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EMPOWERING CITIZENS THROUGH E-GOVERNMENT SERVICES

An empirical study on public service satisfaction, attitudes
and citizen empowerment

MASTER THESIS

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Abstract

The digitalization of public services is an important item on the agenda of the Dutch government. The government's aim is that all public services should be digitally available by 2017. These e-government services are expected to bring citizens and local government in closer contact and increase the citizens' independence. This study focussed on the way public services satisfaction, overall attitude and perceived power relationship with the government are correlated among e-government users and non-users. The aim of this thesis is to provide further insight into the effects of e-government services on citizens. It was expected that the correlation between the citizens' public service satisfaction and perceived power relationship was mediated by the citizens' overall attitude towards the local government. Survey data from the Burgerpeiling in three Dutch municipalities was used for further statistical analysis in SPSS statistics. Results showed that e-government users had a lower public service satisfaction in comparison to non-users, but scored higher on perceived power relationship. The mediation analysis revealed that for users as well as non-users, the relationship between citizen and e-government is partly mediated by the overall attitude. The thesis argues that the improvement of the quality of e-government services both directly and indirectly lead to better perceived power relationship among citizens. Higher public service satisfaction would increase the likelihood of having a more positive overall attitude. This would in turn lead to better perceived power relationship among both users and non-users. Based on these results, further research should study if e-government services of high quality could lead to actual citizen participation in the process of policy making and public innovation.

1.0 Introduction

On the 23th of May in 2013, the Minister of the Interior and Kingdom Relations wrote the Prime Minister of the Netherlands a letter in which he articulated his vision on digitalization for 2017. His ambition was that by 2017 all public services should be available online for both citizens and entrepreneurs (Plasterk, 2013). In 2015, this ambition has been renewed as the goals for the Digital Agenda 2020 by the association for Dutch municipalities, known as the Vereniging Nederlandse Gemeenten (2015). The aims for the years to come are threefold: increasing governmental transparency, adopting more time and cost efficient working methods and meeting individual needs while offering mass digital services (VNG, 2015). While reaching these goals, it is important to remain one univocal government (VNG, 2015). Plasterk emphasized that this could improve the relationship between government and society, as citizens would be enabled to find the information they need more easily and stay in closer connection to their local government (Plasterk, 2012; Van Dooren, 2013). The digitalization of public services should lead to a more positive experience of arranging citizen affairs, tailored to the individual situation and wishes of the citizens (Plasterk, 2012). Underlying purposes of the digitalization are the expansion of the required information society, boosting innovation and eventually including citizens in the process of policymaking (Geurtsen, 2015).

1.1 Trends and developments

The digitalization of public services is not a new ambition and has been on the agenda of the Dutch government since the late 1990's (MBZK, 2016). However, the changing roles of local governments and citizens in the past ten years have increased the urgency to expand digital public services. Minister Plasterk noticed that society has developed from a society of technological possibilities to a society in which information is the most valued common good (Plasterk, 2013). The expectations between citizens and government have changed. The citizen has become a "digital citizen", capable of dealing with the latest technologies and willing to use these technologies to empower themselves (MBZK, 2015). To facilitate this, all information about the government should be available and accessible for at least five days a week (MBZK, 2015; Tai-Kei Ho, 2002).

Furthermore, recent decentralisations in the social domain and the changed responsibilities of local governments increased the urge for digitalization. Former duties of the central government, such as the provision of youth care and social support, are now fulfilled by the local government. These transformations in the social domain increased the

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need to redefine the roles of both government, public servants and citizens. Citizens are increasingly expected to ‘take care of themselves’ and the task of the public servants is to facilitate this. Citizens are responsible for the support they get and expected to participate in society as much as they can. This is called the ‘Eigen Kracht’ (own strength) paradigm and can be explained as a form of citizen self-empowerment. ‘Participation’ remains an umbrella term for different forms of civic participation; socially, politically, culturally and economically (Putters, 2014). These different forms all have in common that they are expected to increase the self-reliance and independence of citizens (Putters, 2014). Besides the increased self-empowerment, the transitions also require a renewed ‘communal thinking’ among family, friends and neighbourhood’ (Putters, 2014; SCP, 2012). In order to strengthen civic participation and communal involvement, the local government needs to support its citizens by setting the appropriate conditions and framework in which the citizens can become empowered (MBZK, 2015).

In the electronic government (e-government), the government uses information technology and particularly the internet to engage with citizens and provide government services (Palvia & Sharma 2007, p. 1). The concept can be interpreted as “the delivery of government information and services through the internet or other digital means” (West, 2004, p. 16). Primarily, digital services were mainly used internally, but are now more widely applied for ‘coordinated network building, external collaboration and customer services’ (Tai-Kei Ho, 2002). As Al Gore noted in the National Performance Review Report in England: E-government ‘will allow citizens broader and more timely access to information and services through efficient, customer-responsive processes-thereby creating a fundamental revision in the relationship between the federal government and everyone served by it’ (Gore, 1993). Because of growing technological possibilities, e-government is a topic of interest for a multitude of disciplines, among which public administration, public information and policy, information technology and political science (West, 2004; Heeks & Bailur, 2007; Bannister & Connolly, 2011). Despite its popularity, not much empirical research is performed on the impact of e-government on citizen empowerment (Aladalah, Cheung & Lee, 2015; Li & Gregor, 2011). As the digital communication between citizens and government will continue to increase in the Netherlands, it is important to gain more understanding on the relationship between the e-government and citizens. Therefore, more research is needed on whether e-government services are a mean to empower citizens in a context of decentralisation and increased individual responsibility. In the theoretical framework that will follow the

empowerment of citizens and the impact of e-government on the attitudes of citizens towards the government are more thoroughly addressed.

2.0 Theoretical framework

Theory on empowerment found its way into academic literature in the 1970s (Perkins & Zimmerman, 1995). Since then, it has been a widely applied concept in a multitude of disciplines; psychology, management and organization, community science and information science (Perkis & Zimmerman, 1995). Julian Rappaport (1981), who was specialized in the field of community psychology, defined the term within a paradox of social and community problems. He explained that the overall aim (of the government) should be ‘to enhance the possibilities for people to control their own lives’ (Rappaport 1981, p. 15). By ‘people’, he meant all human beings, whether competent or incompetent (Rappaport, 1981). In accordance with the explanation of Rappaport, this study will approach ‘empowerment’ as it was clarified by Perkins and Zimmerman (1995). According to them, empowerment can be understood as a construct which consists out of an *empowerment process* and an *empowerment outcome*. As Zimmerman & Warschausky further explain (1998), empowerment processes are the ways through which actors gain control over issues that concern them. Empowerment outcomes are the consequences of these processes (Zimmerman & Warschausky, 1998, p. 6). These processes and outcomes can occur on an individual, organizational and/or communal level, depending on the level of analysis. On the individual level, the empowerment process is ‘receiving help from others to gain control’. Subsequently, the empowerment outcome is a ‘sense of control’. In this study the *empowerment process* is the degree of citizen satisfaction with public services, taking the use of the available (digital) public services as a form of help to gain control. This empowerment process influences the *empowerment outcome*, the sense of control, which in this study is the citizens’ perception on the power relationship between citizen and local government.

