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"Crashing the gates" – selection criteria for television news reporting of traffic crashes

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ABSTRACT

This study investigates which crash characteristics influence the probability that the crash is reported in the television news. To this purpose, all news items from the period 2006–2012 about traffic crashes from the prime time news of two Belgian television channels are linked to the official injury crash database. Logistic regression models are built for the database of all injury crashes and for the subset of fatal crashes to identify crash characteristics that correlate with a lower or higher probability of being reported in the news.

A number of significant biases in terms of crash severity, time, place, types of involved road users and victims' personal characteristics are found in the media reporting of crashes. More severe crashes are reported in the media more easily than less severe crashes. Significant fluctuations in media reporting probability through time are found in terms of the year and month in which the crash took place. Crashes during week days are generally less reported in the news. The geographical area (province) in which the crash takes place also has a significant impact on the probability of being reported in the news. Crashes on motorways are significantly more represented in the news. Regarding the age of the involved victims, a clear trend of higher media reporting rates of crashes involving young victims or young fatalities is observed. Crashes involving female fatalities are also more frequently reported in the news. Furthermore, crashes involving a bus have a significantly higher probability of being reported in the news, while crashes involving a motorcycle have a significantly lower probability. Some models also indicate a lower reporting rate of crashes involving a moped, and a higher reporting rate of crashes involving heavy goods vehicles.

These biases in media reporting can create skewed perceptions in the general public about the prevalence of traffic crashes and eventually may influence people's behaviour.

1. Introduction

Mass media (i.e. means of communication that reach large numbers of people, such as television or newspapers) are one of the primary sources of current information in society, and therefore play an important role in how people perceive society (Dearing and Rogers, 1996). The relationship between mass media and traffic safety for instance is highly relevant. Media are playing an important role in the creation of health awareness, such as road safety attitudes in a population (Combs and Slovic, 1979; Connor and Wesolowski, 2004; Daniels et al., 2010). This appears for example from a number of studies showing an important influence of mass media on alcohol-impaired driving. Mercer (1985) indicates that media coverage is probably a more critical element in the reduction of alcohol-related crashes than police road checks. Epperlein (1987) concludes that the impact of the media reporting about alcohol-impaired driving that preceded a new law against alcohol-impaired driving had a higher influence on reducing alcohol-impaired driving than the introduction of the law itself.

However, media's choices of what stories to cover and how to cover them are in fact driven by economic interests rather than public education goals (Beullens et al., 2008; Connor and Wesolowski, 2004; Frost et al., 1997). Hence, media coverage does not necessarily reflect reality. Research shows that the link between media reporting and developments in reality is far from perfect (Kepplinger and Habermeier, 1995; Lowry et al., 2003; Perse et al., 1997). Editorial decisions about the 'newsworthiness'

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of an event are often based on a story's novelty and dramatic value; events that are more rarely occurring or more dramatic are more likely to get reported (Adams, 1992; Combs and Slovic, 1979; Connor and Wesolowski, 2004; Daniels et al., 2010). In our society where the importance of media has been strongly increasing, the media determine the perception more than reality itself (Ghanem, 1996). Several studies indicate that the public perception of safety risks or threats, such as traffic crashes, are subject to systematic biases (Combs and Slovic, 1979; Connor and Wesolowski, 2004; Daniels et al., 2010). When people consume news, they assume that the coverage presents a fair representation of reality (Kepplinger and Habermeier, 1995). For instance, they assume that a higher number of news items about a specific type of event indicates that such events occur more often in reality (Connor and Wesolowski, 2004; Kepplinger and Habermeier, 1995). This perception influences the way people think about, react on, or adjust their behaviour to diverse forms of safety risks. It is likely that the number of media reported crashes and the way of reporting influence the perception of the risk of certain behaviours (Connor and Wesolowski, 2004; Daniels et al., 2010). Also Frost et al. (1997) suggest that media create a biased perception of different causes of death. Whenever this perceived risk does not correspond with the real risk, biases in the public's perceptions and attitudes of the risk might occur (Beullens et al., 2008). Therefore, increased efforts to analyse the media reporting on traffic crashes and their possible implications on traffic safety are justified.

While there is a large body of research related to media coverage of other injury related topics (such as homicide), reporting about traffic crashes has received little attention in scientific literature (Beullens et al., 2008; Connor and Wesolowski, 2004). Little is known about how media report on traffic crashes, and even less about what crashes are selected by media for reporting. The aim of this study is to contribute to filling the gaps in scientific knowledge about the media reporting of traffic crashes by determining which crash characteristics have an influence on the probability that the crash is reported in the television news. By linking the news items about traffic crashes to the official crash database, a strict input–output analysis of the media selection can be performed, identifying which objectively registered characteristics of the crash have an impact on the probability that the crash is reported in the media.

The structure of this paper is as follows. First, we give a brief overview of the relevant literature about earlier research about the media reporting of traffic crashes. Next, we describe the data and methodology of this research. In the analysis section we start with a description of the collected data. Then, a number of logistic regression models are presented that identify crash characteristics that influence the probability of being reported in the television news. Finally, we present the main conclusions and discuss the limitations of this paper.

2. Literature review

A study by Daniels et al. (2010) investigated the newspaper coverage of 140 injury crashes with motorcyclists. The study indicates that the reporting rate in media increases when the severity of the crash is higher. This finding is in line with other studies about non-traffic accident reporting (e.g. Woodcock (2008) came to the same conclusion in the context of amusement ride accidents). Daniels et al. (2010) also indicate an influence on the probability of reporting from time aspects (day of week, daytime vs. night time and year).

Connor and Wesolowski (2004) on the other hand find that the monthly distribution of fatal crash related newspaper articles in the United States does not differ significantly from the monthly distribution of crashes in the official crash database. They indicate that crashes where poor road conditions are noted in the crash database are significantly less reported. A higher reporting rate of crashes involving teen drivers is also found. Crashes related to driving under the influence of alcohol have a higher probability of being reported in newspaper articles as well. In general, they conclude that newspaper coverage of fatal crashes does not accurately reflect real risk to occupants.

Furthermore, Connor and Wesolowski (2004) indicate that the analysed American newspapers mainly frame fatal crashes as dramas with a 'victim/villain storyline', meaning that one of the involved parties is often mentioned as 'causing' the crash, while the other party is seen as a 'victim'. Beullens et al. (2008) analysed the framing of traffic crashes in Flemish television news, and they concluded that the 'responsibility frame' (i.e. the responsibility for the crash is explicitly attributed to an individual, a group or an organization) is one of the most common frames, together with the 'human interest frame', which implies that the message is personalized or emotionalized. On the other hand, the so-called 'conflict frame', which can be considered comparable to the 'victim/villain storyline' from Connor and Wesolowski (2004), was quite infrequent in Flemish television news items about traffic crashes (7% of all news items).

