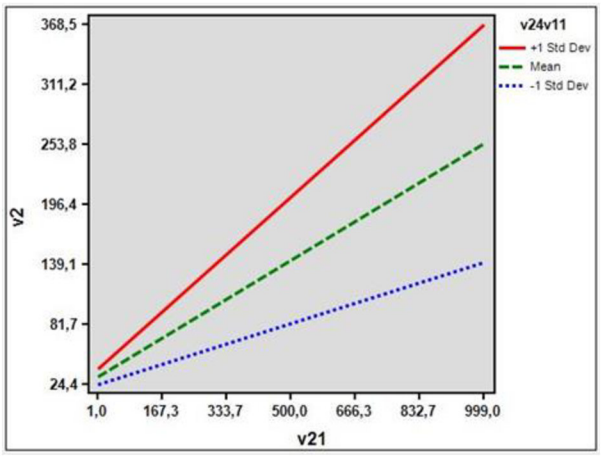
Table 5: Model 4 Summary

	Unstandardized Coefficient B	Standardized Coefficient Beta	Sig.
(Constant)	6.071		.000
Number of Online Services	-.008	-.026	.205
Age	.039	.223	.000
Gender	-.072	-.012	.563
Pol. Efficacy_centered	.547	.203	.000
Satisfaction with local services_centered	.407	.191	.000
Pol. Efficacy_Satisfaction_centered	-.126	-.069	.001

a. Dependent Variable: Participation in a municipal election
b. Adjusted R^2: .132

In the second Interaction model "Satisfaction with Local Services" also serves as the independent variable and "Participation in a Municipal Election" as the dependent one. The moderator in this model is "Political Efficacy". Neither confidence intervals of the +1 standard deviation line, nor of the line of the mean, nor of the -1 standard deviation line overlap. The effect of "Satisfaction with Local Services" on "Participation in a Municipal Election" is different at different levels of "Political Efficacy", and this difference is statistically significant. It can be concluded from the Interaction graph by Soper that -1 standard deviation line has a lower slope than the slope of the mean. And further, the slope of the mean is lower than the one of the +1 standard deviation line. The the effect of "Satisfaction with Local Services" on "Participation in a Municipal Election" is strengthened if an individual has more political efficacy (also see graph created with SPSS in figure 8). These results reveal that the fourth hypothesis can be affirmed, because the strength of the relationship between "Satisfaction with Local Services" and

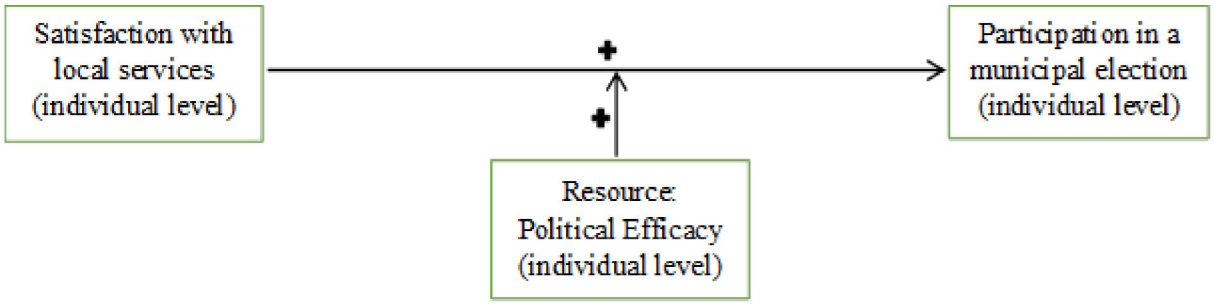
Figure 6: Interaction effect with "Political Efficacy" created with Interaction!



"Participation in a Municipal Election" changes as a function of the variable "Political Efficacy" as expected.

These findings serve as a basis to answer the third sub-question ("Is the possible relationship between satisfaction and voting, affected by the resources of citizens?"). It can be generally stated, that there is a relationship between satisfaction and voting, that is positively affected only by political efficacy, but not by education.

Figure 7: Model 4: Final Causal Diagram



Conclusion

In the following, the general results are presented and the research question is answered. The aim of this study is to find out what the causal relationship between municipal e-services and participation in municipal elections is. This causal relationship is assumed to run through the intervening variable satisfaction with local services. Satisfaction with local services is supposed be the effect of the online presence of a municipality and the cause of participation in a municipal election. Moreover, this analysis has the objective of giving insights about whether also resources such as political efficacy and education are factors that strengthen the relationship between satisfaction and participation. First of all the outputs of the descriptive statistics were presented. These findings reveal that the online services were mostly common in municipalities in the Netherlands in 2015. The Dutch government, as one of the frontrunners in the field of e-governance (OECD), has launched an initiative to invest in e-government to improve the satisfaction of citizen. (Dutch Ministry of Interior and Kingdom Relations and Economic Affairs). This, according to theoretical findings, might also have a positive effect of support for participation in local elections. This study investigated the relationship between e-services and satisfaction with local services as well as satisfaction with local services and participation in local elections. Data was collected for both, municipal and individual-level data on behalf of the Dutch Home Ministry for all Dutch municipalities, and existing data, gathered by a research and data collection institute in Tilburg, was used. The results provide evidence that neither are the number of online services a cause of satisfaction with local services, nor the cause of participation in a municipal election. Therefore the overall research question can be answered with no, there is no causal relationship between municipal e-services and participation. The assumption that satisfaction has a positive influence on participation holds true. Other than expected does education not strengthen this relationship between satisfaction and participation. Only political