2.1 Empowerment process: public service satisfaction

The satisfaction of citizens with digital public services is determined by multiple factors (Welch, Hinnant & Moon, 2004; West, 2004). Welch, Hinnant & Moon (2004) studied the relationship between website use, e-government satisfaction and citizens trust. They distinguished three factors that contributed to the satisfaction: the service convenience (transactions), engaged electronic communication (interactivity) and the information

reliability (transparency) (Welch, Hinnant & Moon, 2004). Dutch research on the digitalization of public services shows that *service convenience* can play an important role in public service satisfaction (Van Dooren, 2013; Bommelje & Keur, 2013). Citizens value the availability of services, but it is very important that these services are easy to use and contain clear information, as not all citizens are equally digitally competent (Bommelje & Keur, 2013; Timmermans et al., 2014). The amount of digital skills of an individual is found to be related to his or hers amount of internet experience, age, gender and educational attainment (Van Deursen & Van Dijk, 2009; Van Deursen, Van Dijk & Peters, 2011). The higher the educational level of the citizen, the more digitally skilled one is expected to be. Increased age negatively affects the level of digital skills and men tend to be more digitally skilled than women (Van Deursen, Van Dijk & Peters, 2011). This means that these factors need to be taken into account when studying the influence of e-government services. The *interactivity of the services*, which is the two-way interaction between citizens and government, are also found to contribute to public service satisfaction among Dutch citizens (Timmermans et al., 2014). It is found that Dutch citizens feel they receive a more personal and instant response if they choose more conventional methods of communication (phone and desk) rather than contact by online methods (Timmermans et al., 2014). In order for citizens to be satisfied with digital contact, online communication and feedback thus needs to be rapid (Stienstra, Winnighoff and de Clercq, 2014; Timmermans et al, 2014). The third factor, *transparency*, can be understood as clear information about the service as well as the digital process behind these procedures. This information transparency can be enhanced by government confirmation and feedback. This would make citizens feel more confident to use digital services (Bannister & Connolly, 2011; Haring, 2016; Timmermans et al., 2014).

Positive experiences digital public services positively influence the overall satisfaction towards the e-government according to Welch, Hinnan and Moon (2005). This overall satisfaction is the extent to which the government meets expectations (Welch, Hinnan and Moon 2005). The underlying reasoning is that increased online public services expand governmental information and transparency, which leads to a more accountable and trustworthy government (Tolbert & Mossberger, 2006; Piotrowski & Ryzin, 2007; De Mul, 2016; Wong & Welch, 2004). As put by Piotrowski & Ryzin (2007), a more transparent government with open information answers the demand of the ‘people’s right to know’ (p. 308). After all, it is harder to hold the government accountable for their actions without open information about their efforts and access to information. Trust can be divided into a basic

form of trust, interpersonal trust and systemic trust. Interpersonal trust and systemic trust are important for understanding the citizen's attitude towards the e-government (De Mul, 2016; Thomas, 1998). In the modernized society, interpersonal trust has been replaced by a systemic trust in which citizens need to trust abstract information technologies (De Mul, 2016; Van Dooren, 2013; WRR, 2011). According to these authors, more e-government satisfaction would lead to more overall satisfaction with the government, which in turn increases citizens trust in the government. Therefore, it is important to maintain a comprehensive and clear digital public environment in order to gain citizens trust (Carter & Bélanger, 2005; Harding, 2013).

2.2 Empowerment outcome: perceived power relationship

E-government services encourage the active involvement of citizens by offering the right tools and information to assist themselves, their local government and their neighbours (Piotrowski & Ryzin, 2007; Aladalah, Cheung & Lee, 2015). Because digital public services contribute to the transparency of processes, citizens are more likely to understand how the rules and policies are applied to their particular situation, which would increase a sense of empowerment (Li & Gregor, 2011). E-government services therefore contribute to redefining the roles of citizens and government and consequently changes the power relationship between these two parties (Li, Gregor & Doode, 2007; Dayal & Johnson, 2000). In their study on the effects of public online services, Li, Gregor and Doode introduced the concept of 'perceived power relationship' as the perception of the citizens own power situation relative to another party (Li, Gregor & Doode, 2007). This concept is related to the more known concept of power distance by Mulder, which defined the degree of inequality between less and more powerful individuals in the same social system (Mulder, 1977). Li, Gregor and Doode (2007) found that the respondents would feel in closer contact with their government when using online services, because they were being treated in a professional and adequate manner. Other authors even found that the digitalization of public services contributes to the transformation of a hierarchical government into a more horizontal and cooperative government that stimulates the initiatives and ideas of its citizens (Sigaloff & Vrouwe, 2016; MBZK, 2006). The use of e-government can therefore be perceived to be a mean for citizens to gain control and empower themselves in relation to the local government, providing that the services are of sufficient quality (Haring, 2016; West, 2004).

2.3 Research question and hypotheses

The literature reviewed in the section above revealed a number of factors that play a role in the relationship between the use of e-government services and citizen empowerment. This study will focus on the mutual relationships between these factors and whether they differ between e-government service users and non-users. This thesis aims to answer the following research question: *To what extent do the citizens' public service satisfaction and overall attitude influence the citizens' perceived power relationship and how does this differ between e-government users and non-users?*

Figure 1 shows the theoretical model of the mutual relationships between the variables. As the theoretical model reveals, the analysis aims to answer if the overall attitude of the citizens mediates the relationship between public service satisfaction and perceived power relationship among e-government service users and non-users. Based on these mutual relationships, the following hypotheses are formulated: (H1) E-government service users have a better perceived power relationship than people who do not use e-government services. (H2) The public service satisfaction is positively correlated to the perceived power relationship. (H3) The public service satisfactions is positively correlated to the overall attitude. (H4) The overall attitude is positively correlated to the perceived power relationship. (H5) The relationship between public service satisfaction and perceived power relationship is fully mediated by the overall attitude of citizens.