3. Data and methodology

For this study, news items about traffic crashes from the prime time television news are linked with the official injury crash database. The study takes place in the region of Flanders, Belgium. Flanders is the Dutch-speaking northern part of Belgium. The region accommodates approximately 6.3 million inhabitants (slightly over half the Belgian population) and covers an area of about 13,500 km^2 (slightly less than half the Belgian surface) (Statistics Belgium, Belgian Federal Government, 2013).

3.1. Electronic news archive

The dependent variable of this study is the coverage of traffic crashes in Flemish television news. The electronic news archive (ENA – http://www.nieuwsarchief.be) is used as a source for the news items about traffic crashes. The database archives and encodes all prime time news broadcasts (the broadcasts start at 19h00) from the main television channels in Flanders, namely VRT and VTM. VRT is the main public broadcasting station and VTM is the main commercial broadcaster in Flanders. By analysing both VRT and VTM, we obtain a good balance of both public and commercial television. All news items labelled as 'traffic accident' are selected for the 2006–2012 period (seven years in total). This is the maximum amount of data that could be included in this study since data from before 2006 are incomplete, and data more recent than 2012 were not yet available at the time of the data collection and preparation.

We focus exclusively on injury crashes (i.e. crashes that involve at least one person with an injury of any severity) that took place on the public road (i.e. roads owned by the government) in the region of Flanders, Belgium. Items reporting about foreign crashes, crashes in the region of Brussels or Wallonia, airplane or boat crashes, train crashes not involving road users and property damage only (PDO) crashes are removed from the database. This delineation was required to maintain full compatibility with the injury crash database.

3.2. Crash database

The official Flemish injury crash database was made available by the Belgian Federal Public Service Economy, department Statistics (FOD ADSEI). The database includes all police-reported injury crashes on public roads in Flanders. Also information about the characteristics of the victims involved per crash are included, such as age of the victims or whether at least one of the involved drivers was under the influence of alcohol. In Flanders, the legal blood alcohol concentration (BAC) limit for all drivers was 0.5 g/l during the study period, and a driver is considered to be under the influence of alcohol when a blood or breath test shows that this limit is exceeded or when the drivers refuses to take a blood or breath test when demanded. For the 2006–2012 period, the database contains approximately 184,000 injury crashes (Nuyttens et al., 2014).

3.3. Linking both databases

To link both databases, a trained coder watched the news items, and identified the corresponding crash record from the crash database based on the information that was mentioned in the news item. The most important elements used to make this link are date, location and severity of the crash, sometimes supplemented with other characteristics such as types of road users involved and age of victims. In case no link could be made with the crash database, the search criteria were eased, for example by searching also for crashes registered in neighbouring municipalities and on adjacent dates. In case the news item could still not be matched with a crash from the database, no link was made for that news item.

In the large majority of cases in which a news item could not be linked to a specific crash in the official crash database, this is because the crash is missing in the crash database. It is well-known that official crash databases tend to suffer from some issues of underreporting. For various reasons, not all injury crashes get reported, and therefore not all are present in the final crash database. The lower the injury severity, the higher the proportion of underreporting. It is estimated that 95% of fatal crashes are reported in the official crash database, while the level of reporting of crashes with severe injuries and crashes with slight injuries are generally substantially lower (70–80% and 25–55%, respectively) (Daniels et al., 2010; Elvik and Mysen, 1999; Hauer and Hakkert, 1988). To avoid possible biases in the results because of under-reporting, analyses are made both for the full database of all injury crashes and for the subset of all fatal crashes, and the results are compared. For approximately 11% of all news items, no link could be made with the crash database. These news items were excluded from the analyses. All news items relating to a fatal crash could however be linked to a crash in the crash database (100% link). The number of missed or erroneous links due to other possible causes (e.g. multiple crashes in the database satisfying the mentioned information, errors in the media reporting or crash database) is believed to be limited and is therefore unlikely to introduce systematic biases in the results.

Table 1
Descriptive statistics database all injury crashes.

Variable	Descriptives all injury crashes (*N* = 183,822)	Descriptives for injury crashes that have been in the news only (*N* = 1122)
VRT – Has the crash been on the VRT news? (dependent var.)	Yes = 530; No = 183,292	Yes = 530; No = 592
VTM – Has the crash been on the VTM news? (dependent var.)	Yes = 849; No = 182,973	Yes = 849; No = 273
NEWS – Has the crash been in the news at any of both channels? (dependent var.)	Yes = 1122; No = 182,700	Yes = 1122; No = 0
# Involved victims – includes all injured in the crash, and all unharmed drivers (unharmed passengers are not included)	Mean = 1.93; S.D. = 0.635; Min = 1; Max = 13	Mean = 2.18; S.D. = 1.33; Min = 1; Max = 12
Max. injury severity–severity level of the most seriously harmed victim. Fatal = victim dies on the spot; severe injury = more than 24 h in hospital; slight injury = injured and not belonging to one of the previous categories	Fatal = 2714; Severe injury = 23,433; Slight injury = 157,675	Fatal = 611; Sever injury = 252; Slight injury = 259
Year	2006 = 27,008; 2007 = 27,844; 2008 = 27,057; 2009 = 26,332; 2010 = 25,477; 2011 = 26,558; 2012 = 23,546	2006 = 228; 2007 = 241; 2008 = 150; 2009 = 146; 2010 = 83; 2011 = 130; 2012 = 144
Month	Jan = 13,571; Feb = 12,439; Mar = 14,572; Apr = 15,307; May = 16,990; Jun = 17,020; Jul = 14,830; Aug = 15,062; Sep = 17,012; Oct = 17,984; Nov = 15,189; Dec = 13,846	Jan = 120; Feb = 87; Mar = 71; Apr = 94; May = 97; Jun = 74; Jul = 102; Aug = 99; Sep = 98; Oct = 78; Nov = 103; Dec = 99
Inside built-up area	Yes = 91,604; No = 90,770; Missing = 1448	Yes = 258; No = 834; Missing = 30
Day of week	Mon = 25,604; Tue = 26,600; Wed = 27,547; Thu = 26,584; Fri = 29,601; Sat = 25,890; Sun = 21,996	Mon = 167; Tue = 159; Wed = 142; Thu = 126; Fri = 166; Sat = 176; Sun = 186
Weekend – defined as Friday 10 PM till Monday 5.59 AM	Yes = 51,203; No = 132,619	Yes = 404; No = 718
Time of week – days are 6 AM till 9.59 PM; nights are 10 PM–5.59 AM	Week day = 122,631; Week night = 9988; Weekend day = 36,434; Weekend night = 14,769	Week day = 604; Week night = 114; Weekend day = 217; Weekend night = 187
Province – in which of the 5 Flemish provinces did the crash take place?	Antwerp = 48,713; Limburg = 24,774; East Flanders = 47,703; West Flanders = 37,675; Flemish Brabant = 24,957	Antwerp = 367; Limburg = 136; East Flanders = 249; West Flanders = 202; Flemish Brabant = 168
Weather conditions	Normal = 158,258; Other = 20,140; Missing = 5424	Normal = 966; Other = 107; Missing = 49
Light conditions	Daylight = 127,291; Other = 55,123; Missing = 1408	Daylight = 629; Other = 469; Missing = 24
Child involved – Age 0–12 years old	Yes = 11,185; No = 172,637	Yes = 97; No = 1025
Teenager involved – Age 13–17 years old	Yes = 19,828; No = 163,994	Yes = 103; No = 1019
Young adult involved – Age 18–29 years old	Yes = 88,938; No = 94,884	Yes = 591; No = 531
Adult involved – Age 30–64 years old	Yes = 137,165; No = 46,657	Yes = 860; No = 262
Senior involved – Age 65 and older	Yes = 30,312; No = 153,510	Yes = 181; No = 941
Pedestrian involved	Yes = 13,041; No = 170,781	Yes = 104; No = 1018
Cyclist involved	Yes = 41,460; No = 142,362	Yes = 118; No = 1004
Moped involved	Yes = 22,179; No = 161,643	Yes = 15; No = 1107
Motorcycle involved	Yes = 13,305; No = 170,517	Yes = 67; No = 1055
Bus involved – includes public transport buses as well as touring cars	Yes = 2765; No = 181,057	Yes = 57; No = 1065
HGV involved – heavy goods vehicle	Yes = 30,587; No = 153,235	Yes = 454; No = 668
Driver under influence of alcohol	Yes = 19,285; No = 164,537	Yes = 100; No = 1022
Driver under influence of drugs	Yes = 339; No = 183,483	Yes = 2; No = 1120
Motorway – did the crash take place on a motorway?	Yes = 15,175; No = 168,647	Yes = 332; No = 790

