THE MEDIA INFLUENCE ON PUBLIC OPINION ABOUT A DUTCH ROAD PRICING POLICY PROPOSAL

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ABSTRACT

This study investigates the effect of exposure to news reported by newspapers about the Dutch road pricing proposal (Kilometerheffing) on public opinion. We combine data from a public opinion survey (N = 705) with a content analysis of 280 news articles about the pricing proposal published in five leading Dutch newspapers. Our findings indicate that exposure to news content about Kilometerheffing affects public opinion. We found that the more negative the news content people are exposed to, the more negative their opinions about Kilometerheffing, and in the same way, the more positive the news content is, the more positive their opinions are. The effect, however, differs for obtrusive and unobtrusive issues. Our hypothesis was that people’s opinions about the financial impact of Kilometerheffing on households would not be affected by exposure to news content about this issue as this is an obtrusive issue for readers, on the other hand, opinions about the impact of Kilometerheffing on congestion or the environment would be affected by news exposure as these issues are unobtrusive. Our results confirm these hypotheses. We, therefore, recommend that policy makers particularly focus on unobtrusive issues such as the impact of their proposals on congestion when organizing information campaigns and providing information to the media.
1. INTRODUCTION

Public support plays a major role in road pricing policy processes. Low public support, which in turn reduces political acceptability, usually leads to failure of the policy implementation (1-2). Ison and Rye (3) stress that information provision is of vital importance in shaping public opinion about road pricing policy in order to gain public support. As the media is an important source of information for the general public, it is widely acknowledged that the media has a key role in the road pricing policy process (e.g. (4-5)).

A substantial body of studies investigated how news exposure influences public opinion about various issues (e.g. (6-8)). In general, all these studies show that exposure to news content about a particular issue affects public opinion regarding this issue. Nevertheless, in road pricing policy research, the relationship between the media and public opinion has not been empirically researched. To our knowledge, the study of Winslott-Hiselius et al. (9) is the only one which investigates the influence of the media on public opinion about road pricing by comparing the tone of news articles and the outcome of a public opinion survey about the Stockholm congestion charging scheme. Their results reveal that the change in tone of news articles published during the Stockholm congestion charging trial coincides with the change in public attitudes towards the charging scheme. However, there is no link between the opinion survey and media analysis in this study, thus whether and to what extent the people surveyed were actually exposed to the media reporting about the Stockholm congestion charging scheme is unknown.

To address this gap, our study investigates the relationship between news exposure and public opinion on the Dutch road pricing policy by integrating the data from a public opinion survey with a content analysis of news articles. Furthermore, studies in communication science demonstrate that the effect of news differs in strength between positive and negative news (see (10)) and obtrusive and unobtrusive issues (see (8)). Based on these studies, we, in this study, examine how news exposure affected public opinion about a Dutch road pricing policy by distinguishing news content according to its tone (positive versus negative) and its topic (obtrusive versus unobtrusive). To achieve this, we used the data prepared by Ardic et al. (11) who carried out a content analysis of news articles published in 5 leading national newspapers during the policy process for a Dutch road pricing proposal “Kilometerheffing”. In addition to that, we conducted a public attitude survey about this proposal which measures not only the opinions of respondents for the Kilometerheffing proposal but also the extent respondents read the 5 newspapers we analyzed. We then combined the data from these two sources to determine the level of exposure to various news content (positive vs. negative, obtrusive vs. unobtrusive) from different newspapers at the individual respondent level.

In the rest of this article, we give a brief history of road pricing policy in the Netherlands, and touch upon public opinion about Kilometerheffing and the media presentation of the proposal in section-2. Section-3 presents our hypotheses and research questions. In section-4, we elaborate on methodological aspects of our study such as public attitude survey, media analysis and the link between them. We present our results in section-5 and our conclusion in section-6. Finally, we finish with a brief discussion and some suggestions for future research in section 7.

2. THE DUTCH ROAD PRICING POLICY, PUBLIC OPINION AND THE MEDIA

Road pricing policy in the Netherlands has been a politically controversial issue since the end of the 1980s and has caused many clashes between policy actors. Conflicts typically arose about various aspects of the policy such as the charge level, the type of revenue use or the type of charging (e.g. flat or price variation according to time and place). Since 1988 several pricing proposals, initiated by various political parties, have been put on the political agenda and intensively discussed in the public sphere with the participation of various lobby groups (e.g. ANWB, the Royal Dutch Touring Club, lobbying, among others, for the interests of Dutch car users). All the proposals ultimately failed to be implemented and each was removed from the agenda at different stages of the policy process. The removal was usually justified by reasons such as technical deficiencies, high technical and implementation costs, or public opposition.

