

A (non) agenda-setting study

The framing of electric vehicles in the news of Aotearoa New Zealand and its (non) role in their use

Abstract: This article explores the news media framing of electric vehicles (EVs) in New Zealand and theorises the role it may have played in the uptake of EVs in the country. The results were unexpected as they did not reflect previous research. The positive valence of EVs, battery life, carbon emissions, the environment, range, public or personal costs, positive public opinion, positive evaluative language and battery reuse were not emphasised at all in the coverage sampled. Instead, the results showed there was a significant focus only on EVs' technological features, such as smart technology. However, despite the lacklustre media coverage of EVs in New Zealand, the sales of EVs went up. This disconnection between previous research detailing the importance of positive media framing and subsequent behaviour has implications for further research examining media effects.

Keywords: agenda setting, climate change, content analysis, EV, electric cars, environment, media framing, newspapers, New Zealand.

LINDA-JEAN KENIX
University of Canterbury

JORGE BOLANOS
Universidad ECOTEC, Ecuador

Introduction

AS THE climate change discussion has intensified, different markets have upgraded their products and services to emphasise features that claim to minimise their impact on the environment. In the transport field, the importance of eco-innovation has arisen with a focus on fossil fuels (Hussain, 2021). Many globalised economies are being challenged to decrease their energy consumption and update technologically outdated equipment (Yang, Jahanger, & Ali, 2021). In this regard, the automotive industry has, in recent years, given more attention to the development of vehicles fuelled by electricity

rather than fossil fuels. However, the increase in the uptake of electric vehicles (EVs) seems to rely on several factors, including cost and EV infrastructure.

EV infrastructure is a potential constraint on EV purchases as potential buyers must be reassured that owning an EV does not provide larger constraints than owning a petrol vehicle. The main areas of concern, in terms of infrastructure are the number of charging stations, the time it takes to fully charge an EV and how difficult it is to locate spare parts if needed (Elkind, 2012).

The cost of EVs is another significant factor that affects the public's perception of such vehicles, and therefore the likelihood of their purchase (Broadbent, Wiedmann, & Metternicht, 2021). The prices of EVs are higher than for petrol cars. To mitigate many of these up-front costs, some governments have enacted policies to encourage the purchase of EVs. For instance, in New Zealand, one proposed policy was for high emissions petrol vehicles to pay additional costs over those driving an EV (Gleisner & Weaver, 2006). The New Zealand government has offered a financial rebate to those who purchase an EV. With similar policies in other regions, there has been a consistent increase worldwide in recent years of EV purchases. For example, from 2019 to 2022, the number of EV car registrations in China went from around 5 percent to just over 25 percent of the market share (THINK, 2023). Similarly, Europe registered 261,000 EV sales in 2021 and the United States 149,000, which was a much higher number than the 194,000 and 122,000 in 2018, respectively (Kopestinsky, 2021).

In New Zealand, the trend is similar with a double increase in the same period, from 6,929 EVs sold in 2018 to 12,744 in 2019 (Ministry of Transport, 2022). Furthermore, according to the Energy Efficiency and Conservation Authority (EECA), in June 2021 it was estimated that from a total of 3.3 million light vehicles, around 27,925 were EVs. By comparison, the Ministry of Transport's statistics for the same year show that there has been a total of 34,123 EV car registrations, along with an increase in the total number of the EV fleet to 37,161 in December 2021. (The total number of the fleet refers to the total number of new and used EV cars located in New Zealand.) This increase is notable given that this was during the COVID-19 pandemic when overall car purchase trends were declining compared to previous years (Energy Efficiency & Conservation Authority, 2021).

Additionally, public opinion data run by local media outlets in recent years has suggested a growing interest in EV vehicles. The intention to buy EVs increased from 2017 to 2019 (1 News, 2019). This positive attitude towards the purchase of EVs was accompanied by support for policies that encouraged their use, such as tax deductions for low-emission vehicles and subsidies aimed at lowering their price (Newshub, 2018, 2019; Stuff, 2019). The uptake of EVs has been noted to require education of car buyers, economic incentives and the creation of sufficient electric car infrastructure—all of which need to be com-

municated to the public through the media. (Elkind, 2012). Specifically, research has demonstrated that the education of car buyers on the benefits of EVs is likely to increase the uptake of EVs that also includes information on incentive programmes and EV infrastructure (Elkind, 2012).

