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The party politics of nuclear energy: Party cues and public opinion regarding nuclear energy in Belgium

Abstract

Political science research suggests that political party communications often have a strong effect on people's positions on political issues. However, studies on support for nuclear energy have hitherto largely ignored party-political factors, especially in multiparty contexts, focusing instead on psychometric variables such as risk perception, benefit perception, and trust. This article analyzes if and how people use party cues when determining their support for nuclear energy. We conducted a public opinion survey in Belgium in 2015, which is representative for the population on age, gender, education and level of urbanization. Our results indicate that parties have a net-effect on support for nuclear energy although the effect is modest compared to the effects of the psychometric variables. Furthermore, we show that partisan cue taking occurs more amongst voters of parties that have a clear and opposing position on nuclear energy (i.e. the issue owning parties and the policy defending parties). Cue taking voters of these parties became somewhat more extreme in their support for nuclear energy in the direction advocated by their preferred party. Hence, parties seem to have a polarizing impact on public opinion on nuclear energy. Furthermore, partisan cue taking on nuclear energy occurred more amongst respondents more knowledgeable/strongly involved on the issue of nuclear than amongst those less knowledgeable/less involved.

Keywords: nuclear energy, support, political parties, elite influence, party cue taking, polarization

Introduction

A rich literature in political science investigates how citizens use cues of their preferred party – i.e. information about the party’s position on an issue –to determine their own position on that issue [1]. Partisan cue taking refers to the process in which citizens adopt or adapt to the policy positions advocated by like-minded elites, like parties or politicians. Some studies show that cue taking means that people *adopt* the position of their preferred party when they get to know this position and when initially did not have a position on the issue [2]. However, others show that cue taking can also mean that people *adapt* their position to that of their party [3]. Cue taking as adaption occurs when people reinforce their position on an issue in response to partisan cues or when they change their initially opposite position to be in line with the party.

Whether or not people use party cues depends on various factors at both the demand and the supply side of politics. In electoral studies, the supply side is used to refer to the behavior of parties, where the demand side refers to the behavior of voters [4]. One such factor is the role parties play in the political debate on an issue. Hartevelde, Kokkonen and Dahlberg [3] show that cue taking is stronger among voters of parties taking a vocal position on an issue, in terms of both amount and clarity of cues. We refer to this as the *supply side* of the cue taking, as partisan behavior is at stake here. Other studies focus on individual level differences in cue taking. We refer to this as the *demand side* of cue taking, as some citizens are socially and psychologically more receptive to partisan cues than are others. While some studies find that cue taking is stronger among the less knowledgeable and less involved [5], others find that party cues affect those more involved on the issue [6].

Despite the extensive research on the relationship between issue positions of parties and voters in political science, the influence of party-political factors has received limited attention in studies addressing support for nuclear energy. The existing studies mainly focus on psychometric predictors such as risk perception, benefit perception and trust [7]. Those studies that did take into account party-political factors, illustrate the importance of party-political factors for support on energy related issues [8-10]. However, most of them focus on the bipartisan US context. Holmberg [11] and Holmberg and Hedberg [12] are among the few that looked at cue taking in the multiparty context and they show that voters align their support for nuclear energy with that of their preferred party. However, these studies did not look at the mechanism underlying cue taking. Therefore, this paper aims to fill this gap. Following up on studies like Mayer and Smith [13] and Azrout and de Vreese [14] we test whether cue taking occurs more often among people with rather limited knowledge/lower issue involvement (low-information heuristic), or by people more knowledgeable/higher issue involvement (high-information heuristic). Furthermore, we also want to contribute to the literature by searching

more thoroughly for the net-effect of party cues on support for nuclear energy by controlling for the traditional psychometric factors that serve as considerations (e.g. risk perception).

To test the effect of partisan cue taking we use recent data from a large-scale public opinion survey on energy technologies conducted in Belgium in the autumn of 2015. This provides a context in which an effect of partisan cue taking is most likely. Two factors typical for Belgium at that time make it a most likely case. First, there is the fact that in Belgium parties play a crucial role, with scholars referring to Belgium as a *partitocracy* [15]. Hence, when politicians communicate on an issue like nuclear energy they will always stick to the party position on that issue. In other multiparty systems, like in Finland, politicians enjoy more freedom to position themselves on the issue of nuclear energy. In addition, parties have a clear and distinct position on nuclear energy in Belgium. Hence, in such a multiparty setting an effect of partisan cues becomes more likely. Second, the issue re-emerged on the agenda because of a political discussion between the newly formed government and the opposition, with the Green parties as main protagonists. While Belgium initially adopted a phase-out law that envisioned a phase-out of nuclear energy by 2025, this decision was partially revoked by the government agreement of the center-right coalition, which stipulated that the operational life of two of the oldest reactors would be prolonged with 10 years. In sum, at the time of survey Belgium could clearly be characterized as a context with clear and intense political elite cues on nuclear energy. However, this does not necessarily mean that these cues will be taken up by the general public because they usually lack interest in energy policy [16], with only a small group of people for whom the issue is politically relevant and salient [17].

Theoretical framework

The psychometric model of support for nuclear energy

Several studies in the field of risk research indicate that perceived risks and benefits are crucial explanatory factors for support for nuclear energy [18], with benefit perception as the strongest predictor [19]. In the debate on the future of nuclear energy climate change and energy security are often used arguments in the justification for using this energy source [20]. Visschers, Keller and Siegrist [19] show that people who believe nuclear energy mitigates climate change, and that nuclear energy guarantees security of energy supply are more in favor of nuclear energy. Another factor often considered in cognitive models of acceptance is trust in the management of nuclear technology: higher trust is associated with more support [21]. Different studies show that the psychometric factors mentioned above – referred to in the following as the psychometric factors – explain nearly half of the variance of support for nuclear energy [7]. This high explained variance is typically seen as proof of the rather exhaustive

nature of the model. In addition, the psychometric factors are thought of as instrumental rational considerations that determine people's level of support for nuclear energy [22].