The subject of this study, Kilometerheffing (one particular form of road pricing), was very close to implementation. The proposal was to charge car drivers per kilometer they drive, and in the meantime, abolish fixed taxes (annual road tax and car purchase tax). The charge per kilometer was to vary according to vehicle type, time and places. The proposal occupied the Dutch political agenda, with several ups and downs, for about 5 years, from 2005 to 2010. When it was finally abolished in 2010, politicians ascribed the decision predominantly to the lack of public support (12). Although the public was mostly in favor of the principle of “who drives, pays more”, according to the outcome of survey conducted by the ANWB, the majority was against one or more of the aspects (e.g. peak hour charge) of the Kilometerheffing proposal (13). According to (14), the Dutch media had a role in the failure of the road pricing policy by affecting public opinion negatively, but there is no empirical evidence regarding whether or to what extent news content about the policy affected public opinion in this process.
3. HYPOTHESIS AND RESEARCH QUESTIONS

We firstly focus on how positive and negative news content regarding Kilometerheffing affected public opinion about the proposal. Several studies in the field of communication (e.g. (6-8)) provide ample evidence that exposure to positive news affects people’s opinions positively while negative news affects opinions negatively. Following on from these studies, we formulate the following hypothesis:

H1: The more people are exposed to negative Kilometerheffing news content, the more negative their opinions are about Kilometerheffing, and in the same way, the more they are exposed to positive news, the more positive their opinions

Secondly, we address differences in the strength of positive and negative news content. Baumeister (15) argues that negative information has a greater influence on people’s opinions than positive information. In the field of psychology, there is sound evidence confirming the greater power of negative information on people compared to positive information (see Baumeister (15) for a review of the literature). In the field of communication, Soroka (10) confirms that negative news has a stronger influence on people’s perception of an economic situation than positive news. Drawing on these studies, we hypothesize as below:

H2: The effect of negative news content about Kilometerheffing on people’s opinions is stronger than positive news content.

Thirdly, we gauge the extent to which the effect of news content differs between obtrusive and unobtrusive issues. McCombs and Reynolds (16) suggest that when the issue is obtrusive, meaning that people personally experience it, they do not rely on media information but rather use their own experience to construct their opinions. For instance, as illustrated by McCombs and Reynolds (16), people do not need media information about gas prices since they learn about the level of prices when paying their bills. On the other hand, they turn to the media for information about unobtrusive issues such as the situation of the trade deficit or national budget since they do not have personal experience with such issues. According to this theory therefore, news only has an impact on opinions if the issues covered in news are unobtrusive for readers. As to the Kilometerheffing news content, we consider the financial impact of the Kilometerheffing on households as an obtrusive issue since people can roughly calculate whether they are going to be financially better or worse off by taking into account their existing transport expenses, mobility patterns (e.g. the number of kilometers driven, the number of cars) and the design of the Kilometerheffing proposal (e.g. flat charge or price variation according to time and place). On the other hand, the effectiveness of Kilometerheffing, in other words its impact on congestion, air quality and noise, is an unobtrusive issue because people are not likely to know whether or to what extent other people will change their mobility behavior (e.g. avoiding road use during peak hours) following its implementation in order to be able to predict the extent to which Kilometerheffing may alleviate congestion, air quality and noise problems. For this they have to rely on the information presented by the media on the effectiveness of Kilometerheffing. Based on these studies and the study of Baumeister (15), we propose the following three hypotheses:

H3: People’s opinions about the financial impact of Kilometerheffing (obtrusive issue) for themselves are not affected by exposure to news content about this issue.

H4: The more people are exposed to negative news content about the effectiveness of Kilometerheffing (its impact on congestion, air quality and noise; unobtrusive issues), the more negative their opinions are about the effectiveness of Kilometerheffing, and in the same way, the more people are exposed to positive news on these unobtrusive issues, the more positive their opinions.

H5: The effect of negative news content about the effectiveness of Kilometerheffing (its impact on congestion, air quality and noise) on people’s opinions is stronger than the positive news content about the effectiveness of Kilometerheffing.

