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The effect of Voting Advice Applications on political understanding

van de Pol, J.

Publication date

2016

Document Version

Other version

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Citation for published version (APA):

van de Pol, J. (2016). *Voting wiser: The effect of Voting Advice Applications on political understanding*.

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Chapter 4

Pushing the Voting Advice Left or Right: Identifying Framing Effects in a Field Experiment

Abstract

The rise of Voting Advice Applications (VAAs) is one of the most significant developments in internet-based political communication over the past decade. VAAs provide voting recommendations to millions of people. As these voting recommendations are based on users' answers to attitude questions, framing these questions can have far-reaching consequences. In a large-scale randomized field experiment using an actual VAA, we studied the effects of minimal differences in the way attitude questions are framed. We found a modest across-the-board effect of issue framing on the answers that was in line with our expectations. The study is a first demonstration of how framing differences may affect people's political attitudes in a natural political choice environment.

4.1 Introduction

Framing can shape public opinion through individuals' perceptions of political issues and choices in many ways. Framing effects, though, might also be directly relevant to the voting considerations of large groups. Voting Advice Applications (VAAs) form an important context in which framing effects can have direct and far-reaching consequences. Before casting their ballot, a large and increasing number of voters in and beyond Europe pay a visit to these web applications in order to receive a voting advice. VAAs ask their users to report their attitudes to a set of policy statements. An algorithm compares users' attitudes to party positions, after which the VAA tells its users which party matches their issue positions best, and to what extent users agree with all other competing parties. Most of these VAAs have self-proclaimed aims of providing a neutral and balanced overview of the issue agreement with each party (Garzia & Marschall, 2014; Van Camp, Lefevere, & Walgrave, 2014). Since the VAA recommendations are based on policy statements, the framing of these statements potentially impacts the attitudes people report, and hence the voting advice a substantial share of the electorate receives from these applications.

The way an issue or attitude question is framed can greatly affect people's attitudes (Chong & Druckman, 2007). More people, for instance, are willing to tolerate a Ku Klux Klan meeting if this is framed as a free speech issue than when framed as a threat to public order (Nelson, Clawson, & Oxley, 1997); more egalitarians agree with government support for poor people if that action is framed as giving them a 'better chance of getting ahead' rather than when it is framed as leading to higher taxes (Sniderman & Theriault, 2004); and 'climate change' is considered an actual phenomenon by more Republicans than 'global warming' is (Schuldt, Konrath, & Schwarz, 2011). The attitude questions or statements included in Voting Advice Applications have the same

potential of steering the attitudes people report to them. Each policy issue is captured in a statement of one or two sentences, often accompanied by a few keywords classifying the policy theme of the issue. When answering these statements, users have little information to navigate on. If a particular frame directs people's attitudes in a certain direction, this will affect the voting advice that people receive. This is relevant since several studies found evidence of a persuasive effect of this voting advice on people's actual vote choices (Alvarez, Levin, Mair, & Trechsel, 2014; Wall, Krouwel, & Vitiello, 2012). Yet there is a paucity of knowledge about the extent to which the framing of policy statements in VAAs affects reported attitudes. This is exactly the aim of our study: A large-scale randomized field experiment using a real-world VAA is carried out to, for the first time, test framing effects of VAA statements. The field experiment allows us to test framing effects in an unobtrusive way, in a naturalistic setting, with great internal and ecological validity, combining the advantages of experiments with the call for increased realism in framing research (e.g. De Vreese, 2012). Our research question is: *To what extent does the way issues are framed in VAAs affect the attitudes people report towards these issues?*

Apart from applying and testing framing theory in this potentially highly relevant, natural context, this study is also important to the emerging field of VAA research. Extant research has shown that aspects of the VAA design influence the voting advice people receive, such as the selection and number of statements (Lefevre & Walgrave, 2014), the way the match between users and each party is presented, and the algorithm used to calculate this match (Louwerse & Rosema, 2014). Statement framing is a crucial way in which design aspects of VAAs can – intentionally or not – affect the voting recommendations received. The fact that VAAs are frequented by large numbers of people – up to 52% of voters during Dutch national elections (*Stemwijzer*), 30% in Germany (*Wahl-O-Mat*), 36% in Finland (*Vaalikone*), and 30% in Sweden (*Valkompassen*) (Marschall, 2014) stresses the urgency of studying framing effects in VAAs.