efficacy actually does and the two resources have a direct positive effect on participation in a municipal election. Additional tests reveal that education has a positive effect on satisfaction. In further tests, the control variables "Age" and "Gender" were added. While gender does not play a role in this context, age influences satisfaction and participation directly in a positive direction and political efficacy in a negative direction.

Next, the current study will be discussed and theoretical and practical implications will be given. The topic of this paper corresponds to current contexts and the study of online services, the role of satisfaction and determinants of participation will "gain further importance in the near future" (Wagner, Vogt, Kabst, 2016). Information and communication technologies are part of the current debate and governments focus on initiatives and reforms that range from improving the effectiveness and responsiveness of municipal public administrations to data privacy (Frias-Aceituno, Garcia-Sanchez, Rodriguez-Dominguez, 2014). In addition, the public debate is formed by topics concerning an upswing of a participation crisis and consequentially by reforms to tackle respective issues through deliberative forums, participatory budgeting or public polls on a municipal level, not just in European countries, but all over the world (Kersting, 2015). With reference to findings of this study, e-services do not guarantee an increase in satisfaction nor participation and thereby enhancing political legitimacy. Investments may nevertheless be useful and if not introduced or further improved might lead to dissatisfaction. As the results of this analysis show, an increase in satisfaction with local services leads to a higher voter turnout. If governments aim at solving the participation crisis and ruling out reasons for political apathy, they will be partly successful by increasing the satisfaction of citizen with local services. However, they can only partly achieve a success through this, because also education and political efficacy are direct important determinants for participation in municipal elections. However, improving legitimacy and enhancing political engagement might also require additional types of changes, like changing politics and channels for participation as well as investing in electronic democracy tools (Oni, Oni, Mbarika, Ayo, 2017). Through the results of this analysis, this study provides consultations for policy-makers and civil servants in local administrations.

Eventually, the limitations of this study, recommendations for further research and its strength will be outlined. This research paper examines the role of the effect of number of online services on the intervening variable "Satisfaction with Local Services". For further research it might be interesting to specify this variable by asking for the satisfaction with online services that the individual's municipality offers. Findings proof that the number of online services does not affect the satisfaction or participation. It would be advisable to see what consequences online services might actually have. This check would have gone beyond the limits of this research and should be investigated in the future. In addition, other variables could be included to be able to generalize findings even further. To draw conclusions on the

role of resources in general, more variables that refer to resources need to be included. In further research, the focus could be laid on motivation-based factors, such as engagement and recruitment (Verba, Brady, Schlozman, 1995). Due to the operationalization of the variable "Political Efficacy", the focus is laid on internal political efficacy. This can be further improved by creating an index that includes both internal and external political efficacy. Moreover, in studies in the future, scholars might replicate the study with citizens and municipalities from other countries and take into consideration differences regarding the political system and the population in specific countries. A possible comparative analysis would give the opportunity to learn from other foreign governments. With the independent variable "Number of Online Services" this study concentrates on e-government. Future research could examine the later stages of the development. Findings contribute to the scientific would, because they build on previous acknowledged theories and add a current component. In this paper, concepts from not only political science were included, but also constructs of information science and political psychology were taken into consideration. Many scholars have focused on the determinants of e-government, but there are not many findings on the consequences of e-government. The results of this study contribute to filling the gap of existing research. Further, this study integrates two levels of analysis, and therefore conclusions can be drawn that refer to the individual and municipal level. This benefits the understanding of the relationship between online presence of local administrations in Dutch municipalities and the voting behavior of citizens living in these municipalities. Even though the unit of analysis in this study are Dutch municipalities and individuals, elements of public participation are part of all political systems of democratic governance and therefore this study is of current interest not only for the Netherlands.

Acknowledgements: The data collection that was used for this analysis, is based on the facilitation of other scholars. I would like to thank Dr. Henk Van der Kolk, Prof. Dr. Bas Denters and Prof. Dr. Ariana Need for making the data available. Further, I would like to thank Prof. Dr. Bas Denters as the first supervisor for his support and guidance during the process of this study. Also, I would like to thank Prof. Dr. Norbert Kersting for being the second supervisor.