Cue taking and support for nuclear energy

Many studies focus on the relationship that exists between party preference and issue positions of citizens [23]. In some of these studies, this relationship is seen as an effect of issue positions on vote intention. Scholars adhering to this view assume that voters decide what party they prefer (vote) based on the positions they hold on salient issues at the moment of the election, i.e. issue voting [24]. However, in most countries nuclear energy production very rarely becomes the ultimate issue to base one's vote on. This may only happen in extreme contexts, such as in the aftermath of a major nuclear accident. Van der Brug shows that in the first Dutch election shortly after the Chernobyl nuclear accident people more often adjusted their party preference based on their issue position rather than the other way around [25]. Other studies argue that the causal arrow generally points in the other direction with party preference being the cause of issue positions, i.e. cue taking. According to this view, political parties affect position taking on political issues by providing party cues to the public [26, 27]. Party cues refer to the parties' communication regarding a specific issue: providing information about their position on and the salience of the issue for the party [28]. Some studies show that voters *adopt* the position of their preferred party [2]. This effect occurs also for people initially holding a different position, and when the party does not provide any justification for its position [23]. Other studies find that people *adapt* their position in response to partisan cues. Hartevelde, Kokkonen and Dahlberg [3] for instance point out that voters in the Netherlands and Sweden took more extreme positions on immigration and European integration in the direction of their preferred party's position. This indicates that parties play an important role in the public opinion process as suppliers of cues. The underlying idea is that people care about their party and that party preference is often an important social identity [29, 30]. In this view, partisan identification is the cause of support for nuclear energy. Effects of partisan cues might be particularly relevant to understand peoples voting behavior in referenda [31]. Referenda on nuclear energy policy have been organized in different European countries (e.g. Austria [32], Italy [33], and Switzerland [34]). Some scholars show that in general elections issue voting and cue taking occur simultaneously [6, 35].

An experimental design – and to some extent a panel design – would allow to make real causal claims about the relationship between support for nuclear energy and partisan cues. Yet, even based on cross-sectional data alone, it seems reasonable to assume that one can control for issue voting by incorporating the psychometric variables in the explanatory model. This because issue voting and the psychometric model both assume that people are

instrumentally rational. People take position on an issue based on particular considerations, and determine their vote choice on issues that are salient to them [36, 37]. In sum, if a significant effect of vote intention on support for nuclear energy persists when controlling for the psychometric factors then this effect is probably due to cue taking [38].

The role of political parties for cue taking (supply side)

Before people can respond to partisan cues, they should first be received [1]. Therefore, part of the differences in cue taking can only be explained by how vocal the parties are on the political issue. In a recent study Harteveld, Kokkonen and Dahlberg [3] found that the role parties play in the political debate on an issue, affects cue taking among voters. Looking at the debate on immigration in Sweden and the Netherlands, they show that cue taking was strongest for the most vocal parties. Voters who prefer the Radical Right adapted their position based on party cues, and became stricter on immigration. Voters who prefer the Radical Left or the Green party also adapted their party position, but in the opposite direction, becoming less strict on immigration. Cue taking effects were smaller among voters of centrist parties, who did not take vocal positions on the issue. On the issue of immigration cue taking caused the voters of parties taking a vocal and extreme position to adopt more extreme position, increasing polarization on the issue.

Not all parties have an incentive to take a vocal position on an issue. A party with a clear incentive to do so is “the issue owning party” [39]. Issue ownership refers to the fact that a party is considered to be committed to an issue which results in a more or less stable association in peoples mind between the party and the issue [40], e.g. the association of environmental parties with an anti-nuclear energy stance. Research shows that parties communicate more actively and clearly on owned than on other issues [41]. In most Western-European countries Green parties are owners of environmental issues and the nuclear energy production issue [42, 43]. Considering the central role of the nuclear energy issue for the ideology of Green parties [44], these parties are likely to take a vocal position on the issue. However, the issue owning party is not the only party with an incentive to take a vocal position. Research by Walgrave and Lefevere [45], shows that governing parties also have reason to take a vocal position, as they have the opportunity to try to steal the issue ownership and need to defend their policy. This incentive is even stronger for the governing party that holds the ministerial portfolio on an issue. Consequently, due to the increased party communication on the issue also policy-defending parties – that are not issue-owners – become more strongly associated with the issue at hand. Whether a governing party has an incentive to defend its policy on an issue depends on its position vis-à-vis the issue owning party, and whether the latter party is part of the government coalition. When the issue owning party is also member of

the government, it will most likely also play the role of policy defender. When the issue owning party is in the opposition, the policy defending party probably holds an opposite position to that of the issue owning party. Together, the issue owning party and the policy defending party will take a more vocal position on the issue. Both parties consider the issue important – attach high salience to the issue – but differ in the position they take on the issue. Given that these parties provide the strongest cues, we can expect that their voters are more strongly affected by party cues than are voters of parties that do not provide clear cues. Therefore, we formulated the following hypotheses:

H1: The net effect of party cues on support for nuclear energy is stronger in the electorate of the issue owning parties, than in the electorate of the other parties.

H2: The net party cue effect on support for nuclear energy is stronger in the electorate of the policy defending parties, than in the electorate of the other parties.

Individual level differences in cue taking (demand side)

In addition to differences in the strength of the effect of cue taking between the electorates of different parties, there are also other individual differences. Mayer and Smith [13] show that the effect of party affiliation is moderated by the level of education of a person. Not every person is equally sensitive to partisan cues, i.e. demand side differences. In many studies, the use of party cues is described as a low-information heuristic [1]. Rather than informing oneself about the issue and reasoning on the issue, people use their party's position as a cue to determine their own position on the issue. Underlying this reasoning is the assumption that people have a motivation to form an 'accurate position' [46]. However, rather than using knowledge to make an informed decision, they use their partisan identification to decide whether or not they support nuclear energy. If cue taking indeed functions as a low-information heuristic than it should be stronger among people who are less involved/less knowledgeable on the issue. Studies show that when involvement is higher: (1) people's cognitive effort to process information increases [47], and (2) the dependence on party cues decreases [48]. Next to involvement, also the level of knowledge determines whether people use partisan cues. Looking at support for nuclear energy Kuklinski, Metlay and Kay [5] find that while both knowledgeable and unknowledgeable citizens use partisan cues, the latter are more dependent on cues when determining their support.