4.2 Issue Framing

Voting Advice Applications are intended to make politics more comprehensible for the general public (De Graaf, 2010; Garzia & Marschall, 2014). The way political issues are perceived depends on the problem definitions that are put forward by different frames (Entman, 1993). When VAA developers formulate issue statements, inevitably they offer users a frame. For instance, consider the statement, “Free market competition makes the health care system function better” (<http://www.euvox2014.eu/>): This formulation surely activates different associations and considerations compared to an alternative statement, “Nationalization of health care companies leads to a better functioning health care system”. Likewise, the headers many VAAs provide with

the statements also carry a particular problem definition. The statement mentioned before had a header indicating this is an *Economy* issue, but it could equally well have been *Health care*, which might have highlighted different aspects of the issue.

Different headings and different ways of phrasing the statements are examples of frames employed by statements in VAAs. Over the past decades, scholars have gathered a vast amount of evidence of the effect of framing on public opinion (Chong & Druckman, 2007; De Vreese, 2012; Druckman, 2001a). Within political communication, framing effects have been classified in two broad categories (Borah, 2011; Caciatore, Scheufele, & Iyengar, 2016; Druckman, 2001b; Matthes, 2007). *Equivalence framing*, often found in psychological research and economic rational-choice literature, exists of “two logically equivalent (but not transparently equivalent) statements of a problem [that] lead decision makers to different options” (Rabin, 1998, p. 36). The famous experiment by Kahneman and Tversky (1979) is often cited in this context, in which was demonstrated that people are inclined to be risk averse if a dilemma is framed in terms of gains and risk taking if the same dilemma is framed in terms of losses.

The second category of framing research, called *emphasis framing*, is most often studied within the field of media effects (Matthes, 2007) and uses a more relaxed definition of framing which supposedly better reflects the “complexity of everyday communication environments, where attitude formation is likely driven by an interplay of complementary or competing frames” (Matthes, 2007, p. 5) and is therefore more reflective of most actual political communication (Druckman, 2001a; Scheufele & Iyengar, 2012). Many studies in this field use the definition of framing by Gamson and Mogdilian (1987, p. 143): Framing as a “central organizing idea or story line that provides meaning to an unfolding strip of events, weaving a connection among them. The frame suggests what the controversy is about, the essence of the issue”. For example, Valkenburg, Semetko, and De Vreese (1999) found that news stories with a human-interest frame, emphasizing an individual’s story or emotional aspects of the issue, made readers focus on individual implications and emotions more often in their responses. The same story with a frame emphasizing conflict between involved parties inspired readers to report thoughts about conflicts more often. Literature on emphasis framing has often received the criticism that their definition of framing is too relaxed and inclusive (Entman, 1993; Scheufele, 1999; Scheufele & Iyengar, 2012). Operationalizations are context-specific and the distinction between frames and messages has become thin, which hinders the generalizability of framing effects.

In our field experiment, we overcome these drawbacks by using an operationalization of emphasis framing that is close to equivalence framing: We study the effect of changing the header that comes with the VAA question, while keeping the attitude question the same, so nothing is changed to the underlying issue. The headers em-

phasize one side of the issue and ignore other considerations people might have with regard to the issue. In this way, we argue, we employ an internally valid test of the emphasis framing effect in a real-world context, and comply with the notion of framing in the ‘strict sense’, as Sniderman and Theriault (2004) put it: “Semantically distinct conceptions of exactly the same course of action which induce preference reversals”. In many previous emphasis-framing studies, subjects might have reported different attitudes in response to different frames, not because their opinion are affected in response to the frame, but because the content or issue they were responding to was slightly different across frames (Cacciatore et al., 2016). Using our operationalization, any effect of framing would demonstrate that users of a VAA form their opinions in response to the framing of questions the application asks, rather than revealing pre-existing ‘true attitudes’ (cf. Zaller, 1992, p. 33).

Druckman (2001a) argues that if people’s opinions are partly dependent on the way issues are framed, this raises concerns regarding the competence of citizens to fulfill the role they have been ascribed in a democracy. Two broadly shared criteria of citizen competence are that people’s political opinions should not be subject to “arbitrary aspects of how an issue or problem is described” or to “elite manipulation” (2001a, 232–233). These criteria are especially relevant to the study of framing effects in VAAs: The point of departure of VAAs is people’s political opinions. VAAs assume that the attitudes reported by users reflect their authentic opinions on the matter (Anderson & Fossen, 2014) and base their voting recommendations on this assumption. Any persuasive effect of the voting advice on people’s vote choices would be problematic if users’ responses to the statements in VAAs do reflect other factors than just the users’ pre-existing attitudes.