4. Analyses

The variable of interest, whether a specific crash has been reported in the television news or not, is a dichotomous variable. Therefore, logistic regression models are used to identify independent variables that are related to a lower or a higher chance of being reported in the media. The functional form of the chosen logistic regression models is the following (Allison, 1999):

$$\text{logit}(P) = \ln\left(\frac{P}{1-P}\right) = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \cdots + \beta_n x_n$$

where

P is the probability of a crash being reported in the media.

β_0 is the intercept (constant).

β_1 to β_n are the partial logistic regression coefficients. β_1 expresses the influence of x_1 on the logit.

Every x_n (independent variable) has its own partial logistic regression coefficient β_n.

First, three logistic regressions are built based on the database for all injury crashes: a general model for the media reporting of all injury crashes for both television channels (the dependent variable is 1 in case the crash was reported on at least one of both channels, and 0 otherwise) and a sub model for each of both channels. Next, three logistic regression models are built for fatal crashes only: again a general model for both channels and a sub model for each of both channels.

The models built on the database for all injury crashes have the advantage of being a more complete representation of the television news reporting about traffic crashes, since a significant portion of media reporting on traffic crashes are about non-fatal crashes. However, the data about fatal crashes can be considered more reliable and complete than the full database for all injury crashes because of the higher rate of police-reporting of fatal crashes. Building additional models on this smaller, yet more reliable subset of the data is therefore a good way to validate the results of the general models on the full database. Furthermore, it is particularly interesting to see which crash characteristics influence the probability that fatal crashes are reported in the media, since fatal crashes are the most important focus in the field of traffic safety.

The models are built using the stepwise LOGISTIC-procedure in the statistical programme SAS 9.4 (SAS Institute Inc.). Only variables that are significant at the 95% confidence interval are included in the end models. The end models are checked for multicollinearity using variance inflation factors (VIFs). VIFs higher than 4 indicate a high correlation between variables in the end model, and are therefore considered unacceptable (O'Brien, 2007). The Hosmer and Lemeshow test is used to assess the model fit; the null hypothesis of the test is that the model has an adequate fit. If this null hypothesis is rejected by the test (i.e. p-value $\leq$0.05), the model fit is inadequate. When necessary, variables that caused multicollinearity or model fit issues were removed from the end

Table 2
Descriptive statistics database fatal crashes only.

Variable	Descriptives for all fatal crashes (N = 2714)	Descriptives for fatal crashes that have been in the news only (N = 611)
VRT – Has the crash been on the VRT news? (dependent var.)	Yes = 281; No = 2433	Yes = 281; No = 330
VTM – Has the crash been on the VTM news? (dependent var.)	Yes = 498; No = 2216	Yes = 498; No = 113
NEWS – Has the crash been in the news at any of both channels? (dependent var.)	Yes = 611; No = 2103	Yes = 611; No = 0
# Fatal victims	Mean = 1.06; S.D. = 0.31; Min = 1; Max = 5	Mean = 1.20; S.D. = 0.53; Min = 1; Max = 5
Year	2006 = 447; 2007 = 433; 2008 = 405; 2009 = 401; 2010 = 365; 2011 = 363; 2012 = 300	2006 = 103; 2007 = 118; 2008 = 88; 2009 = 79; 2010 = 55; 2011 = 84; 2012 = 84
Month	Jan = 171; Feb = 207; Mar = 246; Apr = 234; May = 255; Jun = 222; Jul = 245; Aug = 234; Sep = 247; Oct = 231; Nov = 228; Dec = 194	Jan = 49; Feb = 55; Mar = 39; Apr = 56; May = 57; Jun = 32; Jul = 64; Aug = 52; Sep = 56; Oct = 39; Nov = 57; Dec = 55
Inside built-up area	Yes = 605; No = 1968; Missing = 141	Yes = 127; No = 455; Missing = 29
Day of week	Mon = 329; Tue = 354; Wed = 371; Thu = 334; Fri = 439; Sat = 447; Sun = 440	Mon = 79; Tue = 69; Wed = 67; Thu = 60; Fri = 106; Sat = 116; Sun = 114
Weekend – defined as Friday 10 PM till Monday 5.59 AM	Yes = 990; No = 1724	Yes = 256; No = 355
Time of week – days are 6 AM till 9.59 PM; nights are 10 PM–5.59 AM	Week day = 1415; Week night = 309; Weekend day = 555; Weekend night = 435	Week day = 290; Week night = 65; Weekend day = 130; Weekend night = 126
Province – in which of the 5 Flemish provinces did the crash take place?	Antwerp = 635; Limburg = 477; East Flanders = 630; West Flanders = 616; Flemish Brabant = 356	Antwerp = 161; Limburg = 90; East Flanders = 158; West Flanders = 128; Flemish Brabant = 74
Weather conditions	Normal = 2275; Other = 248; Missing = 191	Normal = 514; Other = 52; Missing = 45
Light conditions	Daylight = 1462; Other = 1171; Missing = 81	Daylight = 308; Other = 282; Missing = 21
Dead child – Age 0–12 years old	Yes = 55; No = 2659	Yes = 29; No = 582
Dead teenager – Age 13–17 years old	Yes = 71; No = 2643	Yes = 32; No = 579
Dead young adult – Age 18–29 years old	Yes = 799; No = 1915	Yes = 203; No = 408
Dead adult – Age 30–64 years old	Yes = 1285; No = 1429	Yes = 297; No = 314
Dead senior – Age 65 and older	Yes = 542; No = 2172	Yes = 88; No = 523
Dead woman	Yes = 607; No = 2107	Yes = 171; No = 440
Dead man	Yes = 2147; No = 567	Yes = 475; No = 136
Pedestrian involved	Yes = 288; No = 2426	Yes = 63; No = 548
Cyclist involved	Yes = 377; No = 2337	Yes = 79; No = 532
Moped involved	Yes = 62; No = 2652	Yes = 9; No = 602
Motorcycle involved	Yes = 396; No = 2318	Yes = 56; No = 555
Bus involved – includes public transport buses as well as touring cars	Yes = 47; No = 2667	Yes = 19; No = 592
HGV involved – heavy goods vehicle	Yes = 731; No = 1983	Yes = 200; No = 411
Driver under influence of alcohol	Yes = 136; No = 2578	Yes = 41; No = 570
Driver under influence of drugs	Yes = 3; No = 2711	Yes = 1; No = 610
Motorway – did the crash take place on a motorway?	Yes = 377; No = 2337	Yes = 143; No = 468