This research examines news reports on EVs from the four highest circulating newspapers in New Zealand in an attempt to identify how EVs are portrayed in New Zealand news. Specifically, this analysis aims to tease out whether there are signs of agenda-setting on this topic, that is, positive coverage of EVs leading to increased purchases of EVs. The results of this analysis will then contribute to the literature on framing and agenda setting. In addition, this research will attempt to uncover the role that news reporting may have had in the use of EVs in New Zealand.

Media framing and agenda setting

Through a content analysis of EV reporting in New Zealand media, this study has attempted to explore how media framed the topic of EVs and whether there is an agenda-setting effect between the media framing of EVs and purchases of EVs in Aotearoa.

Media have the ability to frame information in ways that convey vastly different meanings. Frames are ‘organising principles that are socially shared and persistent over time, that work symbolically to meaningfully structure the social world’ (Reese, Gandy Jr., & Grant, 2001, p. 11). Frames implicitly hold evidentiary information that determines what is ‘relevant’ (Hertog & McLeod, 1995, p. 4) and suggest ‘what the issue is’ (Tankard Jr., et. al., 1991). Those who create media content ‘select some aspect of a perceived reality and make them more salient in a communicating text, in such a way as to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation for the item described’ (Entman, 1993, p. 52). Framing can be harmful, especially when presentations distort an issue or fail to provide solutions to those affected (Kensicki, 2004). That distortion can be manifested through presentations of the cause, effect or responsibility of an issue (Entman & Rojecki, 1993).

There has been a wealth of compelling findings suggesting news messages have a profound influence on how people think about issues. Media representations can define problems, diagnose causes, make moral judgments and suggest remedies. This process occurs through media frames, ‘which are manifested by the presence or absence of certain keywords, stock phrases, stereotyped images, sources of information, and sentences that provide thematically reinforcing clusters of facts or judgments’ (Entman, 1993, p. 52).

Media frames, over time, construct much of what is perceived as reality (Gamson, et. al., 1992) and their importance lies in their ability to create a specific narrative and build a ‘mediated reality’ (Entman, 2004). Here, it is worth

acknowledging that ‘mediated reality’ comes to reflect systemic power, which means that the lack of media representation can be considered a lack of power (Ferree, et. al., 2002). This means that when the reporting successfully portrays the purchase of EVs as a positive act—whether for climate change or for care for the environment—it provides a power to those purchasing EVs, which then can further increase interest in these vehicles (Love, et. al., 2018).

McCombs and Shaw (1972) first connected media frames to the salience of an issue in the public agenda and titled this process, agenda-setting. Later, McCombs defined agenda setting as ‘a theory about the transfer of salience of elements in the mass media’s pictures of the world to the elements in the pictures in our heads’. In other words, agenda setting as a theory, becomes apparent when media frames align with the public’s perception on a certain issue. As people often rely on the news to shape their ideas on a specific topic, the media’s function can be seen as the framework under which citizens build their ideas about a determined topic, such as EVs. Mainstream media play a pivotal role in setting up the topics of discussion for the public and how an issue then is framed, which can then influence public opinion (Ilona Grzywińska & Borden, 2012, p. 16).

The connection between climate change and EV reporting

EV vehicles do not produce emissions, and therefore, one would expect to see reporting that is connected to climate change. The media’s framing on climate change can have a degree of influence on how the public perceives EV vehicles, playing a role in their increase on the road (Broadbent et al., 2021). The connection between EV vehicles and climate change can provide the news media an opportunity to portray specific actions that can be taken to mitigate climate change, creating a positive effect on the readers’ subsequent actions (Broadbent et al., 2021). In this regard, even though research supports the supposition that scientific analysis builds trust and reduces uncertainty amongst prospective buyers of EVs (Love et al., 2018), previous research has found that most of the reporting on EV vehicles did not historically cover aspects usually seen in the reporting of petrol cars, such as safety or performance (Pollak & Zint, 2006). Instead, EV reporting focused more on technological features of EVs and not the connection between EV purchases and environmental improvement.

This connection between EVs and the science of climate change has not been found in research in other countries either. Focus groups with residents of urban and rural areas in the UK found there was little connection in their minds between EVs and climate change (Esmene, Taylor, & Leyshon, 2020). Additionally, other research has found the public is unlikely to see how general climate change messages may affect their lives and their means of transportation (Moser, 2016).