Nonetheless, the general finding in framing research is that people tend to adapt their opinion in the direction of a frame: If a frame motivates them to think positively about a course of action, people are inclined to agree with it; if a frame draws attention to negative aspects or consequences, people will more likely oppose (Sniderman and Theriault 2004; Zaller 1992). Previous literature has suggested several models of the mechanisms driving framing effects – some of which assume direct effects on public opinion and some assuming indirect effects (De Vreese, Boomgaarden, & Semetko, 2011). One account of an indirect framing effect is that a change in opinion is driven by a change to the weight of considerations (reasons to favor or oppose an issue) people hold about the issue at hand. Frames increase the weight or importance of particular considerations by emphasizing a certain aspect of an issue and downplaying other aspects (Gamson & Mogdiliansi, 1987; Nelson, Oxley, & Clawson, 1997). Another indirect framing effect, suggested by, amongst others, Cappella and Jamieson (1997) is that frames make certain considerations more *accessible*. Frames could also affect opinions in a direct way by changing the *content* of considerations about the issue. Especially

when an issue is new for citizens, frames can add new considerations and links between considerations, changing the balance of considerations in people's minds and altering the attitudes people hold (De Vreese et al., 2011; Lecheler & De Vreese, 2012; Slothuus, 2008; Zaller, 1992, p. 119). Empirical evidence on which mechanism is driving framing effects on opinion is yet inconclusive (De Vreese, Boomgaarden, and Semetko, 2011), but scholars agree on the outcome of the process: Frames generally have the power to push people's attitudes in the suggested direction.

This 'direction' could be conceptualized in several ways. Within VAAs, many issues can be organized along the left-right continuum (Van Camp et al., 2014). Like in many Western democracies, in the Netherlands this is the dominant way political views are organized (De Vries, Hakhverdian, & Lancee, 2013; Van der Eijk, Schmitt, & Binder, 2005). It is therefore possible to heap together a variety of political perspectives under the categories "left" and "right" in a fairly consistent way, and study whether people tend to follow these frames. Slothuus and De Vreese (2010) find that people are inclined to follow frames supported by different political parties on this left-right axis, regardless of their own political orientation. Similarly, and consistent with previous research on issue framing, we expect VAA users to report more right-wing opinions when the statement is presented with a header emphasizing right-wing considerations to an issue. In contrast, when a statement comes along with a header emphasizing left-wing aspects to an issue, we expect users to report on average more left-wing opinions in VAAs.

H1 When exposed to a right-wing frame, VAA users report more right-wing opinions than when exposed to a left-wing frame and vice versa.

As Entman (1993) notes, it is certainly possible that people recall facts and make associations not suggested by the frame, and therefore the particular framing of a subject would not affect their thoughts about the topic. Users might have crystallized opinions about certain issues that are covered by VAAs, especially when statements are about key issues in the election campaign. After all, issues in VAAs are selected based on political salience (Van Camp, Lefevere, and Walgrave 2014). If users do have very clear opinions about an issue, they should be more resistant to the framing of this issue, and this is more likely to happen if someone is more politically interested or aware (cf. Converse, 1964). Those with more interest will usually more often follow political news, more often inform themselves about parties and issues, and have more discussions about politics with people around them. Hence, they are more likely to have thought about political issues, before they are asked about these issues in VAAs. Delli Carpini and Keeter (1996) indeed found self-reported political interest to correlate strongly with all dimensions of political knowledge. Zaller (1992) and Sniderman and Theriault (2004) argue that people who are more interested in and informed about politics

are more likely to have opinions that are stable and consistent with their ideology, and also find support for this. Regardless of the framing condition, Sniderman and Thériault (2004) found that better-informed citizens more often report opinions that are consistent with underlying principles they endorse. This would also be in line with the theory, discussed above, that framing effects are driven by a change to the *content* of people's considerations: Since less interested citizens have fewer considerations about issues included in VAAs, they will be more susceptible to new considerations offered by the frame. Hence, we predict the following:

H2a Political interest moderates the framing effect such that the less one is interested in politics, the stronger one is affected by the framing.