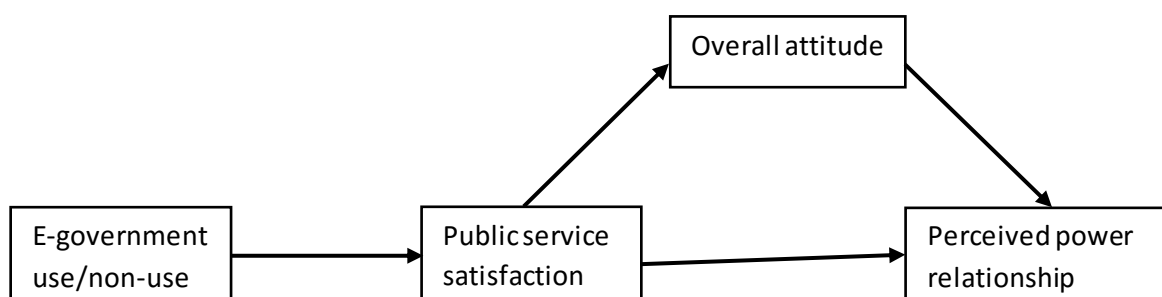


Figure 1. Theoretical model

4.0 Research method

The relationship between the mentioned variables will be studied using data from the Burgerpeiling (Citizen Survey). This survey measured the experiences of citizens on four themes: living environment (including safety), municipal services, the relationship between citizen and local government and wellbeing and care (Gremmen, 2016). The survey was developed by the quality institute for Dutch municipalities, known as KING, and was conducted in 82 municipalities in the year 2015. The aggregate data of this survey is published online (www.waarstaatjegemeente.nl). The purpose of the Burgerpeiling is to enable benchmarking between municipalities on the several themes, which is argued to be a necessity in the context of the decentralizations and growing responsibilities of the local government (Gremmen, 2016). The municipal results of the measurements can be used by the local government to adjust their policies. Before the 'Burgerpeiling' was introduced, the survey was known as 'Burgerrollen' (Gremmen, 2016). 'Burgerrollen' existed out of multiple sources that included both general questions about the municipalities as well as specific questions about public services and demographic data (Stultjens, Du Long & van Bommel, 2008). The questions in the Burgerpeiling are based on these widely used questionnaires and previous research on the experiences of citizens (Stultjens, Du Long & van Bommel, 2008).

4.1 Research population

The above stated research question will be answered using quantitative data from the three municipalities Almelo, Hengelo and Enschede. This survey data is made available by Twentse Kennispunt, who performed the Burgerpeiling in all three municipalities. The survey was performed using the available city panels; the Almelopanel, Hengelopanel and Enschedepanel. Participation of respondents occurred on a voluntary basis. The data was gathered by sending all panel members an e-mail that contained the link to the survey. Because the citizen composition in the city panels does not match the actual city composition, further analysis in this study will be performed using the weighted profiles of the respondents. The profiles are weighted by gender, age-group and neighbourhood to enhance population representativeness. Although the weighing of the profiles does eliminate some bias, still bias could occur because respondents participated on a voluntary basis. Table 1 shows the panel member count, numbers of respondents and the response rate. It is noteworthy that all three municipalities have a rather low response rate.

Table 1.

Panel data

Panel	Members	Respondents	Response
Enschede	6133	1422	.23
Hengelo	2525	1233	.49
Almelo	2351	1345	.57

Note. Content made available by Twentse Kennispunt

The digital maturity tool provides some insight into the digital profile of these municipalities and how they can be compared to the digital development of other municipalities. The Digital Maturity instrument compared 43 unique digital public service products among 393 municipalities in the Netherlands. These digital products include a great variety of digital products that enable citizens to contact the local government for a multitude of issues, such as the application forms for certain permits and tools to file complaints about the living environment (Zarbanoui, Braam & Eikenboom, 2015a). The scores vary from 0% to 100% on digital maturity per public service product. A score of 0% means that there is only information about the product available online and there are no tools for the citizen to act upon their wishes digitally. A score of 100%, on the contrary, means that there is full disposal of digital services to meet the citizen's requests. The overall average of citizen products among all 393 municipalities is approximately 57% (Zarbanoui, Braam & Eikenboom, 2015b). Table 2 presents the average score of the municipalities that are included in this study (Zarbanoui, Braam & Eikenboom, 2015a).

Table 2.

Digital Maturity of Enschede, Hengelo and Almelo

Ranking	Municipality	Nr. of inhabitants	Score
58	Enschede	158.553	67,70%
113	Hengelo	81.059	62,20%
125	Almelo	72,291	61,40%

Note. Results from *Meting aanbod Digitale Dienstverlening* (Zarbanoui, Braam & Eikenboom, 2015a)

From table 2 it can be concluded that these three municipalities score above average on their digital maturity. Enschede ranks highest in comparison to the other two municipalities (58th position). Hengelo and Almelo are comparable in ranking, number of inhabitants and average

score. These three municipalities reflect the overall tendency that municipalities with a higher number of inhabitants tend to score higher on digital maturity (Zarbanoui, Braam & Eikenboom, 2015b).

4.2 Respondents

The respondents of the three municipalities will be combined for analysis to increase sample size and reliability of the results. Only those respondents that had contact with the municipality in the past twelve months will be included in further analysis. Altogether, the dataset contains a total of 2637 respondents, of which 1534 respondents used e-government services (internet, e-mail, social media) and 1103 used more traditional methods of contact (post, helpdesk, phone or other ways). An amount of 1362 respondents were men. There were 1275 women. The age ranged from 18 to 75+ years. The largest group of respondents was between 40-54 years old (37,3%), the second largest group was aged between 55 and 64 years (19,2%). More than 79,7% of the respondents enjoyed some form of tertiary education (MBO, HBO or University degree). The largest group had enjoyed HBO education (38,9%). An overview of the items that are included in the construction of the dependent, independent and control variables in the section below can be found in the appendix.

4.3 Dependent variable

The dependent variable in this study is the perceived power relationship (PPR). The survey included four items addressing the citizen's perception on the power relationship between citizen and municipality. These survey-items ask about the extent to which the citizen feel the local government listens to the ideas of citizens and actively includes them in its plans and activities. These items included the following four statements: (1) the municipality is flexible if necessary, (2) the municipality listens to the opinion of its inhabitants, (3) the municipality includes her inhabitants in her plans, activities and facilities and (4) inhabitants and organisations get enough room to realise ideas and initiatives. All items were measured on a Likert scale from 1 through 6 (1= totally agree, 2=agree, 3=don't agree/don't disagree, 4=disagree, 5=completely disagree, 6= don't know). The 'don't know' category was recoded as a systemic missing value and will be excluded in further analysis. Cronbach's alpha for these four items for perceived power relationship was considered adequate for research purposes ($\alpha=.888$), as a value of Cronbach's $\alpha=.7$ and higher is considered to be acceptable for research purposes (Field, 2009).