In New Zealand, previous research on climate change reporting has found that most of the news reports on climate change focus on a political perspective,

giving less prominence to scientific perspectives (Hopkins, et. al., 2015). This has meant that climate change has historically been considered more of a political issue rather than a scientific issue.

Previous research on the reporting of EVs in New Zealand found that print media was the main channel through which potential EV buyers would get information about EVs (Lemon & Miller, 2013). Potential EV buyers also use print media to get information about EV-related topics, such as policies to promote the uptake of EV cars and their environmental impact. However, the most significant message that readers receive in regards to EVs is generally focussed on their high costs (Broadbent et al., 2021). High costs are considered to be a factor that may be working against the uptake of EVs as readers may regard them as too expensive (Broadbent et al., 2021).

In New Zealand, there are several initiatives aimed at increasing the number of EVs in the country. For example, the Better NZ Trust is a community organisation that often holds EV showcasing events, that may be covered by the news media. Better NZ Trust holds these events in an attempt to increase the awareness of EVs and incentivise their purchase (Love et al., 2018). Additionally, in 2021, the New Zealand government also put in place financial incentives to support the use of electric cars. Through a clean car rebate, electric car buyers could get a rebate of up to \$7,500, which was expected to accelerate the increase of low and no-emissions vehicles in the country.

Methodology

This study carried out a quantitative content analysis of the New Zealand's newspaper reporting of EVs in an attempt to identify how EVs are portrayed to the public and explore whether this coverage correlated with EV purchases. By using this method, it was possible to identify trends in the reporting during a specific timeframe and examine the extent to which the reporting related to the number of EVs being purchased. Specifically, this research aimed to find reporting patterns in framing by answering the following questions:

RQ1: Does the framing of EVs become more positive or negative between 2017 and 2021?

RQ2: Does the prevalence of any EV frames concomitantly increase or concomitantly decrease over the period sampled?

RQ3: If an EV story is framed as environmental (rather than political, economic, or technological development), are the benefits of EVs discussed?

RQ4: Is there an agenda-setting association between the valence of EV coverage and the purchase of EV vehicles?

To answer these research questions, this study gathered news texts on electric cars in New Zealand from 2017, the year when electric vehicles were officially introduced in the New Zealand market, until July 2021. The highest-circulation newspapers in New Zealand were included for study. Additionally, the study purposely included the main city hubs in the country, as these were the places where the number of electric cars was likely to be higher (Agility PR Solutions, 2017; IPFS, 2018; Statista, 2018). This process resulted in focusing on newspapers that were predominantly circulated in Auckland, Wellington, Christchurch and Dunedin. The final selected newspapers were *The New Zealand Herald*, *Dominion Post*, *The Press* and *The Otago Daily Times*.

The research relied upon Factiva and filtered the search for data under the keywords electric vehicle*, electric vehicle*, electric car* and EV car*. Additionally, the search narrowed the appearance of data to these keywords being located only in the news texts' headlines, sub-headlines or lead paragraphs as these stories would likely be more relevant to the reader and could 'affect what existing knowledge can be activated in the audience' (Konnikova, 2014).

The process of ascertaining repeating patterns or themes from each source was guided by thematic analysis (Braun & Clarke, 2006), which used the research questions as a guide to then develop selection criteria of codes that were used for the quantitative content analysis. Definitions of essential terms and their importance to this study then emerged. An initial identification of themes was made first when examining the entire dataset and then those themes were continually refined after closer readings of the text. During this process, principal themes, that could not have been uncovered through segmented or cursory readings, began to emerge. The final 11 coding categories of media frames were determined from an exhaustive thematic analysis guided by the research questions: reference of EVs in the article, overall frame, overall valence of EVs, battery reuse, presence of evaluative language, presence of public opinion, personal cost, range, environment, carbon emissions and battery life.

As is the case with any study examining frames that are categorical by nature, there is nothing 'normal' about the data collected—meaning the coded media frames did not fall on a normally distributed curve and are not assumed to be representative of a larger population of frames. The frames found were representative only of the newspaper sampled, and not of any other newspapers that exist. A quantitative, non-parametric chi-square test was therefore utilised. Percentages, frequencies, chi-square correlations, observed counts, expected counts, and adjusted residual values, were all used to answer the research questions. No one measure itself provided strong evidence of a particular finding, but when taking cohesively, there could be a suggestion of associate

Two coders were used throughout this study to ensure inter-coder reliability. The Cohen's Kappa inter-observer reliability coefficient was used to indicate the

coding scheme's reliability. Ten percent of the total media sample was coded by another coder to determine intercoder reliability measures. Cohen's Kappa was used to determine intercoder reliability, which ranged from 89.16 percent to 95.18 percent for all of the coded variables. The overall intercoder Cohen's Kappa was 92.31 percent, suggesting a highly robust coding scheme.