By contrast, if framing effects are driven by a change in the weight of considerations in people's minds, those who are more interested in politics should be affected more strongly by the framing of issues. Slothuus (2008) and Nelson et al. (1997) argue that before a frame or message could change the weight of considerations in people's minds, they need to be equipped with issue-relevant considerations in the first place. Cacciatore, Scheufele and Iyengar (2016) also argue that "an audience member's pre-existing cognitive schema or knowledge structures will determine the degree to which a frame will resonate" (p. 13). More politically aware or interested citizens are more likely to be exposed to and actively process political messages, and will more often be able to comprehend frames and relate them to their own cognitive schemas or considerations (see also Lecheler & De Vreese, 2012). Support for this theory was reported by Nelson et al. (1997) and Slothuus (2008): Both found that informed citizens put more weight on the considerations on welfare spending suggested by the frame, while uninformed citizens were not susceptible to the framing of the issue. Lecheler and De Vreese (2012), however, found that the most politically aware citizens most often showed a change in the content of considerations. These findings, however, all point towards a stronger framing effect among citizens with more political interest. Our alternative hypothesis therefore is:

H2b Political interest moderates the framing effect such that the more one is interested in politics, the stronger one is affected by the framing.

4.3 Methods

To test our hypotheses, a randomized field experiment was carried out during the campaign for the municipality elections in Utrecht, a large Dutch city. For this experiment we collaborated with the Voting Advice Application *Kieskompas*, which is the second

most well-known VAA in the Netherlands (after *Stemwijzer*)¹. *Kieskompas* was online for 30 days, during which 41,505 people accessed the website. People who visited the website were randomly assigned to one of five versions of the website². Like many VAAs, *Kieskompas* places a header above every statement indicating the issue theme, e.g., ‘Economy’ or ‘Nature & Environment’. We operationalized the framing of the statements by manipulating the headers. Each manipulated statement had either a right-wing or a left-wing header. To ensure ecological validity, we only used headers that normally would be used by a VAA, and that were relevant to the issue at stake. The left-wing headers we used are *Nature & Environment*, *Social policy* and *Culture & Education*. Right-wing headers are *Mobility*, *Safety*, *Building & Living*, *Finances* and *Economy*. Studies of issue ownership confirm these are the issues associated with left-wing and right-wing parties (e.g., Walgrave, Lefevere, & Tresch, 2012)³. Figure 4.1 shows an example of the stimulus material for one of the 17 manipulated statements.

Version A of the VAA was developed according to the standard procedure at *Kieskompas* (see for a discussion on this procedure: Krouwel, Vitiello, & Wall, 2012), and did not include headers. Based on this benchmark version, four alternative versions (B-E) were created in which issue framing and polarity was varied, in a 2 (left-wing and right-wing framing) × 2 (polarity) design. Polarity was manipulated by presenting either positively or negatively formulated statements; this is not reported in this study⁴. An overview of all 17 manipulated statements and corresponding left-wing and right-wing headers, translated from Dutch, is shown in Table 4.1. Users of the VAA were asked to what extent they agree with each statement, on a five-point scale from ‘completely agree’ to ‘completely disagree’ (or ‘no opinion’). The dependent variable in this study is the score on this variable: We test whether people, in a left-wing framing condition, more often agree with a left-wing statement and more often disagree with a right-wing statement. Similarly, we expect people to more agree with a right-wing statement in a right-wing framing condition. The moderator political interest was measured before *Kieskompas* users were directed to the statements (“How

¹ Utrecht University, the Dutch Science Foundation and the Utrecht City Council approved the project description prior to fielding the study. Participation in the survey was voluntarily and participants could stop at any time.

² In the municipality of Utrecht, 258,087 people were eligible to vote and 139,989 eventually did cast a vote. If all visitors to *Kieskompas* would be unique visitors, 29.7% of the voters consulted *Kieskompas*.

³ Left-wing parties are associated with more state intervention and ensuring equal opportunities through education and social support while right-wing parties usually emphasize smaller governments, economic growth and less regulations. Walgrave et al. (2012) observed in Belgium (which has an electoral system comparable to the Dutch) that left-wing parties such as the Greens and the Socialists are associated with issues like environment, social security and culture, while right-wing parties such as the Liberals are associated with issues like taxes, economy and crime.

⁴ As the effect of question headings interacted with the effect of the polarity for only two statements, which is what one could expect based on chance, we decided to report the effect of polarity elsewhere.



Figure 4.1: Issue frames for statement 2. The statement says “The charges for parking can be raised”; the left-wing heading is “Nature and environment” and the right-wing heading is “Mobility”

interested are you in politics?” – $M = 3.3$, $SD = 0.8$, range 1 – 5). This question was answered by 70.7% of the people included in our analyses.

4.3.1 Participants

A total of 41,505 people visited Kieskompas. We included in our analyses those who were eligible to vote (18 years or older), who took more than two minutes to fill out all statements, and who did not give show straight-lining behavior. In addition, we only included people who were assigned to one of the four experimental conditions instead of the benchmark version. Since the benchmark version does not feature any headers, we are not comparing frames when we include this version in the analyses⁵. The resulting sample consists of 31,112 Kieskompas users. Except for people who were excluded because of the reasons listed above⁶, the respondents make up the complete population of users of one of the two major VAAs available in the municipality elections of the city of Utrecht.