References

Alathur, S., Ilavarasan, P. V., & Gupta, M. P. (2016). Determinants of e-participation in the citizens and the government initiatives: Insights from India. *Socio-Economic Planning Sciences, 55*, 25-35. doi: 10.1016/j.seps.2016.04.005

Denters, B., Wouter, J. (2014). *The Internet And Electoral Mobilization In Dutch Local Government Elections.*

CentERdata. LISS Panel. Retrieved 25.03.2016 from https://www.lissdata.nl/lissdata/Home.

Deloitte Touche Tohmatsu Limited. On behalf of Ministeries van Binnenlandse Zaken en Koninkrijksrelaties (BZK) en Economische Zaken (EZ). (April 2015). Meting aanbod Digitale Dienstverlening 2017. Final Report.

Dooley, D. (1995). *Social Research Methods.* (3rd ed.) New Jersey: Prentice Hall.

Frias-Aceituno, J. V., Garcia-Sanchez, I. M., & Rodriguez-Dominguez, L. (2014). Electronic Administration Styles And Their Determinants. Evidence From Spanish Local Governments. *Transylvanian Review of Administrative Sciences*(41E), 90-108.

Gemenis, K. (2015). Linear regression assumptions and diagnostics [Powerpoint slides]. Retrieved May 2017 from https://blackboard.utwente.nl/webapps/blackboard/content/listContent.jsp?course_id=_20011_1&content_id=_900389_1.

Huth, I. (2004). *Politische Verdrossenheit: Erscheinungsformen und Ursachen als Herausforderungen für das politische System und die politische Kultur der Bundesrepublik Deutschland im 21. Jahrhundert.* Münster: LIT Verlag.

Jho, W., Song K. J. (2015). Institutional and technological determinants of civil e-Participation: Solo or duet? *Government Information Quarterly, 32*, 488–495.

Keil, S. I., Gabriel, O. W. (2013) Society and Democracy in Europe. New York: Routledge.

Keohane, R. O., Nye, J. S. (2002). *Introduction.* In Nye, J. S. and Donahue, J.D. (Eds.), Governance in a Globalization World. Washington, D.C.: Brookings Institution Press.

Kersting, N. (2004). Diagnose und Therapieversuch. In *Zeitschrift für Politik, 2.* (pp.403-427).

Kersting, N., Caulfield, J., Nickson, R. A., Olowu, D., Wollmann, H. (2009) *Local Governance Reform in Global Perspective.* Wiesbaden: VS Verlag für Sozialwissenschaften.

Kersting, N. (2012). The future of electronic democracy. In Kersting, N. *Electronic Democracy* (pp.11-54). Opladen: Barbara Budrich Publishers.

Kersting, N. (2013). Online participation: from 'invited' to 'invented'-spaces. *Int. J. Electronic Governance, 6*(4), pp.270–280.

Kersting, N. (2015). Einführung in die Vergleichende Politikwissenschaft. Partizipation. [Powerpoint slides]. Retrieved June 2017 from https://www.uni-muenster.de/LearnWeb/learnweb2/plugin-file.php/652216/mod_resource/content/2/Folien_Kersting_3_VL%20Partizipation%202015.pdf.

Kersting, N. (2015). Das Zeitalter politischer Beteiligung. Partizipativer Wandel oder globales Disengagement? In Haries, L., Lange, D. *Zeitalter der Partizipation.* Schwalbach: Wochenschau Verlag.

Klofstad, C. A. (2016*). New Advantages in the Study of Civic Voluntarism. Resources, Engagement, and Recruitment.* Philadelphia, PA: Temple University Press.

Lips, M. (2007). E-government under construction: Challenging traditional conceptions of citizenship. In Nixon, P. G., Koutrakou, V. N. *E-government in Europe. Re-booting the State.* (pp. 33-47). New York: Routledge.

Ministeries van Binnenlandse Zaken en Koninkrijksrelaties (BZK) en Economische Zaken (EZ). *Digitale Overheid.* Retrieved 29.03.17 from https://www.digitaleoverheid.nl/beleid/verhoging-gebruik/.

Mossberger, K., Tolbert, C. J. (2006). *The Effects of E-Government on Trust and Confidence in Government.* Public Administration Review.

Niemi, R. G., Craig, S. C., Mattei, F. (1991). Measuring internal political efficacy in the 1988 National Election Survey. *The American Political Science Review,* 85 (4), p. 1407-1413.

Oni, A., Oni, S., Mbarika, V., Ayo, C. (2017). *Empirical study of user acceptance of online political participation: Integrating Civic Voluntarism Model and Theory of Reasoned Action.* Government Information Quarterly. DOI: 10.1016/j.giq.2017.02.003.

Organisation for EconomicCo-operation and Development. (n.d.). *Digital government: OECD e-Government Studies: Netherlands.* Retrieved July 2017 from http://www.oecd.org/gov/digital-government/oecde-governmentstudiesnetherlands.htm.