Results

In total, 1,409 articles were examined: 460 in *The New Zealand Herald*, 407 in *The Dominion Post*, 389 in *The Press* and 153 in *The Otago Daily Times*. These articles were examined against a range of variables detailed in the coding sheet.

RQ1

The first research question asked: Does the coverage of EVs become more positive or negative between 2017 and 2021? Two variables were examined for this question: the overall valence of EVs and the positive evaluative language of EVs. Valence refers to the degree to which the articles are critical or complimentary of EV vehicles. Similarly, evaluative language is the amount of positive, negative, or neutral terms used by texts on a certain topic. Overall, 1,009 (71.6 percent) of 1,409 articles were found to have a positive valence toward EVs. Only 341 (24.2 percent) articles demonstrated neutral valence toward EVs. Positive evaluative language was highlighted in 661 news articles (46.9 percent), whereas negative evaluative language was found to be prevalent in only 92 news texts (6.5 percent). The relationship between the overall valence toward EVs and the year of publication was not found to be significant ($\chi^2 = 18.068$, $df = 16$, $p = .320$). However, there were 40 percent of cells with expected counts less than 5 meaning that a basic assumption of the chi-square test has been violated. Turning to another aspect of the data, the likelihood ratio ($\chi^2 = 16.072$, $df = 16$, $p = .405$) suggesting this relationship was insignificant. The directional measure (eta squared) between the year of publication and the overall valence toward EVs as a dependent variable shows that this is an inconsequential relationship. Eta squared (η^2), which measures effect size, shows how much variation is explained in the dependent variable (overall valence of EVs) by variation in the independent variable (year). In this case, $\eta^2 = .004489$. A popular guideline for η^2 is that a value of .02 (2 percent) is small effect size, .13 (13 percent) is medium effect size, and .26 (26 percent) is large effect size. The effect of time on the overall valence toward EVs was very small and the relationship not significant. The relationship between the positive evaluative language of EVs and the year of publication was found to be significant ($\chi^2 = 16.515$, $df = 4$, $p = .002$). Yet, the directional measure was again, very small ($\eta^2 = .01164$). Thus, this research found that the coverage of EVs has neither become more positive over time nor more negative over time.

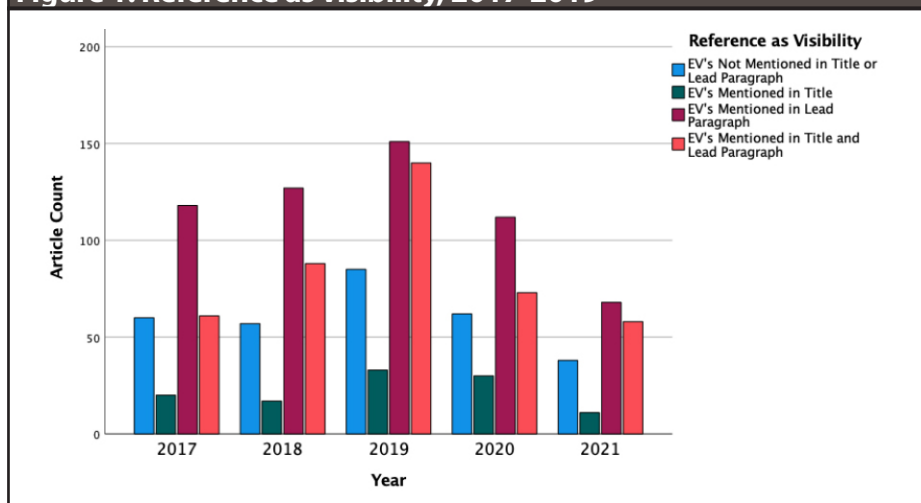
RQ2

The second research question asked: Does the prevalence of any EV frames concomitantly increase or concomitantly decrease over the period sampled? Overall, the frames of technological development, economic positive, and political neutrality were the most used frames, with 743 (52.7 percent), 168 (11.9 percent) and 131 (9.3 percent) respectively. In terms of technological development, the most popular feature in this frame addressed smart technology systems in EVs, such as the EVs' ability to link with the user's smartphones. When the economy was emphasised, the government's rebate scheme for EVs purchases was the prevailing topic. The political neutrality frame occurred where there was subsequent political debate on the scheme. A total of 10 of the 13 variables measured showed no statistically significant relationship with time of publication. However, the positive evaluative language used ($x^2 = 16.515$, $df = 4$, $p = .002$), the mention of carbon emissions ($x^2 = 50.078$, $df = 24$, $p = <.001$), and the frame used ($x^2 = 37.630$, $df = 12$, $p = <.001$), were all found to have a significant relationship with time.