Our experiment is naturalistic in every dimension. The intervention we are studying resembles a real-world phenomenon (framing by headers in VAAs), the participants are those who would normally encounter these frames, the context is an actual VAA and the outcome we measure is the exact outcome of interest: attitudes reported to VAA statements (cf. Gerber & Green, 2012).

A randomization check showed that VAA users in the different conditions did not differ significantly, or substantially, on age ($F(3, 22207) = 1.58$; $p = .19$), gender ($\chi^2(3) = 2.90$; $p = .41$), educational level ($\chi^2(3) = 11.90$; $p = .85$) or interest in politics ($F(3, 21990) = 0.34$; $p = .80$).

4.3.2 Analysis

The dependent variable in this study is the opinion reported by users of the VAA on a series of statements. Two kinds of analyses were carried out. Firstly, a multivariate regression is performed for the framing effect on each statement, and secondly, the framing effect is considered for all statements at once in an inclusive cross-classified multilevel model. The multivariate regression, in which the framing condition is the only independent variable and the opinion on each statement is a separate dependent

⁵ In addition, the polarity of statements in the benchmark version does not align with two of the four experimental versions (for some statements the polarity in version A aligns with version B and D, for other statements with the polarity in version C and E). For this reason it is not possible to include version A in a ML analysis.

⁶ By far the largest portion of the excluded respondents was excluded because they were in the benchmark condition, which means they are a completely random subsample of the population of Kieskompas-users.

variable, has as advantage that the framing effect could be tested for each statement, while preventing an inflation of Type I error chance. The advantage of the second analysis is that an estimation of the general effect is obtained (also preventing a Type I-error-inflation); however, this also brings some challenges. The statements of VAAs are selected to cover a wide range of issues and to discriminate between parties (Van Camp, Lefevre, and Walgrave 2014), which results in small correlations between answers to each statement. This large between-statement variance, together with the small number of statements, makes it difficult to isolate a general framing effect across the statements. On the other hand, the large N in our study allows for very precise estimation of this effect (Hox, 2010).

4.4 Results

4.4.1 Single statements

Table 4.1 provides an overview of all 17 statements included in the framing experiment, the averages for both framing conditions, and the results of a multivariate regression analysis comparing these averages. Figure 4.2 shows the confidence intervals for the framing effect on each statement.

In about one-third of the statements, we find significant differences. More people agree to the statement “Cars that pollute most should be banned from the city center” if the header indicates this is a *Nature & Environment* issue, compared to a *Mobility* issue ($b = 0.041$, $p = .018$). Second, more people agree with the statement “In bad neighborhoods, the municipality is allowed to tear down social housing” if the accompanying frame is *Social policy* instead of *Safety* ($b = 0.067$, $p < .001$). Third, there is a framing effect for the statement “The municipality can build houses in the Rijnenburg polder”; more people agree if this is framed as a *Building & Living* issue instead of a *Nature & Environment* issue ($b = 0.031$, $p = .023$). Fourth, when framed as a *Culture & Education* issue instead of a *Finance* issue, more people agree that “The municipality should invest extra money to fight children’s language deficiencies” ($b = 0.085$, $p < .001$). And fifth, more people agree to the statement “Everyone on social security should be forced to do volunteering work, or his benefits will be cut back” if this was accompanied by the frame *Economy* instead of *Social policy* ($b = 0.027$, $p = .049$). For other statements the framing did not significantly affect reported opinions. Except for the statement about tearing down social housing, all effects were in the expected direction of a more right-wing opinion in the right-wing framing condition. In summary, we have some evidence for Hypothesis 1, but the effect size is very small. The largest effect is 0.085 on a 5-point scale, meaning a difference between “neutral” and “agree” (or between “completely disagree” and “disagree”) for every 12th VAA user.