Alternatively, party cue taking might be stronger among people who are motivated to maintain their party affiliation. Different studies have referred to this as "the expressive utility function of cue taking" [49]. In this case, party cues might have a stronger effect on support for nuclear energy for the more involved voters. In order to understand why this is the case we look at group polarization theory [50]. According to this theory there is a tendency in a group

leaning towards a position to take a more extreme position in the same direction [50]. One explanation for group polarization is based on social comparison. This explanation assumes that people want to show allegiance to a party and will therefore adapt their position to the dominant group position [51]. However, for voters it is not possible to infer directly the dominant group position, but they can use the party's position as a proxy for the dominant group position. Hence, voters will take a more extreme position on those issues on which political parties take a more extreme position than the party's electorate. A second explanation of group polarization focuses on the effect of corroboration on position extremity [51]. When people learn that they share a position with relevant others, e.g. a political party president), they become more confident that this position is correct [52]. Both explanations of group polarization assume that people adopt a more extreme position on the selected issue, because they identify with a social group. The people who are more involved on an issue are probably those for whom the issue is strongly linked to their political identities, like party identification. Therefore, the polarizing effect of party cues will be strongest among people with a high issue involvement.

Based on the two contradictory explanations of individual level variance in cue taking – low-information heuristic vs. high-information heuristic – the following alternative hypotheses are formulated:

H3: The net effect of party cues on support for nuclear energy is stronger among people with low issue involvement than among people with high issue involvement. H3.a: The net effect of party cues on support to nuclear energy is stronger among people with high issue involvement than among people with low issue involvement.

H4: The net effect of party cues on support to nuclear energy is stronger among people with less issue-specific political knowledge than among people with more issue-specific knowledge. H4.a: The net effect of party cues on nuclear energy is stronger among people with more issue-specific political knowledge than among people with less issue specific knowledge.

Party politics on nuclear energy in Belgium

Belgium is a federal state consisting of two separate multiparty systems [53]. In the North of Belgium (Flanders), Dutch-speaking parties compete with each other for votes. The most important parties here are the Christen-democratic party (CD&V), the Green party (Groen), the Flemish regionalist party (N-VA), the liberal party (Open VLD) and the social-democratic party (sp.a). In the South of Belgium (Wallonia), – French-speaking parties compete for votes. Here the most important parties are the Christen-Democratic party (cdH), the Green party (Ecolo), the liberal party (MR), the socialist party (ptb-Go) and the social-democratic party (PS). Citizens living in bilingual territory of Brussels can choose whether they

vote for a French-speaking party or for a Flemish party. Dutch speaking people generally vote on Flemish parties, while the French-speaking citizens vote the Walloon parties.

With a Green party in each regional party system, there is a party principally against nuclear energy in both Flanders and Wallonia. It is generally assumed that the Green parties' participation in government is the reason that the Belgian government decided to phase-out nuclear energy in 1999 [43]. Like in most other Western European countries nuclear energy is an important issue for the Green party, of which they are the issue owners [43].

Where the two issue owning parties belong to the same party family, this is not the case for the policy defending parties. In Flanders, the Flemish nationalist party N-VA took up this role. They are also the only party that suggested to build a new nuclear reactor in their 2014 party manifesto [54]. In Wallonia, the liberal party (MR) is the staunchest proponent of nuclear energy. The position of this party became more visible since this party provided the Minister of Energy of the government Michel I. In 2014, the coalition partners – N-VA, CD&V, MR and Open VLD – decided to extend the operational life of two of Belgium's oldest reactors. Between the political decision in the autumn of 2014 and the enactment of the new law in the summer of 2016, a fierce debate developed between government and opposition parties. Therefore, the MR was very visible as defender of the pro-nuclear policy decision.

In order to know the position of the other parties on the issue, we use data collected to construct the Belgian vote aid application (VAA) 'De Stemtest' of 2014 [55]. For the development of this VAA, the political parties in both party systems indicated their position on different statements. One such statement is '*some nuclear reactors should remain open*'. Until now, no study reported about the answers of the parties on this statement. Table 1 shows that in Belgium in 2014 all left-wing parties oppose the option, while the right-wing parties generally support this idea. A notable exception is the Flemish liberal party Open VLD: the only right-wing party to oppose the option.

[Table 1 about here]

Method

Data

The study is based on data from a large scale public opinion survey on perceptions and attitudes towards nuclear technologies in the Belgian population [56]. The fieldwork of the survey (N=1028) was carried out between 2015-09-11 and 2015-10-13 by IPSOS Belgium. The random route sample of respondents is representative for the Belgian population with respect to gender, age, province, education and degree of urbanization. Computer Assisted Personal Interviews (CAPI) were conducted at the respondents' homes in either Dutch or

French (interviewee's choice). More information about the data collection is provided as supplementary material to this article.

Dependent variable

The dependent variable – *support for nuclear energy* – was measured with three items. The first item asked respondents: *What is your opinion about the use of nuclear energy for electricity production?* Respondents answered this question on a five-point Likert scale ranging from (1) totally against to (5) totally in favor. Next respondents indicated their agreement with two statements on nuclear energy: (1) *'The reduction of the number of nuclear power plants in Belgium is a good cause'*; (2) *'Nuclear power plants endanger the future of our children'*. Agreement was measured using a five-point Likert-scale ranging from (1) strongly agree to (5) strongly disagree. Principal axis factoring analysis showed that the three items form a unidimensional factor (loadings > 0.70; Cronbach alpha: 0.80). Because the items have similar factor loadings a sum scale was constructed (min=3; max=15).