4. METHOD

This study combines the data from two different sources: a content analysis of newspaper articles (280 news articles) published during the Kilometerheffing policy process between 2005 and 2010 and a public opinion survey (N=705) conducted in December 2012. Based on this data, our study develops four structural equation models (SEM). SEM is an advanced multivariate analysis method which enables the estimation of a series of regression equations simultaneously. Contrary to conventional regression analysis that assumes that all variables are measured without measurement error, SEM can, among others, incorporate latent variables into the analysis. Hence, a distinction is made between the measurement model, which indicates how the latent variables are...
measured, and the structural model, which estimates the structural relations among the variables of interest. Very briefly stated, with this procedure the measurement error remains in the measurement model and the latent variables can be regarded as variables that are corrected for measurement error. The result is that the equations contain latent variables, resulting in more valid estimates. In addition, software packages (e.g. AMOS) by which SEM models can be estimated allow procedures to test whether particular coefficients differ significantly in a statistical sense (17).

4.1. Content Analysis

The content analysis of news articles about the Dutch road pricing policy was carried out by Ardic et al. (11).

The content analysis was conducted on news articles published in 5 Dutch national newspapers with the highest five circulation rates in 2010: De Telegraaf (type: popular, political leaning: right), Algemeen Dagblad (type: popular, political leaning: right), de Volkskrant (type: quality, political leaning: centre/left), NRC Handelsblad (type: quality, political leaning: right) and Trouw (type: quality, political leaning: centre/left). Newspapers are widely used as a source of news by the Dutch public (Commissariaat voor de Media, 2011) and the number of newspapers’ readers in total constitute a large number of Dutch newspaper readers (more than 35% and 45% of the total and paid newspaper readers respectively) (11).

The Kilometerheffing was discussed in the public sphere between 2005 and 2010, but the proposal was only high on the agenda during major policy events. The policy debate attracted media attention mostly during these policy events. Therefore, the sample included news articles published in the two weeks (one week before and one after the event date) around 5 major policy events during which media attention for the policy peaked (see Table 1).

**TABLE 1 Major Policy Events in Kilometerheffing Policy Process**

<table>
<thead>
<tr>
<th>Date</th>
<th>Policy event</th>
</tr>
</thead>
<tbody>
<tr>
<td>30.04.2005</td>
<td>Major Dutch policy actors (Nouwen Committee) agreed on Kilometerheffing</td>
</tr>
<tr>
<td>08.09.2005</td>
<td>National transport policy document (Nota Mobiliteit) was announced, which delayed implementation of Kilometerheffing</td>
</tr>
<tr>
<td>05.02.2007</td>
<td>Kilometerheffing was included in the coalition government agreement</td>
</tr>
<tr>
<td>13.11.2009</td>
<td>Kilometerheffing, as a final proposal, was sent to parliament</td>
</tr>
<tr>
<td>18.03.2010</td>
<td>Kilometerheffing was removed from the political agenda</td>
</tr>
</tbody>
</table>

Source: (11)

The coding scheme included 25 issues about Kilometerheffing, each of which indicated a different aspect of the Kilometerheffing proposal such as its financial impact on households, impact on congestion, air quality and noise. Each issue was given a varying amount of space (number of words) and presented in different tone (positive, negative, mixed or neutral) by the five newspapers. Thus, the data provides the total space allocation, measured by the number of words, for each issue per type of tone and newspaper. We, in this study, divided the mixed and neutral space allocation for each issue and newspaper equally between the positive and negative space allocation variables. The reliability test of content analysis performed by two coders reveals satisfactory results (see Ardic et al. (11) for detailed information about the coding process).

4.2. Survey and Combination of the Survey with Content Analysis

The survey was conducted by TNS NIPO (The Dutch Institute for Public Opinion Research and Market Research) using computer/assisted self-interviewing. Respondents (N=705) were randomly sampled from their database which is representative of Dutch population. The ratios of male and female respondents in our sample are 50.1% and 49.9 respectively. The ratio of respondents aged between 18 and 34 is 22.7%, between 35 and 49 is 28.5% and over 50 is 48.6%. The ratios of low, middle and high educated respondents are 27.8%, 41.2, and 30.8% respectively (see Table 1). The Kilometerheffing was discussed in the public sphere between 2005 and 2010, but the proposal was only high on the agenda during major policy events. The policy debate attracted media attention mostly during these policy events. Therefore, the sample included news articles published in the two weeks (one week before and one after the event date) around 5 major policy events during which media attention for the policy peaked (see Table 1).