Table 4.1: Framing effect per statement

N ^o	Statement	Left frame	M	SD	Right frame	M	SD	b	s.e.	p
1	The A27 highway should be broadened at Amelisweerd	N & E	2.54	1.28	M	2.54	1.28	0.01	0.02	0.790
2	Parking charges can be raised in the city of Utrecht	N & E	2.22	1.15	M	2.21	1.15	0.01	0.02	0.623
3	Cars that pollute most (older than EURO 3 for diesel and EURO 0 for gasoline) should be allowed in the city center	N & E	3.39	1.23	M	3.37	1.23	0.04	0.02	0.018
4	The budget for improving neighborhood livability (the livability budget) should be abolished	SP	2.35	0.97	F	2.36	0.96	0.01	0.01	0.595
5	In disadvantaged neighborhoods, the municipality can tear down social housing	SP	3.16	1.12	S	3.09	1.12	-0.07	0.02	0.000
6	The municipality can cut down on social work	SP	2.52	1.02	F	2.53	1.03	0.01	0.01	0.459
7	The municipality can build houses in the Rijnenburg polder	N & E	2.92	0.98	B & L	2.95	0.99	0.03	0.01	0.023
8	The municipality should invest money to build a bicycle bridge over the Amsterdam-Rijn canal between Oog in Al and Leidsche Rijn	N & E	3.39	1.11	F	3.39	1.11	0.00	0.02	0.960
9	The municipality should invest extra money to fight children's language deficiencies	C & E	3.75	1.00	F	3.68	1.04	0.09	0.01	0.000
10	Waste charges should be abolished	N & E	2.62	1.03	F	2.63	1.03	0.01	0.01	0.458
11	The municipality can cut down on art and culture	C & E	2.84	1.20	F	2.83	1.21	0.01	0.02	0.686
12	Taxes may be increased for measures for the environment	N & E	3.03	1.09	F	3.02	1.10	0.00	0.02	0.798
13	The municipality may force businesses to take energy-saving measures	N & E	3.47	1.10	E	3.45	1.10	0.01	0.02	0.450
14	A wind park can be built at the Lage Weide industrial zone	N & E	3.57	1.15	B & L	3.59	1.14	0.01	0.02	0.438
15	The municipality should spend more money to fight poverty, even if taxes should be increased for this	SP	3.02	1.07	E	3.01	1.08	0.01	0.01	0.415
16	It's better if the municipality has temporary deficits instead of having to cut down on social services	SP	2.98	1.09	E	2.98	1.09	0.01	0.01	0.678
17	Everyone on social benefits should be forced to do volunteering work, or their benefits will be cut back	SP	3.44	1.19	E	3.47	1.20	0.03	0.01	0.049

* $N = 21029$. For the multivariate regression (column *b*), the dependent variable is coded such that a higher value indicates a higher agreement with the right-wing direction.

Abbreviations: N&E = Nature & Environment, SP = Social policy, C&E = Culture & Education, M = Mobility, F = Finances, S = Safety, B&L = Building & Living, E = Economy.

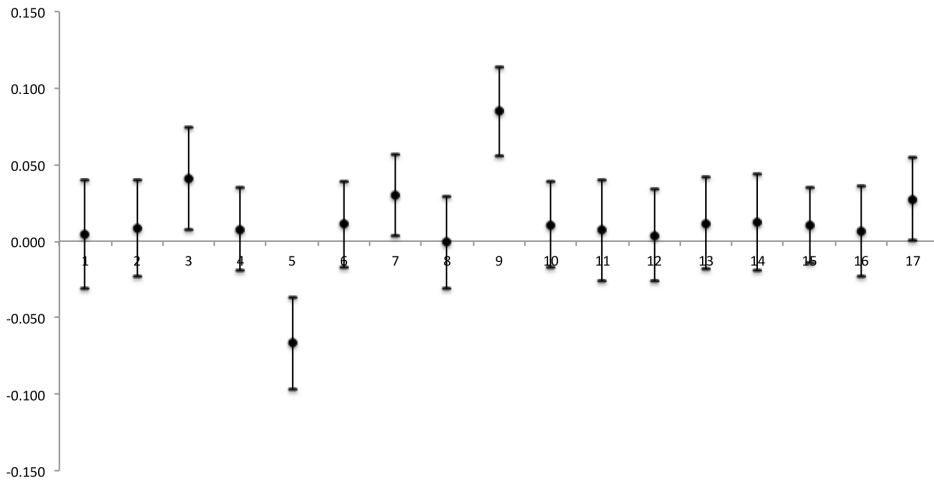


Figure 4.2: Confidence intervals for framing effects for each statement. Opinions and framing effects were coded in the same direction: a higher value means a more right-wing opinion. The point estimates indicate the mean differences between the right-wing and the left-wing framing condition.