Independent variables

Four socio-demographic variables are included in the model. *Age* is operationalized as a categorical variable with four categories: 18-34 years (21%), 35-54 years (38%), 55-64 years (21%), and 65+ years (21%). *Gender* is a dichotomous variable with men being the reference category (women: 48.5%). *Education* is a categorical variable with three categories: lower (primary & lower secondary: 28.7%), intermediate (higher secondary: 40.3%) and higher education (university: 31.0%). In addition, the models also control for the fact that voters belong to different regions. *Region* is coded zero (0) for respondents living in Wallonia and one (1) for respondents living in Flanders. Respondents living in Brussels and intending to vote for a French-speaking party were attributed to Wallonia. Respondents living in Brussels and intending to vote for a Flemish party were attributed to Flanders.

Benefit perception of nuclear energy was measured as the level of agreement with the statement: *'Overall, the benefits of nuclear energy outweigh the disadvantages'* (1= strongly disagree; 5=strongly agree). In addition, the model contains two additional considerations that are linked with the benefits of nuclear energy for electricity production. The first consideration is on the relationship between climate change and the use of nuclear energy for electricity production, measured as level of agreement with the statement *'Nuclear energy is an effective way to limit climate change'* (1= strongly disagree; 5=strongly agree). The second consideration is about the necessity of nuclear energy for energy security in the context of the transition towards the use of more renewable sources. This consideration is measured as agreement with the statement *'Renewable energy sources are able to cover our current energy needs'* (1= strongly disagree; 5=strongly agree).

Risk perception of nuclear energy production was measured with three items. Respondents were asked how they perceive the potential personal health risk within the next 20 years from: (1) radioactive waste, (2) an accident in a nuclear installation, and (3) a terrorist attack with a radioactive source. Risks were rated on a scale ranging from 'no risk at all' (1) to 'a very high risk' (5). Principal axis factoring indicated an underlying unidimensional risk perception (factor loadings > 0.66; Cronbach alpha=0.77). As all items have similar factor loadings a sum scale was constructed based on the three items (min=3; max=18).

Trust in the nuclear management was measured as agreement with three statements: (1) '*Nuclear reactors in Belgium are operated in a safe manner*'; (2) '*In Belgium, radioactive waste is handled in a safe manner*', and (3) '*I feel well protected against the risk from nuclear installations*'. Respondents indicated their agreement on a five-point scale that ranged between 1 (strongly disagree) and 5 (strongly agree). All three items load on a single factor (factor loadings > 0.52; Cronbach alpha= 0.80). As all items have similar factor loadings a sum scale was constructed based on the three items (min=3; max=15).

Vote intention is used as a proxy for party identification. *Vote intention* was measured at the beginning of the survey with the following question: '*In case a Federal election was organized next Sunday, which political party would you vote for?*'. Respondents in Flanders and Wallonia were given a list of all major political parties active in their region. Respondents from Brussels could select their preferred party from a list of Flemish and Walloon parties. The options '*other party*' and '*don't know/no answer*' were provided. Based on their answers respondents were classified in three groups of electorates: i) the electorate of the issue owning parties (Ecolo & Groen; N=81); ii) the electorate of the policy defending parties (MR & N-VA; N=177) and iii) the electorate of all other parties (including 'don't know/no answer' N=468). Out of the 744 respondents used in the analyses 468 (66%) indicated that they would vote for another party than the issue owning parties or policy defending parties or answered the question with DK/NA. Of these 468 respondents 144 (29.6%) used the option DK/NA. Another 54 respondents (11.1%) used the option 'other party', meaning a party not mentioned in the list. The remaining 42% indicated that they would vote for another party mentioned in the list.

Issue involvement was measured by asking respondents whether they would still vote for their preferred party (see *vote intention*), if this party a particular position on nuclear energy. Next, they were given a list of four possible party positions. Position 1: '*Belgium should close all its nuclear power plants as soon as possible*'. Position 2: '*Belgium should use the nuclear power plants it already has, but not build new ones*'. Position 3: '*Belgium should use the nuclear power plants it already has and build new nuclear power plants to replace the old ones*'. Position 4: '*Belgium should close the existing power plants and build new ones*'. For

each of these statements respondents used a five point Likert-scale (1= definitely not; 5= definitely yes). Subsequently, for each electorate we selected the statement opposite to the party's position (closest statement possible). For the Green voters this is item three, while for the N-VA and MR voters this is item one. Next, we recoded this item so that a higher score indicates that respondents would definitely not vote for their preferred party anymore in case this party switches its position on nuclear energy. Hence, recoded in this direction higher scores indicate that the respondent values his/her position on nuclear energy more than his/her party affiliation.

Knowledge of parties' positions is an index that indicates for how many political parties the respondent knew the position on nuclear energy. Respondents were first asked how they perceive the positions of the political parties in their region using a five-point scale (1= totally against – 5= totally in favor). These answers were recoded into four categories: 'against', 'neither in favor nor against', 'in favor' and 'don't know/now answer' (DK/NA). Next, these answers were compared with the answers given by the parties in the 2014 party survey^j [55] (Table 1). The position of a party is known (coded 1) when a respondent correctly perceived the party to be in favor or against nuclear energy. If the respondent answered with 'neither in favor, nor against' or 'DK/NA' then we coded the position as unknown, as well as when the position was incorrectly perceived as being in favor or against (coded zero). Subsequently, an index was calculated of the number of correct answers, and this score was then divided by the actual number of political parties in the region, to control for the fact that there are more parties in Flanders than in Wallonia. Hence, the knowledge of a respondent is indicated with a score between 0 and 1.

Table 5 (appendix) provides descriptive statistics for the continuous variables used. Table 6 (appendix) gives information about the correlations between these variables.

Results

Tests of supply side hypotheses

Models 1 to 3 (table 2) show the outcome of different ordinary least squares regressions (OLS), given that the dependent variable is a continuous variableⁱⁱ. In model 1 the psychometric factors are included (see table 2). All psychometric factors have a statistically significant and substantial effect on support for nuclear energy. *Benefit perception* has a positive effect on support for nuclear energy ($b=.81^{***}$; $SE=.08$). The more a person is convinced that renewable energy sources can cover the current energy needs the less supportive (s)he is of nuclear energy ($b=-.61$; $SE=.06$). People who are more convinced that nuclear energy mitigates climate change – *belief climate change* – are more supportive of nuclear energy ($b=.31^{***}$; $SE=.07$). Higher *risk perception* decreases support for nuclear energy ($b=-.12^{***}$; $SE=.03$). The

higher the *trust* in the nuclear *management* the higher the support for nuclear energy: (b=.26***; SE=.03). The effects of the socio-demographic variables gender, age, education and region are not statistically significant. With an explained variance of 49%, the psychometric model, i.e. model one, provides a good explanation as to how people think about nuclear energyⁱⁱⁱ.