4.4 Independent variables

The independent variables are the citizen public service satisfaction and overall attitude towards the government. Public service satisfaction (PSS) exists out of *service convenience*, *transparency* and *interactivity*. The items that were used to construct these variables were measured on a Likert Scale, ranging from 1-6 (1= totally agree, 2=agree, 3=don't agree/don't disagree, 4=disagree, 5=completely disagree, 6= don't know) or rated on a scale from 1-11 (1=1, 2=2, 3=3, 4=4, 5=5, 6=6, 7=7, 8=8, 9=9, 10=10 and 11=don't know). The 'don't know' category is recoded as a systemic missing value and will be excluded in further analysis. 'Service convenience' is constructed out of three variables that measured the ease and quality of service delivery: (1) I perceive the procedure of application or questions to be easy, (2) the received information was accurate and complete and (3) in the end, I got what I wanted. Cronbach's alpha for these 3 items were considered adequate for research purposes ($\alpha=.781$) (Field, 2009). 'Transparency' is constructed out of two variables that provide insight into the service procedure of those that used e-government services: (1) I have easy access to the required municipal information and (2) how do you rate the communication and the information availability from the municipality? Cronbach's Alpha for these 2 items were considered adequate for research purposes ($\alpha=.715$). The third variables, interactivity, is constructed out of two variables: (1) The time it took to finish the procedure was acceptable and (2) I was sufficiently informed about the progress of the procedure. Cronbach's alpha for these two items was considered adequate for research purposes ($\alpha=.855$). Together these newly computed variables *service convenience*, *transparency* and *interactivity* are combined into the one variable of public service satisfaction ($\alpha=.827$).

The *overall attitude* towards the local government was constructed out of three items; (1) Do you trust the way your municipality is being governed? (2) the local government does what she says/claims to do and (3) the local government adequately controls the compliance of rules. All variables were measured on a Likert Scale, ranging from 1 through 6 (1= totally agree, 2=agree, 3=don't agree/don't disagree, 4=disagree, 5=completely disagree, 6= don't know). Once again, the 'don't know' category was recoded as a systemic missing value and will be excluded in further analysis. Cronbach's alpha for these 3 items were considered adequate for research purposes ($\alpha=.823$).

4.5 Control variables

The control variables that will be included in the analysis are related to the personal characteristics of the respondents. These control variables are included to control for any personal characteristics that might influence the relationship between public service satisfaction, overall attitudes and perceived power relationship. The control variables are labelled *age*, *educational level* and *gender*. Age remained the same with seven answer categories (1=18-29, 2=30-39, 3=40-54, 4=55-64, 5=65-74, 6=75 and older). The control variable 'educational level' was a categorical variable with initially six categories, ranging from attended elementary school to a university degree (1=primary school, 2=vmbo/mavo, 3=vwo/havo, 4=mbo, 5=hbo, 6=university). Values 1 through 4 are recoded 0=low and medium education. Values 5 and 6 are recoded into 1=higher education. Gender is coded with the values 0=woman and 1=man.

4.6 Statistical methods

The hypothesis will be tested using SPSS statistics. The first hypothesis will be tested by an independent sample t-test for continuous variables and a chi-square test for comparing the categorical variables between e-government users and non-users. This is a preferable testing method over performing a Manova because there are no variables in the analysis of which can be assumed that they are highly correlated in the analysis. The hypotheses 2 through 5 will be tested using a mediation analysis as it was developed for SPSS by F. Hayes (Hayes, 2013). The mediation will provide insight into the mutual relationships between the independent variables and dependent variables (Field, 2013). This method is the preferable method for mediation analysis because it uses bootstrapping to generate results. Bootstrapping is a non-parametric test and requires a limited amount of assumptions to be met. The method does not require any assumptions about the distribution of the population, but estimates its mean and confidence interval by repeated resampling through replacement (Field, 2009, 2013). Bootstrapping tends to give less powerful statistical results, but the results are found to be more representative for other research samples (Field, 2009, 2013). The mediation analysis will be run once for both the e-government users as non-users. Although this will not suffice for a full comparison between the two groups, the results will give an indication of the interdependent relationship between the variables for both groups.

5.0 Results

An independent sample t-test was performed to compare the mean in perceived power relationship between the citizens who use e-government services (N=1014) and citizens who do not use e-government services (N=686). Before performing the independent sample t-test all assumptions were met. In the case of equal variance, the interpretation for the t-test was continued. In the case of equal variance not being assumed, the Welch's test was interpreted to compare the difference in means. Cases were excluded analysis by analysis, meaning that the group of people that previously scored 'don't know' on one of the questions, were excluded from the between-group comparisons.

The t-test was statistically significant with the e-government users scoring higher on perceived power relationship (M=2.84, SD=.82) in comparison to non-users (M=2.73, SD=.79) on a 95% CI [-.19, -.04], $t(1698) = -2.884$, $p < .01$, two-tailed, $d = .14$, which is considered a small effect size (Cohen, 1988). This finding leads to the conclusion that there is a significant difference in perceived power relationship between e-government users and non-users, meaning that the first hypothesis (H1) can be confirmed. There was also a significant difference found between the two groups in public service satisfaction. E-government non-users scored higher on public service satisfaction (M=3.7, SD=.62) in comparison to users (M=3.6, S=.73) on a 95% CI [.03, .14], $t(1977) = 2.83$, $p < .01$, two-tailed, $d = .15$. The last significant difference concerned the mean age of the two groups. On average, the non-users (M=3.8, SD=1.28) are older in comparison to the users (M=3.27, SD=1.13) on a 95% CI [.48, .67], $t(2196) = 11.94$, $p < .01$, two-tailed, $d = .44$. There was corrected for multiple testing to avoid a type 1 error, using the Bonferroni correction. The results remained significant for $\alpha = .05/4 = .0125$. The results of the t-test can be found in the table below.

Table 3.
Mean differences between e-government use and non-users

Outcome	Non-Users			Users			95% CI		t	df	d
	M	SD	N	M	SD	N	LL	UL			
PSS	3.71	.62	841	3.62	.73	1264	.03	.14	2.83*	1977	.15
OAT	2.71	.78	873	2.78	.76	1255	-.13	.01	-1.75	2126	-
PPR	2.73	.79	686	2.84	.82	1014	-.19	.04	-2.87*	1689	.14
Age	3.84	1.28	1103	3.27	1.14	1534	.48	.67	11.95*	2197	.44

* $p < .01$. Note. CI= confidence interval.

Before proceeding to the interpretations of the results of the Chi-square test, it could be confirmed that the assumptions of independence of participants and expected frequencies were met. The results of the chi-square test can be found in the table 4. The chi-square test was found to be significant for the association between educational level and e-government use with $\chi^2(1, N=2636)=55.67, p<.001$, Cramer's V =.15). This was also the case for the association between age and e-government use with $\chi^2(1, N=2636)=19.92, p<.001$, Cramer's V =.09. Cramer's V is the measure of association between two variables and runs from 0-1 (Field, 2009). The results thus indicate that there was a significant, but very small association between the variables to be found.