models. All presented models in Section 5 satisfy the multicollinearity and model fit checks.

5. Results

5.1. Descriptive statistics

Table 1 shows the descriptive statistics of the database for all injury crashes, while Table 2 shows the descriptive statistics for the fatal crash database. The left column of these tables contains the variable name and description. The middle column shows the descriptive statistics for all crashes (both the ones that have been on the news and the ones that have not), and the right-most column shows the descriptive statistics for the crashes that have been in the news only (i.e. where NEWS = 'Yes').

It should be noted that the term 'fatal crash' is used in this study in a slightly different way than usual. Usually, victims who die shortly after the crash (in Flanders: within 30 days after the crash) as a cause of the injuries they incurred are also considered as fatalities. However, in this paper it is decided to consider fatal crashes as crashes with at least one 'on the spot' fatality. This decision has been made because media usually report about crashes shortly after they have taken place (95% of the news items in our database report about a crash that has taken place on that same day or the day before). Therefore, these victims will often only be considered as injured victims by the media, rather than fatalities.

The variables used for both analyses are largely the same. The main difference is the use of the number of fatal victims in the model for fatal crashes instead of the total number of involved victims. Also the age group of the fatal victims instead of all involved victims is integrated in the model for fatal crashes.

In the research period 2006–2012, 183,822 traffic crashes with deceased and injured people took place on the public road in Flanders. The dependent variable indicates whether the crash has been reported in the television news or not. The main broadcasters in Flanders covered in total 1122 traffic crashes (0.6% of all injury crashes). The private station VTM reports about a substantially higher number of injury crashes (849) than the public channel VRT (530). 257 crashes are reported by both television channels, which implies that 592 crashes are only reported on the private channel VTM, while 273 crashes are reported on the public channel VRT.

The television news reporting rate of fatal crashes is significantly higher: 611 out of a total of 2714 fatal crashes (22.5%) are reported by at least one of these broadcasters. In total, the private channel VTM reports about 498 fatal crashes, while public channel VRT reports about 281 fatal crashes. 168 fatal crashes are reported by both television channels, which implies that 330 fatal crashes are only reported on the private channel VTM, while 113 crashes are only reported on the public channel VRT.

5.2. Selection criteria models for all injury crashes

Table 3 indicates all variables that are related to the probability of being reported in the television news for the full database of all injury crashes. The left-most two columns indicate the variable and (if applicable) the different categories for categorical variables. Columns 3–6 represent the general model for both channels combined, including the parameter estimate, the standard error (SE), the *p*-value and the odds ratio (OR) respectively. Columns 7–10 show the same elements for the sub model for the public channel (VRT), and columns 11–14 for the sub model for the private channel (VTM). Since the sub models for both channels do not strongly differ from the general model for both channels combined, we will mainly discuss the general model, and only point out noteworthy differences for the sub models. The variables that have an impact on the probability of being reported can be subdivided in characteristics describing the crash severity, time and place of the crash, the victims' personal characteristics and the types of road users involved.

A higher number of involved victims increases the probability that the crash gets reported in the media. The variable 'maximum injury severity' indicates a much stronger probability of a crash being reported by the media in case there is a fatally injured victim. Severe injury crashes have a lower probability of being reported in the television news than fatal crashes, but a higher probability than slight injury crashes.

A number of variables describing the moment the crash takes place has a significant impact on the probability of being reported in the media. The variable 'year' indicates that crashes that take place in the 2008–2011 period have a significantly lower probability of being reported than crashes in 2006, 2007 and 2012. Crashes in 2010 had the lowest probability of being reported in the media. The variable 'month' mainly shows that crashes that take place in January have a significantly higher probability of being reported in the television news than crashes in other months. Some indications for a lower probability of being reported for crashes in March, May, June and October are also present in the data, but these are less distinct. The variable 'time of week' indicates that crashes that occur during weekend nights have the highest probability to get media attention, while crashes that happen on week days during daytime have the lowest probability to get media attention. A double pattern seems to be present in this variable: crashes during nighttime are more likely to get reported than crashes during daytime, and crashes in weekends are more likely to get reported than crashes on week days.

A number of crash location factors also play a role. Different provinces have different reporting rates. While crashes that take place in the province of Antwerp have a significantly higher probability of being reported in media than crashes in any of the other provinces, crashes that take place in the province of Limburg have the lowest probability of being reported. Furthermore, all models show a significantly higher probability of being reported for crashes that take place on motorways (OR = 2.51). The general model shows a higher reporting about crashes that take place inside built-up areas compared to crashes outside built-up areas, but the variable is not significant in the sub models for both channels.

A number of characteristics of the involved victims and road users also have an influence on the probability that the crash is reported in the media. Injury crashes that involve children (OR = 2.11), teenagers (OR = 1.91) and young adults (OR = 1.24) are significantly more reported by media. Crashes involving buses and heavy goods vehicles (HGV) have a higher chance to get into the news (OR = 5.01 and OR = 2.08, respectively), while crashes involving powered two-wheelers (i.e. mopeds and motorcycles) have a significantly lower probability of being reported (OR = 0.23 and OR = 0.54, respectively). Crashes involving cyclists also have a lower probability of being reported, but only on the commercial channel VTM.

5.3. Models for fatal crashes

Table 4 indicates all variables that are related to the probability of being reported in the media for fatal crashes. The structure of the table is similar to the previous table.

