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## The autonomous vehicle as a socially-constructed object (VACOM)

### Overview

The VACOM project was the outcome of a question voiced by the Mission des Transports Intelligents (Intelligent Transport Taskforce) at the DGITM (General Directorate for Infrastructure, Transport and the Sea – French Ministry for Sustainable Transition) concerning the image of the autonomous vehicle among the general public: what are the expectations and doubts expressed by so-called public opinion in this period that is proclaimed as that of the pre-marketing of the first vehicles with level 4 or 5 autonomy? The methodology chosen was to analyse the way in which the autonomous vehicle is represented and portrayed in French and English media coverage, in order to analyse spontaneous rather than artificially-generated discourse.

The discourse was collected from the so-called "general public" print and Internet media, and from Twitter to reflect "social" media, between December 2017 and May 2018. The "contemporary" French-speaking press corpus (2,618 articles) included a selection of conventional press publications and sources identified on the web by a search engine without any pre-selection. A "historical" corpus of articles published in the national daily press between 2012 and 2018 (2,236 articles) rounded off the contemporary corpus for the purposes of diachronic analysis. For the English-language press, three publications were monitored between January 2012 and May 2018 (2,034 articles): the New York Times (United States), the Guardian and the Daily Mail (England).

This data collection provided quantitative and qualitative information on the media status of autonomous vehicles. What volume of information is disseminated on this topic through these channels? Who is responsible for this information? How is the issue usually framed? How do representations travel between the different media?

#### 1- Does the autonomous vehicle stimulate discussion?

The autonomous vehicle has an increasing presence in media discourse. 2015 marked the beginning of a surge in the number of articles published about it in the French and English daily press. This sudden increase in volume coincides with the presentation to the general public of the demonstration prototypes produced by the main car manufacturers. In 2017, nearly 1,000 articles were published in the French daily press, three times more than in 2015 and... fifty times more than in 2012.

Between December 2017 and May 2018, 20,000 French-speaking Twitter accounts mentioned autonomous vehicles, with an average of 280 tweets per day (compared to 915 daily English-language tweets). Over the same period, an average of 17 French-language documents on this subject were published every day, 70% of them on the Internet<sup>1</sup>.

The amount of media attention paid to the autonomous vehicle fluctuates. The tweets exhibit a saw tooth distribution. The most striking peaks in activity are triggered by current events. During the period, two major peaks (more than 1,000 daily tweets) were generated by the Las Vegas Consumer Electronics Show (January 2018) and by an accident resulting in a pedestrian death (March 2018). Eight medium-intensity peaks (450 to 600 tweets) are associated with other public events (motor shows),

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<sup>1</sup> This high proportion is also due to our use of web crawling without a selection policy when the printed press was examined on the basis of a selection of 27 publications.

government announcements about trial opportunities, and developments in the investigation of the first accident as well as the occurrence of a second fatal accident. This second accident, which resulted in the driver's death, caused a less marked peak than the first.

The major peaks were also found in the number of press articles published (more than 50). During a peak of this intensity, almost all the major press publications cover the event in a very similar way. In situations of this type, the Twittersphere becomes more democratic, with the awakening of silent accounts, soaring rates of publication<sup>2</sup> and the doubling of the (very small) proportion of tweets expressing an opinion.<sup>3</sup>

The autonomous vehicle therefore occasionally stirs up public opinion. However, the recurrence of a similar dramatic event (fatal accident) did not generate a cumulative increase in the intensity of media reactions, regardless of the communication space. This suggests that the autonomous vehicle has not yet become a genuine societal topic.

## 2- Who's talking about autonomous vehicles?

The major national dailies (notably Les Echos, Le Monde, Le Figaro) have a very high degree of dominance among the main producers and disseminators of information on autonomous vehicles (contemporary corpus). Next come weekly and monthly magazines aimed at the general public, whether generalist or specialized (mainly focused on cars or on business news about industry, including the automotive industry). The magazine "Challenges", which was not included in the ranking at the beginning of the collection period, made a spectacular rise to second place following Renault's acquisition of a stake in the press group that owns it (December 2017). This strong presence of the automotive industry in the news landscape is also apparent in the ranking achieved by the Comité des Constructeurs Français d'Automobiles website and the multiservice platforms dealing with the automotive sector (Lesfurets.com, largus.fr, caradisiac.com...). These players are neck and neck with the "pure play" news sites. The latter include two sites that are devoted to high-tech consumer products (lesnumériques.com and numerama.fr) that stand out for the consistency and scale of their content on the subject. The regional press has a marginal presence. The inclusion in the ranking of two radio station websites (France Info and Europe1) shows that, among the conventional mass media, the written press does not have the monopoly on information about autonomous vehicles.

On Twitter, the activity relating to autonomous vehicles is based on around fifty highly active Twitter accounts, while three-quarters of users publish very sporadically (less than one tweet over the period). The most active accounts on the topic (hundreds of tweets published over the period) are not, however, those with the most followers. They are also rarely retweeted. The opinion leaders, i.e. those who influence the image of autonomous vehicles, are found among accounts which are less active on the topic (30 to 50 tweets on the topic) but having a very large number of followers (several thousand) and above all, which are often retweeted. The majority of these (7 out of 10) are institutional accounts. The personal accounts are those of media figures who are among the most influential on the social network. In contrast to this professional use of the social network, the accounts with very low levels

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<sup>2</sup> The daily publication rate refers to the number of accounts that have published one or more tweets on a given day compared to the total number of accounts in the corpus.