4.4.2 Cross-classified multilevel model

In the cross-classified multilevel analysis, opinions are nested within people and simultaneously within statements. This means that the analysis assumes that variation in opinions can be explained by the individual reporting the opinions (i.e., some people tend to have more right-wing opinions than others) and by the statements the opinions are reported towards (i.e., people will on average agree more with some statements than with others). However, the analysis does not assume that statements are nested within individuals or the other way around, which means that individuals and statements are both on the second level. To test our hypotheses, we include on the attitude level (the first level) the framing predictor. This variable varies among individuals and statements. On the second level, we include political interest, which only varies among individuals. The attitudes are recoded such that a higher value always indicates a more right-wing opinion. The framing predictor is a dummy variable indicating per statement which condition had the right-wing frame (the left-wing frame is the reference category, thus had value 0). Political interest is grand-mean centered for a better interpretation of the moderation effect.

Table 4.2 shows the results of the multilevel analyses. The models are fitted on a subsample of the data with only valid responses to the manipulated statements and to

the political interest question ($N = 21,981$)⁷. The first model does not estimate any effects, but merely decomposes the variance at the different levels. The intercept of 2.79 is the overall average attitude score (on a scale from 1 – 5). The random part of the model shows the standard deviations that belong to each level of the model. The subscripts of the standard deviations refer to the part of the model of which the variance is estimated: σ_y is the extent to which the intercept of the attitude varies due to different statements; the standard deviation σ_i refers to the variation on the level of individual and σ_s to the variation between statements. The estimated residual standard deviations at the attitude level, the individual and the statement level are $\sigma_y = 1.01$, $\sigma_i = 0.44$, and $\sigma_s = 0.40$. Thus, the variation among attitudes is largest – only a part of the total variation can be attributed to individual differences or differences between statements. In fact, the intra-class correlation (ICC)⁸ for individuals is 0.160, which means that differences between individuals account for 16.0% of the total variance. The ICC for statements is 0.137. Taken together, the statements and individuals account for 29.6% of the total variance. The following models will show the extent to which this percentage can be attributed to framing differences.

⁷ Of all respondents to the statements, 29.3% did not respond to the political interest question, and could therefore not be included in Model 5. To enable comparison across models, we fitted all models on the subsample of those who answered the interest question. The results of Model 1 – 4 were the same when fitted on the full sample of $N = 31,112$.

⁸ The ICC (for individuals) is calculated using the formula: $\sigma_i^2 / (\sigma_i^2 + \sigma_y^2)$

Table 4.2: Results multilevel analysis of reported opinions

	Model 1		Model 2		Model 3		Model 4	
	Intercept only		+ Framing effect		+ Random effect framing		+ Interaction framing × political interest	
	Coeff. (s.e.)	<i>t</i>	Coeff. (s.e.)	<i>t</i>	Coeff. (s.e.)	<i>t</i>	Coeff. (s.e.)	<i>t</i>
Fixed part								
Intercept	2.789 (0.098)	28.59	2.783 (0.098)	28.54	2.784 (0.098)	28.54	2.784 (0.098)	28.54
Right-wing frame			0.011 (0.003)	3.11	0.011 (0.003)	3.11	0.011 (0.003)	3.12
Political interest							-0.026 (0.005)	-5.54
Frame × interest							-0.006 (0.004)	-1.53
Random part								
σ_y	1.010		1.010		1.010		1.010	
σ_i	0.440		0.440		0.441		0.441	
σ_s	0.402		0.402		0.402		0.402	
σ_f					0.001		0.002	
Deviance	1048599.8		1048590.2		1048590.1		1048539.2	
<i>N</i>	21981		21981		21981		21981	

* Opinions are nested within individuals and within statements. A higher value on the dependent variable indicates a more right-wing opinion. Political interest is grand mean centered. *N* = number of individuals.

In Model 2, the framing of the statements is taken into account. This improves the model slightly, as is clear by the decrease of the deviance. Framing has a significant effect on the opinion ($t = 3.11$), which means that a right-wing frame leads to more right-wing opinions across all statements and individuals. However, this significant average effect is not very large: On a five-point scale, people's reported attitudes are in general 0.01 point more right wing because of a right-wing frame. The inclusion of the framing predictor in the equation does not noticeably explain variance at the level of statements, individuals or attitudes. In sum, the model provides evidence for hypothesis 1, but shows a very modest effect size.

In order to test the rivaling hypotheses H2a and H2b and study whether the effect of framing is stronger for people with either more or less political interest (i.e., on the level of individuals), we estimated a random slope for the framing effect in Model 3. The variance in framing effect across individuals is $\sigma_f = 0.001$, which is negligible. This means there is hardly any variance in the framing effect across individuals that can further be explained by another variable. In other words, the framing effect is too similar for different people to further analyze how the effect differs for different people. Indeed, when an interaction between the individual-level variable political interest and framing is added in Model 4, this interaction shows to be nor substantial nor significant ($t = 1.53$). We can therefore find no evidence of a stronger effect among either more or less politically interested VAA users.