The number of fatalities in the crash has a positive correlation with media reporting: a higher number of fatal victims significantly increases the probability that the crash is reported in the media. The variables 'year' and 'month' are also relevant and they are roughly in line with the general model for all injury crashes, although the patterns are not as distinct: there are some

Table 3
Selection criteria models – all injury crashes.

Variable	Categories	Model for both channels				Model for public channel VRT				Model for private channel VTM			
		Estimate	SE	*p*-value	OR	Estimate	SE	*p*-value	OR	Estimate	SE	*p*-value	OR
Intercept		−6.79	0.21	<**0.01**		−7.51	0.28	<**0.01**		−7.23	0.23	<**0.01**	
# Involved victims		0.42	0.03	<**0.01**	1.52	0.43	0.04	<**0.01**	1.53	0.42	0.04	<**0.01**	1.52
Max. injury scale	Fatal	5.18	0.09	<0.01	177.44	4.89	0.12	<0.01	132.29	5.41	0.10	<0.01	224.21
	Severe inj.	1.76	0.09	<0.01	5.80	1.71	0.13	<0.01	5.55	1.96	0.11	<0.01	7.11
	Slight inj.	0 (ref)		<**0.01**		0 (ref)		<**0.01**		0 (ref)		<**0.01**	
Year	2006	0.18	0.12	0.14	1.20	0.27	0.17	0.10	1.32	0.10	0.14	0.44	1.11
	2007	0.23	0.12	0.06	1.26	0.52	0.16	<0.01	1.69	0.04	0.14	0.76	1.04
	2008	−0.32	0.13	0.02	0.73	−0.71	0.21	<0.01	0.49	−0.24	0.14	0.10	0.79
	2009	−0.26	0.13	0.05	0.77	−0.10	0.18	0.60	0.91	−0.37	0.15	0.01	0.69
	2010	−0.85	0.15	<0.01	0.43	−0.80	0.22	<0.01	0.45	−0.73	0.17	<0.01	0.48
	2011	−0.33	0.14	0.02	0.72	−0.32	0.19	0.09	0.72	−0.19	0.15	0.20	0.83
	2012	0 (ref)		<**0.01**		0 (ref)		<**0.01**		0 (ref)		<**0.01**	
Month	Jan	0.36	0.15	0.02	1.43	0.10	0.21	0.63	1.11	0.39	0.17	0.03	1.47
	Feb	−0.15	0.17	0.36	0.86	−0.11	0.22	0.63	0.90	−0.17	0.19	0.37	0.84
	Mar	−0.55	0.18	<0.01	0.58	−0.58	0.24	0.02	0.56	−0.43	0.19	0.02	0.65
	Apr	−0.21	0.16	0.20	0.81	−0.20	0.22	0.37	0.82	−0.23	0.19	0.22	0.80
	May	−0.34	0.16	0.04	0.71	−0.60	0.23	<0.01	0.55	−0.27	0.18	0.13	0.76
	June	−0.45	0.17	<0.01	0.64	−0.40	0.23	0.08	0.67	−0.36	0.19	0.06	0.70
	July	−0.11	0.16	0.49	0.89	−0.00	0.21	0.98	1.00	−0.26	0.19	0.17	0.78
	Aug	−0.10	0.16	0.52	0.90	−0.23	0.22	0.29	0.79	−0.05	0.18	0.76	0.95
	Sep	−0.27	0.16	0.10	0.77	−0.56	0.23	0.02	0.57	−0.16	0.18	0.37	0.85
	Oct	−0.47	0.17	<0.01	0.62	−0.52	0.23	0.02	0.59	−0.49	0.19	0.01	0.61
	Nov	−0.09	0.16	0.59	0.92	−0.26	0.22	0.23	0.77	−0.07	0.18	0.71	0.94
	Dec	0 (ref)		<**0.01**		0 (ref)		<**0.01**		0 (ref)		<**0.01**	
Time of week	Week day	−0.66	0.10	<0.01	0.52	−0.83	0.13	<0.01	0.44	−0.54	0.11	<0.01	0.59
	Week night	−0.22	0.14	0.12	0.80	−0.40	0.19	0.03	0.67	−0.33	0.16	0.04	0.72
	Weekend day	−0.44	0.12	<0.01	0.64	−0.71	0.16	<0.01	0.49	−0.28	0.13	0.03	0.76
	Weekend night	0 (ref)		<**0.01**		0 (ref)		<**0.01**		0 (ref)		<**0.01**	
Province	Antwerp	0.24	0.11	0.03	1.27	0.28	0.15	0.05	1.33	0.09	0.12	0.46	1.09
	Limburg	−0.36	0.14	<0.01	0.70	−0.27	0.18	0.14	0.76	−0.35	0.15	0.02	0.70
	East Flanders	−0.10	0.12	0.38	0.90	−0.19	0.16	0.22	0.82	−0.06	0.13	0.63	0.94
	West Flanders	−0.19	0.12	0.12	0.83	−0.17	0.17	0.31	0.84	−0.19	0.13	0.15	0.82
	Flemish Brabant	0 (ref)		<**0.01**		0 (ref)		<**0.01**		0 (ref)		<**0.01**	
Motorway		0.92	0.09	<**0.01**	2.51	1.12	0.11	<**0.01**	3.05	0.83	0.10	<**0.01**	2.30
Inside built-up area		−0.27	0.09	<**0.01**	0.76								
Child involved		0.75	0.12	<**0.01**	2.11	0.62	0.17	<**0.01**	1.86	0.77	0.14	<**0.01**	2.16
Teenager involved		0.65	0.12	<**0.01**	1.91	0.38	0.18	**0.03**	1.47	0.83	0.13	<**0.01**	2.29
Young adult involved		0.22	0.07	<**0.01**	1.24	0.27	0.10	<**0.01**	1.31	0.22	0.08	<**0.01**	1.25
Cyclist involved										−0.65	0.13	<**0.01**	0.52
Moped involved		−1.47	0.27	<**0.01**	0.23	−1.97	0.51	<**0.01**	0.14	−1.51	0.29	<**0.01**	0.22
Motorcycle involved		−0.62	0.14	<**0.01**	0.54	−0.94	0.23	<**0.01**	0.39	−0.73	0.16	<**0.01**	0.48
Bus involved		1.61	0.16	<**0.01**	5.01	1.81	0.20	<**0.01**	6.13	1.38	0.19	<**0.01**	3.98
HGV involved		0.73	0.08	<**0.01**	2.08	0.78	0.10	<**0.01**	2.17	0.52	0.09	<**0.01**	1.67
Max-rescaled R-square		0.38				0.35				0.39			
Hosmer–Lemeshow		Chi-square = 11.21, df = 8, p = 0.19				Chi-square = 10.05, df = 8, p = 0.26				Chi-square = 11.75, df = 8, p = 0.16			

p-values in bold represent the type 3 test significance (i.e. significance of the variable as a whole). For categorical variables (>2 categories), these values are included in the line of the reference category. *p*-values not in bold represent the significance of a category compared to the reference category.
Odds ratios for each category of a categorical variable are expressed compared to the reference category.
Empty cells for a specific variable in a specific model indicate that the variable is not included in that specific model.

