

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

3
 4 Özgül Ardic *
 5 Delft University of Technology
 6 Faculty of Technology, Policy and Management
 7 Section Transport and Logistics
 8 Jaffalaan 5, PO Box 5015, 2600 GA Delft – The Netherlands
 9 Phone +31 (0)15 2788910, Fax + 31 (0) 15 2782719
 10 Email o.ardic@tudelft.nl

11
 12 Dr. Jan Anne Annema
 13 Delft University of Technology
 14 Faculty of Technology, Policy and Management
 15 Section Transport and Logistics
 16 Jaffalaan 5, PO Box 5015, 2600 GA Delft – The Netherlands
 17 Phone +31 (0)15 2788912, Fax + 31 (0) 15 2782719
 18 Email J.A.Annema@tudelft.nl

19
 20 Dr. Eric Molin
 21 Delft University of Technology
 22 Faculty of Technology, Policy and Management
 23 Section Transport and Logistics
 24 Jaffalaan 5, PO Box 5015, 2600 GA Delft – The Netherlands
 25 Phone +31 (0)15 2788510, Fax + 31 (0) 15 2782719
 26 Email E.J.E.Molin@tudelft.nl

27
 28 Prof. Dr. Bert van Wee
 29 Delft University of Technology
 30 Faculty of Technology, Policy and Management
 31 Section Transport and Logistics
 32 Jaffalaan 5, PO Box 5015, 2600 GA Delft – The Netherlands
 33 Phone +31 (0)15 2781144, Fax + 31 (0) 15 2782719
 34 Email g.p.vanwee@tudelft.nl

35
 36 Dr. Jan Willem Bolderdijk
 37 University of Groningen
 38 Department of Marketing
 39 Faculty of Economics and Business
 40 Nettelbosje 2 9747 AE Groningen - The Netherlands
 41 Phone: +31 (0) 50 363 9086
 42 Email J.W.Bolderdijk@rug.nl

43

44

45
 46 * Corresponding author

47

48

49

50 **Word count**

51 Abstract..... 207
 52 Main text 5248
 53 1 Figure and 4 tables (5 * 250) ... 1250
 54 **Total 6705**
 55 33 References 933

56

57

58 Submitted on 29 July 2013 (revised version on 17 October 2013)
 59 to the *Transportation Research Board (TRB) 93rd Annual Meeting (2014), Washington, D.C.*

60 **ABSTRACT**

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

74 1. INTRODUCTION

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

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

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

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

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

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

121 The subject of this study, Kilometerheffing (one particular form of road pricing), was very close to
122 implementation. The proposal was to charge car drivers per kilometer they drive, and in the meantime, abolish
123 fixed taxes (annual road tax and car purchase tax). The charge per kilometer was to vary according to vehicle
124 type, time and places. The proposal occupied the Dutch political agenda, with several ups and downs, for about 5
125 years, from 2005 to 2010. When it was finally abolished in 2010, politicians ascribed the decision predominantly
126 to the lack of public support (12). Although the public was mostly in favor of the principle of “who drives, pays
127 more”, according to the outcome of survey conducted by the ANWB, the majority was against one or more of
128 the aspects (e.g. peak hour charge) of the Kilometerheffing proposal (13). According to (14), the Dutch media
129 had a role in the failure of the road pricing policy by affecting public opinion negatively, but there is no
130 empirical evidence regarding whether or to what extent news content about the policy affected public opinion in
131 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

194 measured, and the structural model, which estimates the structural relations among the variables of interest.
 195 Very briefly stated, with this procedure the measurement error remains in the measurement model and the latent
 196 variables can be regarded as variables that are corrected for measurement error. The result is that the equations
 197 contain latent variables, resulting in more valid estimates. In addition, software packages (e.g. AMOS) by which
 198 SEM models can be estimated allow procedures to test whether particular coefficients differ significantly in a
 199 statistical sense (17).