Osborne, J., Waters, E. (2002). Four assumptions of multiple regression that researchers should always test. *Practical Assessment, Research &Evaluation,* 8(2).

Palvia, S., Sharma, S. *E-Government and E-Governance: Definitions/Domain.* Retrieved 19.03.17 from http://csi-sigegov.orgwww.csi-sigegov.org/1/1_369.pdf.

Parry, G. (1972). *The idea of political participation.* In: Geraint Parry (Eds.): Participation in Politics. Manchester: Manchester University Press, p. 3–38.

Rossum, M., Dreessen, D. (2007). E-government in the Netherlands: from strategy to impact – the pursuit of high-volume, high-impact citizen e-services in the Netherlands. In Nixon, P. G., Koutrakou, V. N. *E-government in Europe. Re-booting the State.* (pp. 33-47) New York: Routledge.

Schlozman, Verba, Brady (1995). *Participation's not a Paradox: The view from American activists.* British Journal of Political Science. Cambridge University Press.

Soma, K., Termeer, C., Opdam, P. (2016). Informational governance – A systematic literature review of governance for sustainability in the Information Age. *Environmental Science & Policy, 56*, 89–99.

Soper, D. S. (2006). Interaction! [Computer software]. Retrieved May 2017 from http://www.danielsoper.com/Interaction/default.aspx.

Van Deth, J. W. (2009). *Politische Partizipation.* In: Kaina, Victoria/ Römmele, Andrea (Eds.): Politische Soziologie. Ein Studienbuch. Wiesbaden: VS Verlag für Sozialwissenschaften, p. 141–163.

Verba and Nie. 1972. *Participation in America: Political democracy and social equality.* New York: Harper and Row.

Verba, S., Schlozman, K. L., & Brady, H. E. (1995). *Voice and Equality: Civic Voluntarism in American Politics*: Harvard University Press.

Wagner, S. A., Vogt, S., & Kabst, R. (2016). How IT and social change facilitates public participation: A stakeholder-oriented approach. *Government Information Quarterly, 33*(3), 435-443. doi: 10.1016/j.giq.2016.07.003

Yamamoto, M., Kushin, M. J. (2014). More Harm Than Good? Online Media Use and Political Disaffection Among College Students in the 2008 Election. *Journal of Computer-Mediated Communication.* doi:10.1111/jcc4.12046

Appendix

Table 6: Model Overview

			Indep. Variable	Interaction	Dep. Variable
Sub-question 1: To what extent do number of online services provided by a municipality have an effect on citizens' satisfaction with local services?	Hypothesis 1: The more online services are provided by a municipal government, the higher the satisfaction of citizens with online services.	Model 1	Number of online services, age, gender, education	-	Satisfaction with local services
Sub-question 2: To what extent does satisfaction with services affect the likelihood of citizens' voting?	Hypothesis 2: The higher the satisfaction of citizens with online services, the more likely it is that a citizen will vote in a municipal election.	Model 2	Step 1: Number of online services, age, gender, education Step 2: add Satisfaction with local services, Political Efficacy	-	Participation
	Hypothesis 3: The higher the satisfaction of citizens with online services, the less likely it is that citizen will vote in a municipal election.				
Sub-question 3: Is the possible relationship between satisfaction and voting, affected by the resources of citizen?	Hypothesis 4: The more resources a citizen has, the more likely it is that the effect of satisfaction with services on the participation of citizen municipal elections is strengthened in a positive direction.	Model 3	Step1: Number of online services, age, gender, Step 2: add satisfaction with local services	Education	Participation
		Model 4	Number of online services, age,	Political Efficacy	Participation

		gender, satisfaction with local services

Table 7: Frequencies Satisfaction with local services

		Frequency	Percent	Cumulative Percent
Valid	1 extremely dissatisfied	25	1,2	1,2
	2	11	,5	1,8
	3	22	1,1	2,8
	4	762	3,0	5,9
	5	205	10.1	15,9
	6	430	21,1	37,0
	7	774	38,0	75,0
	8	435	21,3	96,4
	9	63	3,1	99,5
	10 very satisfied	11	,5	100,0
Total		2083	100,0	

Table 8: Frequencies Participation in municipal election

		Frequency	Percent	Cumulative Percent
Valid	0 for sure not	114	5,6	5,6
	1	41	2,0	7,6
	2	46	2,3	9,9
	3	44	2,2	12,0
	4	40	2,0	14,0
	5	124	6,1	20,1
	6	124	6,1	26,2
	7	176	8,6	34,8
	8	267	13,1	47,9
	9	268	13,2	61,0
	10 for sure yes	794	39,0	100,0
Total		2038	100,0	

Table 9: Frequencies Education

		Frequency	Percent	Cumulative Percent
Valid	1.00	55	2,7	2,7
	2.00	400	19,6	22,3
	3.00	150	7,4	29,7
	4.00	462	22,7	52,4
	5.00	615	30,2	82,5
	6.00	356	17,5	100,0
Total		2038	100,0	