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4.2.1. Dependent Variables

7 indicator variables in total were used in the survey to measure three latent variables: support, financial impact for themselves and effectiveness. Respondents were asked to indicate the degree to which they agreed with items presented on a 7 points-scale ranging from “totally disagree” (1) to “totally agree” (7). Table 2 presents the indicator variables for each of these latent variables.
TABLE 2 Latent and Indicator Variables

<table>
<thead>
<tr>
<th>Latent variables</th>
<th>Indicator variables</th>
<th>Items presented to respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support</td>
<td>support1</td>
<td>I find the proposed measure to be acceptable</td>
</tr>
<tr>
<td></td>
<td>support2</td>
<td>It is good that this measure is introduced</td>
</tr>
<tr>
<td>Financial impact for themselves</td>
<td>financial_impact1</td>
<td>I think that the proposed measure will bring financial benefits to me</td>
</tr>
<tr>
<td></td>
<td>financial_impact1</td>
<td>This measure will make me financially worse off</td>
</tr>
<tr>
<td>Effectiveness</td>
<td>effectiveness1</td>
<td>I think that the proposed measure will be effective in decreasing congestion level</td>
</tr>
<tr>
<td></td>
<td>effectiveness2</td>
<td>I think that the proposed measure will improve air quality</td>
</tr>
<tr>
<td></td>
<td>effectiveness3</td>
<td>I expect that the proposed measure will lower noise level.</td>
</tr>
</tbody>
</table>

4.2.2. Independent Variables

To measure reading frequencies of newspapers, we asked respondents how often they read the 5 newspapers: *De Telegraaf, Algemeen Dagblad, de Volkskrant, Trouw* and *NRC Handelsblad* and they responded with a 5 points-scale ranging from “never” (0) to “daily” (4). We determined the level of news exposure to various types of news content by combining the reading frequency variable of each newspaper in the survey with the space allocation variable of each newspaper obtained from content analysis of news articles. By doing so, we produced 6 different news exposure variables listed below:

- Exposure to positive Kilometerheffing news content
- Exposure to negative Kilometerheffing news content
- Exposure to positive news content about the financial impact of Kilometerheffing on households
- Exposure to negative news content about the financial impact of Kilometerheffing on households
- Exposure to positive news content about the effectiveness of Kilometerheffing
- Exposure to negative news content about the effectiveness of Kilometerheffing

Exposure to positive Kilometerheffing news content for each respondent was calculated in two steps. Firstly, the positive space allocation for Kilometerheffing in each newspaper was multiplied by the reading frequency of this newspaper by this respondent to obtain exposure to positive news content of each newspaper. Then, we summed the exposure to positive news content of the 5 newspapers. Exposure to negative Kilometerheffing news content was calculated using the same method.

We repeated a similar procedure to calculate the other four news exposure variables related to financial impact and effectiveness. Positive and negative space allocation variables used for the calculation of the financial impact variables consisted of the amount of space allocation only for the issue impact on congestion and effectiveness3. Space allocation variables used for the calculation of effectiveness variables were the sum of space allocation of three issues impact on congestion, impact on air quality and impact on noise.

4.2.3. Control Variables

Our analysis included several control variables. Gehlert et al. (19) and Jaensirisak et al. (20) state that people’s attitude towards road pricing policy is usually influenced by their socio-demographic characteristics such as age, gender, education and income as well as their mobility behaviors (e.g. transport mode used, frequency of car use). Moreover, the socio-demographic characteristics of people are the most important determinants of news consumption patterns (e.g. the choice of newspapers, reading frequency) (see (21; 22)). Since our news exposure variables are calculated based on the reading frequencies of 5 national newspapers, there is a danger that some common characteristics of readers of individual newspapers, rather than exposure to their news content, actually cause changes in dependent variables. We, therefore, included the following control variables in the analysis.

- Age is measured in years. Gender (female) is a dummy variable. Education is an ordinal variable with three levels (1 low, 2 middle and 3 high). The social class variable, which contains information about both level of education and occupation, is an ordinal variable with three levels (1 low, 2 middle and 3 high). Furthermore, we controlled for kilometers driven per week and number of cars owned, which both explain important parts of people’s mobility pattern. Both are continuous variables. Number of cars owned ranges from “no car” (1) to “6 and more” (6). Finally, Jaensirisak et al. (20) show that people’s attitude towards road pricing policy changes according to the design characteristics of the pricing schemes. We, therefore, controlled for Kilometerheffing (with price variation according to vehicle type) which is a dummy variable.