While findings were not significant for all variables, general trends, such as the reference to visibility over time, demonstrated that the prominence of EVs as a story has been steadily decreasing since 2019 (Figure 1) as is the positive valence towards EVs (Figure 2) and also the negative valence, but to a lesser degree. Indeed, discussion of battery life, carbon emissions, the environment, range, personal or public costs and battery reusability all declined after 2019.

The significant relationship between the year and the positive language used was more than would be expected by chance alone (adjusted residual = 2.8) in 2020 and positive language was used less than would be expected by chance

Figure 1: Reference as visibility, 2017-2019



alone (adjusted residual = -2.1) in 2021. Yet, the directional measures demonstrating a concomitant decrease or increase over the entire five year period were very small ($\eta^2 = .01164$).

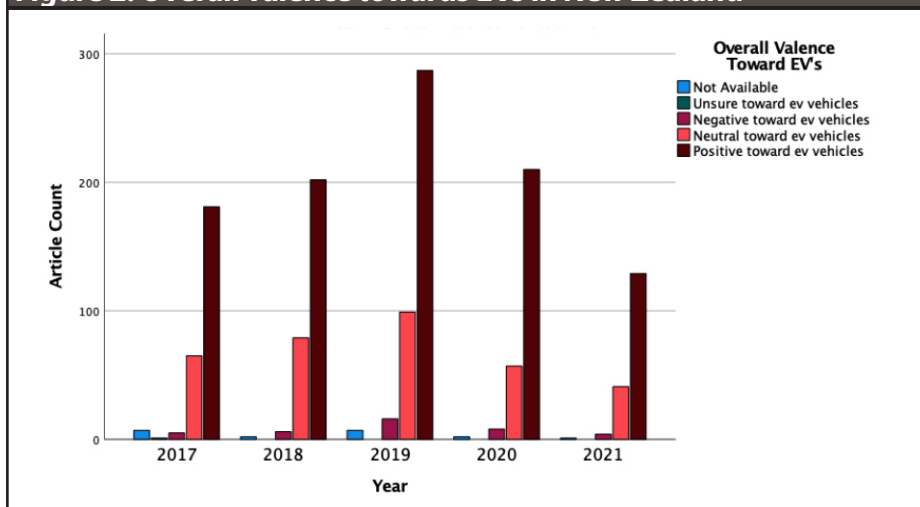
The significant relationship between the year and the use of carbon emissions in the text was more than would be expected by chance alone (adjusted residual = 3.5) in 2021. Yet, the directional measures demonstrating a concomitant decrease or increase over the entire five year period were again very small ($\eta^2 = .0064$). The significant relationship between the year and the frame used in the text demonstrated that economics (adjusted residual = 2.3) and politics (adjusted residual = 2.4) were more than one would expect on chance alone in 2021 and technological development was used as a frame in media text less than would be expected by chance (adjusted residual = -4.7). Yet, again, the directional measures demonstrating a concomitant decrease or increase over the entire five year period were very small ($\eta^2 = .011236$).

These findings suggest that while a significant relationship was found, in each case it was uneven and not found to be consistently linear over time. Thus, it was concluded that none of the 13 measures of how EVs were framed in media coverage, concomitantly increased or concomitantly decreased over the period sampled.