Table 10: Frequencies Political Efficacy

		Frequency	Percent	Cumulative Percent
Valid	1 strongly disagree	312	15,3	15,3
	2 disagree	613	30,1	45,4
	3 neither agree nor disagree	623	30,6	76,0
	4 agree	391	19,2	95,1
	5 strongly agree	99	4,9	100,0
Total		2038	100,0	

Table 11: Correlation Matrix

	1	2	3	4	5	6
2. Number of Online Services						
3. Satisfaction with local services	-0.02					
4. Participation in municipal election	-0.05**	0.21***				
5. Education	0.05**	0.11***	0.13***			
6. Political efficacy	0.01	0.04**	0.2***	0.27***		
7. Age	-0.08***	0.07***	0.22***	-0.37***	-0.10***	
8. Gender	0.01	-0.07***	-0.08***	-0.12***	-0.17***	-0.07***

p<0.1; **p<0.05; ***p<0.01

Table 12: Model 1 Summary

	Unstandardized Coefficient B	Unstandardized Coefficient B[b]	Standardized Coefficient Beta	Standardized Coefficient Beta[b]	Sig.	Sig.[b]	VIF
(Constant)	5.888	5.969			.000	.000	
Number of Online Services	-.003	-.003	-.022	-.025	.320	.255	1.006
Age	.010	.009	.120	.142	.000	.000	1.178
Gender	-.126	-.061	-.046	-.027	.038	.225	1.031
Education	.146	.136	.153	.176	.000	.000	1.185

a. Dependent Variable: Satisfaction with local services
b. Selecting only cases for which Cook's Distance < .00197
c. Adjusted R^2 including influential cases: .028
d. Adjusted R^2 selecting only cases for which Cook's Distance < .00197: .033

Table 13: Model 2 Summary

		Unstandardized Coefficient B	Unstandardized Coefficient B[b]	Standardized Coefficient Beta	Standardized Coefficient Beta[b]	Sig.	Sig.[b]	VIF
1	(Constant)	3.590	3.099			.000	.000	
	Number of Online Services	-.010	-.008	-.035	-.026	.098	.225	1.006
	Age	.053	.056	.302	.323	.000	.000	1.178
	Gender	-.150	-.150	-.026	-.026	.232	.235	1.031
	Education	.487	.527	.239	.261	.000	.000	1.185
2	(Constant)	.402	-.518			.529	.442	
	Number of Online Services	-.009	-.006	-.031	-.020	.127	.334	1.007
	Age	.050	.052	.287	.302	.000	.000	1.194
	Gender	.034	.015	.006	.003	.783	.906	1.055
	Education	.352	.386	.173	.191	.000	.000	1.274
	Satisfaction with local services	.351	.430	.165	.164	.000	.000	1.031
	Political Efficacy	.452	.424	.168	.159	.000	.000	1.101

a. Dependent Variable: Participation in a municipal election
b. Selecting only cases for which Cook's Distance < .00197
c. Adjusted R^2 including influential cases Step 1: .099; Step 2: .151
d. Adjusted R^2 selecting only cases for which Cook's Distance < .00197 Step 1: .111; Step 2: .161

Table 14: Model 3 Summary

		Unstandardized Coefficient B	Unstandardized Coefficient B[b]	Standardized Coefficient Beta	Standardized Coefficient Beta[b]	Sig.	Sig.[b]	VIF
1	(Constant)	6.668	6.462			.000	.000	
	Number of Online Services	-.009	-.006	-.030	-.019	.166	.384	1.006
	Age	.037	.038	.213	.220	.000	.000	1.011
	Gender	-.357	-.374	-.061	-.064	.000	.004	1.005
2	(Constant)	5.617	5.292			.000	.000	
	Number of Online Services	-.009	-.006	-.032	-.022	.123	.307	1.009
	Age	.049	-.052	.284	.299	.000	.000	1.198
	Gender	-.106	-.122	-.018	-.021	.394	.325	1.033
	Education_centered	.434	.466	.046	.231	.000	.000	1.209
	Satisfaction with local services_centered	.357	.453	.167	.173	.000	.000	1.035
	Education_Satisfaction_centered	.028	-.002	.019	-.001	.356	.968	1.014

a. Dependent Variable: Participation in a municipal election
b. Selecting only cases for which Cook's Distance < .00197
c. Adjusted R^2 including influential cases Step 1: .051; Step 2: .125
d. Adjusted R^2 selecting only cases for which Cook's Distance < .00197 Step 1: .055; Step 2: .138