Table 4
Selection criteria models – fatal crashes.

Variable	Categories	Model for both channels				Model for public channel VRT				Model for private channel VTM			
		Estimate	SE	*p*-value	OR	Estimate	SE	*p*-value	OR	Estimate	SE	*p*-value	OR
Intercept		−3.05	0.33	<**0.01**		−4.78	0.38	<**0.01**		−3.20	0.34	<**0.01**	
# Fatal victims		1.66	0.18	<**0.01**	5.25	1.56	0.18	<**0.01**	4.76	1.58	0.17	<**0.01**	4.87
Year	2006	−0.23	0.18	0.21	0.79	0.03	0.26	0.91	1.03	−0.28	0.19	0.15	0.76
	2007	−0.08	0.18	0.67	0.93	0.21	0.25	0.40	1.24	−0.21	0.19	0.28	0.81
	2008	−0.48	0.19	0.01	0.62	−0.79	0.30	<0.01	0.45	−0.47	0.20	0.02	0.62
	2009	−0.51	0.19	<0.01	0.60	−0.12	0.27	0.65	0.89	−0.69	0.21	<0.01	0.50
	2010	−0.88	0.21	<0.01	0.42	−0.54	0.30	0.07	0.58	−0.78	0.22	<0.01	0.46
	2011	−0.25	0.19	0.19	0.78	−0.19	0.27	0.50	0.83	−0.17	0.20	0.41	0.85
	2012	0 (ref)		<**0.01**		0 (ref)		<**0.01**		0 (ref)		<**0.01**	
Month	Jan	0.25	0.25	0.32	1.29					0.43	0.27	0.10	1.54
	Feb	0.09	0.24	0.70	1.10					0.13	0.26	0.61	1.14
	Mar	−0.60	0.26	0.02	0.55					−0.35	0.27	0.20	0.71
	Apr	−0.04	0.24	0.86	0.96					−0.15	0.26	0.58	0.86
	May	−0.23	0.24	0.34	0.79					−0.26	0.26	0.31	0.77
	June	−0.79	0.27	<0.01	0.46					−0.70	0.29	0.02	0.50
	July	0.09	0.24	0.71	1.09					−0.00	0.26	1.00	1.00
	Aug	−0.06	0.24	0.81	0.94					0.05	0.26	0.86	1.05
	Sep	−0.12	0.24	0.62	0.89					0.05	0.26	0.84	1.05
	Oct	−0.50	0.26	0.05	0.61					−0.51	0.28	0.07	0.60
	Nov	−0.04	0.24	0.86	0.96					0.14	0.26	0.59	1.15
	Dec	0 (ref)		<**0.01**						0 (ref)		<**0.01**	
Weekend		0.30	0.10	<**0.01**	1.36	0.43	0.15	<**0.01**	1.54	0.33	0.11	<**0.01**	1.39
Province	Antwerp	0.47	0.17	<0.01	1.60	0.83	0.26	<0.01	2.29	0.33	0.19	0.08	1.39
	Limburg	0.03	0.19	0.86	1.03	0.43	0.29	0.13	1.54	−0.02	0.21	0.91	0.98
	East Flanders	0.44	0.17	0.01	1.55	0.58	0.26	0.03	1.78	0.47	0.18	0.01	1.60
	West Flanders	0.09	0.18	0.60	1.10	0.36	0.27	0.19	1.43	0.05	0.19	0.80	1.05
	Flemish Brabant	0 (ref)		<**0.01**		0 (ref)		**0.01**		0 (ref)		<**0.01**	
Motorway		0.87	0.13	<**0.01**	2.39	0.95	0.18	<**0.01**	2.58	0.84	0.14	<**0.01**	2.32
Inside built-up area						0.45	0.18	**0.01**	1.58				
Dead child		1.29	0.30	<**0.01**	3.64	1.08	0.37	<**0.01**	2.93	1.33	0.31	<**0.01**	3.77
Dead teenager		0.91	0.27	<**0.01**	2.49					1.03	0.27	<**0.01**	2.79
Dead senior		−0.46	0.14	<**0.01**	0.63	−0.59	0.21	<**0.01**	0.55	−0.32	0.15	**0.03**	0.73
Dead woman		0.26	0.12	**0.03**	1.30								
Driver under influence of alcohol						0.66	0.26	**0.01**	1.93				
Motorcycle involved		-0.53	0.16	<**0.01**	0.59	−0.86	0.26	<**0.01**	0.43	−0.51	0.18	<**0.01**	0.60
Bus involved		1.00	0.32	<**0.01**	2.71	1.72	0.35	<**0.01**	5.57				
HGV involved						0.43	0.16	<**0.01**	1.54				
Max-rescaled R-square		0.18				0.18				0.16			
Hosmer–Lemeshow		Chi-square = 8.50, df = 8, *p* = 0.39				Chi-square = 1.89, df = 8, *p* = 0.98				Chi-square = 11.63, df = 8, *p* = 0.17			

p-values in bold represent the type 3 test significance (i.e. significance of the variable as a whole). For categorical variables (>2 categories), these values are included in the line of the reference category. *p*-values not in bold represent the significance of a category compared to the reference category.

differences between the different models, and the variable 'month' does not appear in the sub model for the public channel VRT. The variable 'weekend' indicates that crashes that take place during the weekend have a significantly higher probability of being reported. This variable is chosen over the variable 'time of week' in the previous models since it appears that fatal crashes that happen during weekend days as well as during weekend nights have a significantly higher probability of being reported in the news.

Also in the model for fatal crashes the variable 'province' indicates that crashes in Antwerp have a significantly higher probability of being in the media. Furthermore, also fatal crashes in the province East Flanders have a higher probability to get reported than crashes in other provinces. However, fatal crashes in Limburg do not have a lower probability of being reported; fatal crashes in Limburg, West Flanders and Flemish Brabant have similar probabilities of being reported in the television news. The general model and the sub model for the commercial channel VTM indicate a higher probability of being reported for crashes in the province East Flanders. Again, the variable 'motorway' clearly indicates that fatal crashes that take place on a motorway are significantly more reported in the media than crashes on other roads (OR = 2.39). The sub model for the public channel VRT indicates that crashes that occur in built-up areas have a significantly higher chance of being reported on VRT than crashes outside built-up areas.

Similar to the models for all injury crashes, it appears that crashes in which a child (OR = 3.64) or a teenager (OR = 2.49) dies have a higher probability of being reported in the media (although the variable 'dead teenager' is not significant in the sub model for the public channel VRT), while crashes in which a senior (OR = 0.63) dies have a significantly lower probability. The general model also indicates that crashes in which a woman dies have a higher probability of being covered in the media than crashes in which no woman dies (OR = 1.30). The sub model for the public channel VRT indicates a higher reporting of crashes involving a driver under the influence of alcohol.