4.3. SEM and Regression Analysis with Latent Dependent Variable

In our study, we developed four multiple linear regression models. Each regression model has one latent dependent variable (support, financial impact for themselves or effectiveness) and is combined with a
measurement model in a structural equation model by using AMOS software. Chi-Squared test, GFI, AGFI, CFI, RMSEA and SRMR fit indices were used to determine the extent to which the structural equation model fitted the data. An insignificant chi square value (p value > 0.05) is regarded as an indication of a good model fit (23). However, since the chi squared test is sensitive to sample size and that often suggests poor model fit with large samples like ours, we also consulted other fits indices. A good model fit is suggested by GFI and AGFI values above 0.90, a CFI value above 0.95, a RSMEA value below 0.06 and a SRMR value below 0.08 (24; 25).

Furthermore, we tested whether two coefficients has the same magnitude by comparing two models: one with constraining regression weights of negative and positive news exposure variables to be equal to each other, and one without. Statistically significant different chi square values suggest that the magnitudes of both coefficients are statistically different.

5. RESULTS

Around 64% (n=452) of the respondents in our survey read at least one of the 5 newspapers analyzed. Among the newspaper readers (N=452), De Telegraaf (n=280) is the highest and Trouw (n=70) the lowest number of readers. The great majority of each newspaper’s readers also read one of the other newspapers (60% of De Telegraaf readers (n=168), 80% of de Volkskrant readers (n=130), 88% of NRC Handelsblad readers (n=180), 87% of Trouw readers (n=61) and 79% of Algemeen Dagblad readers (n=174)). In total, 53% (N=238) of the newspaper readers read more than one newspaper and 31% (N=139) of them are exposed to both right-leaning (de Telegraaf, Algemeen Dagblad or NRC Handelsblad) and left-leaning (Trouw or de Volkskrant) newspapers at the same time.

Figure 1 presents the space allocation to positive and negative news content about Kilometerheffing for the 5 newspapers. The space allocation for the proposal is highest in De Telegraaf, followed by Algemeen Dagblad and Trouw. De Telegraaf has the highest amount of negative space allocation compared to the other newspapers and is also the only newspaper which allocates more space to negative news than positive news. Trouw has the highest amount of positive space allocation for the proposal. To sum up, all newspapers have both positive and negative space allocation for Kilometerheffing but to a varying extent. The extent that a respondent is exposed to negative or positive Kilometerheffing news content depends on which newspaper(s) (and how often) s/he reads. It is also important to note that we assume that the readers of each newspaper read all the news about Kilometerheffing in this newspaper.

Figure 1 The Overall Tone Of Kilometerheffing News Content Across Newspapers

We will now consider the effect of exposure to Kilometerheffing news content on people’s opinions, based on our hypotheses and research questions. Table 3 presents the results of a structural equation model comprising a multiple regression model predicting support for Kilometerheffing and its measurement model. The model has a satisfactory model fit (Chi square = 14.073, 10 degrees of freedom, p = 0.170, GFI=0.99, AGFI=0.97, CFI=0.99, RMSEA=0.02, SRMR=0.004). The measurement model shows that the indicator variables are statistically significant (p = 0.000), indicating that these variables are adequate indicators of support. The regression model suggests that exposure to positive Kilometerheffing news content is significantly positively associated with support for Kilometerheffing while exposure to negative Kilometerheffing news content is significantly negatively associated with support for Kilometerheffing as we expected. This result confirms our hypothesis (H1) that the more positive the Kilometerheffing news content exposed to, the more favorable people’s opinions are about Kilometerheffing, and in the same way the more negative news content exposed to, the more negative opinions are. The regression model also indicates that age, number of cars owned,
kilometers driven per week and Kilometerheffing (with price variation vehicle type) are also statistically significant predictors of support for Kilometerheffing. There is more support for the Kilometerheffing proposal with a price variation according to vehicle type, compared to the proposal without a price variation. Older people are more in favor of Kilometerheffing. The support for Kilometerheffing declines as the number of cars people have and the kilometers they drive (per week) increase.

