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Algorithmic Governance and public values

A mixed methods analysis of parliamentary debates deducting public values linked to algorithmic governance

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Abstract

The public values of political actors can be seen as the underlying mechanism of opinions, however no previous research has studied politicians values. This thesis will focus on Hood's typology of values: the sigma (efficiency), theta (fairness) and lambda (resilience) type values. Through an content analysis of 44 Dutch parliamentary debates, this study gives explorative results on politicians' values regarding the topic of algorithmic governance. The study focuses on algorithms since it is a topic with increased relevance, and the results can contribute towards the development of algorithmic governance. In addition to the explorative analysis, four hypotheses have been tested through 14 single linear regressions, in order to examine the effect of party family and parliamentary opposition status on change and diversity of values. The collected data consists of a sample size of 422. The hypotheses in this article are derived from political literature and have formed expectations based on parties' size and resources. The results of this study show that the values regarding algorithms are somewhat equally distributed, yet lean towards being more sigma and theta. This shows the tension between efficiency and ethics. Furthermore, the results indicate that larger parties like the socialist and religious party family are less likely to change their values than smaller parties like the green party family. Moreover, coalitions' values will change less and are more diverse than oppositions' values. The results suggest that when creating an assessment framework for algorithms within the government, the tension between the sigma and theta values needs to be acknowledged.

Keywords: Algorithmic governance; public values; party family; coalition; opposition; changing values; diversifying values; parliamentary debates

Introduction

This thesis aims to illuminate the unmapped values of politicians on algorithmic governance through an analysis of parliamentary debates. *Algorithmic governance* is defined by the increased use of algorithms within the governments' decision-making processes. An algorithm is a calculation process and/or a problem-solving operation that is followed by a computer (Katzenbach & Ulbricht, 2019). The development of increased use of algorithms within the government, can result in them becoming more efficient and uniform (Rieder & Simon, 2016). However, it may also result in the algorithmic decision-making process becoming untransparent and discriminating (Gandy, 2010; Cotter & Reisdorf, 2020).

Recently an algorithm scandal has occurred in the Netherlands, which led to the Dutch government being forced to step down (Erdbrink, 2021). The tax authorities had been unjustly targeting parents with dual nationalities when controlling for fraud on childcare benefits. This targeted group was constructed by an algorithm that created potential risk groups based on fraud cases that had been found in the past. This scandal illustrates that governmental algorithms can be quite impactful and therefore require re-evaluation. Meanwhile, the amount of parliamentary debates on algorithmic governance have increased and so have the government-sponsored studies on this topic (Algemene Rekenkamer, 2021; Doove & Otten, 2018). This shows the relevance of studying specifically the topic of algorithms.

To estimate what needs to change in relation to the use of algorithms within the government, the values that are linked with these algorithms need to be mapped. Most existing literature focus on parties' policy preference, position or opinion (Häusermann, Picot & Geering, 2013; Meyer, 2013; Leeper & Slothuus, 2014; Sohlberg, 2017). Yet the goal of this study is to add to the existing literature by measuring the values of political parties. This is valuable knowledge, since values underlie opinions, yet have rarely been measured and studied by political scientists (Feldman, 1988). This study will focus on three types of values: the sigma, theta and lambda type values (Hood, 1991). All representing a certain type of core value commonly displayed amongst public management, them being focused on either efficiency, fairness or resilience. When these values of a macro-organization, like the government, are in line with the values of the micro-personal, this results in a harmonious operation of modern bureaucracy (Vigoda-Gadot & Meiri, 2008).

Furthermore, the values in relation to algorithmic governance do have an actual influence on the outcome of policy (Danaher et al., 2020). For instance, if the values of

politicians are mainly focussed on the efficiency of algorithms, this would indicate that there would be less values displayed in relation to the ethical side of algorithms. Thus, the assessment then has to shift towards controlling whether the algorithms remain ethical. This example illustrates that when more knowledge is available on how policy makers see algorithms, the assessment criteria developed to prevent more algorithmic scandals can become more effective. Since political parties are responsible for organizing policy making within the government, it is essential to focus on politicians' values (Strøm & Müller, 1999). The parliamentary debates, in which political parties vocalize their opinions and values, can be seen as a fundamental part of democratic policy making (Proksch & Slapin, 2015). Therefore, the parliamentary debates are a rich information source to deduct the values of political parties (Lauderdale & Herzog, 2016). While the main focus of this thesis is the study of public values, four additional hypotheses will be added. The goal of these hypotheses is to test the influence of party family and parliamentary opposition status on these values, this knowledge can contribute to the more broader theories on understanding parties' motivation for political positions.

Furthermore, the choice has been made to conduct this study in the Netherlands due to two reasons. First, the Netherlands has been a precursor in terms of digitalization of the government. It is ranked fourth in the European Digital Economy and Society Index (DESI) 2020 (European Commission, 2020). This index consists of digital public services which includes algorithmic governance. Since the Netherlands is a precursor in digitalization, the results can be generalized to similar countries that are successors in terms of digitalization. Next, partly due to the above mentioned benefit scandal, algorithms have been discussed increasingly since 2015 in the parliament which gives us rich data to analyse (Tweede Kamer der Staten-Generaal, n.d.). This study will use quantitative measure to deduct the displayed values, yet to test the hypotheses a quantitative method will be applied, resulting in this study being a mixed methods study. The data will be constructed through a content analysis of 44 parliamentary debates on algorithms held within the House of Representatives. The research question that will be answered is as follows: *What public values linked to algorithmic governance do party families display in Dutch parliamentary debates?*

The analysis shows that the distribution of values are relatively even, yet less evenly distributed when subdivided by party families. These findings provide crucial input for better understanding the underlying mechanisms of politicians' opinions. Moreover, the results can be applied for the creation of an assessment framework for algorithms within the government.

Locus

To deduct the values of political actors on algorithmic governance, it is essential to give a broad overview of the development of algorithms as a whole, yet also within the Dutch government. By including this knowledge on algorithms, the importance of this study will be clarified. Moreover, the results will be understood better in light of this given context. Therefore, this chapter will contain a literature overview providing valuable context to substantiate the study.

Development of Algorithmic Governance

Algorithms can be defined by their computer-based ability to create procedures through inherent mathematical logics and statistical practices (Katzenbach & Ulbricht, 2019). Understanding algorithms and their impact on public discourse requires thinking about more than how they work or where they are deployed (Gillespie, 2014, p.25). Gillespie (2014) argues that algorithms are such complex systems, that they become largely incomprehensible to most people. Meanwhile these procedures are unavoidably selective, emphasizing some information and discarding others, and their choices can be very consequential (Gillespie, 2014, p.25). Yet, people see their outcomes as liable truths due to their mathematical logics and statistics which could result in problematic outcomes. This locus part of the thesis will outline the context of algorithmic governance based on existing literature, while illuminating their impact.

In scholarly debate the concept of *algorithmic governance* has emerged over the last decade. It has been constructed to create a deeper understanding of the societal impact of algorithms used by governments. There are multiple types of algorithms used in governance, in this thesis the emphasis will be on two types: (1) automated decision making through algorithms and (2) advisory algorithms. The first type makes decisions without a human involved and the second type gives advice on the decisions a human has to make. Algorithmic governance is a form of social ordering that relies on coordination between actors, it is based on rules and incorporates particularly complex computer-based epistemic procedures (Katzenbach & Ulbricht, 2019, p.2). In other words, an algorithm is a calculation process or a different problem-solving operation followed by a computer.

Recently governments have been using more algorithms for automated decision making. Examples of algorithmic decision making by governments include increasingly relying on them to aid with public-sector functions like the police, tax administration,

regulatory oversight, and benefits administration (Coglianese & Lehr, 2019). Government started using algorithms for a multitude of reasons. First and foremost, algorithms are a very powerful method to cover large parts of the analytical and decision-making process that occur within the bureaucracy (Rieder & Simon, 2016). Next to that, by focusing on correlations rather than causes the need for theories, models and human expertise decreased. Therefore, making the government more uniform and efficient. Lastly, the use of algorithms has expanded the realm of what can be measured. Algorithms make it possible to calculate what is yet to come in a smart, fast and cheap manner (Rieder & Simon, 2016). When governments start using more algorithms, governance can become more powerful, intrusive and pervasive. Yet, simultaneously governance can become more responsive and efficient (Sætra, 2020).

Besides the government becoming more intrusive and pervasive, there are various other downfalls to the use of algorithms. The use of algorithms in governance is characterized by low transparency, high complexity and high degrees of automation (Sætra, 2020). It can be used by governments to nudge, bias, guide, provoke, control and manipulate human behaviour (Coglianese, & Lehr 2019). Due to full transparency making algorithms vulnerable to manipulation, transparency is often neither possible nor desirable (Katzenbach & Ulbricht, 2019). When many governmental decisions are being made by computer-processed algorithms, this could lead to implications for liberty and democracy since transparency is seen as a cornerstone of democracy (Coglianese & Lehr, 2019). In light of the transparency debate scholars have been questioning the underlying social values of algorithms based decision making (Coglianese & Lehr, 2019). Since algorithms are computer-based through mathematical logics and statistics some see them as objective and truthful (Boyd & Crawford, 2012; Gillespie, 2014). While other studies have disputed this idea by stating that social inequality, unfairness and discrimination in the society will translate into biased decision making (Gandy, 2010; Cotter & Reisdorf, 2020). Algorithms are not biased per se, yet studies showed they are unfair due to them judging individuals based on their reference groups behaviour instead of on their individual actions (Corbett-Davies, Pierson, Feller, Goel & Huq, 2017). For instance, when you have a specific ethnic background that generally has a lower socioeconomic background, the algorithm will use the behaviour of everyone with that ethnic background to predict your behaviour. As a result, algorithms are likely to contribute to economic and social inequality (Gandy, 2010; Cotter & Reisdorf, 2020). The earlier mentioned tax authorities unjustly targeting parents with dual nationalities is a great example of how this works in practice. Multiple studies have shown that algorithmic systems routinely favour the privileged while discriminating against marginalised groups (Noble, 2018;

Corbett-Davies et al., 2017). This indicates that the societal consequences of algorithms are of great impact. The following paragraph will provide more information on the development of algorithms in the Dutch context.