Table 15: Model 4 Summary

	Unstandardized Coefficient B	Unstandardized Coefficient B[b]	Standardized Coefficient Beta	Standardized Coefficient Beta[b]	Sig.	Sig.[b]	VIF
(Constant)	6.071	5.786			.000	.000	
Number of Online Services	-.008	-.003	-.026	-.012	.205	.571	1.007
Age	.039	.039	.223	.227	.000	.000	1.029
Gender	-.072	-.089	-.012	-.015	.563	475	1.042
Pol. Efficacy_centered	.547	.560	.203	.210	.000	.000	1.017
Satisfaction with local services_centered	.407	.498	.191	.190	.000	.000	1.045
Pol. Efficacy_Satisfaction_centered	-.126	-.170	-.069	-.073	.001	.001	1.006

a. Dependent Variable: Participation in a municipal election
b. Selecting only cases for which Cook's Distance < .00197
c. Adjusted R^2 including influential cases: .132
d. Adjusted R^2 selecting only cases for which Cook's Distance < .00197: .138

Interaction

Figure 8: Interaction effect with "Political Efficacy" created with SPSS

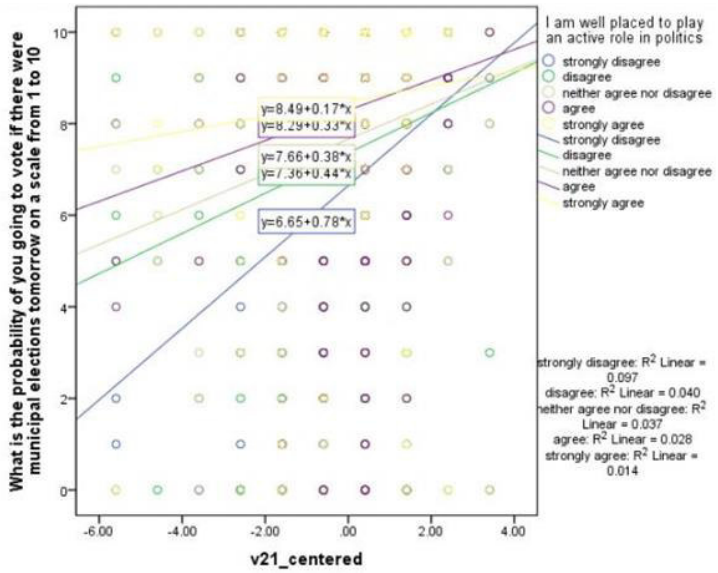
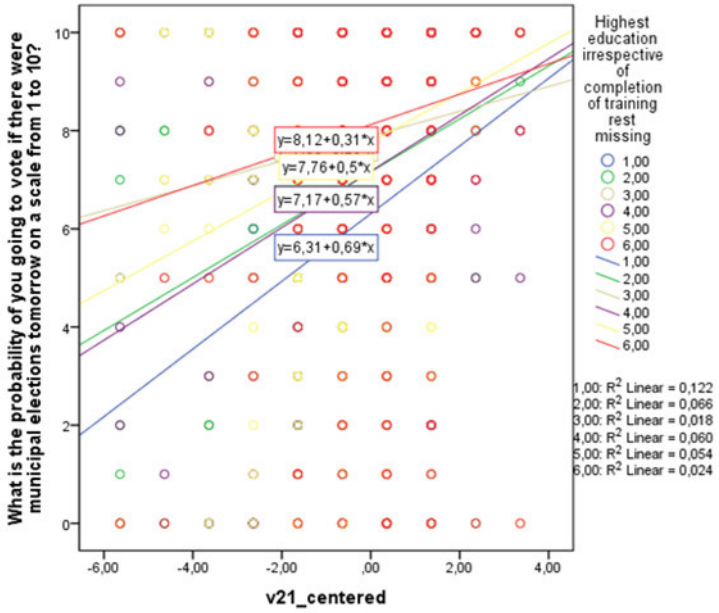


Figure 9: Interaction effect with "Education" created with SPSS



Cook's Distance

According to a "rule of thumb", a case is labelled as being influential if Cook's D is bigger than 4/(n-k-1), where n represents the number of valid cases and k the number of independent variables. (Gemenis) For all models included in the analysis, the criterion amounts to 0.00197 rounded. With reference to the maximum value of Cook's D of the residual statistics, in all models at least one case is bigger than the criterion. An inspection of the data shows that in model 1 104 cases are bigger than 0.00197, in model 2 160 cases, in model 3 141 cases and finally in model 4 150 cases. A sensitivity analysis is conducted to see if the inferences change substantially after removing these influential cases. (Gemenis) Only in the first two models considerable changes are visible: The results of model one excluding the influential cases reveals that there is in fact no statistically significant effect of "Gender" on the dependent variable "Satisfaction with Local Services" compared to model 1 including these cases where the effect was statistically significant (Table X). In addition, in model two after having removed the influential cases the significance of "Number of Online Services" changed from .098 to .225, which expresses that the direct effect of "Number of Online Services" on "Participation in a Municipal Election" is not statistically significant. These findings of no statistical significance were already retrieved from the analysis results of the second step of model two (Table y).