Table 4.
Associations between gender, educational level and e-government use

Dependent variables	E-government use (N=2636)		
	χ^2	p	V
Gender	19.922	.000*	.09
Educational level	55.687	.000*	.15

* $p < .001$. Adjusted standardized residuals appear in parentheses below group frequencies.

5.1 The mediation analysis.

The mediation for e-government included 869 users. There were 580 cases excluded from the analysis, due to a 'don't know' answer on one of the variables. For non-users the amount of included respondents was 601 cases. There were 532 non-users excluded due to missing data. The results can be found in table 4. For e-government users, the model that included the mediator accounted for 61% of explained variance in perceived power relationship ($R^2=.61, F(5, 863), p<.01$) against the 31% ($R^2=.31, F(4, 864), p<.01$) explained variance of the model that did not include the mediator. For non-users, the model that included the mediator accounted for 70% of the variability in perceived power relationship ($R^2=.70, F(5, 595), p<.01$) against 23% ($R^2=.23, F(4, 596), p<.01$) of explained variance in the model that did not include the mediator. The results of the analysis are presented in two path diagrams that illustrate the mutual relationships and the size effects of the variables (Figure 2 & Figure 3). More detailed information on these paths can be found in table 5. There are three models

represented in this table. The first model shows the effect of the predictor on the mediator, excluding the perceived power relationship from the model. The second model includes all predictors and mediator, using the perceived power relationship as the independent variable. The third model shows the effects of the predictors on the perceived power relationship, excluding the mediator from the analysis.

The third model in the analysis shows that there was a significant direct effect between the public service satisfaction and the perceived power relationship (users: $b = .59$, $t(869) = 19.63$, $p < .001$ and non-users: $b = .58$, $t(601) = 13.25$, $p < .001$). This is also known as path *c*, which is the direct path between the predictor *X* and the dependent variable *Y*. The hypothesis (H2) assuming that there is a positive relationship between public service satisfaction and perceived power relationship can be confirmed based on the result for both groups. The first model indicates that there was also a significant relationship found between the public service satisfaction and the mediator for both groups (users: $b = .56$, $t(869) = 20.03$, $p < .001$ and non-users: $b = .58$, $t(601) = 13.25$, $p < .001$). This path is called path *a*, indicating that the third hypothesis (H3) can also be confirmed. This was also the case for the relationship between the mediator and the dependent variable (users: $b = .71$, $t(869) = 25.58$, $p < .001$ and non-users: $b = .77$, $t(601) = 30.59$, $p < .001$), leading to the confirmation of the fourth hypothesis (H4). In the figure below, this relationship is defined as path *b*. The analysis showed that controlling for the overall attitude, there still remains a significant relationship between the public service satisfaction and the perceived power relationship for both groups (users: $b = .20$, $t(869) = 7.10$, $p < .001$ and non-users: $b = .13$, $t(601) = 4.24$, $p < .001$). In the case of a full mediation, the direct effect would have become insignificant when the mediator is included in the model and decreased to a value of zero for perfect mediation (Field, 2013; Hayes, 2013). The control variables age, gender and educational level were included in the analysis, but were not found to be significant predictors for the interdependent relationship for either users or non-users.

Table 4.
Model fit for e-government users and non-users

Steps	Non-users (N=601)				Users (N=869)			
	<i>R</i>	<i>R</i> ²	<i>F</i>	<i>P</i>	<i>R</i>	<i>R</i> ²	<i>F</i>	<i>p</i>
Model 1	.48	.23	44.56 (4, 596)	.00*	.57	.32	102.35 (4, 864)	.00*
Model 2	.84	.70	280.33 (5, 595)	.00*	.78	.61	267.70 (5, 863)	.00*
Model 3	.48	.23	45.33 (4, 596)	.00*	.56	.31	97.44 (4, 864)	.00*

* $p < .001$.

Table 5.
Mediation effects for e-government users and non-users

Models	Non-Users (N=601)			Users (N=869)		
	<i>b</i>	<i>t</i>	<i>p</i>	<i>b</i>	<i>t</i>	<i>p</i>
Model 1 (DV=OAT)						
PSS (path <i>a</i>)	.58	13.25	.00*	.56	20.03	.00*
Gender	-.06	-1.03	.30	-.01	-.264	.79
Educational level	-.02	-.40	.69	.08	1.09	.28
Age	.025	.97	.33	.02	1.14	.25
Model 2 (DV = PPR)						
OAT (path <i>b</i>)	.77	30.59	.00*	.71	25.58	.00*
PSS (path <i>c</i>)	.13	4.24	.00*	.20	7.10	.00*
Gender	-.02	-.39	.70	.02	.40	.69
Educational level	.01	.31	.76	-.02	-.67	.51
Age	.01	.36	.84	.00	.23	.82
Model 3 (DV = PPR)						
PSS (path <i>c</i>)	.58	13.25	.00*	.59	19.63	.00*
Gender	-.06	-1.04	.30	.01	.13	.90
Educational level	-.02	-.40	.69	.01	.22	.83
Age	.03	.97	.33	.02	.92	.36
Indirect effect with bootstrapped 95% CI	.40 [.35, .45]			.42 [.38, .46]		