The hypothesis (H2) proposes that the effect of negative news content about Kilometerheffing on people’s opinions is greater than the positive news content. Table 3 shows that the magnitude of the regression weight of negative news exposure (-0.215) is slightly bigger than positive news exposure (0.193). However, the comparison of two models with and without constraints on the absolute values of the regression weights of these variables reveals no statistically significant result (chi square = 0.001, 1 degrees of freedom, p = 0.973), suggesting that the regression weights of two news exposure variables are not significantly different. Hypothesis (H2) can therefore be rejected, that the effect of negative Kilometerheffing news content on people’s opinions is stronger than the positive Kilometerheffing news content.

| TABLE 3 Structural Equation Model Explaining Support for Kilometerheffing |
|-----------------------------------|----------------------|---------------|--------------|
| Regression model                  | Standard Regression Weights | Critical ratio | P value |
| Gender (female)                   | -0.03                | -0.812        | 0.417     |
| Age                               | 0.13                 | 3.298         | 0.000     |
| Social class (middle)             | 0.005                | 0.093         | 0.926     |
| Social class (high)               | 0.018                | 0.318         | 0.751     |
| Education (middle)                | -0.004               | -0.081        | 0.936     |
| Education (high)                  | 0.049                | 0.906         | 0.365     |
| Number of cars owned              | -0.099               | -2.575        | 0.010     |
| Kilometer driven per week         | -0.223               | -5.702        | 0.000     |
| Kilometerheffing with price variation (vehicle type) | 0.082 | 2.3 | 0.021 |
| Exposure to negative Kilometerheffing news content | -0.215 | -2.852 | 0.004 |
| Exposure to positive Kilometerheffing news content | 0.193 | 2.473 | 0.013 |

<table>
<thead>
<tr>
<th>Measurement model</th>
<th>Standard Regression Weights</th>
<th>Critical ratio</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support1</td>
<td>0.99</td>
<td>na</td>
<td>na</td>
</tr>
<tr>
<td>Support2</td>
<td>0.91</td>
<td>20.001</td>
<td>0.000</td>
</tr>
</tbody>
</table>

*Reference group is taken as social class (low)*
*b Reference group is taken as education (low)*
“na” not applicable

The effect of news about Kilometerheffing on people’s opinions is expected to differ for two types of news topics: the financial impact of Kilometerheffing on households and the effectiveness of Kilometerheffing (its impact on congestion, air quality and noise). Table 4 presents the results of two structural equation models (model A and model B) which estimate opinions about the financial impact of Kilometerheffing and the effectiveness of Kilometerheffing. Both models have satisfactory model fits (Model A: Chi-Square = 36.365, 10 degrees of freedom, p = 0.000, GFI=0.99, AGFI=0.93, CFI=0.98, RMSEA=0.06, SRMR=0.01; Model B: chi-square = 18.127, 22 degrees of freedom, p = 0.698, GFI=0.99, AGFI=0.98, CFI=1, RMSEA=0, SRMR=0.009).

Model A has a good model fit according to all indices but chi square test (p=0.000). However, since chi square test often produces a significant result with large samples as we noted in section 4.3, we consider Model A to have a sufficient model fit. Measurement models indicate that indicator variables of both latent dependent variables (financial impact for themselves and effectiveness) are appropriate indicators (p = 0.000). Model A confirms the hypothesis (H3) that exposure to neither negative nor positive news content about financial impact of Kilometerheffing on households significantly affects people’s opinions about this issue. Model B, on the other hand, shows that exposure to negative news content about the effectiveness of Kilometerheffing is negatively and significantly related to opinion about the effectiveness of Kilometerheffing while exposure to positive news content about the effectiveness of Kilometerheffing is positively and significantly related to opinion about the effectiveness, as we expect. This indicates that the more negative news content about the effectiveness of Kilometerheffing people are exposed to, the more negative their opinions are about the effectiveness of Kilometerheffing, or in the same way, the more positive news content exposed is, the more positive opinions are, as hypothesized in H4.
As stated in our hypothesis (H5), we also expect the effect of negative news content about the effectiveness of Kilometerheffing to be greater than the positive news content about the effectiveness of Kilometerheffing. To test this hypothesis, we applied the same procedure used for testing H2 by comparing two models with and without constraining regression weights for negative and positive news exposure variables. The comparison of the two models shows that the model fits are not significantly different (chi square = 1.27, 1 degrees of freedom, p = 0.26), suggesting that the effect of negative news content about the effectiveness of Kilometerheffing is not greater than the positive news content for this issue.