H1 and H2 state that cue taking is stronger among voters who identify with parties that play a more prominent role in the political debate on nuclear energy, namely the issue owning parties and the policy defending parties. In model 2 (table 2) we specifically compare respondents that intended to vote for the issue owning parties and the policy defending parties with those who intended to vote for another party (including don't know or no answer). Voters of the issue owning parties were significantly more negative about nuclear energy than the reference category (b=-2.14***; SE=.29). The electorate of the policy defending parties on the other hand is significantly more positive about nuclear energy, when compared to the reference category (b=1.01***; SE=0.25). Yet, the explained variance of model 2 (10%) is far below that of the psychometric model (51%). This indicates that vote intention only partially captures differences in beliefs people have on nuclear energy.

Furthermore, the effects of vote intention do *not* disappear when controlling for the socio-demographic variables and psychometric factors, this is tested in model three (table 2). The electorates of the issue owning parties and the policy defending parties are still different from the control group in terms of support for nuclear energy. Voters of the policy defending parties are still more supportive of nuclear energy than the control group (b=.55**; SE=.19), while those who intend to vote for the issue owning parties are still less supportive than the reference group (b=-.68**, SE=.26). That the coefficients in model 3 are smaller than the coefficients in model 2 means that part of the effect of vote intention on support found in model 2 is due to differences in thinking about nuclear energy between these groups captured by the psychometric factors. However, the fact that there remains a net-effect of vote intention in model 3 also indicates that parties do affect support for nuclear energy and this effect seems to be unrelated to the issue specific considerations. Adding vote intention to the model containing the most relevant considerations – being the psychometric model – still allows a more accurate prediction of the level of support. However, the net-effect of vote intention is small in terms of explained variance. Model 3 explains 51% of the variance in support for nuclear energy, 2% more than the psychometric model (model 1). Although being quite small the change in explained variance is statistically significant: F change= 9.46; df(1)= 2 – df(2)= 729; p=.000^{iv}. Overall, these results therefore confirm H1 and H2: cue taking is stronger among the voters of the issue owning and the policy defending parties, than among the voters of the other parties.

[Table 2 about here]

Tests of demand side hypotheses

In this section, we look more closely at the demand side of cue taking. For these analyses, a dichotomous indicator ‘cue taking’ was constructed based on the net-effect of vote intention on the residuals of the model explaining support for nuclear energy. To capture the net of vote intention we saved the absolute residuals of the psychometric model (model 1 in table 2 and indicated with Ψ) and the absolute residuals of the full model (model 3 in table 2 indicated with ‘full’). Next, we calculated the difference between these absolute residuals using the following formula: $|y_i - \hat{y}_{i(Full)}| - |y_i - \hat{y}_{i(\psi)}|$. Positive scores indicate that the residual of model 3 (with vote intention) is larger than the residual in model 1 (without vote intention). For respondents with a positive score, adding vote intention results in a less accurate prediction of position on nuclear energy. Negative scores indicate that the residual decreases when vote intention is included in the explanation of support for nuclear energy. Next, a dummy indicator was constructed based on the net-effect of vote intention. The indicator equals one if adding ‘vote intention’ to the psychometric regression model leads to a better prediction (i.e. decrease in residual) of the observed support for nuclear energy ($|y_i - \hat{y}_{i(Full)}| - |y_i - \hat{y}_{i(\psi)}| > 0$). The indicator equals zero if adding ‘vote intention’ to the psychometric regression model leads to a less accurate prediction (i.e. increase in residual) of support for nuclear energy ($|y_i - \hat{y}_{i(Full)}| - |y_i - \hat{y}_{i(\psi)}| < 0$). To test the demand side hypotheses, we focus only on the voters of the issue owning parties and the policy defending parties. Among the voters of the issue owning parties (N=80) 65% are cue takers, while 54% of the voters of the policy defending parties are cue takers (N=176).

To test H3 and H3.a – regarding the relationship between cue taking and issue involvement – we first look at the respondents belonging to the electorate of the issue owning parties and the policy defending parties together (N=256). For this group we find a positive relationship between cue taking and issue involvement. This is shown by the significant mean difference in issue involvement between cue takers and non-cue takers (see table 3). Among cue takers the mean issue involvement score is 3.57 (SE=.12; N=146) compared to 2.8 (SE=.13; N=106) among non-cue takers. This mean difference is statistically significant (p=.000). Next, we calculated the effect size r. There is a medium effect of issue involvement on cue taking (r=.30). To test the robustness of this finding, we also ran tests for the electorates of the issue owning parties and the policy defending parties separately (see table 3). The positive relationship between cue taking and issue involvement is also present when looking at these electorates separately. The relationship seems most uncertain in the electorate of the

issue owning parties, but this is probably because nearly all members of this electorate gave a high score on issue involvement. Based on these results H3.b is confirmed.

[Table 3 about here]

Next, we test if and how knowledge about the parties' positions on nuclear energy moderates cue taking (H4 and H4.a). To test whether cue-takers and non-cue takers differ in their *knowledge of the parties' positions* on nuclear energy a t-test is used (see table 4). A t-test was conducted for the electorate of the issue owning parties and the policy defending parties together (N=256). Cue takers (mean=.48; SE=.02; n=109) are more knowledgeable about the parties' positions than the non-cue takers (mean=.39; SE=.02; n=147). This difference is statistically significant: $t(254) = -2.793$; $p < 0.05$. The effect of knowledge of parties' positions on nuclear energy is rather small ($r = 0.14$). The relationship between cue taking and knowledge of the parties' positions was also re-assessed for the specific electorates. For the electorate of the issue owning parties the cue takers are significantly more knowledgeable (mean=.57; SE=.04; n=52) than the non-cue takers (mean=.42; SE=.05; n=28): $t(78) = -2.30$; $p = 0.012$. A similar relationship between cue taking and knowledge is present in the electorate of the policy defending parties, with cue takers (mean=.43; SE=.03; n=95) being more knowledgeable than the non-cue takers (mean=.38; SE=.03; n=81). Yet, this difference is not statistically significant: $t(174) = -1.51$; $p = 0.07$. Nevertheless, overall these tests indicate that cue taking occurs more among respondents with greater knowledge of the parties' positions on nuclear energy than among respondents with less knowledge, confirming H4.a.