* $p < .001$. Note b =unstandardized coefficients and CI=Confidence Interval

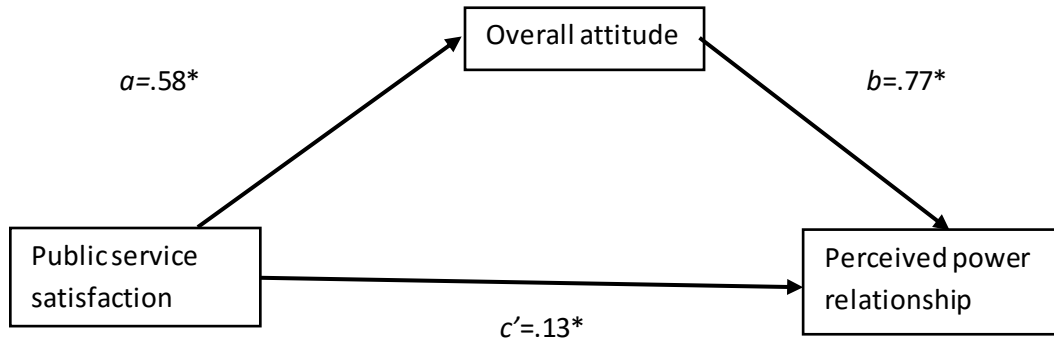


Figure 3. Statistical model for non-users, * $p < .001$

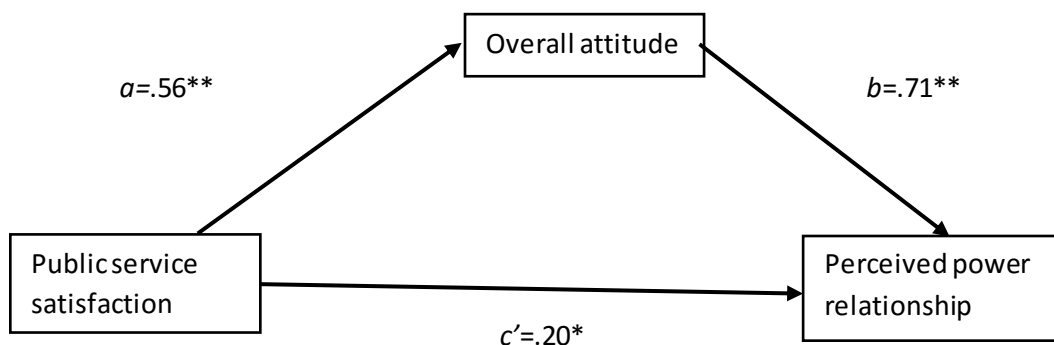


Figure 2. Statistical model for users, * $p < .001$

Unstandardized indirect effects were computed for each of 1000 to test for partial mediation (Hayes, 2013). The bootstrapped unstandardized indirect effect ($c - c'$) was $b = .42$ at a 95% confidence interval ranged from .38 to .46 for users. For non-users the indirect effect was valued $b = .40$ at a 95% confidence interval ranging from .35 to .45. These results show that there was a significant indirect effect as the range did not contain zero for both groups (Field, 2013). The ratio of indirect effect to direct effect had a value of 2.0 for users. This value was 3.4 for non-users. This ratio indicated that the chance for the relationship between PSS and the PPR to run via the mediator is 2.0 more greater than to run through the direct effect for e-

government service users. For non-users, the relationship is 3.6 times more likely to run through the indirect effect. Based on these results, it is found that the relationship between public service satisfaction and perceived power relationship was partially mediated by the overall attitude for both groups, which leads to the rejection of the fifth hypothesis (H5).

The results indicate that there is a significant difference in citizen's public service satisfaction and perceived power relationship between e-government users and non-users. The mediation, which provided more insight into the interdependent relationships, revealed that the relationship between the public service satisfaction and the perceived power relationship more or less run the same for both groups. The likelihood of having a more positive perception increases as you are more satisfied with public services. The relationship between the independent and dependent variable is found to be partially mediated by the overall attitude and explains a relatively large part of the effect on the dependent variable. It seems that one is more likely to have a higher perception power relationship with the government when the mediator is added in both cases. Comparing the two groups shows that the direct effect is stronger among users than among non-users. Subsequently, the indirect effect among non-users is stronger in comparison to users. This could suggest that there are perhaps other mediators that influence the relationship between the public service satisfaction and perceived power relationship. Unfortunately, testing the strength and significance of the differences between the two groups lies beyond the scope of this study.

6.0 Conclusion

Technology has become increasingly important in contemporary society. Citizens expect to find all of the information they need at any time. The government acknowledges this need and aims to make technological improvements at a rapid pace. By 2017, the government should be fully digitalized according to the minister of the Interior and Kingdom Relations (Plasterk, 2013). A clear digital environment with convenient public services and municipal information is expected to contribute to a better relationship between citizens and local government and encourage citizens to become more involved and take control in fulfilling their own needs (Carter & Bélanger, 2005; Harding, 2013; Li & Gregor, 2011). Digitalization of public services is increasingly understood as a mean to facilitate this empowerment of citizens. These changes in public service provision increase the urge to gain understanding on the effects of the digitalization of these services and citizens' perceptions (West, 2004). This study therefore aimed to gain a better understanding on the extent to which citizens' public

service satisfaction and overall attitude explain the citizens' perceived power relationship with the local government and how this may differ between e-government services users and non-users.

Based on the results of this study, it can be concluded that citizens with a higher public service satisfaction are more likely to feel empowered. This is the case for citizens who use e-government services and citizens who don't. The results indicate that a large part of the empowerment process can be explained by the overall attitude of citizens towards their local government. The satisfaction on the public services positively influences the likelihood of more positive attitudes, which in turn positively influence the likelihood of a more positive citizens' perception on their own power situation relative to the power situation of their local government. This would indicate that more satisfaction would indirectly increase the likelihood of citizens feeling more empowered. The users of e-government services tend to be less satisfied with the services that are provided than non-users. Lower satisfaction actually means that citizens find their e-government services to be less convenient, less transparent (access to information and communication) and less helpful in comparison to the non-users. This is in accordance with previous findings on digital service satisfaction that indicated the preference to more traditional methods of communications due to the more personal character of these services (Timmermans et al., 2014). Despite this lower satisfaction, the empowerment outcome is better among users in comparison to non-users. These results indicate that more positive empowerment outcome of citizens could be induced by optimizing digital services in respect to more conventional methods like calling, desk service and post. It can therefore be concluded that investing in e-government satisfaction and the quality of online services both directly and indirectly increases the likelihood of citizens feeling more empowered.

Plasterk's ambition to have a fully digitalized government by 2017 included multiple goals. One of these goals was to include citizens into the process of policymaking and public innovation. Before this could occur, first steps have to be made to increase the e-government service satisfaction. Changing the role of citizens from merely customers to active and in control citizens would require modifications to increase service convenience and online interactivity, such as a good online response and information systems. Higher quality of e-government services with a better two-way digital interaction could contribute to this goal. Changes that needs to be made vary per population and per municipality, in part also depending on the digital maturity. Only with great digital improvements will citizens be able

to make a difference into the creation and realisations of plans, ideas and initiatives through the utilisation of e-government services.

7.0 Discussion

This final chapter will briefly discuss some limitations to this research. These limitations concern the characteristics of the group sample, the interpretation of the statistical results and the broader representativeness of these findings. This chapter will also offer some suggestions for further research.

The first point of discussion is the reliability and construction of the included variables. This analysis has focused on the mutual relationships between e-government use, attitudes and perceptions among e-government users and non-users. In further research, a broader and more reliable construct of the variables might be considered. The overall attitude could include more variables that might influence citizens' attitudes. This could for example be the citizen's opinion on the safety in the neighbourhood, the quality of the living environment and political trust. Further analysis should not be limited to the perception on the power relationship between citizens and government, but include the effects of e-government services on actual participation of citizens. Although the analysis made a modest comparison between e-government service users and non-users, further research should aim to make a more extensive comparison using different statistical procedures.