RQ3

The third research question asked: If an EV story is framed as environmental (rather than political, economic, or technological development), are the benefits of EVs discussed? Again, the frame of the article, the valence of EVs, battery life, carbon emissions, range, public or personal costs, positive public opinion, positive evaluative language, and battery reusage could all be considered

Figure 2: Overall valence towards EVs in New Zealand



positive benefits of EVs if addressed positively, or if at all, in coverage. None of the relationships was found to be significant. However, in each case, there were 25 percent to 82.1 percent of cells with expected counts less than five, meaning that a basic assumption of the chi-square test had been violated. Turning to another aspect of the data, the likelihood ratio was also insignificant in all of the possible relationships suggesting that all were insignificant. This is not surprising given the weight of frequency is measured. For instance, only 1 percent of articles mentioned that there was a high cost to the environment, 11 percent stated that there was a low cost to the environment and .3 percent suggested that there was both a high cost and a low cost to the environment. However, the near totality of the content did not mention the environment at all. Indeed, 1,234 articles or 87.6 percent did not mention the environment in news content. Therefore, almost no variation can be explained in any of these variables by variation in the independent variable (mention of the environment). It needs to be noted that the data was so lopsided that significant likelihood ratios were not able to be achieved.

RQ4

Lastly, the fourth research question asked: Is there an agenda-setting association between the valence of EV coverage and the purchase of EV vehicles? As has been detailed, the positive coverage of EVs actually decreased over the last two years after a high point in 2019. Conversely, the purchase of EVs has continued to rise year on year (Ministry of Transport, 2022) (Figure 3).

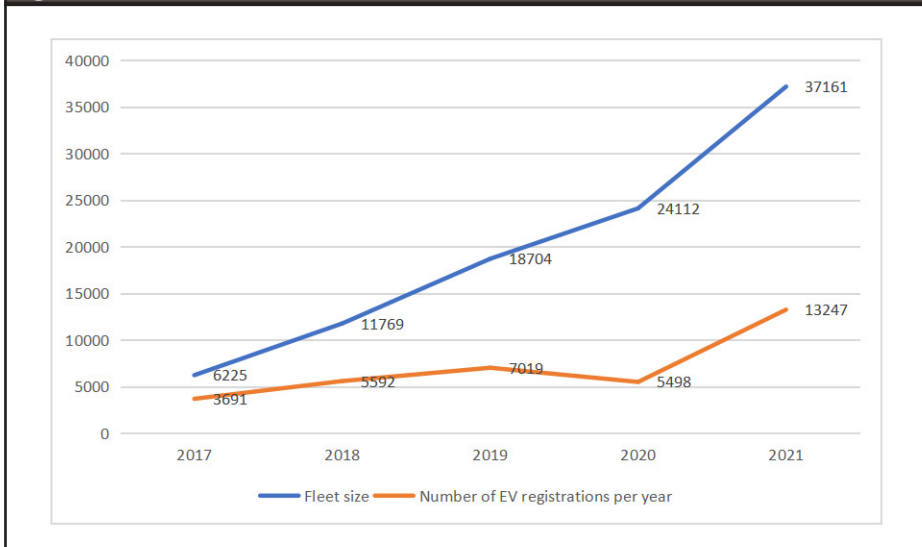
According to early statistics, in the first year since the clean car rebate started, the uptake of EVs increased by 56 percent, making up 20 percent of the total vehicle purchases (Woods & Shaw, 2022). Thus, it can be suggested that there is no indication of an agenda-setting association between the valence of EV coverage and the purchase of EV vehicles.

Discussion and conclusion

This study examined the reporting of EV vehicles in four major New Zealand newspapers: The New Zealand Herald, Dominion Post, The Press and Otago Daily Times. The study was theoretically based on a range of literature on media framing (Entman, 2004) and agenda setting (McCombs & Shaw, 1972). This research examined the framing of EV reporting in order to discover if there was any relationship between their use in New Zealand (Energy Efficiency & Conservation Authority, 2021; Kopestinsky, 2021; Ministry of Transport, 2022) and media coverage.

The results of this research demonstrated a surprising and dominant absence of information in news articles that were otherwise expected as purchases of EVs increased. The 1,409 news articles examined in this study showed very little framing of costs, carbon emissions, environment, or range in relation to EVs. Instead, the framing in this reporting featured the presence of technological features and

Figure 3: EV fleet size increase in New Zealand, 2017-2021



Source: NZ Ministry of Transport, 2022

high-end designs. Specifically, news articles that covered the launch of new EV models generally highlighted their built-in operating systems, speed capabilities, and luxury accessories, such as leather seats and interiors.

Rather, on the whole, there was a lack of connection between EVs and combating climate change or care for the environment. This is a significant finding as previous research found that if readers do not see the connection between EVs and positive factors, such as the improvement of the environment, they are less likely to attempt to purchase EVs (Konnikova, 2014). The rapid increase in the purchase of EVs, suggests that the purchasing of EVs in New Zealand may not be connected to environmental reasons. In fact, the reporting seems to reflect previous research, which reported that EV coverage remained focused on a consumerist perspective (Esmene et al., 2020).