200

201 4.1. Content Analysis

202 The content analysis of news articles about the Dutch road pricing policy was carried out by Ardic et al. (11).
 203 The content analysis was conducted on news articles published in 5 Dutch national newspapers with the highest
 204 five circulation rates in 2010: *De Telegraaf* (type: popular, political leaning: right), *Algemeen Dagblad* (type:
 205 popular, political leaning: right), *de Volkskrant* (type: quality, political leaning: centre/left), *NRC Handelsblad*
 206 (type: quality, political leaning: right) and *Trouw* (type: quality, political leaning: centre/left). Newspapers are
 207 widely used as a source of news by the Dutch public (Commissariaat voor de Media, 2011) and the number of 5
 208 newspapers' readers in total constitute large number of Dutch newspaper readers (more than 35% and 45% of the
 209 total and paid newspaper readers respectively) (11).

210

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

216

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

217

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

218

219

Source: (11)

220

221

222

223

224

225

226

227

228

229

230

230 4.2. Survey and Combination of the Survey with Content Analysis

231

232

233

234

235

236

237

238

239

240

241

241 4.2.1. Dependent Variables

242

243

244

245

246

242 7 indicator variables in total were used in the survey to measure three latent variables: *support*, *financial impact*
 243 *for themselves* and *effectiveness*. Respondents were asked to indicate the degree to which they agreed with items
 244 presented on a 7 points-scale ranging from "totally disagree" (1) to "totally agree" (7). Table 2 presents the
 245 indicator variables for each of these latent variables.

247 **TABLE 2 Latent and Indicator Variables**
 248

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

249

250

4.2.2. Independent Variables

251

252

253

254

255

256

257

258

259

260

261

262

263

264

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

265

266

267

268

269

270

271

272

273

274

275

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.

276

277

278

279

280

281

282

283

284

285

286

287

288

289

290

291

292

293

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.

294

4.3. SEM and Regression Analysis with Latent Dependent Variable

295

296

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

297 measurement model in a structural equation model by using AMOS software. Chi-Squared test, GFI, AGFI, CFI,
 298 RMSEA and SRMR fit indices were used to determine the extent to which the structural equation model fitted
 299 the data. An insignificant chi square value (p value > 0.05) is regarded as an indication of a good model fit (23).
 300 However, since the chi squared test is sensitive to sample size and that often suggests poor model fit with large
 301 samples like ours, we also consulted other fits indices. A good model fit is suggested by GFI and AGFI values
 302 above 0.90, a CFI value above 0.95, a RSMEA value below 0.06 and a SRMR value below 0.08 (24; 25).
 303 Furthermore, we tested whether two coefficients has the same magnitude by comparing two models: one with
 304 constraining regression weights of negative and positive news exposure variables to be equal to each other, and
 305 one without. Statistically significant different chi square values suggest that the magnitudes of both coefficients
 306 are statistically different.

307

308

5. RESULTS

309

310

311

312

313

314

315

316

317

318

319

320

321

322

323

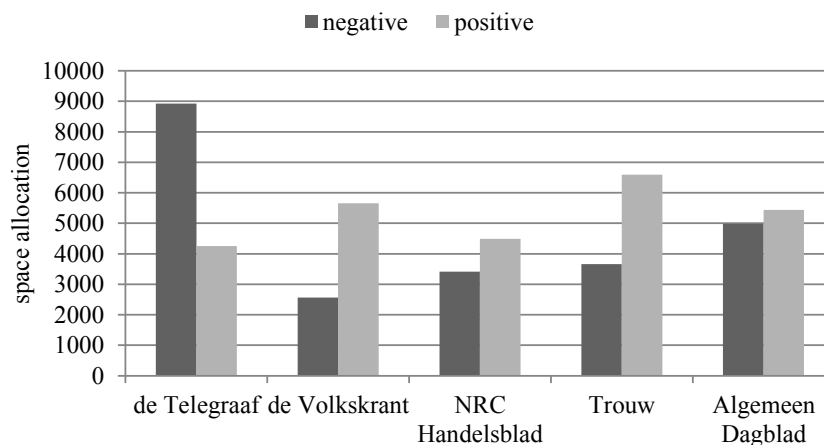
324

325

326

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.



327

328

329

FIGURE 1 The Overall Tone Of Kilometerheffing News Content Across Newspapers

330

331

332

333

334

335

336

337

338

339

340

341

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,

342 *kilometers driven per week* and *Kilometerheffing (with price variation vehicle type)* are also statistically
 343 significant predictors of support for Kilometerheffing. There is more support for the Kilometerheffing proposal
 344 with a price variation according to vehicle type, compared to the proposal without a price variation. Older people
 345 are more in favor of Kilometerheffing. The support for Kilometerheffing declines as the number of cars people
 346 have and the kilometers they drive (per week) increase.