There are also some remarks that need to be taken into account concerning the representativeness of the findings. The respondents that were included in the analysis were members of existing survey panels. The survey is conducted through online application. This eliminates all citizens that are not in the panel, are not active online or have no digital experience at all. The enhancement of digital public services can thus only benefit those who are active on the internet. The low response rate in the panels could also suggest that people don't feel the need to express their opinion or find the completion of such as survey to be useless. In addition to this, a large part of the respondents felt indifferent on a number of items about public services. These cases unfortunately had to be excluded from the analysis. The people included in this analysis are people that are willing to express their opinion and possess some amount of digital skills. Therefore, this research population might not be representative for the actual population in Twente or a larger part of the population in the Netherlands. The group that responded to the survey and that is included in the analysis may

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very well be the group for whom the qualitative enhancement of digital services would be the most effective and would feel most empowered. The improvement of e-government services may be effective for a certain population, perhaps especially the citizens who grew up in an era of digitalization. However, there remains to be a part of the population that have no to little digital skills. Therefore, the government should continue to enhance the possibilities for people to take control in a variety of ways and not limit their services to the online environment. As Julian Rappaport put it in his theory on empowerment; the overall aim (of the government) should be ‘to enhance the possibilities for people to control their own lives’ (Rappaport 1981, p. 15). And by ‘people’, he meant all human beings, whether competent or incompetent (Rappaport, 1981).

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Appendix A: Variables and survey-items

Variable name	Survey-items	Scale
Perceived Power Relationship		
	The municipality is flexible if necessary	1-5
	The municipality listens to the opinion of its inhabitants.	1-5
	The municipality includes her inhabitants with her plans, activities and facilities.	1-5
	Inhabitants and organisations get enough room to realise ideas and initiatives.	1-5
Public service satisfaction		
Service convenience	I perceive the procedure of application or questions to be easy.	1-5
	The received information was accurate and complete.	1-5
	In the end, I got what I wanted	1-5
Transparency	I have easy access to the required municipal information.	1-5
	How do you rate the communication and the information availability from the municipality?	1-5
Interactivity	The time it took to finish the procedure was acceptable.	1-5
	I was sufficiently informed about the progress of the procedure	1-5
Overall attitude		
	How much do you trust the way your municipality is being governed?	1-5
	The local government does what she	1-5

	says/claims to do.	
	The local government adequately controls the compliance of rules	1-5
Control variables		
Age	What is your age?	1-7
Educational level	What is your highest level of education?	0-1
Gender	What is your gender?	0-1

Appendix B: Syntax

** select cases if respondents had contact with the municipality in the last twelve months into new dataset*

```
DATASET ACTIVATE DataSet1.
```

```
DATASET COPY newdata.
```

```
DATASET ACTIVATE newdata.
```

```
FILTER OFF.
```

```
USE ALL.
```

```
SELECT IF (dv02 = 1).
```

```
EXECUTE.
```

```
DATASET ACTIVATE DataSet1.
```

** E-USE **

```
COMPUTE e_use=dv03_0 + dv03_1 + dv03_2.
```

```
EXECUTE.
```

** Recode new variable with 0-->0=telephone, desk, phone and 1,2,3--> 1= internet/email/social media **

```
RECODE e_use (0=0) (1=1) (2=1) (3=1).
```

```
EXECUTE.
```

** PERCEIVED POWER RELATIONSHIP**

```
RECODE bo02_2 (6=SYSMIS) (5=1) (4=2) (3=3) (2=4) (1=5) INTO PPR_flexibility.
```

```
VARIABLE LABELS PPR_flexibility 'PPR_flexibility'.
```

```
EXECUTE.
```

```
RECODE bo03_0 (6=SYSMIS) (5=1) (4=2) (3=3) (2=4) (1=5) INTO  
PPR_listens_to_opinion.
```

```
VARIABLE LABELS PPR_listens_to_opinion 'PPR_listens_to_opinion'.
```

```
EXECUTE.
```

```
RECODE bo03_1 (6=SYSMIS) (5=1) (4=2) (3=3) (2=4) (1=5) INTO  
PPR_includes_inhabitants.
```

```
VARIABLE LABELS PPR_includes_inhabitants 'PPR_includes_inhabitants'.
```

```
EXECUTE.
```

```
RECODE bo04_0 (6=SYSMIS) (5=1) (4=2) (3=3) (2=4) (1=5) INTO PPR_ideas_initiatives.
```

```
VARIABLE LABELS PPR_ideas_initiatives 'PPR_ideas_initiatives'.
```

```
EXECUTE.
```

RELIABILITY

```
/VARIABLES=PPR_flexibility PPR_listens_to_opinion PPR_includes_inhabitants  
PPR_ideas_initiatives
```

```
/SCALE('ALL VARIABLES') ALL
```

```
/MODEL=ALPHA
```

```
/STATISTICS=DESCRIPTIVE SCALE CORR
```

```
/SUMMARY=TOTAL.
```

```
COMPUTE PPRnew=PPR_flexibility + PPR_listens_to_opinion + PPR_includes_inhabitants  
+ PPR_ideas_initiatives / 4.
```

```
VARIABLE LABELS PPRnew 'PPRnew'.
```

```
EXECUTE.
```

PUBLIC SERVICE SATISFACTION

```
RECODE dv05_0 (6=SYSMIS) (5=1) (4=2) (3=3) (2=4) (1=5) INTO PSS_serviceconv_easy.
```

```
VARIABLE LABELS PSS_serviceconv_easy 'PSS_serviceconv_easy'.
```

```
EXECUTE.
```

```
RECODE dv07_0 (6=SYSMIS) (5=1) (4=2) (3=3) (2=4) (1=5) INTO  
PSS_serviceconv_accuracy.
```

```
VARIABLE LABELS PSS_serviceconv_accuracy 'PSS_serviceconv_accuracy'.
```

EXECUTE.

RECODE dv07_3 (6=SYSMIS) (5=1) (4=2) (3=3) (2=4) (1=5) INTO
PSS_serviceconv_wanted.

VARIABLE LABELS PSS_serviceconv_wanted 'PSS_serviceconv_wanted'.

EXECUTE.

RECODE dv08_0 (6=SYSMIS) (5=1) (4=2) (3=3) (2=4) (1=5) INTO
PSS_transparency_access.

VARIABLE LABELS PSS_transparency_access 'PSS_transparency_access'.

EXECUTE.

RECODE dv07_1 (6=SYSMIS) (5=1) (4=2) (3=3) (2=4) (1=5) INTO PSS_interactivity_time.

VARIABLE LABELS PSS_interactivity_time 'PSS_interactivity_time'.