[Table 4 about here]

In addition, we also find that cue taking occurs more among the electorates for whom the psychometric model predicts most accurately the level of support for nuclear energy. This is shown in figure 1, which shows the explained variance of the psychometric model for the different electorates. This information was obtained by rerunning model 1 (table 2) for the different electorates. For the electorate of the issue owning parties the explained variance of the psychometric model is 59%. Also for the voters of the policy defending parties, the explained variance is high, with 55% of the variance in support for nuclear energy. The explained variance is lower for the voters who said they would vote for one of the other parties or who answered the vote intention question with 'don't know' or 'no answer' (41%). Hence, figure one shows that the net-effect of cue taking is stronger for the electorates for whom we are able to predict their support based on the psychometric model.

[Figure 1 about here]

In addition, robustness tests were conducted to see if the results hold for alternative classifications of vote intention, alternative operationalization of cue taking and differences between parties in how individual characteristics moderate cue taking. Our results proved to be robust. The robustness tests are available as supplementary material to this paper.

Discussion

This paper investigates the effect of cue taking on support for nuclear energy. Many political science studies demonstrate that people use the position of their preferred party to determine their own position, referred to as cue taking. [2]. However, cue taking has received little attention in studies on support for nuclear energy. The scarce studies that did look at the influence of cue taking on support for nuclear energy mainly focused on the US context and did not investigate cue taking in a multiparty context. This paper therefore aims to contribute to the literature by studying cue taking in a multiparty context. Our results show that party cues affect support for nuclear energy, also outside the bipartisan context. Hence, our study finds that on the issue of nuclear energy people follow – at least to some extent – their preferred party's lead. This results aligns with the literature on cue taking [26] and confirms previous findings by Holmberg [11]. However, this paper goes one-step further by also looking at the mechanism underlying party cue taking on the issue of nuclear energy in a multiparty context. To unravel the party cue taking mechanism both the supply side (cf. party behavior) and the demand side (cf. individual preferences) are taken into account.

For the supply side, we find that the vocality of parties influences party cue taking. Results show that cue taking is stronger among voters of parties that play a more prominent role in the issue debate, i.e. among the voters of the issue owning parties and the policy defending parties. Voters of the issue owning parties (i.e. Green parties) appear to oppose nuclear energy more than could be expected based on their underlying considerations. In a corresponding manner, the voters of the policy defending parties support nuclear energy more than expected based on their underlying considerations. Voters of the issue owning parties and the policy defending parties adopted a more extreme position in the direction advocated by their preferred party. This finding shows that parties have an effect on support for nuclear energy and that this effect does not run via the voter's considerations about nuclear energy. By taking up a more active and prominent role in the debate on nuclear energy, these parties provide their voters with partisan cues, which result in greater polarization of public opinion on the issue. The results of this study align with the conclusions by Hartevelde, Kokkonen and Dahlberg [3] who show that cue taking on the immigration issue was stronger among voters of parties that were more vocal on the issue, and that this resulted in adopting a more radical position along the party lines.

In addition, this study explores individual level differences in cue taking by assessing which individuals are most dependent on partisan cues (cf. demand side). According to scholars like Kuklinski, Metlay and Kay [5] cues serve as heuristics, while others argue that cue taking increases cognitive processing [57]. Hence, alternative hypotheses were

formulated. Our results show that cue taking occurs more often among people who are more involved with and are more knowledgeable about the issue, rather than among people who are less involved and less knowledgeable. This suggests that in the case of nuclear energy production partisan cue taking functions as a high-information heuristic. The more involved and the more knowledgeable voters polarize along party lines, by taking a more extreme position in the direction advocated by their preferred party. This polarization seems to be an affective response to their party affiliation, which causes people to overstate their level of support for nuclear energy in one or the other direction.

In line with the foregoing, our results show that the effect of cue taking on support for nuclear energy is stronger in the electorates for whom the predictive power of the psychometric model is stronger. The net-effect of party cues on support for nuclear energy – i.e. the affective mobilization by parties – is stronger for people who hold considerations that back-up their support on nuclear energy. The net contribution of cue taking to the explanation of support for nuclear energy is limited. In line with the existing literature our results show that most variance in support for nuclear energy can be explained based on the psychometric factors (e.g. risk perception, trust in nuclear management) [7], that serve as considerations people use when they determine their position on nuclear energy. However, although limited in size the observed net-effect of vote intention is relevant for two reasons. Firstly, because an effect of cue taking is observed in a model that makes it hard to find such an effect. The psychometric model already provides a good explanation of support for nuclear energy, making it more difficult to contribute to the model. Secondly, the limited net-effect is part of a larger gross-effect of vote intention. Together with the socio-demographic variables vote intention explain 10% of the variance in support for nuclear energy. This indicates that a part of the gross-effect of vote intention actually results from differences in considerations on nuclear energy (i.e. psychometric factors) between electorates. In addition, the fact that the net-effect of vote intention is limited is also ‘good news’, as we argue that it captures a kind of affective polarization.

Our findings on the effect of party cues are made in the Belgian context. As in many other European countries, political parties play an important role in the debate on nuclear energy [43]. In Belgium, politicians are the actor with the highest percentage of speaking time on the issue of nuclear energy and there is a high degree of party discipline. Not in all countries, party discipline is as high as in Belgium. In Finland, for instance, nuclear energy is considered an ‘issue of conscience’, meaning that politicians can freely determine their position on the issue [58]. Hence, in Finland parties do not provide cues on the issue. Such differences in party discipline will affect the process of party cue taking. Another important contextual factor is the level of polarization. Part of this polarization on the issue is due to the specific issue.