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

355
 356
 357

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) ^a	0.005	0.093	0.926
Social class (high) ^a	0.018	0.318	0.751
Education (middle) ^b	-0.004	-0.081	0.936
Education (high) ^b	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
Measurement model	Standard Regression Weights	Critical ratio	P value
Support1	0.99	na	na
Support2	0.91	20.001	0.000

358
 359
 360
 361
 362

^a Reference group is taken as *social class (low)*

^b Reference group is taken as *education (low)*

“na” not applicable

363
 364
 365
 366
 367
 368
 369
 370
 371
 372
 373
 374
 375
 376
 377
 378
 379
 380
 381
 382

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

Regression model	Model A (explaining opinion about financial impact of Kilometerheffing for themselves)			Model B (explaining opinion about effectiveness of Kilometerheffing)		
	Standard Regression Weights	Critical ratio	P value	Standard Regression Weights	Critical ratio	P value
Gender (female)	0.054	1.406	0.16	-0.005	-0.124	0.901
Age	0.113	2.697	0.007	0.151	3.532	0.000
Social class (middle) ^a	-0.06	-1.133	0.257	0.008	0.151	0.880
Social class (high) ^a	0.012	0.215	0.830	0.002	0.026	0.979
Education (middle) ^b	-0.003	-0.063	0.949	-0.066	-1.255	0.209
Education (high) ^b	-0.006	-0.106	0.916	-0.011	-0.188	0.851
Number of cars owned	-0.095	-2.335	0.020	-0.11	-2.661	0.008
Kilometers driven per week	-0.287	-5.337	0.000	-0.175	-4.114	0.000
Kilometerheffing with price variation (vehicle type)	0.023	0.627	0.531	0.053	1.377	0.168
Exposure to negative news content about the financial impact of Kilometerheffing on households	-0.070	-1.163	0.245	na	na	na
Exposure to positive news content about the financial impact of Kilometerheffing on households	0.050	0.806	0.42	na	na	na
Exposure to negative news content about the effectiveness of Kilometerheffing	na	na	na	-0.202	-1.978	0.048
Exposure to positive news content about the effectiveness of Kilometerheffing	na	na	na	0.258	2.448	0.014
Measurement model	Standard Regression Weights	Critical ratio	P value	Standard Regression Weights	Critical ratio	P value
Financial_impact1	0.6	na	na	na	na	na
Financial_impact2	-0.975	-7.605	0.000	na	na	na
Effectiveness1	na	na	na	0.821	na	na
Effectiveness2	na	na	na	0.792	21.891	0.000
Effectiveness3	na	na	na	0.821	22.928	0.000

^a Reference group is taken as *social class (low)*

^b Reference group is taken as *education (low)*

“na” not applicable

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

406 about the financial impact of Kilometerheffing for themselves since this issue is obtrusive for people. On the
 407 other hand, we did expect that the more negative news about the effectiveness of Kilometerheffing people are
 408 exposed to, the more negative their opinions would be about its effectiveness and in the same way, the more
 409 positive their opinions would be as a result of positive news. Our results confirm these hypotheses.

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

418 Finally, we found that the effect of negative news about Kilometerheffing is not greater than positive
 419 news, contrary to many studies (see (15)). This suggests that the power of negative news might not always be
 420 greater than positive news and both can have roughly equal impact on opinions for some issues, as already noted
 421 by Baumeister (15).
 422

423 7. DISCUSSION AND FUTURE RESEARCH

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

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

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

451 Finally, our study is based on cross sectional data. Studies using a longitudinal design might measure
 452 the change in opinions as a result of exposure to news content and draw more concrete conclusions. We would
 453 suggest conducting a panel survey on people's opinions before and after a certain policy event related to road
 454 pricing and, additionally, analyzing the news content on the policy during this policy event. This approach is
 455 widely used in studies which analyze the effect of news on voters during elections and referendums. We should,
 456 however, note that it might be difficult to set such a research design for issues like road pricing policy since the
 457 policy process is usually very difficult to predict and often encounters unexpected developments. Additionally,
 458 our analysis includes only newspapers. TV news containing some visual elements might have stronger effect on
 459 audience. Studies including other media (radio, TV, internet) could bring new insights to this issue.
 460