Development of Algorithms in the Dutch government

The Dutch government has launched in 2020 their digitalization strategy, in which they have formulated their goals for an increasingly digital government (Ministry of Economic Affairs and Climate, 2020). The goals regarding algorithms are the following: apply them in more sectors in the future, increase the monitoring of algorithms to make them more in line with public values and lastly create guidelines for the transparency of algorithms. This implies that the Dutch government is aware of some implications of algorithmic governance, yet most of the issues still have to be addressed. Multiple studies have shown that obtaining transparency and legitimacy with algorithmic governance is complex and quite difficult (Coglianese, & Lehr 2019; Katzenbach & Ulbricht, 2019). It is essential to ensure that these algorithms are an effective means for achieving a legitimate policy goal, which is simultaneously fair, open and unbiased (Danaher et al., 2020).

Governments applying algorithms usually highlight the efficiency of automatically governed spaces, but typically overlook the ethical issues that come along with delegating to technological solutions (Katzenbach & Ulbricht, 2019). A recent study confirms this, by revealing that within the Dutch government there is a bigger focus on the privacy of citizens' data when using algorithms, than on the avoidance of unethically applying them (Algemene Rekenkamer, 2021). This study has formulated recommendations for the government, stating it is essential to create an assessment framework for algorithms within the government for the near future. To create a fitting assessment criteria for algorithms within the government, it is essential to illuminate the awareness of political actors applying these algorithms. A lot of issues related to algorithmic governance, can be avoided when the assessment fits the perspective of the political actors. Currently only three of the twelve ministries indicated that they redeemed ethics as an important factor when applying algorithms (Algemene Rekenkamer, 2021). This shows the different values in relation to algorithms within the government, yet these differences in the values should have an actual impact on the policy. For instance, if the majority of political parties see algorithms only as a way to maximize efficiency within the government, the assessments should focus on algorithms being fair and ethical.

As stated before, the aim of this thesis is to study the public values that are linked with algorithmic governance within the government. Algorithmic governance literature shows that transparency issues is a border-crossing problem, which multiple countries struggle with (Coglianese & Lehr, 2019). The results of this study can be extended to countries with similar algorithmic governance issues since the representation of certain values can impact the implementation of algorithms within the government. The results can be used in countries with advanced digitalization developments, applying them for assessment frameworks for algorithms within the government. However in countries that have completely opposite forms of government, like a presidential system, these results are less relevant. Recently, most algorithmic governance literature has been focused on algorithmic governance as a broader issue. Very few scholars have narrowed their topics to specific cases or countries, this can be explained by algorithmic governance being a relatively new research field. Since there remain a lot of unanswered questions in this field, it is relevant to broaden and deepen the existing knowledge on algorithmic governance (Danaher et al., 2020). In conclusion, when there is more knowledge on public values linked to algorithmic governance of political actors in the Netherlands, an unbiased assessment framework can be developed to increase the effectiveness and comprehensibility of algorithms. This locus has shown that an increase in ethics, effectiveness and comprehensibility is urgently needed.

Theoretical Framework

As the locus of this thesis has elaborated, algorithmic governance is a topic that requires more examination. This study will examine which values on algorithms political parties display during parliamentary debates. The following paragraphs will further explain why the values of political parties are important to study. Moreover, four hypotheses will be developed based on existing literature in regards to party family and parliamentary opposition status.

Political Parties' Opinions

It is widely known that the opinions of political parties are important to focus on since they influence public attitudes, as well as government policy outputs and outcomes (Jensen & Spoon, 2011; Zaller, 1992). For instance, if the composition of the government consists of a majority of green parties, policy outputs will be more environmental, leading to a greener society as an outcome (Sohlberg, 2017). Multiple studies have shown that public opinion is

partially caused by political parties' opinions (Sohlberg, 2017). Classical literature by Zaller (1992) shows that when political elites change their opinions, the public changes its attitudes accordingly. For instance, if politicians send an one-sided message on a political issue, the consequence is that the public shifts in one direction and there will be little variance in public opinion. Yet, when a politician will send a two-sided message, public opinion will become more diverse (Zaller, 1992). This strong relation can be explained by political parties' opinions simplifying the decision-making process for the public. People can swiftly form opinions by adopting the same positions as trusted politicians (Sohlberg, 2017, p.2). Parties' influence on voters' political opinions depend on an individual's type of motivation and the amount of effort put into political reasoning. When parties have more seats in parliament, they exert their higher influence in psychologically different ways with distinct consequences for reasoning processes and opinion outcomes (Leeper & Slothuus, 2014, p.4). People have the tendency to strive toward the completion of certain goals, this goal-oriented behaviour also occurs within politics. These goals can be economic yet also serve higher goals like belongingness or social attachment. Thus, when an influential party is held responsible for a bad economic performance, this will affect the reasoning process and opinion outcome of an individual (Leeper & Slothuus, 2014). Since voters' behaviour influences political parties' opinions and vice versa, parties' opinions can be quite influential. This reveals the importance of the opinions of political actors linked to algorithms, since these are likely to influence the public opinion. On a topic as complex as algorithms, it is quite presumable that people adopt the same position as politicians.

Moreover, studies have shown that parties' opinions matter for policy output (Jensen & Spoon, 2011). Schmidt (1996) shows that differences in the party composition of government generate significant differences in political choices and public policy outputs. This party composition theory is based on similarities between party families. For instance, if the majority of the government consists of Christian parties, policies will remain more conservative. Moreover, a change in the party composition of a government is associated with changes in policy choices and outputs (Jensen & Spoon, 2011; Zaller, 1992).

Concluding, politicians' opinions do have an influence on public opinion. In addition to that, studies have shown that political opposition status can influence policy outcomes. Thus, the way that algorithms are applied within a government, is something politicians can influence through their parties' opinions. The influence of political opinions are widely known and studied (Sohlberg, 2017; Leeper & Slothuus, 2014; Jensen & Spoon, 2011; Zaller,

1992). However, values which are the underlying mechanism of these influential opinions have been rarely studied.

Exploration of values

The values that political parties exercise are potentially very influential, yet have not been the main focus of many studies. While various researches have linked values to voting behaviour (Barnea & Schwartz, 1998; Goren, 2005; Caprara et al., 2006), there are no studies focussed on politicians' values. Most scholars either examine a parties' policy preference, a parties' position or a parties' opinion (Downs, 1957; Häusermann, Picot & Geering, 2013; Meyer, 2013; Leeper & Slothuus, 2014; Sohlberg, 2017). Next to that, literature on parties' positions focus mainly on changes in position or on issue emphasis, which is giving special attention to certain issues like climate change (Harmel & Janda, 1994; Adams & Somer-Topcu, 2009; Wagner & Meyer, 2014). Furthermore, existing literature has analysed the importance of the voters' values (Kam, 2005; Caprara et al., 2006). For instance, citizens are often exposed to arguments in political discourse that can resonate with their underlying values (Kam, 2005). Furthermore, voters' personalities including traits and values account for significant portions of variance in political judgments (Caprara & Zimbardo, 2004). Yet, no study has been focussed on the effect of politicians' values, even though values can be seen as the underlying mechanism of opinions (Feldman, 1988). The lack of research is remarkable, since a study has shown that legislative policy choices, particularly votes on bills, result from the politicians' preferences (Rosas, 2005). Research on politicians' values is necessary to create a better understanding of, for instance, politicians' voting behaviour in parliament (Rosas, 2005). Since the prior knowledge on values of political parties is slim to none, this study will be an explorative study as an addition to the existing literature on political parties. The values that will be measured are categorized into three types of values: the sigma, theta and lambda type values (Hood, 1991). All representing a certain type of core value commonly displayed amongst public management, them being focused on either efficiency, fairness or resilience. Since this thesis will be of an explorative nature, with a specific focus on Hood's (1991) values, this study differs from and contributes to most research on political parties.

The choice has been made to measure the values on a specified policy issue, being algorithmic governance. This policy issue is relevant since algorithmic governance is an upcoming scientific field and an important societal issue. This field is new and – perhaps therefore – has been studied mostly in a more broad manner (Gandy, 2010; Gillespie, 2014; Katzenbach & Ulbricht, 2019; Cotter & Reisdorf, 2020), while less studies have linked its

topic to politics in a specific context. Due to the newness of this topic, and thus being less a common topic, it is more realistic to use all relevant and available data. If the studied topic was more common and widely discussed, it would be necessary to do a random sample instead of using all available data. Next to that, values on this topic will be displayed in politics during a recent time period. Besides expanding the scientific knowledge on political parties' values, this study can be used to map out the different values amongst party families or parties' opposition status. The main focus of this thesis is the exploration of political parties' values. However, based on prior research on political parties and their behaviour, four hypotheses will be formulated to contribute to the more broader theories on parties' motivation for certain decisions.

Type of values

Values are a broad term, therefore this paragraph will further explain which type of values this study is going to focus on. Simultaneously, the impact and influence of these types of values will be illuminated.