However, also the particular political context will played its role. The French-speaking policy defending party MR for example was in special position, as it was for the first time that there was no majority on the Walloon side. With the MR party providing the minister of energy, the nuclear energy issue became an important issue for the opposition parties.

This research identified the following topics for future research. Firstly, upcoming studies on cue taking should use longitudinal data, as this would provide the opportunity to make a stronger causal claim. According to some, there is cue taking [5], while others found that issue voting tops cue taking [25]. Moreover, both occur at the same time among different groups [6, 35]. However, we argued that controlling for the psychometric factors that serve as important considerations, allows us to interpret the net-effect of vote intention as an indication of cue taking rather than of issue voting. Nevertheless, future research on energy related cue taking on energy related issues should use experimental and longitudinal designs to better disentangle causality. Secondly, future research should measure party identification as vote intention might be caused by different motivations. The continuous nature of the measure would allow grasping how differences in strength of identification affect cue taking. Nonetheless, research has shown that vote intention is a good proxy for party identification, as both strongly correlate [59]. Future research could also look further in the complexity of the psychological process underlying cue taking. In a political debate, different parties provide party cues and issue frames and it is not always clear which information people process and how this affects position taking [60]. To do this, future studies might also adopt a more qualitative design. Although cue taking might be a rather subconscious process that is difficult to capture with qualitative methods. Finally, future studies should also look at cue taking on nuclear energy in a comparative design to describe how this process is affected by national context, focusing on differences in political trust and the media system.

Conclusion

This paper points out how voters use party cues of their preferred party to determine their position on nuclear energy. Party cues provided by the political parties affect voters' support for nuclear energy. Part of the individual differences in support for nuclear energy seem to be due to differences in how parties supply their voters with cues. Cue taking occurs more often among voters of parties that take a more active and prominent role in the debate on the issue (i.e. party vocality). Voters of the Green parties – the issue owning parties Groen and Ecolo – are more negative on the use of nuclear energy than one would expect based on their considerations alone. Voters of MR and N-VA – the policy defending parties – became more positive on the use of nuclear energy. In addition, we found that cue taking occurred more among those people who are (1) more involved with the issue of nuclear energy and (2)

have a higher issue-specific political knowledge. Hence, cue taking also functions as an affective high-information heuristic. In sum, because the psychometric factors and partisan cue taking effects of both issue owning and policy defending parties are complementary rather than conflicting the voters of these parties polarized on the issue of nuclear energy along party lines. Overall, our results show that political parties do influence support for nuclear energy, but their effect should not be overestimated. The psychometric factors explain far more of the variance in support for nuclear energy than vote intention.

How can these findings be generalized to the nuclear energy policy making in other countries? We studied the effect of cue taking on opinion formation in a so-called most likely effect context. Although being a multiparty system the Belgian for some reasons resembled the bipartisan context of the US with clear party cues coming from a limited number of voices. Hence, the fact that only limited party effects were found, indicates that the effects might even be more limited in other countries with a multiparty system where the clarity of cues is less clear. This can be seen as rather positive news for democracy. While many have been concerned about the polarizing effect of political elite debate on public opinion, they may be too alarmist. We observed a polarizing effect of partisan cue taking regarding the nuclear energy issue, it nevertheless remains very limited compared to the traditional psychometric factors.

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Appendix

[Table 5 about here]

[Table 6 about here]

Endnotes

ⁱ The answer 'neither in favor, nor against' was considered incorrect.

ⁱⁱ While testing the Gauss-Markov assumptions underlying linear regression models, we found that the assumption of homogeneity of variances is violated (i.e. heteroscedasticity). This was indicated by a significant Breusch-Pagan test for model 2: $\text{Chi}^2(1)=17.697$; $p=.000$. Because heteroscedasticity can affect significance tests the model was re-estimated using heteroscedasticity robust standard errors . Using robust standard error did not change the results of model 2.

ⁱⁱⁱ The variables used in model 1 seem to load on a single factor in a principal axis factoring with all variables having a factor loading between 0.26 for the reversed opinion that nuclear energy mitigates climate change and 0.79 or the opinion about nuclear energy (Cronbach alpha= 0.67). Nevertheless, because all the variance inflation factor (VIF) scores are below 5 there is no reason to be concerned about excessive multicollinearity.

^{iv} This was tested by running the linear regression in SPSS and selecting the R^2 change test.

^v For all t-tests and ANOVA's reported equality of variances was tested. If this assumption was violated than the Welsh test is used to account for this.

Table 1: Position of political parties in Belgium by left-right position (Partirep, 2014)

	Some nuclear reactors should remain open	
	Opposes nuclear energy	Supports nuclear energy
Left party	Green parties (Ecolo & Groen)*, Social democratic parties (PS & sp.a), Communist parties (PVDA & PTB- GO!)	/
Right party	Flemish liberal party (Open VLD)	Christen-democratic parties (cdH & CD&V), French speaking liberals (MR)**, Flemish regionalist party (N-VA)**, Populist right party (VB)

* Issue owning party; ** Policy defending party

Table 2: Linear regression models (OLS) of support for nuclear energy (N=744)