One reason for the disconnection between media coverage and non-consumerist environmental benefits may be that potential buyers were already aware of these benefits. This could suggest that newspaper coverage may not play a significant role in any decision-making processes surrounding EV purchases. However, if the connection between the environment and the purchase of EVs is indeed strong in the public, then a shift in the coverage of EVs would be key for continued growth. It is important to note that the purchase of EVs may have been even higher if media coverage was positive and more connected to the environment. It is impossible to know that from this content analysis, but given the previous research in this area, that eventuality cannot be discounted.

Another possible conclusion to draw from these findings is that if the public

feels strongly enough about a specific issue, it simply does not matter how the media frames that issue. Therefore, the media may lose some of their agenda-setting power in such cases. For example, a recent study found that issue exposure (amount and emphasis of coverage) and news factor exposure (content of coverage that provides newsworthiness reasons) stimulate individual-level agenda-setting effects (Geiß, 2022). News consumers consider both amount and content of coverage to appraise and update issue salience. So, even if coverage was generally neutral or negative, the amount of coverage may have had a stronger agenda-setting effect than the coverage itself. This may be an effect even more pronounced when a consumer feels particularly strong about a purchase decision.

These findings open the discussion of what other factors may play a role in the uptake of EV vehicles, and to what extent New Zealand reporting plays a role in the number of EV vehicles being purchased. The lack of positive media EV coverage seems to confirm previous claims that motoring newsrooms continue to rely on traditional coverage that privileges petrol cars. It may be that the concept of climate change is challenging to communicate in a way that audiences can see its role in their daily lives (Moser, 2016; Pollak & Zint, 2006) or it may be that advertising dollars from petrol car companies still predominate over newsroom decisions. The only way to disentangle these possibilities is to conduct in-depth interviews with reporters. However, if negative coverage of EVs continues to predominate, then sellers of EVs in New Zealand will become even more important for the continued growth in the sector by promoting their cars to the news media, whether through free test drives or free informational sessions available to news reporters. The input from EV sellers may help shift reporters' perspectives toward EVs and give more salience to environment-related features of EVs, such as lower carbon emissions and sustainability. Furthermore, traditional viewpoints of reporters who cover cars in the news could be addressed through promotion, such as free test drives or free informational sessions.

Future research could directly compare media coverage of EVs as well as petrol cars in an attempt to investigate direct disparities in coverage. While the framing of EVs found minimal presence of cost, carbon emissions, environment, or range in relation to EVs, it is not known what perceived benefits of petrol cars are or are not emphasised. For example, does news media coverage of petrol cars emphasise cost or gas mileage in terms of range? Does news coverage address low carbon emissions of newer models? How are the benefits of petrol cars framed in the news media?

Future studies may also wish to explore if potential buyers get their information about EVs from newspaper media or another source. It may be particularly enlightening to explore whether EV purchasers use different media than petrol car purchasers. It may be that other communicative platforms, such as social media, are far more important for potential buyers to solidify the connection between

climate change and the purchase of EVs. The dominant age group for EVs in the United States is 25-54 years old (Fuels Institute, 2021) and social media is skewed to younger age groups (Perrin & Monica, 2019). So, it simply may be that potential EV purchasers are not attending to newspaper media coverage, but rather other social media platforms. If so, the comparison conducted here is not applicable in determining future EV purchasing intentions or behaviour.

This research leads to several different future directions for scholarship. What remains clear from this research is that the New Zealand newspaper media have not emphasised the benefits of EVs since 2017, but EV purchases have continued to grow. This presents interesting challenges to previous agenda-setting research and demands closer scrutiny from scholars who are interested in the continued growth of the EV sector.

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Linda Jean Kenix is head of the School of Language, Social, and Political Sciences and professor at the University of Canterbury. Her research specialities include the visual and textual media representation of marginalised groups. Linda Jean has been a visiting research fellow at Oxford University, the University of Cambridge, Monash University and the University of Valencia.

lindajean.kenix@canterbury.ac.nz

Jorge Bolanos Lopez was awarded his PhD by the University of Canterbury. His research interests include media discourse, journalism ethics and practices. Jorge has published several articles on media discourse and journalism practices. He has also been a lecturer of communication and film studies at universities in Ecuador and New Zealand.

jorge.bolanos.L@gmail.com