In line with the previous models, we observe that crashes with motorcycles have a significantly lower chance of being reported in the media (OR = 0.59), while crashes involving a bus have a significantly higher chance (OR = 2.71) (except in the sub model for the commercial channel VTM). Fatal crashes with heavy goods vehicles only have a higher probability of being reported in the sub model for the public channel VRT.

6. Discussion

6.1. Interpretation of results

An overall result is that all variables that indicate the severity of the crash (in terms of maximum severity level, number of involved victims and number of fatalities) have a significant impact on the probability of being reported in the media. Generally, the more severe the crash and its consequences, the higher the probability that it is reported in the media. This is in line with other research, confirming that media tend to focus on more dramatic news events (Combs and Slovic, 1979; Daniels et al., 2010; Galtung and Ruge, 1965; Tresch, 2008; Woodcock, 2008).

From all models it appears that the probability of crashes being reported in the television news depends on a number of aspects describing the moment the crash has taken place. Media selection does not accurately mirror fluctuations of crashes over time; significant deviations are observed over the different years and months. The patterns are not always similar, but this clearly indicates that some structural biases exist in the media reporting rate of crashes. Since people assume that a higher number of reports in media reflect a true increase in the number of events that have taken place (Kepplinger and Habermeier, 1995), this could bias people's perceptions of (short-term) evolutions in crashes. This is in line with media research in other fields, indicating for example that media coverage of criminal events does not accurately reflect fluctuations in official crime statistics (Ghanem, 1996; Graber, 1990). The public arenas model (Hilgartner and Bosk, 1988) treats public attention as a scarce good, emphasizing that news selection is the result of competition between different news events. These dynamics of competition can lead to fluctuations in the attention for a specific societal issue. The presence of the 'year' and 'month' variables may be an expression of this competition between the societal issue of traffic crashes and other relevant issues in society.

The exact causes of these fluctuations are not always clear. In terms of the month in which the crash occurred, two possible patterns could have been expected, namely a 'silly season' effect and an 'end of year period' effect. During the summer period ('silly season'), there is generally less news to be reported, which could for instance lead to reporting more traffic crashes in the news. However, this pattern does not emerge from the data; crashes during the summer do not have an increased probability of getting media attention. During the end of year period (December–January), a lot of sensitization campaigns are held (mainly about driving under the influence of alcohol). Crashes that take place in January generally have the highest probability of getting reported in the media. Also for crashes that take place in December, there is a relatively high probability of getting reported in the media, although the patterns for December are less pronounced and not significant. This can be seen as an indication that an 'end of year period' effect may exist in the television news reporting about traffic crashes.

Fatal crashes during weekends get in the television news significantly more often than fatal crashes during the week. Furthermore, injury crashes during weekend nights have the highest probability of getting reported in the news, while injury crashes on week days during daytime have the lowest probability of getting reported. This could bias people's perception about the prevalence of road crashes as well. In the present case, this could lead people to overestimate the share of weekend crashes in the total number of crashes. These findings are largely in line with Daniels et al. (2010), who found that the probability that crashes get reported in newspapers is not similar for all years, and that crashes on Saturdays have a higher probability of being reported in newspapers than crashes on other days.

Also locational aspects of the crashes play an important role. Especially crashes that happen on a motorway have a higher probability of being reported in the television news. A possible explanation could be that crashes on motorways often lead to serious traffic jams and related economic losses. This implies that the consequences they produce can be considered higher and affect more people. The news value theory (Galtung and Ruge, 1965) states that the newsworthiness of an event, that is determined by a number of characteristics of the event, influences the probability that the event is reported in the media. Our interpretation is that crashes on motorways are considered more newsworthy because they lead to higher consequences, and therefore these crashes are more likely to get reported in the news.

The province in which the crash has taken place has a significant impact as well. The most distinct finding is that crashes in the province of Antwerp, and also in East Flanders in the case of fatalities, are generally more represented in the media, while injury crashes in Limburg are less represented in the media. A possible explanation could be that Antwerp and East Flanders are the provinces with the highest populations, while Limburg is the province with the lowest number of inhabitants (1.7 and 1.4 vs. 0.8 million inhabitants, respectively (Statistics Belgium, Belgian Federal Government, 2013)). Broadcasting stations might think that a larger audience could be interested in crashes that take place in these provinces with higher populations. On the other hand, the news routine theory (Gans, 2005; Tuchman, 1980) acknowledges that everyday practicalities can have a substantial impact on news selection. In line with this theory, we might have expected a higher probability of media attention for crashes that take place closer to the headquarters of both broadcasting stations, and a lower probability of media attention for crashes that occur further away from the headquarters. Since both headquarters are situated within the province of Flemish Brabant, this theory would predict a higher probability of being reported in the media for crashes in the province of Flemish Brabant, and the lowest probability for the most peripheral provinces Limburg and West Flanders. However, these patterns are only partly observed.

The general model for all injury crashes for both channels and the sub model for the public channel VRT for fatal crashes also include the variable 'built-up area'. However, the former indicates a lower representation of crashes in built-up areas, while the latter indicates a higher representation of crashes in built-up areas. The impact of whether the crash takes place inside built-up area or not therefore remains quite unsure.

The models also reveal that there are a number of significant biases in media reporting about traffic crashes regarding age and gender of the involved victims. The most pronounced finding is that crashes that involve children under 12 years old have significantly higher chance of being reported in the media. Nearly all models also indicate a higher reporting of crashes that involve teenagers. Furthermore, the models for all injury crashes show a higher representation of crashes involving young adults, while the models for fatal crashes indicate that crashes in which a senior dies are less likely to be reported in the media. Therefore, there seems a clear trend that, the younger the involved victims are, the higher the probability is that the event is reported in the news.

A likely explanation is that crashes involving young people (especially in case they die in the crash) are considered more dramatic. However, a possible additional explanation for the higher representation of young adults in the models for all injury crashes may also be that young drivers are generally an important risk group in traffic crashes. These findings can be related to the finding by Beullens et al. (2008) that the age of victims is most often explicitly mentioned in the news in case the victims are younger than 30. This finding also seems to imply a focus on younger victims. The higher representation of young victims in the media may increase the perception of the road being an unsafe place for youngsters. While this may be partly true, a too negative perception of the road safety of youngsters may lead parents to behave in an overprotective way, discouraging them to allow children and teenagers to travel independently. A trend of decreasing independent mobility for children and teenagers is already observed in many countries (Fyhri et al., 2011). Such trend is highly undesirable because it has negative consequences for their health, psychology and environment (Fyhri and Hjorthol, 2009).