Variables	Model 1	Model 2	Model 3
	B (SE)	B (SE)	B (SE)
Gender			
<i>Man</i>	Ref. cat.	Ref. cat.	Ref. cat.
<i>Woman</i>	-0.19 (.15)	-0.58 (.21) **	-0.17 (.15)
Age			
<i>18-34</i>	Ref. cat.	Ref. cat.	Ref. cat.
<i>35-54</i>	-0.18 (.21)	-0.58 (.29) *	-0.18 (.21)
<i>55-64</i>	-0.11 (.24)	-0.16 (.33)	-0.14 (.24)
<i>65+</i>	0.01 (.25)	-0.22 (.33)	-0.08 (.24)
Education			
<i>Lower</i>	Ref. cat.	Ref. cat.	Ref. cat.
<i>Secondary</i>	0.20 (.20)	0.67 (.27) *	0.22 (.20)
<i>Higher</i>	-0.29 (.17)	0.22 (.29)	-0.22 (.21)
Region			
<i>Wallonia</i>	Ref. cat.	Ref. cat.	Ref. cat.
<i>Flanders</i>	-0.29 (.17)	-0.03 (.22)	-0.38 (.17) *
Benefit perception	0.81 (.08) ***		0.77 (.08) ***
Renewables consideration	-0.61 (.06) ***		-0.58 (.06) ***
Climate change consideration	0.31 (.07) ***		0.29 (.07) ***
Risk perception	-0.12 (.03) ***		-0.12 (.03) ***
Trust management	0.26 (.03) ***		0.25 (.03) ***
Vote intention			
<i>Other party</i>		Ref. cat.	Ref. cat.
<i>Issue owning parties</i>		-2.14 (.29) ***	-0.68 (.26) **
<i>Policy defending parties</i>		1.01 (.25) ***	0.55 (.19) **
Constant	6.05 (.61) ***	8.13 (.36) ***	6.30 (.61) ***
N	744	744	744
R²	0.50	0.11	0.52
Adj. R²	0.49	0.10	0.51
rmse	2.08	2.79	2.06

Notes:

(1) Dependent variable is support for nuclear energy.

(2) Significance levels: *** = p<0.001; ** = p<0.01; * = p<0.05.

Table 3: t-tests of issue involvement by cue taking for different electorates

	Not cue takers	Cue takers	
Group	Mean (SE) (N)	Mean (SE) (N)	T-test
Electorate issue owning & policy defending parties (N=252)	2.80 (.13) (N=146)	3.57 (.11) (N=106)	T(250)=-4.37; p<.000
Electorate issue owning parties (N=79)	3.71 (.24) (N=28)	4.31 (.14) (N=51)	T(77)=-2.30; p<.01
Electorate policy defending parties (N=173)	2.47 (.14) (N=78)	3.17 (.14) (N=95)	T(171)=-3.41; p<.000

Table 4: t-tests of knowledge of parties' positions on nuclear energy by cue taking for different electorates

	Cue takers	Not cue takers	
Group	Mean (SE)	Mean (SE)	T-test
Electorate issue owning & policy defending parties (N=258)	.48 (.02) (N=109)	.39 (.02) (N=147)	T(254)=2.793; p<.05
Electorate issue owning parties (N=80)	.57 (.04) (N=28)	.42 (.05) (N=80)	T(78)=-2.30; p<.42
Electorate policy defending parties (N=176)	.43 (.03) (N=81)	.38 (.03) (N=95)	T(174)=-1.51; p=.07

Table 5: Descriptive statistics (N=744)

	Lowest score – highest score	Mean (SD)	Skewness	Kurtosis
Support for nuclear energy	3 - 15	7.87 (2.93)	0.35	2.61
Benefit perception	1 - 5	2.99 (1.14)	-0.11	2.15
Climate change consideration	1 - 5	2.81 (1.13)	0.06	2.23
Renewables consideration	1 - 5	3.07 (1.26)	-0.07	1.88
Risk perception	3 - 18	13.33 (3.34)	-0.46	2.50
Trust nuclear management	3 - 15	9.15 (2.86)	-0.19	2.45
Issue involvement*	1-5	3.24 (1.42)	-0.20	1.71
Knowledge parties' positions**	0-1	0.44 (0.27)	-0.07	1.98

* N=252: only for the voters of policy defending parties (N=173) and issue owning parties (N=79).

** N=256: only for the voters of policy defending parties (N=177) and issue owning parties (N=81)

Table 6: Correlations between independent variables (N=744)

	1	2	3	4	5
1) Support for nuclear energy	1.00				
2) Climate change consideration	.33***	1.00			
3) Renewables consideration	-.40***	-.08*	1.00		
4) Benefit perception	.56***	.33***	-.25***	1.00	
5) Trust nuclear management	.52***	.35***	-.16***	.44***	1.00
6) Risk perception	-.27***	-.15***	.07*	-.10**	-.34***

*p<0.05; ** p<0.01; *** p<0.001

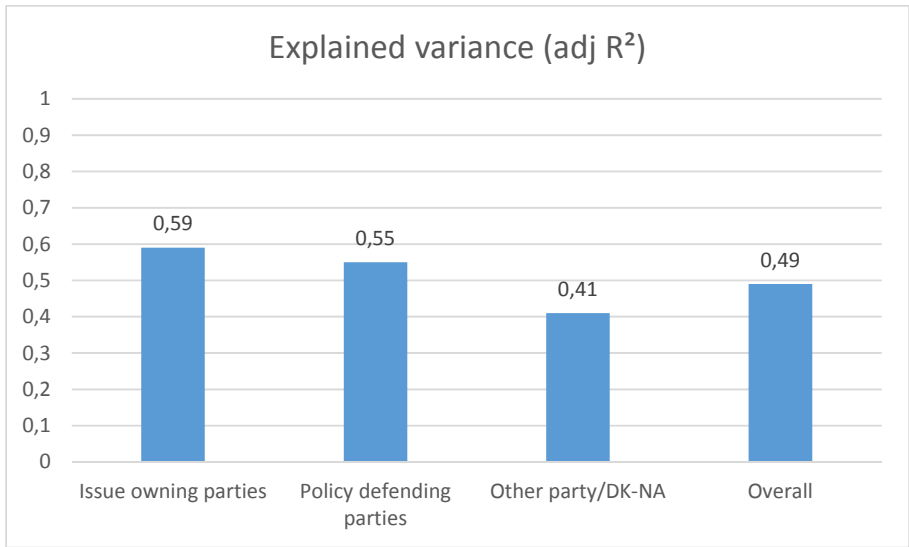


Figure 1: Explained variance of the psychometric model by electorate: issue owning parties (N=81); policy defending parties (N=177); other party & DK/NA (N=486).

Note: Based on OLS regressions of the relationship between position on nuclear energy and the psychometric predictors (see model 1 – table 2).