Linear Regression Assumptions

In order, for the results of this linear regression analysis to be trustworthy and useful to interpret findings, linear regression assumptions must be met. (Osborne, Waters, 2002) These are four assumptions: linearity, independence of errors, constant error variance and a normal distribution of errors. The assumption of linearity implies that the relationship between the independent and dependent variable is

linear. A method to check for linearity is the examination of a scatterplot with the independent variable on the X-axis and the dependent variable on the Y-axis. If perfect linearity is the case, a diagonal (from bottom left to top right or top left to bottom) right can be identified. The second assumption assumes that all errors are independent. If the units of the independent variable are dependent to each other, this assumption is violated. An autocorrelation does not bias the estimates of the coefficient B, but can make the test of statistical significance invalid. In order, to check whether the assumption of independence of errors is met, scatterplots with standardized predicted values on the X-axis and standardized residuals on the Y-axis will be examined. In addition, the third assumption implies homoscedasticity, which means that the variance of the error should not change across the values of the independent variable. Heteroscedasticity can lead to an inefficient standard error for b. Finally, errors should be normally distributed. A consequence of abnormal is an inefficient least squares estimation. (Gemenis) In the following, these assumptions will be tested. In the models of the analysis, linear regression is used for the analysis of the relationship between "Number of Online Services" and "Satisfaction with Local Services', as well as "Satisfaction with Local Services" and "Participation in a Municipal Election".

First, the assumptions for the relationship between "Number of Online Services" provided by a municipality and "Satisfaction with Local Services" will be checked for. It is assumed that there is a linear relationship between the two variables. As the inspection of the scatterplot with "Number of Online Services" provided by a municipality on the X-axis and "Satisfaction with Local Services" on the Y-axis reveals, there is rather a cluster than a linear relationship. The adjusted R^2 of 0,000% indicates that no variance is explained. This might indicate, that there is not no relationship, however, it is not linear. The assumption is not met. Consequentially, the estimate of the coefficient B will be misleading and the analysis will underestimate the true relationship between the variables. Results need to be carefully interpreted. The second assumption implies that errors are independent. The scatterplot of the residuals shows that there is no autocorrelation. In addition, there is a low negative correlation between the two variables (Person's r: -0,02, table 11). The second assumption is affirmed. Furthermore, homoscedasticity is desirable. A constant error variance can be seen by examination of the graph that shows the studentized residuals in relation to the predicted value of "Satisfaction with Local Services". The third assumption is met. Finally, errors are assumed to be normally distributed. After having taken a look at the Histogram and P-P-Plot, it can be stated that this assumption is not met and therefore the least squares estimation might be inefficient.

Figure 10: Scatterplot with "Number of Online Services"on the X-axis and "Satisfaction with Local Services" on the Y-axis

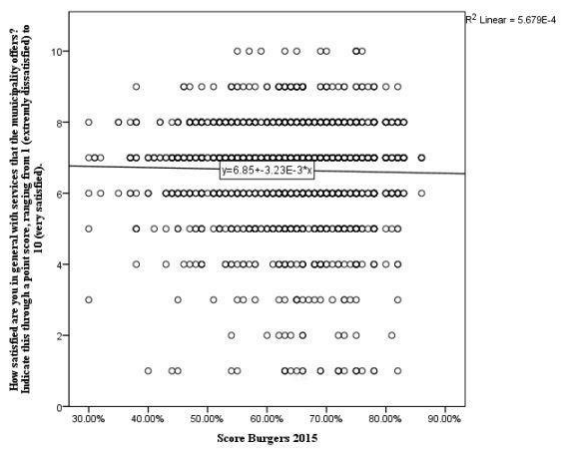


Figure 11: Histogram for dependent variable "Satisfaction with Local Services"

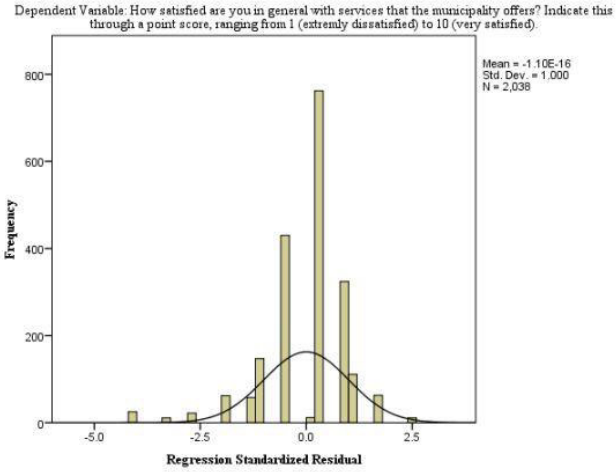


Figure 12: Normal PP-Plot of Regression Standardized Residuals for the dependent variable "Satisfaction with Local Services"