The three different types of public value that this thesis mainly builds upon are Hood's (1991) categorization of core values of public management. These values are commonly used as indicated by the 14,511 references to Hood's study (1991), yet also other studies have focussed on them (Bannister & Connolly, 2014). Hood's values can be measured on a personal or organizational level, and give a clear idea on what is seen as important in public organizations (Vigoda-Gadot & Meiri, 2008). Them being able to show what is seen as important in public organizations is part of the motivation to measure these exact values. Moreover, when the values of a macro-organization are synchronized with the values of the micro-personal, this can result in a harmonious operation of modern bureaucracy. Furthermore, the values from Hood reflect the need to improve effective management, strengthen the relationship with the public through transparency and develop strategic thinking aimed at clearer and measurable goals (Vigoda-Gadot & Meiri, 2008, p.117). By measuring these values in relation to algorithmic governance, the government can strive for a better fit between micro-personal and macro-organization values and improve the government on the above mentioned aspects.

Hood (1991) describes three sets of core values that are visible within public management (see figure 1). Firstly, the *sigma-type value* focuses on reaching specified goals in a maximized efficient manner. Money and time are seen as the currency of success and failure, therefore waste is failure. The sigma-type is focused on output, therefore controllable

goals are essential. Second, there is the *theta-type value* in which the achievement of fairness is central. In this value the standard of failure is seen as unfairness, bias or abuse of power. It is important that policies are honest, fair and thus legitimate. The focus therefore lies on process control, rather than output control. Lastly, the *lambda-type value* is about being able to adapt rapidly in a crisis. Security and survival are at the core of this type of value. The achievement of reliability, adaptivity and robustness are their standard of success. This type of value is compatible with relative loose coupling and emphasis on information as an asset. Hood (1991) has suggested that it is hard to satisfy all three dimensions, only two can be met simultaneously. This results in politicians being forced to trade-off which values are going to be satisfied.

Figure 1. Overview of Hood's (1991) values.

<i>Value</i>	<i>Characteristics</i>
Sigma type value	Efficiency, goal oriented, money, time, output, waste, resources, capital, inefficiency and essential
Theta type value	Honesty, fair, discrimination, legitimacy, transparency, unfairness, bias, political representation, racism, marginalized, inequality and fairness
Lambda type value	Robust, future, digitalization, modernization, security, safety, catastrophe, reliability, invest, future and assets

Relating these types of values to algorithmic governance can be very insightful. As stated above, only two values can be obtained at the same time. Due to these values being dependent on each other, a trade-off between different values needs to be made by politicians. For instance, it is hard to create efficient algorithms that are simultaneously fair and resilient for catastrophes. Therefore, examining which values are the core values can give indications to which type of assessment criteria algorithmic governance needs to confirm. If politicians have mainly *sigma-type values* and *lambda-type values*, this means that they find mainly efficiency and safety of algorithms important. This would indicate that there is a shortage of the *theta-type value*, therefore the assessment needs to shift towards controlling if the algorithms remain ethical. To understand the impact of values in a broader way, it is essential to examine what influences these public values of political parties. This part of the theoretical

framework has focussed on exploring politicians' values, the next paragraph will focus on testing what might influence these values.

Additional analysis

While this study will be mainly of an explorative nature, based on the existing literature a few hypotheses are formulated on what type of values can be expected within a certain political party family. In this study, to make representative statements on each political party, they will be categorized into six party families: *socialist party family*, *religious party family*, *liberal party family*, *green party family*, *right party family* and *pension party family* (Armingeon et al., 2020). Various studies from political science have tested what impacts the decisions and actions of political parties (Adams & Somer-Topcu, 2009; Häusermann et al., 2013). The choice has been made to focus on changing values and the diversity of values as the dependent variables of the additional analyses. Studies focussed on the behaviour of political parties will be applied to explain the changes and diversity of political parties' values. Furthermore, diversity and changes in values is knowledge that can be obtained with the gathered data. The following four hypotheses will be added to contribute to the more broader theories on understanding politicians' motivation for certain decisions.

Party families: changing or diversifying values

Multiple political scientists have studied influences on the policy positions of a political party. For instance, Häusermann et al. (2013) have conducted a review study to examine what precisely influences a parties' policy preference. The *traditional partisan politics approach* argues that parties' policy preferences are driven by their industrial class base (Häusermann et al., 2013). For instance, left-wing parties represented the working class. Traditional partisan politics theory is a classic theory and assumes a linear and direct relationship between the type of party in power and policy output. Yet, there have been three strands of research developed that question this linear relation in its own way. The first approach is *changing electoral constituencies* and assumes parties' policy preferences are driven by the interest of their current, post-industrial electorate (Häusermann et al., 2013). They assume that parties may still be programmatic organizations with well-developed ties to particular social groups, however we need to reconceptualize who these social groups are. Another approach aims to take context into account and assumes that parties' policy preferences are driven by party interaction with the institutional context, with competing parties and their

position in the party system. For instance, two left parties operating under different electoral rules may differ in their effect on policies. The last strand of research is *party-voter linkages* which assumes that parties policies preferences depend on the kind of linkages they use to mobilize voters. Thus, the more specific a party mobilizes voters, the more narrow its preferred policies will be. Concluding, the study of Häusermann et al. (2013) implies that multiple factors have an effect on a parties' policy preferences; their industrial class base, their interest of their current (post-industrial) electorate, their party interaction with the institutional context, competing parties, their position in the party system and the kind of linkages they use to mobilize voters. This shows a multitude of factors have an influence on parties' opinions.

Given the importance of the parties' positions, various political scientists have tried to explain the different choices for parties' policy preference. Many models build on Downs' (1957) model that argues that multi-party systems will converge to the median voter's policy preferences. Since no one wants to compromise on an option that lies further from their own policy proposal, the median voter always casts their vote for the policy that is adopted. This model assumes that parties' opinions are driven by the incentive to win as many votes as possible (Downs, 1957). While other scholars believe parties' opinions could be driven by power, posts or influencing policies (Leeper & Slothuus, 2014). The second hypothesis of Downs' (1957) model is that political parties will adjust their policies in response to policy shifts by their competitors. Thus, policy preferences are influenced by the motivation to win votes and simultaneously by the policy positions of the other parties in the parliamentary system (Adams & Somer-Topcu, 2009). Another reason for parties to shift their policy position can be the public opinion which would indicate that citizens have an influence on parties' opinions as well as the other way around (Leeper & Slothuus, 2014). A study has examined this effect and found that if the public opinion is shifting away from the policy position of a political party, parties will adjust their ideology (Adams et al., 2004). In sum, the incentive to win votes, the political power, adjusting to shifting competitors or shifting public opinion can all explain why a party takes a certain stance on a topic.

The question remains why a party takes certain positions in parliamentary debates? Evidently, a party cannot just take a policy position from scratch since it has represented certain positions in the past. Deviation from the status quo entails taking a lot of risks as a party (Meyer, 2013). Harmel & Janda (1994) have shown that a deviation of the status quo can result from leadership change, a change of dominant faction within the party or an external stimulus for change. Yet, there are multiple constraints for a party to shift their

policy positions. First, the status quo is a rational and safe bet, thus the parties' shift away from the status quo has to be augmented by them reaching another optimal outcome. Furthermore, parties' internal structure affects the likelihood of them shifting their positions. Uncertainty on the consequences of alternative policy preferences influences party policy shifts (Harmel & Janda, 1994). Due to algorithms being a relatively new issue, the consequences of their policy preference are very uncertain. Therefore, we can expect parties' preferences on algorithmic governance to be influenced by their preferences on traditional issues (Meyer, 2013). Thus broader preferences for example on digitalization or fairness of policy play a central role in explaining why certain parties are more likely to have specific values linked to algorithmic governance. Behind these broader policy preferences lies strategy, parties are more likely to focus on issues that they have ownership over and issues that currently concern voters (Wagner & Meyer, 2014). Larger parties with more resources are more likely to focus on the current concern of voters, while smaller parties with less resources will choose to focus on the issue they have ownership over (Wagner & Meyer, 2014). Furthermore, studies have shown that parties were particularly responsive to policy shifts by members of their party families (Adams & Somer-Topcu, 2009).

Based on the prior discussed literature, two hypotheses can be formulated about the expected results of this study. The literature illuminated that parties' preferences stem from their positions on traditional issues. These traditional issues that the party focuses on are influenced by the resources of a party. Due to older parties having more history, they are less adaptable to the environment and thus less likely to deviate from the status quo (Harmel & Janda, 1994). Larger and older parties are less likely to change their positions on policies (Wagner & Meyer, 2014). Next to that, larger parties with more resources will steadily focus on specific issues that currently concern voters. The religious party family, the liberal party family and the socialist party family have been dominating the political landscape the longest (Lucardie, 2002; Van Kessel & Krouwel, 2011). Therefore, their values on algorithmic governance will change less than of smaller parties with less resources, like the green, the right and the pension party family. This results in the following hypothesis:

H1: The public values on algorithmic governance of the socialist, the religious and the liberal party family will change less than the public values of the green, the right and the pension party family.

Meanwhile party families that are newer to the parliament are more likely to focus on one specific issue they have ownership over (Wagner & Meyer, 2014). Since these newer parties

have less resources they tend to focus more on one issue. As shown in the Dutch history of political movements, the green, the right and the pension party family are relatively new in the Dutch political landscape (Lucardie, 2002; Van Kessel & Krouwel, 2011). Therefore, as opposed to the socialist, the religious and the liberal party family their values will be less diverse. Thus, the following hypothesis will be tested:

H2: The public values on algorithmic governance of the green, the right and the pension party family will be less diverse than the public values of the socialist, the religious and the liberal party family.