461 8. ACKNOWLEDGEMENTS

462 This research was undertaken as part of Innovative Pricing for Sustainable Mobility (i-PriSM) project, funded by
 463 The Netherlands Organization for Scientific Research (NWO).
 464
 465

REFERENCES

- 466
467
468 [1] Isaksson, K., and T. Richardson. Building legitimacy for risky policies: The cost of avoiding conflict in
469 Stockholm. *Transportation Research Part A: Policy and Practice*, Vol. 43, No. 3, 2009, pp. 251-257.
- 470 [2] Oberholzer-Gee, F., and H. Weck-Hannemann. Pricing road use: politico-economic and fairness
471 considerations. *Transportation Research Part D: Transport and Environment*, Vol. 7, No. 5, 2002, pp. 357-371.
- 472 [3] Ison, S., and T. Rye. Implementing Road User Charging: The Lessons Learnt from Hong Kong, Cambridge
473 and Central London. *Transport Reviews*, Vol. 25, No. 4, 2005, pp. 451-465.
- 474 [4] Ryley, T., and N. Gjersoe. Newspaper response to the Edinburgh congestion charging proposals. *Transport*
475 *Policy*, Vol. 13, No. 1, 2006, pp. 66-73.
- 476 [5] Schade, J., and B. Schlag. Acceptability of Urban Transport Pricing. In, Helsinki: Government Institute for
477 Economic Research, Helsinki, 2000.
- 478 [6] Azrout, R., J. Van Spanje, and C. De Vreese. When News Matters: Media Effects on Public Support for
479 European Union Enlargement in 21 Countries. *JCMS: Journal of Common Market Studies*, Vol. 50, No. 5, 2012,
480 pp. 691-708.
- 481 [7] Hopmann, D. N., R. Vliegthart, C. De Vreese, and E. Albæk. Effects of Election News Coverage: How
482 Visibility and Tone Influence Party Choice. *Political Communication*, Vol. 27, No. 4, 2010, pp. 389-405.
- 483 [8] Boomgaarden, H. G., J. van Spanje, R. Vliegthart, and C. H. de Vreese. Covering the crisis: Media
484 coverage of the economic crisis and citizens' economic expectations. *Acta Politica*, Vol. 46, No. 4, 2011, pp.
485 353-379.
- 486 [9] Winslott-Hiselius, L., K. Brundell-Freij, A. Vagland, and C. Byström. The development of public attitudes
487 towards the Stockholm congestion trial. *Transportation Research Part A: Policy and Practice*, Vol. 43, No. 3,
488 2009, pp. 269-282.
- 489 [10] Soroka, S. N. Good News and Bad News: Asymmetric Responses to Economic Information. *The Journal of*
490 *Politics*, Vol. 68, No. 02, 2006, pp. 372-385.
- 491 [11] Ardic, O., J. A. Annema, and B. v. Wee. Is the Media acting as a "Policy Actor" in Road Pricing Policy
492 Processes? The Dutch case. *submitted for publication*, 2013.
- 493 [12] Schonewille, M.-L., and O. Vermeer. De auto is politiek onaantastbaar; Met intrekken steun door CDA
494 komt einde aan plan kilometerheffing. In *NRC Handelsblad*, 2010.
- 495 [13] van Houten, M. Politiek blij met ANWB-peiling; Alle partijen zien in uitslag enquête kilometerheffing
496 bevestiging van eigen gelijk. In *Trouw*, 2010.
- 497 [14] Seidel, T., A. Matthes, B. Wieland, B. Schlag, J. Schade, E. Verhoef, B. Ubbels, K. Tanczos, A. Kosztyó,
498 and F. Mészáros. TIPP (Transport Institutions in the Policy Process) - Deliverable 4 Political Acceptability and
499 Perceived Legitimacy of Transport Policy Implementation. In, European Commission, 2004.
- 500 [15] Baumeister, R. F., E. Bratslavsky, C. Finkenauer, and K. D. Vohs. Bad is stronger than good. *Review of*
501 *General Psychology Review of General Psychology*, Vol. 5, No. 4, 2001, pp. 323-370.
- 502 [16] McCombs, M. E., and A. Reynolds. News influence on our pictures of the world. In *Media effects advances*
503 *in theory and research*, Lawrence Erlbaum Associates, Mahwah, N.J., 2002.
- 504 [17] Hair, J. F. *Multivariate data analysis : a global perspective*. Pearson Education, Upper Saddle River, N.J.;
505 London, 2010.
- 506 [18] NIPO, T., *TNS NIPObase, samenstelling, kwaliteit en kenmerken*. 2012
- 507 [19] Gehlert, T., C. Kramer, O. A. Nielsen, and B. Schlag. Socioeconomic differences in public acceptability and
508 car use adaptation towards urban road pricing. *Transport Policy*, Vol. 18, No. 5, 2011, pp. 685-694.
- 509 [20] Jaensirisak, S., M. Wardman, and A. D. May. Explaining Variations in Public Acceptability of Road Pricing
510 Schemes. *Journal of Transport Economics and Policy*, Vol. 39, 2005, pp. 127-154.
- 511 [21] Elvestad, E., and A. Blekesaune. Newspaper Readers in Europe: A Multilevel Study of Individual and
512 National Differences. *European Journal of Communication*, Vol. 23, No. 4, 2008, pp. 425-447.
- 513 [22] Lauf, E. Research Note: The Vanishing Young Reader: Sociodemographic Determinants of Newspaper Use
514 as a Source of Political Information in Europe, 1980-98. *European Journal of Communication*, Vol. 16, No. 2,
515 2001, pp. 233-243.
- 516 [23] Barrett, P. Structural equation modelling: Adjudging model fit. *Personality and Individual Differences*, Vol.
517 42, No. 5, 2007, pp. 815-824.
- 518 [24] Byrne, B. M. *Structural equation modeling with AMOS basic concepts, applications, and programming*.
519 Lawrence Erlbaum Associates, Mahwah, 2001.
- 520 [25] Hu, L. t., and P. M. Bentler. Cutoff criteria for fit indexes in covariance structure analysis: Conventional
521 criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, Vol. 6, No. 1, 1999,
522 pp. 1-55.
- 523 [26] Ardic, O., J. A. Annema, and B. v. Wee. The media coverage of Dutch road pricing policy: have the media
524 or the policy actors determined the news? *submitted for publication*, 2013.