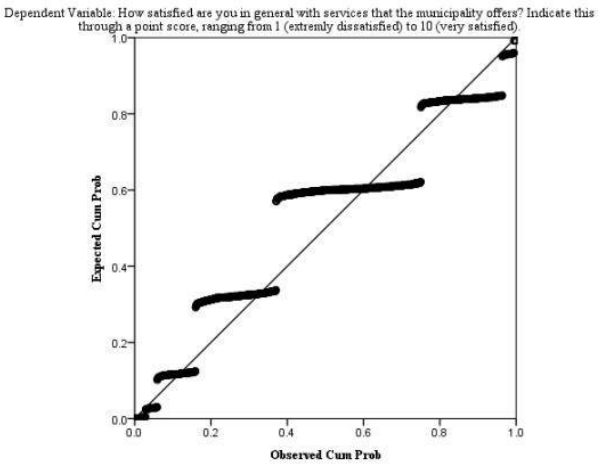
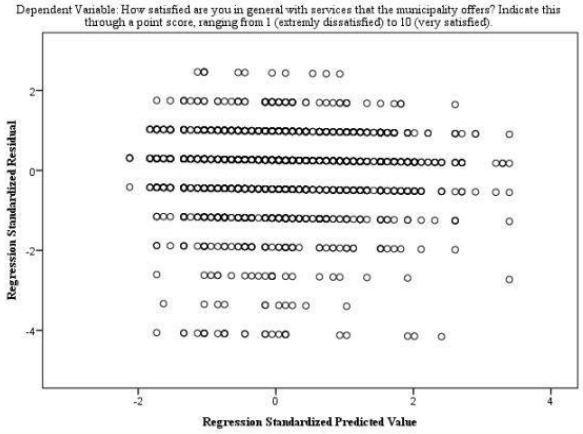


Figure 13: Scatterplot with standardized predicted values on the X-axis and standardized residuals on the Y-axis



Second, the assumptions for the relationship between "Satisfaction with Local Services" and "Participation in a Municipal Election" will be checked for. As the graphs reveal see appendix, the assumption for linearity is met. Moreover, the units of the independent variable are not dependent to each other. An autocorrelation that can make a test of statistical significance invalid, is not present. This can be supported by taking a look at the correlation between "Satisfaction with Local Services" and "Participation in a Municipal Election", which expresses a low positive relationship (Person's r: 0,21, table 11). The second assumption is met. Further, the inspection of a residual plot reveals that the variance of errors is not the same across all levels of the independent variable. A pattern is visible: every point more right on the x-axis, the range of errors shifts in the negative direction on the y-axis. Consequentially the assumption of homoscedasticity cannot be affirmed. The standard error of b needs to be carefully interpreted. The fourth assumption of normally distribute errors needs to be taken into

consideration as well. The histogram reveals that errors are not normally distributed and therefore the least squares estimation might be less efficient.

Figure 14: Scatterplot with "Satisfaction of Local Services" on the X-axis and "Participation in a Municipal Election" on the Y-axis

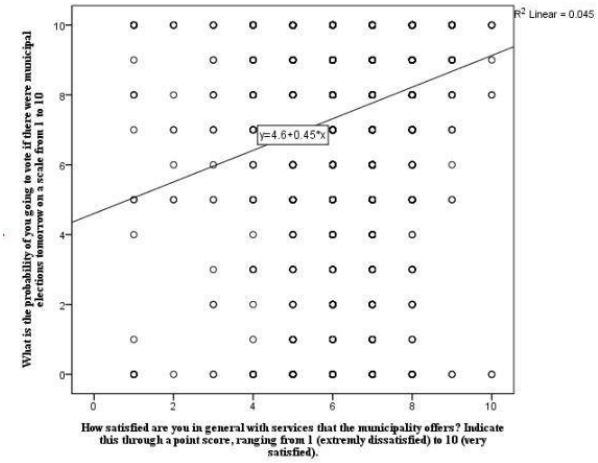


Figure 15: Histogram for dependent variable "Participation in a Municipal Election"

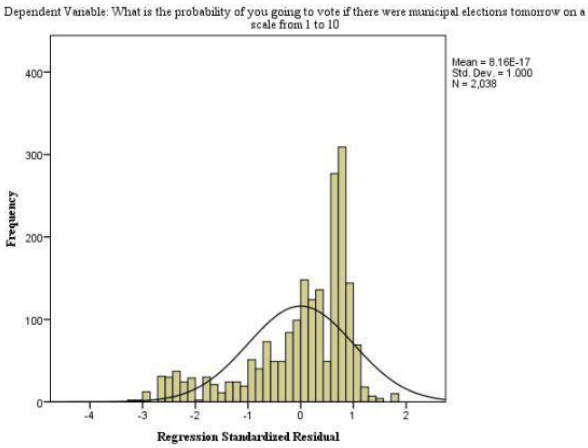


Figure 16: Scatterplot with standardized predicted values on the X-axis and standardized residuals on the Y-axis