Coalition parties: changing or diversifying values

The above formulated hypotheses are focused on how the type of party family can influence their values. Yet, not only does the type of party have an influence on values, so does the parliamentary opposition status of a party. Therefore, this study will formulate two hypotheses on the impact that being part of the governing coalition can have on parties' values. Various political scientists have focussed on the coalition forming process (Alemán & Tsebelis, 2011; Glasgow, Golder & Golder, 2012; Falcó-Gimeno & Fernández-Vázquez, 2020). Parliamentary opposition statuses and institutions influence the formation of government coalitions (Alemán & Tsebelis, 2011). Political parties prefer to join a coalition with parties that are ideologically closer to each other within the classic right/left spectrum (Glasgow, Golder & Golder, 2012). Thus, whether a party will join a coalition is influenced by a party's size, previous experience in government, willingness to trade policy for office and its ideological position in the parliamentary party system (Warwick, 1996). Furthermore, the likelihood of a given fraction leaving a governing coalition can be explained by their ideological affinity to the president's fraction (Altman, 2000). This illuminates that a party's ideology or values play an influential role within the coalition formation. Particularly, similarities between parties' values are fairly important.

Not only are values influential during the formation of a coalition, being part of a governing coalition affects their ability to change their policy position. Most parties adjust their policy positions to public opinion (Leeper & Slothuus, 2014). Yet, in a coalition government the policy that emerges is often the outcome of negotiations between governing parties (Kayser & Rehmert, 2020). Within the coalition formation process promises have to be made to be chosen, this results in parties making fixed decisions on certain policy preferences. This gives parties less freedom to change their policy preferences once they are in a formed coalition. Since values are the underlying mechanism of policy preferences, the

expectation can be formulated that coalition parties are less likely to change their values than opposition parties (Feldman, 1988). Therefore, the following hypothesis can be formulated:

H3: The public values on algorithmic governance of parties that are part of the governing coalition will change less over time than the public values of the opposition parties.

Being included in the coalition influences whether a party is able to push through their preferred policies within the government, yet it also affects the selection of those preferred policies in the first place (Kayser & Rehmer, 2020). Parties that are chosen to join a coalition are selected based on the ideological similarities between parties (Alemán & Tsebelis, 2011). This results in opposition parties adjusting their policy preferences to make themselves ideologically compatible with the potential future partner for the future government (Kayser & Rehmer, 2020). Not only are political parties chosen based on similarities, they also prefer themselves to join a coalition with parties that are ideologically closer to each other (Glasgow, Golder & Golder, 2012). This results in the expectation that parties located in the governing coalition will have less diverse values than of opposition parties. Therefore, the following hypothesis can be formulated:

H4: The public values on algorithmic governance of parties that are part of the governing coalition will be less diverse than the public values of the opposition parties.

Methods

Data Description and Selection

In this thesis a content analysis of transcripts of plenary debates in the Dutch House of Representatives has been conducted to answer the formulated research question: *What public values linked to algorithmic governance do party families display in Dutch parliamentary debates?* The House of Representatives—the Dutch parliament—plays an important role in policy-making, and is directly elected by the Dutch voters (Tweede Kamer der Staten-Generaal, n.d.). Parliamentary debates are a forum for public communication that parties use to represent the party views and values (Proksch & Slapin, 2015). Using parliamentary debates to this end is therefore the most powerful form available in the legislative context (Lauderdale & Herzog, 2016). Furthermore, there have been multiple content analyses of the Dutch parliamentary debates conducted in the past on topics like the tone of debate or unparliamentary language (Schellens, 2013; Hoetink, 2020). This

illuminates that valuable information can be contracted from parliamentary debates, and it is thus a valid method.

This thesis focuses on all plenary debates in the Dutch house of Representatives containing the word ‘algorithm’. The first debate that included this word took place on the 26th of November 2015 and the last one on the 29th of April 2021. The decision has been made to exclude the 9 most recent debates that have occurred in the year 2021. This choice has been made due to the parliament having resigned on the 15th of January and therefore being a caretaker cabinet, which could influence the outcome (Ministry of General Affairs, 2021a). After this first selection, the data contained 75 transcribed debates, all containing the word ‘algorithm’ (Tweede Kamer der Staten-Generaal, *n.d.*). After examining each debate for its relevance, this selection was then further restricted. A multitude of debates did not make the selection due to lack of relevance. The debates that were excluded from the analysis were for instance merely voting on bills (in which no values are displayed) or focused on private algorithms which are not the focus of this study. This resulted in a population of 44 plenary debates, which constitutes the final sampling frame (see Appendix A). Through the use of a questionnaire, all data will be hand coded and this gathered data will construct a SPSS file. Questions that were included in the questionnaire were for instance ‘What is the party family?’ or ‘What is the party’s position?’ (see Appendix B). Since the data will be coded and interpreted by one individual researcher, there is no need to report an intercoder reliability assessment (Riffe et al., 2019). All formulated hypotheses will be tested through single linear regressions in which the effect of party family and parliamentary opposition status will be tested. All analysis will be conducted using SPSS Statistics 26.

Ethics

Before the data collection process starts it is essential to take the ethics of this research into account. In this thesis the analysis that will be conducted uses pre-existing public documents from the government (Schellens, 2013). Due to the documents being public the analysis is less privacy sensitive. The debates are recorded and can be viewed by all citizens, ditto for the transcribed text from the parliamentary debates. Since this study aims to contribute to valuable scientific knowledge, the data can be requested per email from the researcher in question, in order to replicate the findings. To contribute to the reliability of the study there has been openness on the whole process of data collection by including the used questionnaire and an overview of used debates in the Appendix. Furthermore, since the data will be interpreted by a single researcher it can be more sensitive to fiddling with the results.

Therefore, the formulated hypotheses will be registered to aspredicted.org (As Predicted, 2021). This is a website that forces a researcher to stick with the hypotheses that were originally formulated. This contributes to the reliability of this study. Furthermore, the method that has been chosen for this study can be seen as a valid method for multiple reasons. First, no selections or random samples have been made to the data, this results in a valid representation of the population the study focuses on. The findings of this study can be generalized to similar countries terms of digitalization. Next to that, the data collection process has been accurately and extensively executed by a single researcher, in order to have no effect on the internal validity of this study.

Operationalization of data

Dependent variable

The measured values will be interpreted by the researcher in a qualitative manner. However, when the data has been gathered, they will be coded into a quantitative variable consisting out of three categories. This variable will be used to construct both independent variables: *diversity in values* and *change of values*.

Sigma-type values. The first value that has been constructed by Hood (1991) is the public value that he described as ‘keeping it lean and purposeful’. When statements are coded as this variable, the following words or synonyms will be used; efficiency, goals (of using algorithms), money, time, output, waste, resources, capital, inefficiency and essential. An example of the sigma type value displayed during one of the debates is the following: ‘*In fact, it is extremely important to detect fraud, because fraud undermines the support base under our social security, our solidarity. In fact, these municipalities are doing what they need to do: detecting fraud more effectively and efficiently. I also think it's important to give space to that. I am in favor of data-driven enforcement.*’

Theta-type values. The next public value that Hood (1991) has constructed, is focused more on the ethical aspects of algorithmic governance. This is categorised as ‘keeping it honest and fair’. When statements are coded into this specific variable, the following words synonyms will be used; honesty, discrimination, legitimacy, transparency, unfairness, bias, political representation, racism, marginalized, inequality and fairness. An example of this value displayed during one of the debates is the following: ‘*...and then you see that at a local level algorithms are increasingly being used to, for example, detect fraud or make decisions in the field of care or work. We must be careful not to unconsciously add discriminatory aspects to such an algorithm.*’

Lambda-type values. The last public value is categorised as ‘keeping it robust and resilient’ (Hood, 1991). As described in the theoretical framework, this framework has more focus on the future. When statements are coded into this specific variable, the following words or synonyms will be used; robust, future, digitalization, modernization, security, safety, catastrophe, reliability, invest, future and assets. An example of the lambda type value displayed during debate would be the following: *‘However, the increasing dependence on the same technology also makes our society vulnerable. That is why we must continuously invest in the means by which we protect and defend our society. This applies to the police and the judiciary, to defense and to our intelligence and security services.’*

Diversity of values

To measure the diversity of values each party family has displayed, the distribution of values amongst each family has been calculated using crosstabs. This displayed the percentages of the total amount of values each type of value represented. This percentage was used to represent the amount of diversity in values. The higher the percentage, the less diverse the values of a party family were. The same method was used to construct the diversity of values amongst different opposition statuses.

Changes in values

The variable *change of values* will map whether party families have changed their values over time. The choice has been made to measure change by comparing two moments in time and calculating the difference in displayed values. Regrettably, it would not be representative or reliable to use the middle debate (debate 22) and the last debate (debate 44) as the two moments in time. When doing this a multitude of factors would influence the reliability. First and most importantly, the party families have displayed unequal amounts of values during the debates. Thus, when calculating these differences on a specific date it would not reliably measure the changes in values. Next to that, other factors could influence the measured difference. For instance, speaking time, the changed cabinet formation, having formulated opinions on topics and so forth. Therefore, the choice has been made to divide the N of each party's families' values into two. Then distinguish how their values were distributed at the first half of the registered data and on the second half of the registered data. Lastly, calculate for each party family the difference in both moments in time for the three types of values they have displayed. This resulted in a variable that measured the amount of change, without direction, thus the higher the number the more the values had changed. An example of this

would be the change in the sigma value for the socialists party family being 8. This is an average change since the minimum measured for party family was 0 and the maximum change was 18. This calculation process was repeated for the parties' parliamentary opposition status.