- 525 [27] Hårsman, B., and J. M. Quigley. Political and Public Acceptability of Congestion Pricing: Ideology and
526 Self-Interest. *Journal of Policy Analysis and Management*, Vol. 29, No. 4, 2010, pp. 854–874.
- 527 [28] Mencher, M. *Melvin Mencher's news reporting and writing*. McGraw-Hill, Boston, 2006.
- 528 [29] Stroud, N. Media Use and Political Predispositions: Revisiting the Concept of Selective Exposure. *Political*
529 *Behavior*, Vol. 30, No. 3, 2008, pp. 341-366.
- 530 [30] Wanta, W., and Y.-W. Hu. The Effects of Credibility, Reliance, and Exposure on Media Agenda-Setting: A
531 Path Analysis Model. *Journalism & Mass Communication Quarterly*, Vol. 71, No. 1, 1994, pp. 90-98.
- 532 [31] Johnston, C. D., and B. L. Bartels. Sensationalism and Sobriety Differential Media Exposure and Attitudes
533 Toward American Courts. *Public Opinion Quarterly*, Vol. 74, No. 2, 2010, pp. 260-285.
- 534 [32] Scmitt-Beck, R. Mass Communication, Personal Communication and Vote Choice: The Filter Hypothesis of
535 Media Influence in Comparative Perspective. *British Journal of Political Science*, Vol. 33, No. 02, 2003, pp.
536 233-259.
- 537 [33] van der Wurff, R. Do audiences receive diverse ideas from news media? Exposure to a variety of news
538 media and personal characteristics as determinants of diversity as received. *European Journal of*
539 *Communication*, Vol. 26, No. 4, 2011, pp. 328-342.