### TABLE 4 Structural Equation Models Explaining Opinion about Financial Impact of Kilometerheffing and Effectiveness Of Kilometerheffing

<table>
<thead>
<tr>
<th>Regression model</th>
<th>Model A (explaining opinion about financial impact of Kilometerheffing for themselves)</th>
<th>Model B (explaining opinion about effectiveness of Kilometerheffing)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (female)</td>
<td>0.054, Standard Regression Weights 1.406, Critical ratio 0.16, P value 0.16, -0.005, Standard Regression Weights -0.124, Critical ratio 0.901</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>0.113, Standard Regression Weights 2.697, Critical ratio 0.007, P value 0.151, 3.532, Critical ratio 0.000</td>
<td></td>
</tr>
<tr>
<td>Social class (middle)</td>
<td>0.126, Standard Regression Weights -0.06, Critical ratio 0.133, P value 0.257, 0.008, Standard Regression Weights 0.151, Critical ratio 0.880</td>
<td></td>
</tr>
<tr>
<td>Social class (high)</td>
<td>0.012, Standard Regression Weights 0.215, Critical ratio 0.830, P value 0.002, Standard Regression Weights 0.026, Critical ratio 0.979</td>
<td></td>
</tr>
<tr>
<td>Education (middle)</td>
<td>0.003, Standard Regression Weights -0.063, Critical ratio 0.949, P value 0.008, Standard Regression Weights -1.255, Critical ratio 0.209</td>
<td></td>
</tr>
<tr>
<td>Education (high)</td>
<td>0.006, Standard Regression Weights -0.106, Critical ratio 0.916, P value 0.002, Standard Regression Weights -0.188, Critical ratio 0.851</td>
<td></td>
</tr>
<tr>
<td>Number of cars owned</td>
<td>-0.095, Standard Regression Weights -2.335, Critical ratio 0.020, P value -0.11, Standard Regression Weights -2.661, Critical ratio 0.008</td>
<td></td>
</tr>
<tr>
<td>Kilometers driven per week</td>
<td>-0.287, Standard Regression Weights -5.337, Critical ratio 0.000, P value -0.175, Standard Regression Weights -4.114, Critical ratio 0.000</td>
<td></td>
</tr>
<tr>
<td>Kilometerheffing with price variation (vehicle type)</td>
<td>0.023, Standard Regression Weights 0.627, Critical ratio 0.531, P value 0.053, Standard Regression Weights 1.377, Critical ratio 0.168</td>
<td></td>
</tr>
<tr>
<td>Exposure to negative news content about the financial impact of Kilometerheffing on households</td>
<td>-0.070, Standard Regression Weights -1.163, Critical ratio 0.245, P value na, Standard Regression Weights na, Critical ratio na, P value na</td>
<td></td>
</tr>
<tr>
<td>Exposure to positive news content about the financial impact of Kilometerheffing on households</td>
<td>0.050, Standard Regression Weights 0.806, Critical ratio 0.42, P value na, Standard Regression Weights na, Critical ratio na, P value na</td>
<td></td>
</tr>
<tr>
<td>Exposure to negative news content about the effectiveness of Kilometerheffing</td>
<td>na, Standard Regression Weights na, Critical ratio na, P value -0.202, Standard Regression Weights -1.978, Critical ratio 0.048</td>
<td></td>
</tr>
<tr>
<td>Exposure to positive news content about the effectiveness of Kilometerheffing</td>
<td>na, Standard Regression Weights na, Critical ratio na, P value 0.258, Standard Regression Weights 2.448, Critical ratio 0.014</td>
<td></td>
</tr>
<tr>
<td>Measurement model</td>
<td>Financial impact1, 0.6, Standard Regression Weights na, Critical ratio na, P value na</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Financial impact2, -0.975, Standard Regression Weights -7.605, Critical ratio 0.000, P value na</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Effectiveness1, na, Standard Regression Weights na, Critical ratio 0.821, P value na</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Effectiveness2, na, Standard Regression Weights 0.792, Critical ratio 21.891, P value 0.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Effectiveness3, na, Standard Regression Weights 0.821, Critical ratio 22.928, P value 0.000</td>
<td></td>
</tr>
</tbody>
</table>

* Reference group is taken as social class (low)