Independent variable

Party families

Since the amount of speaking time a party has is related to the amount of seats they have in parliament, not every party will have the same amount of time to speak and thus to display values. The unequal number of seats in the Dutch parliament (see Appendix C, figure 2 and 3), would influence the reliability of the results. Therefore, in order to realise higher sample sizes for each group the choice has been made to operationalize political parties as six categories which are merged parties into party families. The choice has been made to use the categories that are constructed by the Comparative Political Data Set, which is a collection of political and institutional country-level data of 36 democratic countries (Armingeon et al., 2020) and that is often used in social science research. The CPDS has constructed the categorization party families, which is based on the work of Lane, McKay and Newton (1992). This categorization distinguishes 13 party families, based on three features: nativism, authoritarianism and populism (Armingeon et al., 2020). Seven of the party families from this variable are present in the Netherlands. However, most literature reference the socialist party family and the left socialist party as one whole party family (Lucardie, 2002; Van Kessel & Krouwel, 2011). Therefore, the choice has been made to add the left socialist party, which consisted of the SP, to the socialist party since their political positions are in line as well. The amount of seats in parliament are somewhat equally distributed (see Appendix C, figure 2 and 3). Thus, the following categories will be used to operationalize the Dutch political parties.

1. *Socialist party family*. This party family consists of the labour party (PvdA), DENK and the Socialist Party (SP).
2. *Religious party family*. This party family consists of Christian Democratic Appeal (CDA), Christian Union (CU) and the Political Reformed Party (SGP).
3. *Liberal party family*. This party family consists of People's Party for Freedom and Democracy (VVD) and Democrats 66 (D66).
4. *Green party family*. This party family consists of Green Left (GL) and Party of Animals (PvdD).

5. *Right party family.* This party family consists of the Freedom Party (PVV) and the Forum of Democracy (FvD).
6. *Pension party family.* This party family consists of the 50PLUS (50+).

Parliamentary Opposition Status

Since the third and fourth hypothesis aim to test the effect of political parties' opposition status on values, a second dependent variable has to be constructed. This variable measures whether a party is located in the coalition or in the opposition. This variable will be operationalized as a dichotomous variable, consisting of coalition or opposition. In the period of the data that is used in this study, from 2015 until 2020, two different coalition formations have been in government. Therefore, two different formations will be relevant for this variable (see Appendix C, figure 4). From 2015 until 2017 in the Rutte II cabinet, the coalition consisted of two parties: the VVD and the PvdA (Ministry of General Affairs, 2017). In the following formation in Rutte III from 2017 until 2021 the coalition consisted of VVD, CDA, D66 and ChristenUnie (Ministry of General Affairs, 2021b). After the inauguration on the 26th of October 2017, the coding of coalition parties will change. Parties that are not coded as coalition will be automatically coded as opposition.

Descriptive statistics

Table 1 shows the descriptive statistics of each variable used in this thesis. The maximum variable of change of values amongst party families is quite high with 18, compared to the maximum of opposition status ($M = 7.901$; $SD = 12.968$). The mean of the diversity of values amongst party families is lower than the medium which indicates that the majority of party families do not have a lot of diversity in values ($M = 36.668$; $SD = 15.288$). Judging by the mean of change of values amongst coalition and opposition, the data is slightly skewed towards the right which indicates quite a lot of change of values ($M = 8.096$; $SD = 4.484$). The diversity of values amongst opposition and coalition has quite a high minimum which indicates not very diverse values ($M = 37694$; $SD = 12.968$). Party family is a nominal variable, thus the mean does not include relevant information. The mean of the variable opposition status is closer to one than to two, which indicates that coalition parties have displayed more values during the debates than opposition parties ($M = 1.360$; $SD = 0.481$). The mean of values displayed during debates leans towards 2, which indicates that the mostly displayed value is the theta value ($M = 1.901$; $SD = 0.783$). Within the theta-type value the achievement of fairness is central. As you can see in table 1 below, the definitive sample size

of this thesis is 422. This means that within the 44 debates that have been analysed a total amount of 422 values has been displayed.

Table 1. *Descriptive statistics of the variables.*

Name	N	Min.	Max.	Mean	SD.
(y1) Change of values Party Families	422	0.00	18.00	7.901	12.968
(y2) Diversity of values Party Family	422	5.77	78.85	36.668	15.288
(y3) Change of values Opposition Status	422	2.00	14.00	8.096	4.484
(y4) Diversity of values Opposition Status	422	20.26	57.52	37.694	12.968
(x1) Party Family	422	1.00	6.00	2.65	0.997
(x2) Opposition Status (Coalition=1)	422	1.00	2.00	1.360	0.481
(z) Type of value	422	1.00	3.00	1.901	0.783

Analytical strategy

This paragraph is going to clarify which analytical strategy has been applied to answer the research question. The hypotheses aim to test two dependent variables, change of values and diversity in values, therefore it is necessary to test the hypotheses using a multitude of regression models. Since party family is a nominal variable, dummies have to be constructed to make reliable statements on each party family. Thus, to test the two dependent variables on the party families and on the different opposition statuses, the formulated hypotheses will be tested by 14 single regression analyses in total. Models 1 through 6 test the effect of party family on change of values using dummies. Models 7 through 12 test the effect of parliamentary opposition status on the variety in values while using dummies for the party family. Model 13 will test the effect of the parliamentary opposition status on the change of values. Lastly, Model 14 will test the effect of the parliamentary opposition status on the variety of values. Before the tests were conducted, the multicollinearity was checked. This was checked by analysing the VIF's, to see whether the dependent variables violated the independence of the models. Every VIF was below 10, thus the analysis could proceed.

Results

This result section will answer the formulated research question: *What public values linked to algorithmic governance do party families display in Dutch parliamentary debates?* by examining the results in an explorative results section. Later in the results section, the

quantitative results will be presented to test the effect a party family parties' or the opposition status has on their value diversity or change of values.

Explorative results

Besides from the hypotheses that have been tested, the main goal of this thesis was to answer the explorative research question: *What public values linked to algorithmic governance do party families display in Dutch parliamentary debates?* Based on the results that have been found, it is possible to make first statements on this matter. Within Dutch politics two types of values are mostly present. The sigma value was displayed most with 36.0%, which has its main focus on the efficiency of the algorithms. With 37.9% the second most displayed value was the theta value, which is focussed on the fairness of the algorithms. The fewest registered value was the lambda value with 26.1%, the focus of this value is being resilient for the future. Overall these three different types of values have been relatively equally distributed amongst the party families in debates. As mentioned earlier, the equal distribution of sigma and theta values could indicate that tension is present between these values. The implication of these values contradict, since it is hard to make an effective and equally ethically correct governmental algorithm. The dilemma of both being equally important yet hard to aspire equally, has been confirmed by the gathered data.

In Table 2, the difference in the displayed values amongst party families are shown. As stated above, explorative conclusions will be drawn exclusively on the socialist, religious, liberal and green party family. The most displayed value amongst parties of the socialist party family is the theta value (41.8%), with its focus on the ethical side of algorithms. Next, the religious party family has sigma value (38.5%) as its most displayed, hereby focussing on the efficiency of algorithms. For the liberal party family, consisting mostly of coalition parties, sigma value was their most displayed value with 43.1%. The green party family stands out in this row of party families' values. Their most displayed value was the theta value with 78.9%, as one might expect green parties are more focussed on the fairness of the process and less on the efficiency and the outcomes. The right party family and the pension party family both have an N below 10, therefore no reliable conclusions can be drawn upon their results.

The values were distributed in a different manner when a division was made between the values of coalition and opposition parties, as shown in Table 3. During the debates the ministers, all part of coalition parties, mostly focussed on the efficiency of algorithms, thus the sigma values. While opposition parties asked critical questions focussed on the ethical side of algorithms, thus displaying theta values. This statement is supported by the amount of

theta values displayed amongst opposition parties (57.5%) in comparison to the coalition parties (26.8%). Conversely, the sigma value has been displayed more amongst coalition parties (43.9%) than amongst opposition parties (22.1%) which aligns with the statement that coalition is more focussed on the efficiency and practicality of algorithms than the opposition who focus more on the fairness of algorithms. The lambda value which has been displayed the least with 110 times, yet 71.8% of this was by the coalition parties. Therefore, we can presume that coalition parties focus more on being resilient for the future and keeping up with other developing countries when applying algorithms.

Table 2. Crosstabs values and party families.

	Socialist party family		Religious party family		Liberal party family		Green party family		Right party family		Pension party family		Total
Sigma value	23	34.33%	35	38.46%	87	43.07%	3	5.77%	3	50%	1	25%	152
Theta value	28	41.79%	24	26.37%	63	31.19%	41	78.85%	2	33.33%	2	50%	160
Lambda value	16	23.88%	32	35.16%	52	25.74%	8	15.38%	1	16.67%	1	25%	110
<i>Total</i>	67	100%	91	100%	202	100%	52	100%	6	100%	4	100%	422

Table 3. Crosstabs values and Parliamentary Opposition Status.

	Coalition parties		Opposition parties		Total
Sigma value	118	43.87%	34	22.22%	152
Theta value	72	26.77%	88	57.52%	160
Lambda value	79	29.37%	31	20.26%	110
<i>Total</i>	269	100%	153	100%	422

Hypotheses tested

This following results' section examines the hypotheses, testing the effect of a party's family and opposition status on value diversity and the change of values. To contribute to the comprehensibility of the results section, the hypotheses will be repeated below. H1 being the following: 'The public values on algorithmic governance of the socialist, the religious and the liberal party family will change less than the public values of the green, the right and the pension party family'. H2 is: 'The public values on algorithmic governance of the green, the

right and the pension party family will be less diverse than the public values of the socialist, the religious and the liberal party family’. Next, H3 is: ‘The public values on algorithmic governance of parties that are part of the governing coalition will change less over time than the public values of the opposition parties’. Lastly, H4 is: ‘The public values on algorithmic governance of parties that are part of the governing coalition will be less diverse than the public values of the opposition parties’.