4.5 Discussion

This study tests the effects of issue framing in the new context of Voting Advice Applications (VAAs). We carried out a large-scale randomized field experiment during local elections in the Netherlands. By changing the headers of the statements in the VAA, we framed these statements either as a right-wing or as a left-wing issue. Analyzed on an item-by-item basis, we found differences for 5 out of 17 statements. These were generally in line with our expectation that right-wing frames would cause people to report more right-wing attitudes than left-wing frames, and vice versa. However, the size of these framing effects is small. Multilevel analyses considering all statements at once confirmed this conclusion: Framing the VAA statements has a small, but significant, across-the-board effect. On a 5-point scale, people's attitudes are on average 0.01 point more right wing, and the largest effect for a single statement would mean that every 12th user would shift one category on the answer scale, like from "neutral" to "agree". Given the sheer amount of real world users however, we do not consider this inconsequential or trivial.

We formulated two rivaling hypotheses about who is more likely to be affected by the framing of issues: Either the least politically interested users or the most politically

interested users. On the one hand, people with more interest are assumed to have more crystallized opinions, which are more consistent with general principles. On the other hand, in order for frames to affect considerations users hold towards issues, users need to have considerations toward the issue in the first place, which is more likely if they are more interested in politics. Our findings, however, do not support either of these hypotheses. The framing effect did not vary much between users, so one's political interest could not explain variance in framing effects. One explanation of this lack of variation in susceptibility to framing might be that both mechanisms are at work and balance out against each other: Less interested people would be more susceptible to how issues are framed but often failed to recognize how the header was relating to the issue; more interested people better understood this association but also had crystallized opinions about the issues more often. Another explanation could be that less politically interested citizens are less likely to use a VAA, leaving us with a group of relatively interested users, and within this group there is not enough variance in interest to observe differential susceptibility to framing effects.

By manipulating the header of the statements in the VAA and keeping the statements identical, our study can be regarded as an emphasis-framing study using a narrow operationalization of framing: We changed the issue frames while keeping the underlying issue or message exactly the same. Doing this we have overcome some critics of emphasis framing research that the definition of framing has become too inclusive (e.g., Cacciatori et al., 2016; Scheufele, 1999): As it is often hard to keep the content of messages similar while changing the frames, emphasis-framing studies cannot rule out the possibility that attitude changes are attributable to differences in message contents rather than frames (see also Scheufele and Iyengar 2012; Zaller 1992). The effects in this study, however, demonstrate that people change their opinion in response to frames even when the underlying issue remains exactly the same.

The other side of the bargain is that our manipulation of issue framing is quite minimalistic. It might therefore be the case that users have overlooked these headings, and that a manipulation of the framing of statements themselves would yield stronger effects. However, manipulating issue frames in the statements of an actual VAA would not be desirable, given the large effects this could have on VAA results. The conclusion, in any case, should not be that framing of VAA statements does not matter. Previous research has shown the power of simple adjustments to attitude questions; we speculate that with more obtrusive manipulations of VAA statements, effects of a larger magnitude can also be expected in such a context. Future studies could test to what extent people notice the headers and take their suggestions into account in reporting opinions.

Because of the wide reach of VAAs (Marschall 2014) and the persuasive effects their advice has on the party preferences of some users (Wall, Krouwel, and Vitiello

2012) it would not be desirable for these voting advices to reflect anything else than the match between users' opinions and party positions. However, this study presents new evidence of design aspects affecting the vote advice, in addition to the selection of statements (Lefevere and Walgrave 2014) and the choice for a matching algorithm (Louwerse and Rosema 2014). If VAA developers want to offer applications that are as objective and neutral as possible, they need to find out how to avoid steering people's attitudes in any direction.

On a final note, while previous framing effects research mostly relied on lab experiments or survey-based experimentation, this study provides some evidence for the effect of framing on public opinion that is innovative in two regards: First, it finds evidence for framing effects in the new context of VAAs. Users of VAAs have other objectives for filling out survey questions (or statements) than respondents in a regular survey: they take the test spontaneously and out of interest rather than feeling obliged, or in order to receive an incentive. Second, the experiment provides evidence of the issue framing effect with great ecological validity, next to the high internal validity warranted by the experimental set-up. But most importantly, this study shows that if VAA developers want to help citizens to make informed vote choices, and in that way improve democratic representation, they should be aware of the potential powers of framing.

4.6 References

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