6. CONCLUSION

Our findings indicate that the news coverage of the Kilometerheffing proposal influences public opinion about this proposal. We found that the level of exposure to positive news increases the level of support for Kilometerheffing while exposure to negative news decreases support. However, the effect of news exposure on opinion is different for two aspects of the policy: the financial impact of Kilometerheffing on households and effectiveness of Kilometerheffing. Following McCombs and Reynolds (16), we did not expect that exposure to news content on the financial impact of Kilometerheffing on households would influence people’s opinions...
about the financial impact of Kilometerheffing for themselves since this issue is obtrusive for people. On the other hand, we did expect that the more negative news about the effectiveness of Kilometerheffing people are exposed to, the more negative their opinions would be about its effectiveness and in the same way, the more positive their opinions would be as a result of positive news. Our results confirm these hypotheses.

These findings imply that if policy makers aim to implement a road pricing scheme, they should pay close attention to their media policy since the news content about their policy influences public opinion. Ardic et al. (26) state that policy makers should provide sufficient information to the media since this might help to increase positive news in the media. Our analysis shows that information about especially unobtrusive issues such as the impact of the policy on congestion and the environment affects public opinion while information about obtrusive issues such as the financial impact of the policy on households has no significant effect on people’s opinion. Therefore, policy makers should focus especially on the unobtrusive issues related to their policy proposal while preparing policy information packages and organizing information campaigns.

Finally, we found that the effect of negative news about Kilometerheffing is not greater than positive news, contrary to many studies (see (15)). This suggests that the power of negative news might not always be greater than positive news and both can have roughly equal impact on opinions for some issues, as already noted by Baumeister (15).

7. DISCUSSION AND FUTURE RESEARCH

Our study is the first to provide empirical evidence on relationship between news content and public opinion about road pricing policy. Our findings suggest that exposure to news content about road pricing policy affects people’s opinion, controlling for socio-demographic and mobility variables. However, in reality the relationship between news content and people’s opinions may be more complicated than conceptualized in our study and could be conditioned by other factors besides socio-demographic and mobility variables. The investigation of these factors provides many opportunities for future studies.

Political beliefs, for instance, is one of these factors. People’s political beliefs and their attitude towards the government might influence their opinions on road pricing policy (27). Similarly, newspapers might have a political leaning which influences the presentation of policy issues (28). Political beliefs might also determine which newspapers (and to what extent) people read (29). In other words, people might be more inclined to read like-minded newspapers, thereby being exposed to news which confirms their existing beliefs. Consequently, people’s opinions about road pricing policy might correlate with the tone of road pricing news content due to similarities in their political beliefs and the political leaning of the newspaper(s) they read rather than as a result of the news. In our study, we did not control for political beliefs. However, our results show that the news content of newspapers on Kilometerheffing does not fully match their political leanings. While two right leaning newspapers, NRC Handelsblad and Algemeen Dagblad have slightly more positive coverage of Kilometerheffing than negative, the other right leaning newspaper, De Telegraaf, has far more negative coverage (see figure 1). Furthermore, 50% of the readers in our sample read more than one newspaper and around 30% read right and left leaning newspapers concurrently (see section 5). Therefore, in our study the correlation found between people’s opinions and the level of news exposure is less likely to be explained by overlap in the political beliefs of people and their newspapers chosen. Still, future studies which include political beliefs (and attitude towards government) in the analysis may offer more conclusive results.

Furthermore, factors not included in our study, such as (but not limited to) the perceived credibility of the news source (e.g. newspaper) (30), the degree of political sophistication of individuals (31), interpersonal communication (32) and the level of interest in the issue (33) might have an impact on the degree of news exposure and how readers perceive information presented in news. Research into the interactions between these factors and news exposure might shed further light on the effect of news on opinions about road pricing policy.

Finally, our study is based on cross sectional data. Studies using a longitudinal design might measure the change in opinions as a result of exposure to news content and draw more concrete conclusions. We would suggest conducting a panel survey on people’s opinions before and after a certain policy event related to road pricing and, additionally, analyzing the news content on the policy during this policy event. This approach is widely used in studies which analyze the effect of news on voters during elections and referendums. We should, however, note that it might be difficult to set such a research design for issues like road pricing policy since the policy process is usually very difficult to predict and often encounters unexpected developments. Additionally, our analysis includes only newspapers. TV news containing some visual elements might have stronger effect on audience. Studies including other media (radio, TV, internet) could bring new insights to this issue.

8. ACKNOWLEDGEMENTS

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