To be able to test the hypotheses, 14 single linear regression models, using the ordinary least squares method, have been performed. In Table 3 - Model 1 through 6, the effect of the party family on change of values has been tested by conducting 6 regression. Every model includes a different dummy variable of the party family as the independent variable. In Table 4 - Model 7 through 12, through regression analysis the effect of the party family on the diversity of values has been tested. In each model a different dummy of the variable party family has been included. In Table 5 - Model 13 and 14, the last two regressions were conducted to test the effect of the parliamentary opposition status on the dependent variables, diversity of values and change of values. In all models an alpha of .05 has been used. To see whether the independent variables reliably predict the dependent variable when used together, the overall significance of models has been tested. All models, with the exception of Model 11 and 12, were found significant (see Appendix D). Thus, no conclusions can be drawn on Model 11 and 12. Yet, all other models do reliably predict the dependent variable, therefore the analysis can proceed.

Table 3. Linear regression analysis Change of values (Model 1 -6). Regression β -slope (SE).

	Model 1 (Socialist party family)	Model 2 (Religious party family)	Model 3 (Liberal party family)	Model 4 (Green party family)	Model 5 (Right party family)	Model 6 (Pension party family)
	B	B	B	B	B	B
Constant	8.656** (0.248)	8.798** (0.257)	4.336** (0.233)	8.319** (0.253)	7.993** (0.241)	7.962** (0.242)
(x1) Party family dummy	-4.761** (0.622)	-4.160** (0.554)	07.446** (0.322)	-3.396** (0.719)	-6.493* (2.025)	-6.462* (2.484)
R^2	0.122	0.118	0.560	0.050	0.024	0.014
N	422	422	422	422	422	422

**p<.001/2 *p<.05/2

Table 3 - Model 1 shows that being part of the socialist party family has a negative significant effect on the change of values (b=-4.761, t=-7.655, p<.001/2). Thus, being part of the socialist party results in less change of values over time. Model 2 shows that being part of the religious party family has a negative significant effect on the change of values (b=-4.160,

$t=-7.510$, $p<.001/2$). These results indicate that being part of the religious party family results in values that are less likely to change over time in comparison to other parties. Model 3 shows that being part of the liberal party family has a positive significant effect on the change of values ($b=7.446$, $t=23.099$, $p<.001/2$). These results indicate that the values of the liberal party family are more likely to change over time compared to all other party families. Model 4 shows that being part of the green party family has a negative significant effect on the change of values ($b=-3.396$, $t=-4.721$, $p<.001/2$). Thus, being part of the green party means your values are less likely to change over time. Furthermore, Model 5 shows that being part of the right party family has a negative significant effect on the change of values ($b=-6.493$, $t=-3.207$, $p<.05/2$). Thus, the values of the right party family are less likely to change over time. Last, Model 6 shows that being part of the pension party family has a negative significant effect on the change of values ($b=-6.462$, $t=-2.601$, $p<.05/2$). These results indicate that the values of the pension party family are less likely to change over time.

Concluding, a significant negative effect on change of values has been found with almost all types of party families, with the exception of the liberal party. However, the effect size of the right and pension party surpassed the effect size of the socialist and religious party families. This is in contradiction with the formulated expectations. Yet, based on the effect sizes the socialist and religious values change relatively more over time compared to the green party. Based on these results, the conclusion can be drawn that the socialist and religious party families are less likely to change their values compared to the green party family. Therefore, hypothesis 1 can be partly accepted: *The public values on algorithmic governance of the socialist, the religious and the liberal party family will change less than the public values of the green, the right and the pension party family.*

Table 4. Linear regression analysis of diversity of values (Model 7 -12). Regression β -slope (SE).

	Model 7 (Socialist party family)	Model 8 (Religious party family)	Model 9 (Liberal party family)	Model 10 (Green party family)	Model 11 (Right party family)	Model 12 (Pension party family)
	B	B	B	B	B	B
Constant	39.396** (0.807)	39.943** (0.831)	42.046** (1.004)	34.816** (0.588)	38.666** (0.750)	38.680** (0.749)
(x1) Party family dummy	-4.576* (2.027)	-5.906* (1.789)	-7.055** (1.451)	31.272** (1.676)	0.222 (6.294)	-1.180* (7.689)
R^2	0.012	0.025	0.053	0.453	0.000	0.000
N	422	422	422	422	422	422

** $p<.001/2$ * $p<.05/2$

Furthermore, Table 4 - Model 7 shows that being part of the socialist party family has a negatively significant effect on the diversity of values ($b=-4.576$, $t=-2.258$, $p<.05/2$). These results suggest that being part of the socialist party family will lead to more diverse values. Model 8 shows that being part of the religious party family has a negative significant effect on the diversity of values ($b=-5.906$, $t=-3.302$, $p<.05/2$). Thus, these results suggest that the values of the socialist party family will be more diverse. Model 9 also shows that being part of the liberal party family has a negative significant effect on the diversity of values ($b=-7.055$, $t=-4.861$, $p<.001/2$). Thus, these results suggest that when you are part of the liberal party family, your values are more diverse. Model 10 shows that being part of the green party family has a positive significant effect on the diversity of values ($b=31.272$, $t=18.655$, $p<.001/2$). Which indicates that green parties have less diverse values. Since the Models 11 and 12 are not significant, no conclusions can be drawn from these models.

In conclusion, these results indicate that the socialist, religious and liberal party family are more likely to have more diverse values. Meanwhile, the green party family is expected to have less diverse values. Since the diversity of values has not been found significant for the right and pension family, we can only partially accept hypothesis 2: *The public values on algorithmic governance of the green, the right and the pension party family will be less diverse than the public values of the socialist, the religious and the liberal party family.*

Table 5. Linear regression analysis (Model 13 & 14). Regression β -slope (SE).

	Model 13 (Change of values)	Model 14 (Diversity in values)
	B	B
Constant	11.979** (0.594)	27.700** (1.828)
(x1) Parliamentary Opposition Status	-2.849** (0.411)	7.335** (0.005)
R^2	0.102	0.074
N	422	422

** $p<.001/2$ * $p<.05/2$

Table 5 - Model 13 shows that being part of the coalition has a significant negative effect on the displayed changes in values ($b=-2.849$, $t=-6.925$, $p<.001/2$). Therefore, when a party is part of the coalition, their values are less likely to change over time. Based on these results, there has been evidence found in support of hypothesis 3: *The public values on algorithmic governance of parties that are part of the governing coalition will change less over time than*

the public values of the opposition parties. Furthermore, Model 14 shows that the effect of parliamentary opposition status on the diversity of values has been found positively significant ($b=7.335$, $t=5.798$, $p<.001/2$). This indicates that when a party is part of the coalition, their values are more likely to be more diverse than of opposition parties. Therefore, based on these results hypothesis 4 can be rejected: *The public values on algorithmic governance of parties that are part of the governing coalition will be less diverse than the public values of the opposition parties.*

In short, for the first hypothesis has been found partial support. The expectation can be confirmed that the socialist and religious party families are less likely to change their values than the green party families. The second hypothesis was only confirmed for the green party which had less diverse values than the socialist, religious and liberal party families. Furthermore, when a party is part of the coalition their values will change less over time. Lastly, the values of governing coalition parties are not less diverse than those of opposition parties.

Conclusion and discussion

This study aimed to answer the following question: *What public values linked to algorithmic governance do party families display in Dutch parliamentary debates?* To answer this, the goal of this study was to map the values of politicians based on an analysis of parliamentary debates, while testing four hypotheses based on prior existing political literature. Since no prior existing literature had focussed on the actual values of political actors, the nature of this study has been explorative. This explorative analysis has created a multitude of valuable knowledge. By interpreting the data in a qualitative manner, more detailed results could be found. The three types of values created by Hood (1991) sigma, theta and lambda were more evenly divided than expected, specifically among the larger party families like the liberal and socialist. The right party family displayed very few values during all debates, the comments they made were less content related, it seemed like they were not very opinionated on the topic of algorithmic governance. This has led to very few displayed values, so few no reliable conclusions could be drawn based on their values. For future studies on values amongst political parties, it would be recommended to study values in regards to a different topic, to test if the right party family is more vocally opinionated on other topics or display less values in general. For the right and the pension party the very few displayed values can be explained by their very small amount of speaking time, this party family consisted of one single party

with 2 seats in parliament. In hindsight it would be recommendable to control the data for the speaking time of each party family. By doing this, one would guarantee more reliable and valid results. For instance, parties with ministers that were responsible for algorithms or digitalization had relatively much speaking time. Furthermore, since they were responsible for the implementation of the algorithms their focus was more on the effectiveness and the cost of the algorithms (sigma values) and were less in the position to question the ethics (theta values) of their own implementation. This was a remarkable dynamic, ministers of coalition parties were justifying the effectiveness of the algorithms, while opposition parties were questioning the ethics of these algorithms. While this was an interesting phenomenon, it could have influenced the results, thus in future studies it might be sensible to control for the effect of ministers responsible for the topic that the study focuses on. Furthermore, while interpreting the data the observation was made that the parties that together formed the liberal party family (VVD and D66) had quite contrary values. VVD with multiple ministers responsible for digitalization and algorithms displayed a lot of sigma values. Meanwhile D66 kept objecting to the focus on efficiency and money of the VVD by reminding them of the ethics of algorithms. However, since they both were in the same party family, the end results of the liberal party family were more average than leaning in one direction. Yet, this was the only party family that had such contradicting values. In future research, these might be put into separate party families or a different operationalization could be chosen for politicians.

The first two hypotheses had their focus on party families and theorized that due to having more resources larger and older parties were less likely to change their values over time (Wagner & Meyer, 2014). This effect has been found significant with the exception of the liberal and the right and pension party family. The lack of effect for the liberal party family can perhaps be explained by the contradicting values of the VVD and D66 who constitute this party family. Moreover, the lack of effect for the right and pension can be explained by their low amount of values displayed. The expectation that larger parties were less likely to change over time were confirmed for the socialist and religious parties. This could indicate that these larger party families with more resources do not feel the pressure to adjust their values based on the public opinion or on other parties in order to stay relevant (Adams & Somer-Topcu, 2009). Newer parties like the green party family might feel this pressure to adjust.