The models for fatal crashes indicate a higher representation of crashes involving a female fatality. A possible explanation could be that women are a lower proportion of traffic fatalities (only 24% of Flemish fatalities are female (Nuyttens et al., 2014)), and therefore could raise more interest due to the lower frequency of crashes involving female fatalities. Furthermore, some studies looking at the content of media items indicate that the gender of women is more often explicitly mentioned than the gender of men (Banwart et al., 2003; Niven, 2005; Niven and Zilber, 2001). This could indicate a tendency by the media to emphasize more on female actors. Daniels et al. (2010) however found no significant age and gender effects on the newspaper reporting of motorcycle crashes.

The types of road users involved in the crash also have a significant impact on the probability that the crash is reported in the media. The most pronounced patterns are the lower probability of media reporting of crashes involving a motorcycle, and the higher probability of reporting crashes involving a bus. A possible explanation for the relatively higher representation of crashes with buses in the media can be their low frequency, making them more unexpected and novel, hence more newsworthy (Galtung and Ruge, 1965). An overrepresentation of crashes involving buses in media might negatively influence the public perception of the safety of buses (both for using the bus as a passenger and for encountering them as an opposing road user in traffic). This may lead to a more negative attitude towards public (bus) transit, which can be seen as a negative implication because public transit is generally a very safe and sustainable means of transportation (Elvik, 2009; Evans, 2004). On the other hand, motorcyclists have a higher involvement in crashes than would be expected based on their exposure (Haque et al., 2010). In other words, motorcycle crashes are more common than would be expected based on their importance as a transport mode expressed in vehicle kilometres. This relatively high frequency of motorcycle crashes may partly explain why they are relatively less reported in media. The lower reporting of motorcycle crashes may lead people to underestimate the riskiness of motorcycles as a transport mode. A somewhat remarkable finding is the fact that injury crashes involving mopeds have a significantly lower probability of being reported in the news, while the variable is not significant in the models for fatal crashes. Injury crashes with heavy goods vehicles have a higher probability of being covered by the media, but the pattern is much less pronounced for fatal crashes. In the models for fatal crashes, the variable is only included in the sub model for the public channel VRT. For bicyclists and pedestrians, few significant deviations were found. Only the sub model for the commercial channel VTM for all injury crashes indicates a lower reporting of crashes involving bicyclists.

The involvement of drivers who are under the influence of alcohol or drugs does not seem to correlate strongly with the probability of being reported by the media. Only the sub model for the public channel VRT for fatal crashes shows a significantly higher representation of fatal crashes involving a driver under the influence of alcohol.

A final conclusion is that the differences in selection criteria between the public channel VRT and the commercial channel VTM seem to be fairly limited. Most variables in the sub models for both channels are the same as the general model, and the direction of the effect is nearly always similar. The commercial channel VTM however reports about a significantly higher number of crashes than the public channel VRT.

6.2. Strengths, limitations and further research

This study is unique both in its focus as well as in the data that are used. The literature review reveals that media reporting of traffic crashes has not been studied extensively before. From the perspective of traffic safety research, the insights of this study are relevant because they can contribute to understanding how mass media reporting may influence people's perceptions of traffic safety. Further research is however needed to understand to what extent mass media reporting about crashes does indeed influence people's perceptions of traffic safety, and what effects these perception biases have on people's behaviour.

From the perspective of media research, a unique characteristic of this study is that the link with official crash statistics allows us to make a comparison between the media reporting and a decent measurement of 'the reality'. For other topics in media reporting (such as politics), 'the reality' is often unclear, which makes it difficult to investigate selection procedures in the media. Despite the fact that crash statistics have some well-known issues regarding underreporting, this should be considered as an important strength of the study.

In this study, the probability of a crash being reported in the media is linked to a number of objective characteristics of the crash. The study therefore explores the implicit selection criteria. This implies that such considerations are not (always) consciously made by editors. While this is interesting, a limitation of this approach is that the interpretation of reasons why such characteristics influence the probability of being reported in the media is somewhat uncertain. Further research could therefore focus on detailed content analyses of news items about traffic crashes, as well as structured interviews or focus groups with editors. Such studies may provide more insight in the underlying reasons why these specific characteristics of crashes influence the probability of being reported in the media. Furthermore, the study only includes independent variables that are registered in the crash database. There could however also be other aspects that affect the probability that a crash is reported in the media. For example, crashes involving a celebrity could be considered more newsworthy by editors and therefore be more likely to get reported in the media. Further research using other data or methods may therefore reveal additional aspects that affect the probability that a crash is reported in the media.

The length of the news broadcasts may have an influence on the number of crashes that are reported. Our database does not provide accurate information about the length of the broadcasts. Therefore, we cannot fully exclude the possibility that unknown systematic patterns in the length of the news broadcasts may affect the results. To the best of our knowledge, the only systematic pattern in news broadcast length is that news broadcasts during weekends are shorter than news broadcasts during weekdays (approximately 30 min on weekend days vs. 40–45 min on week days). However, we do not believe that news length has a substantial effect on the results because we do not take the length of news items into account, and because the results show that crashes that take place during the weekends are more likely to get reported in the media than crashes during week days, despite the fact that broadcasts during weekends are shorter on average.

Since few studies have focused on selection criteria for reporting traffic crashes in media, further research is needed to assess the generalizability of the results. 'Generalizability' should here be interpreted both in terms of generalizability to other countries and/or other television channels, as well as in terms of generalizability to other types of mass media (such as newspaper reporting about traffic crashes).

7. Conclusions

Five types of crash characteristics have been identified to have an impact on the probability of the crash being reported in the prime time television news. These are characteristics related to the crash severity, the moment the crash takes place, the location of the crash, personal characteristics of the involved victims and finally the involved road user types. This indicates that the number and the nature of reported crashes in the television news not always exactly follow the reality.

More severe crashes (in terms of the number of victims and the severity of injuries) are more often reported in the media. Significant variations in the probability of being covered by news broadcasts are observed over time (in terms of year and month in which the crash takes place). Crashes during week days are generally less reported in media compared to crashes during the weekend. The province in which the crash takes place also has a significant impact on the probability of being reported in the media. Crashes on motorways are significantly more represented in the media. Regarding the age of the involved victims, a clear trend of a higher probability of reporting of crashes involving young victims or young fatalities can be observed in the media. Especially crashes involving children and teenagers have a higher probability of being reported in the media. Crashes involving female fatalities also seem to have a higher probability of being reported by media. Considering the involved types of road users, crashes involving a bus have a significantly higher chance of being reported in the media, while crashes involving a motorcycle have a significantly lower chance. Some of the models indicate a lower reporting of crashes involving a moped, and a higher reporting of crashes involving heavy goods vehicles.

These findings indicate that a number of significant biases are present in the media reporting of crashes. These biases in media reporting can create skewed perceptions about the issue of traffic safety, which could in turn have unfavourable effects on people's behaviour.

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