EXECUTE.

RECODE dv07_2 (6=SYSMIS) (5=1) (4=2) (3=3) (2=4) (1=5) INTO
PSS_interactivity_progress.

VARIABLE LABELS PSS_interactivity_progress 'PSS_interactivity_progress'.

EXECUTE.

RECODE dv10 (11=SYSMIS) (1 thru 10=Copy) INTO dv10missing.

VARIABLE LABELS dv10missing 'dv10 coded 11 as missing'.

EXECUTE.

COMPUTE psstransrescale=((5 - 1) * (dv10missing - 1) / (10 - 1)) + 1.

VARIABLE LABELS psstransrescale 'pss transparency validation'.

EXECUTE.

RELIABILITY

/VARIABLES=PSS_serviceconv_easy PSS_serviceconv_accuracy
PSS_serviceconv_wanted

/SCALE('ALL VARIABLES') ALL

/MODEL=ALPHA

/STATISTICS=DESCRIPTIVE SCALE CORR

```
/SUMMARY=TOTAL.
```

RELIABILITY

```
/VARIABLES=PSS_transparency_access psstransrescale
```

```
/SCALE('ALL VARIABLES') ALL
```

```
/MODEL=ALPHA
```

```
/STATISTICS=DESCRIPTIVE SCALE CORR
```

```
/SUMMARY=TOTAL.
```

RELIABILITY

```
/VARIABLES=PSS_interactivity_time PSS_interactivity_progress
```

```
/SCALE('ALL VARIABLES') ALL
```

```
/MODEL=ALPHA
```

```
/STATISTICS=DESCRIPTIVE SCALE CORR
```

```
/SUMMARY=TOTAL.
```

```
COMPUTE NEWPSS_serviceconv=(PSS_serviceconv_easy + PSS_serviceconv_accuracy +  
PSS_serviceconv_wanted) / 3.
```

```
VARIABLE LABELS NEWPSS_serviceconv 'NEWPSS_serviceconv'.
```

```
EXECUTE.
```

```
COMPUTE NEWPSS_transparency=(PSS_transparency_access + PSSstransrescale) / 2.
```

```
VARIABLE LABELS NEWPSS_transparency 'NEWPSS_transparency'.
```

```
EXECUTE.
```

```
COMPUTE NEWPSS_interactivity=(PSS_interactivity_time + PSS_interactivity_progress) /  
2.
```

```
VARIABLE LABELS NEWPSS_interactivity 'NEWPSS_interactivity'.
```

```
EXECUTE.
```

RELIABILITY

```
/VARIABLES=NEWPSS_serviceconv NEWPSS_transparency NEWPSS_interactivity
```

```
/SCALE('ALL VARIABLES') ALL
```

```
/MODEL=ALPHA
```

```
/STATISTICS=DESCRIPTIVE SCALE CORR
```

```
/SUMMARY=TOTAL.
```

```
COMPUTE PSSnew=(NEWPSS_serviceconv + NEWPSS_transparency +  
NEWPSS_interactivity) / 3.
```

```
VARIABLE LABELS PSSnew 'new egovernment satisfaction'.
```

```
EXECUTE.
```

```
** OVERALL ATTITUDE**
```

```
RECODE bo01 (6=SYSMIS) (5=1) (4=2) (3=3) (2=4) (1=5) INTO OATT_trust_governance.
```

```
VARIABLE LABELS OATT_trust_governance 'OATT_trust_governance'.
```

```
EXECUTE.
```

```
RECODE bo02_0 (6=SYSMIS) (5=1) (4=2) (3=3) (2=4) (1=5) INTO OATT_trust_reliable.
```

```
VARIABLE LABELS OATT_trust_reliable 'OATT_trust_reliable'.
```

```
EXECUTE.
```

```
RECODE bo02_1 (6=SYSMIS) (5=1) (4=2) (3=3) (2=4) (1=5) INTO OATT_trust_rules.
```

```
VARIABLE LABELS OATT_trust_rules 'OATT_trust_rules'.
```

```
EXECUTE.
```

RELIABILITY

```
/VARIABLES= OATT_trust_governance OATT_trust_reliable OATT_trust_rules
```

```
/SCALE('ALL VARIABLES') ALL
```

```
/MODEL=ALPHA
```

```
/STATISTICS=DESCRIPTIVE SCALE CORR
```



```
/SUMMARY=TOTAL.
```

```
COMPUTE oatnew=(OATT_trust_governance + OATT_trust_reliable + OATT_trust_rules) /  
3.
```

```
VARIABLE LABELS oatnew 'new overall attitude'.
```

```
EXECUTE.
```

```
** GENDER recoden met 1=man en 0=woman**
```

```
RECODE ch01_gender (1=1) (2=0) INTO Gender.
```

```
VARIABLE LABELS Gender 'Gender'.
```

```
EXECUTE.
```

```
**EDUCATIONAL LEVEL into dichotomous variable **
```

```
RECODE ch03 (7=SYSMIS) (5 thru 6=1) (ELSE=0) INTO educlev.
```

```
VARIABLE LABELS educlev 'educational level'.
```

```
EXECUTE.
```

```
** AGE into new variable **
```

```
RECODE ch02 (1=Copy) (2=Copy) (3=Copy) (4=Copy) (5=Copy) (6=Copy) INTO Age.
```

```
VARIABLE LABELS Age 'Age'.
```

```
EXECUTE.
```

```
** CHECKING OF ASSUMPTIONS for independent sample t-test, excluding listwise.  
Assumption are met **
```

```
EXAMINE VARIABLES=pssnew oatnew pprnew Age BY e_use
```

```
/PLOT HISTOGRAM NPLOT
```

```
/STATISTICS DESCRIPTIVES
```

```
/CINTERVAL 95
```

/MISSING LISTWISE

/NOTOTAL.

****FURTHER ANALYSIS****

**** t-test comparing mean of continuous variables between users and non-users****

T-TEST GROUPS=e_use(0 1)

/MISSING=ANALYSIS

/VARIABLES=pssnew oatnew pprnew Age

/CRITERIA=CI(.95).

**** crosstab chi square for comparing categorical variables between users and non-users ch03 is educational level ****

CROSSTABS

/TABLES=Gender educlev BY e_use

/FORMAT=AVALUE TABLES

/STATISTICS=CHISQ PHI

/CELLS=COUNT EXPECTED ROW COLUMN TOTAL

/COUNT ROUND CELL

/BARCHART.

****only select users before mediation analysis****

temporary.

select if (e_use=1).

****run mediation of Hayes without pasting, it will give 100000 lines ****

****only select non-users before mediation analysis****

temporary.

select if (e_use=0).

**run mediation of Hayes without pasting, it will give 100000 lines **