Furthermore, the expectation was formulated that smaller and newer parties with more resources were more likely to focus on one issue. This hypothesis was found significant only for the green party, they had less diverse values than the socialist, religious and liberal party

family. The lack of significance for the right and the pension party can be explained by the extremely low N for both the right and the pension party. Yet it is interesting to see that for almost each party, thus with two exceptions, these expectations have been met. The green party having less diverse values than the socialist, religious and liberal party family shows that smaller parties like the green party family have more emphasis on one issue they have ownership over (Wagner & Meyer, 2014). The green party family consisting of opposition parties are able to relate most comments to the fixed point of view they have taken. Meanwhile, larger party families more often have ministers in them, who do not have the possibility to only take one point of view since they have to respond to opposition comments.

The second two hypotheses tested the effect of the parliamentary opposition status, thus whether they were coalition or part of the opposition, on changing and diversifying values. The expectation was formulated that coalition parties were less likely to change their values since they were forced to make promises during the coalition formation process (Kayser & Rehmert, 2020). This expectation has been confirmed by the first hypothesis, which was found significant. The second hypothesis expected that the values of governing coalition parties would be less diverse, since parties that are chosen to join a coalition were selected on ideological similarities (Alemán & Tsebelis, 2011). However, this expectation has not been confirmed by the results. The lack of significance can be explained by the green party having less diverse values than the socialist, religious and liberal party families, which all have coalition parties in their families. This indicates that specifically opposition parties are one issue parties with fixed positions. This was shown during the debates by the coalition discussing the algorithms and all the aspects that come with it, while opposition were more likely to choose on point of view and focus on that. For instance, the green party family was really focussed on the ethical side of algorithms, this led to them having non diverse values. Since they consist of opposition parties, this could have influenced the results as well.

This study had two aims, first the exploration of values in relation with algorithmic governance and second testing expectations based on existing literature. The goal of this study was to map out the values on algorithmic governance, by mapping out these values not only more knowledge was acquired on Hood's (1991) values, yet also on the political stance on algorithms has been illustrated. What this research has shown is not the lack of theta values, rather the unequal distribution. The parties with the most power, based on their seats in parliament, number of ministers and being part of the coalition, show more sigma values. For instance, the religious and liberal party families both consist of coalition parties with lots of resources. This would suggest that the overall values are somewhat equally distributed, yet

the policy outcomes would tend towards the efficiency of algorithms. This is something the Algemene Rekenkamer can take into account while creating an assessment framework to avoid the unethical use of algorithms.

For future research two related topics can be recommended. First, a research focusing on the values of Hood (1991) on a different topic to illuminate the expected difference in distributions of values. A topic that might be relevant to study Hood's (1991) values on could be migration, since each type of value can be related to such a topic. Second, a study that focuses on these values within the ministries since they implemented the algorithms and presumably have more knowledge. Currently only three of the twelve ministries indicated that they redeemed ethics as an important factor when applying algorithms (Algemene Rekenkamer, 2021). Thus, a study with more focus on the implementation side of algorithmic governance, instead of the policy developing side, would be valuable.

Concluding, this thesis has found that values of larger and older party families are less likely to change their values and have more diverse values. Next to that, the values of coalition parties are less likely to change than of opposition parties. This is an interesting contribution to the process of understanding behaviour of political parties. In conclusion, this research has contributed to the existing knowledge by studying in specific the values of political actors. Moreover, this study has contributed to the mapping of the values specifically in regards to algorithmic governance. Next to that, this research can contribute to the ongoing development of the algorithmic governance field of study. In addition to that, hopefully this research can contribute to the creation of the assessment criteria for the use of algorithms within the government.

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Appendix A

List of sampled plenary debates.

Number	Date	Debate number	Topic	Coded on	Unused
1	26/11/15	30	Begroting Veiligheid en Justitie	15/4	X
2	23/6/16	100	Kansspelen op afstand	15/4	
3	30/11/16	29	Digitale overheid	16/4	
4	13/12/16	34	Opsporing en vervolging computercriminaliteit	19/4	
5	8/2/17	50	Wet op inlichtingen- en veiligheidsdiensten	20/4	
6	10/5/17	73	Werkdruk in het basis onderwijs	21/4	X
7	12/9/17	101	Richtlijnen markten voor financiële instrumenten	21/4	
8	4/10/17	8	Digitalisering infrastructuur	21/4	
9	15/11/17	22	Begroting Binnenlandse Zaken en Koninkrijksrelaties 2018	21/4	
10	16/11/17	23	Informatie-uitwisseling bovengrondse en ondergrondse netten en netwerken	22/4	
11	12/12/17	33	Nederlandse bijdrage aan Resolute Support (Afghanistan) in 2018	23/4	X
12	6/3/18	57	Nederlandse voedsel- en warenautoriteit	23/4	X
13	8/3/18	59	Algemene verordening gegevensbescherming	23/4	
14	10/4/18	71	Vragenuur	23/4	
15	16/5/18	81	Cryptovaluta	23/4	X
16	23/5/18	84	Verantwoordingsdebat 2017	23/4	
17	6/6/18	90	Big Data en de bescherming van persoonsgegevens	25/4	
18	12/6/18	92	Stemmingen	28/4	X
19	20/6/18	96	Groeiende filedruk	28/4	
20	21/6/18	97	Problemen bij innen belastingen	28/4	X
21	26/6/18	98	Dividendbelasting	28/4	
22	4/9/18	104	Herziene richtlijn betaaldiensten	28/4	X
23	19/9/18	2	Algemene Politieke Beschouwingen	28/4	
24	11/10/18	12	Uitkeringsfraude door Poolse arbeidsmigranten	28/4	

25	18/10/18	15	Begroting Binnenlandse Zaken 2019	29/4	
26	30/10/18	16	Begroting Onderwijs, Cultuur en Wetenschap 2019	29/4	X
27	1/11/18	18	Regeling van werkzaamheden	29/4	X
28	7/11/18	20	Beantwoording kamervragen Uber	29/4	X
29	8/1/18	21	Begroting Economische Zaken en klimaat 2019	29/4	X
30	4/12/18	31	Vragenuur	29/4	
31	20/12/18	39	Spionage door Rusland	29/4	X
32	15/1/19	40	Gebruik van contant geld in de samenleving	3/5	X
33	20/2/19	56	VSO Telecomraad 1 maart 2019	3/5	
34	21/2/19	57	Stemmingen	3/5	X
35	13/3/19	62	Discriminatie	3/5	
36	2/4/19	69	Sociale veiligheid in het onderwijs	3/5	X
37	29/5/19	87	Digitale Overheid	3/5	
38	4/6/19	88	Stemmingen moties Digitale Overheid	3/5	X
39	18/6/19	94	Stemmingen motie Digitale Overheid	3/5	X
40	25/6/19	97	Bescherming persoonsgegevens	3/5	
41	27/6/19	99	Leven Lang Ontwikkelen	4/5	X
42	2/7/19	100	Tijdelijke commissie Digitale Toekomst	4/5	X
43	10/9/19	106	Rapport van de Raad van State over de digitalisering van de overheid	5/5	
44	17/9/19	1	Aanbieding Prinsjesdagstukken	6/5	
45	24/9/19	4	Stemming moties Rapport van de Raad van State over de digitalisering van de overheid	6/5	X
46	29/10/19	16	Begroting Binnenlandse Zaken 2020	14/5	
47	30/10/19	17	Begroting Volksgezondheid, Welzijn en Sport 2020	6/5	X
48	19/11/19	25	Begroting Economische Zaken en Klimaat 2020	6/5	
49	20/11/19	26	Begroting Justitie en Veiligheid	6/5	
50	27/11/19	29	Begroting Sociale Zaken en Werkgelegenheid 2020	6/5	
51	4/12/19	32	Ten onrechte ingevorderde kinderopvangtoeslagen	10/5	

52	14/4/20	40	Regeling van werkzaamheden	10/5	X
53	5/2/20	50	Wet Digitale overheid	10/5	
54	19/5/20	72	Regeling van werkzaamheden	11/5	X
55	27/5/20	75	Stopzetten kinderopvangtoeslag	11/5	
56	4/6/20	79	Kunstmatige intelligentie en sleuteltechnologieën	11/5	
57	9/6/20	80	Stemmingen moties Kunstmatige intelligentie en sleuteltechnologieën	11/5	X
58	1/7/20	90	Institutioneel racisme in Nederland	12/5	
59	12/8/20	93	Ontwikkelingen rondom het coronavirus	12/5	X
60	3/9/20	97	Uitvoering sociale zekerheid	12/5	X
61	23/9/20	5	Initiatiefwetsvoorstel-Verhoeven Wet Zerodays Afwegingsproces	12/5	
62	30/9/20	8	Meer parlementaire grip op digitalisering	12/5	
63	7/10/20	11	Begroting Algemene Zaken en begroting Koning 2021	12/5	X
64	14/10/20	14	Begroting Binnenlandse Zaken 2021	12/5	
65	15/10/20	15	Begroting Binnenlandse Zaken 2021	13/5	
66	29/10/20	18	Wijziging van de wet open overheid	13/5	
67	3/11/20	19	Regeling van werkzaamheden	13/5	X
68	5/11/20	21	Begroting Economische Zaken en Klimaat 2021	13/5	
69	10/11/20	22	Pakket Belastingplan 2021	13/5	X
70	12/11/20	24	Terreurdaad in Frankrijk en de vrijheid van meningsuiting	13/5	X
71	17/11/20	25	Begroting Sociale Zaken en Werkgelegenheid 2021	13/5	
72	25/11/20	29	Begroting Justitie en Veiligheid 2021	13/5	
73	26/11/20	30	Begroting Justitie en Veiligheid 2021	14/4	
74	3/12/20	33	Begroting Defensie	14/5	
75	17/12/20	39	Tijdelijke wet Tweede Kamerverkiezingen covid-19	14/5	X

Appendix B

Question 1

Please Choose a Date

[calendar to pick date]

Question 2

What is the Party Family?

1. Socialist party family (PvdA, DENK & SP)
2. Religious party family (CDA, CU & SGP)
3. Liberal party family (VVD & D66)
4. Green party family (GroenLinks & PvdD)
5. Right party family (PVV & FvD)
6. Pension party family (50PLUS)

Question 3

What is the Party Position?

1. Coalition (VVD, PVDA (until 26th October 2017), D66 (from 26th October 2017), CDA (from 26 October 2017) and CU (from 26th October 2017))
2. Opposition (PvdA (from 26th October 2017), DENK, SP, CDA (until 26th October 2017), CU (until 26th October 2017), SGP, D66 (until 26th October 2017), GroenLinks, PvdD, PVV, FvD and 50PLUS.)

Question 4

Sigma-type values (keeping it lean and purposeful: efficiency, goals, money, time, output, waste, resources, capital, inefficiency and essential).

[open ended answer]

Question 5

Theta-type values (keeping it honest and fair: honesty, fair discrimination, legitimacy, transparency, unfairness, bias, political representation, racism, marginalized, inequality and fairness).

[open ended answer]

Question 6

Lambda-type values (keeping it robust and resilient: robust, future, digitalization, modernization, security, safety, catastrophe, reliability, invest, future and assets).

[open ended answer]

Question 7

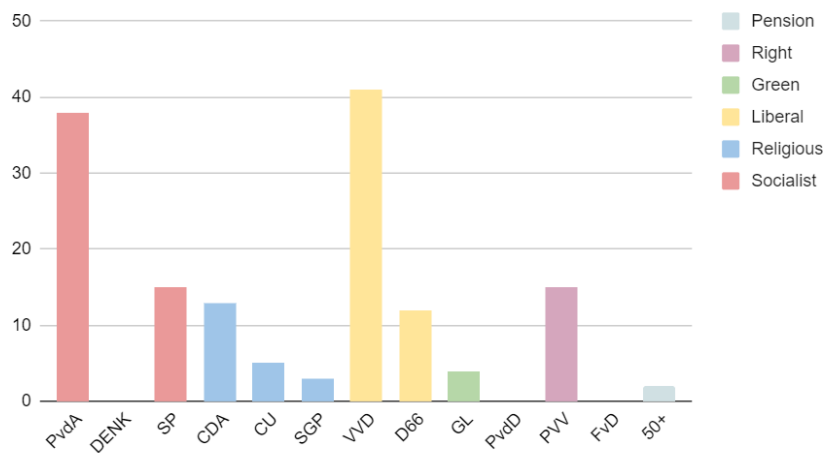
Number of debate?

[open ended answer]

Appendix C

Figure 2

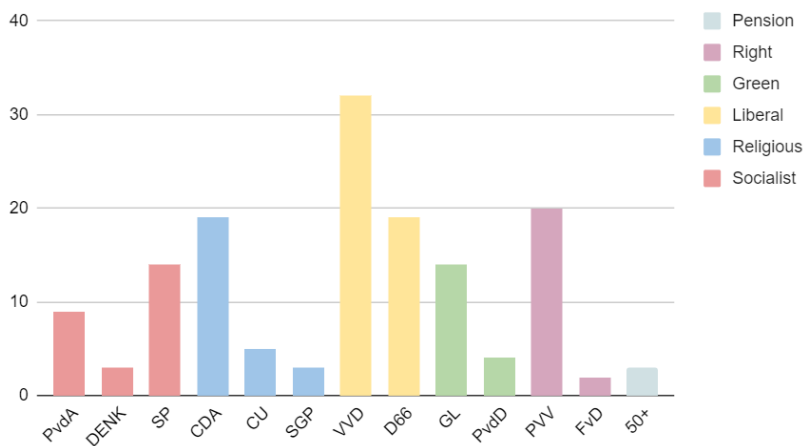
Visualization of the amount of seats in Dutch parliament shown for each party family of Rutte II.



Note. Figure 2 displays the amount of seats each party had in parliament during the period of 2012 until 2017, which was the cabinet Rutte II. Each colour represents a party family. It has been made visible that the seats in the parliament are not equally distributed between the family parties.

Figure 3

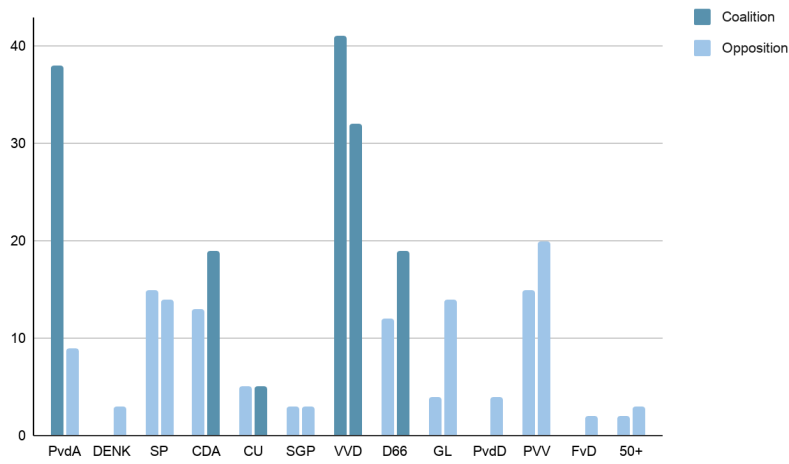
Visualization of the amount of seats in Dutch parliament shown for each party family of Rutte III.



Note. Figure 3 displays the same information, amount of seats in parliament, yet in a different time period which was from 2017 until 2021 in cabinet Rutte III. Here it is shown that, besides from the pension party family as an outlier, the amount of seats they have in parliament is somewhat equally distributed.

Figure 4

Visualization of Rutte II and Rutte III coalition and opposition ratio.



Note. This figure demonstrates the distribution of seats in parliament between coalition and opposition parties. The left represents Rutte II while the right represents Rutte III.

Appendix D

Note. In this paragraph the significance of all regression models will be discussed in order of the text.

Table 3 - Model 1 which includes the socialist party family as a dummy variable has been found to be significant, $F(1, 420) = 58.598$ with an alpha of $<.001$. The value of the R-square variable is 12.2%. This indicates that the independent variable does reliably predict the dependent variable, thus based on Model 1 further conclusion can be drawn. Model 2 which includes the religious party family as a dummy variable has been found to be significant as well, $F(1, 420) = 56.406$ with an alpha of $<.001$. The value of the R-square variable is 11.8%. This indicates it is possible to draw careful conclusions based on Model 2. Model 3 which includes the liberal party family as a dummy variable has been found to be significant, $F(1, 420) = 533.581$ with an alpha of $<.001$. The value of the R-square variable is 56.0%. Model 4 which includes the green party family has been found to be significant, $F(1, 420) = 22.287$ with an alpha of $<.001$. The value of the R-square variable is 5.0%. This indicates it is possible to draw careful conclusions based on Model 4. Model 5 which includes the right party family as a dummy variable has been found to be significant, $F(1, 420) = 10.283$ with an alpha of $.001$. The value of the R-square variable is 2.4% which indicates that the explained variance is relatively low, yet the model is significant enough to proceed. Model 6, which includes the pension party family has been found to be significant, $F(1, 420) = 6.767$ with an alpha of $.010$. The value of the R-square variable is 1.6%. This indicates that the independent variable does reliably predict the dependent variable of Model 6.

Furthermore, in Table 4 - Model 7 which includes the socialist party family as a dummy variable has been found to be significant, $F(1, 420) = 5.100$ with an alpha of $.024$. The value of the R-square variable is 1.2%. This indicates that the independent variable does reliably predict the dependent variable, thus based on Model 7 further conclusions can be drawn. Model 8 which includes the religious party family as a dummy variable has been found to be significant as well, $F(1, 420) = 10.904$ with an alpha of $.001$. The value of the R-square variable is 2.5%. This indicates it is possible to draw careful conclusions based on Model 8. Model 9 which includes the liberal party family as a dummy variable has been found to be significant, $F(1, 420) = 23.629$ with an alpha of $<.001$. The value of the R-square variable is 5.3%. Model 10 which includes the green party family has been found to be significant, $F(1, 420) = 348.012$ with an alpha of $<.001$. The value of the R-square variable is 45.3%. This indicates it is possible to draw careful conclusions based on Model 10. Model 11 which includes the right party family as a dummy variable has not been found to be significant, $F(1, 420) = 0.001$ with an alpha of $.972$. The value of the R-square variable is 0% which indicates that this model does not reliably predict the dependent variable and no conclusions can be drawn on this model. Model 12, which includes the pension party family has not been found to be significant, $F(1,$

420) = 0.024 with an alpha of .878. The value of the R-square variable is 0%. This indicates that the independent variable does not reliably predict the dependent variable of Model 12.

Lastly Table 5- Model 13, which includes the change of values of opposition and coalition parties, has been found to be insignificant, $F(1, 420) = 47.956$ with an alpha $<.001$. The value of the R-square variable is 10.2%. This indicates that the independent variable does not reliably predict the dependent variable, thus conclusion can be drawn based on Model 13. Model 14, which includes the variety of values of the coalition and opposition parties, has been found to be significant as well, $F(1, 420) = 33.614$ with an alpha $<.001$. The value of the R-square variable is 7.4%. This indicates it is possible to draw careful conclusions based on Model 14.