<sup>3</sup> A sub-corpus was manually created from all the French-speaking tweets, bringing together 692 tweets expressing an opinion. Any retweeting of these opinions was eliminated.

of activity are mainly personal accounts with an "amateur" profile, that highlight diversified personal interests outside the digital domain.

### 3- How do people talk about autonomous vehicles?

The thematic categorization framework that was developed to automatically decipher the issues addressed in the articles and tweets comprises eight themes<sup>4</sup>. The large number of themes covered in each press article (around 5 on average compared to one and a half for tweets) indicate that the problem frameworks as defined have wide acceptance. However, we still need to decide in how much depth each is covered.

The theme of "stakeholders" is omnipresent (mentioned in nearly nine out of ten articles published in recent months and in 60% of tweets<sup>5</sup>). It nominally refers to the companies and institutions involved in implementing an autonomous driving ecosystem. The dominant vocabulary in the press and the Twittersphere are the names of Google, Tesla, Uber and almost every vehicle manufacturer, while very little mention is made of the public-sector players. Governance is the poor relation of the topics covered, especially on Twitter. The technological developments produced by these companies also play an important role in media output, and are far from being confined to the columns of the specialised press. The theme of the "vehicle as a product", which was scarcely present in 2012, is found in half of the articles in 2017 (and a comparable increase has occurred on Twitter). This rise follows the increasing publicisation of this technology. Sites have a very high output, such as *lesnumeriques.com* and *numerama.com*, focus on products (including buses, trains and flying cars) and their functionalities, as well as on business news (partnerships, conflicts and most of all the personalities of the CEOs).

Sustainable mobility issues are mentioned in 60% of the articles. This high proportion, which has nevertheless slightly decreased over time, reflects the widespread adoption of the sustainability yardstick. However, an analysis of the terms used shows that the concepts of pollution, congestion, urban sprawl and the sharing of public space are not in wide currency. It is the question of shared mobility services (mainly taxis, PHVs and, to a lesser extent, shuttles) that dominates this thematic field, in the press and even more so on Twitter. Autonomous driving is as facilitating mobility (through the ability to respond to individual demand) much more than regulating mobility.

The theme of safety has been losing ground since 2014, but it still appears in every other article in 2017 and seems set to be extremely present 2018, after the accidents. The theme of utilizations is secondary but on the rise, and is more popular in the Twittersphere than in the press. Opinion tweets show a marked split between enthusiasts and (extreme) sceptics with regard to the question of whether the autonomous vehicle will change our daily lives

Media discourse on autonomous vehicles focuses primarily on the technologies and the companies that are developing them. The most productive sources on this topic are newspapers that give extensive coverage to economic and financial information, websites dedicated to high-tech consumer products, and the Twitter accounts of experts on innovation. This stakeholder input informs the way the issues are framed in the articles. The economics of autonomous driving is addressed through the

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<sup>4</sup> The eight themes are: Stakeholders, Sustainable mobility, Safety, the Vehicle as a product, Utilisation, Smart city, Economics, Governance.

<sup>5</sup> The proportion is lower for tweets because they are much more monothematic than articles. The relative weight of this theme compared to the other seven is even more overwhelming for the content of tweets than articles.

activities of the international road haulage industry and their announcements. Only a minority of the articles deal with the themes of the smart city and localized economic impacts. The local ecosystem, involving the mobility system and geographical areas, receives little attention. This decontextualised approach to the system of stakeholders is also fragmented: stakeholders are considered as single entities and not as a category that is united by shared goals or a shared situation. The articles devoted to accidents offer a historical analysis that is often restricted to the player involved (Uber or Tesla).

#### 4- How do representations circulate between the different media?

An examination of our sources shows that the principal national daily newspapers have clearly dominated media coverage of the autonomous vehicle since 2015. But the web hosts a great diversity of sources whose large number means that they contribute massively to this coverage. The multitude of digital sources creates a relative diversity of content: webzines or comparison sites have editorial teams that provide information added value that is focused on the technological product and very well documented. These sites are also present on Twitter, where they enjoy an audience that is proportionate to their output or even greater, while not all major print media outlets do not continue to exert the same influence when they move from one communication space to another. While the many articles in Challenges rarely attract any attention on Twitter, the handful of articles in Le Parisien are widely disseminated on the social network. However, many of the major print media outlets retain their dominant position in the distribution of information on Twitter (Les Echos, Le Monde, Le Figaro): their articles attract a great deal of attention and are retweeted. The social network's specific opinion leaders have the same number of followers as they do. A significant event generates extensive media coverage in the press and receives a democratic expression of interest on Twitter, combined with a greater uniformity of content. On this topic, which remains one for experts, the sources of information are the same for everyone, and authors have become skilled in the art of recycling articles produced by others (and prior to that, in AFP dispatches).

The two communication spaces respond to the same event stimuli, but their sensitivity to that event may be different: for example, the social network reacts to incidents that have gone unreported in the written press, for example the citizen debate that was held in January 2018 and television programmes. However, regardless of the type of source and the communication space, a similar narrative is constructed around the practices, actions and rhetoric of the firms involved in the field of autonomous driving. These companies, which obtain a particularly large number of followers if their CEO has a personality that can be cast in a heroic light, exist side by side in the articles but are presented as following separate paths: the existence of cross-cutting analyses is only marginal. This predominance of the point of view of (private sector) stakeholders constitutes the dominant problem framework for all the themes we have considered. Without political problematisation and in the absence of reactions from the public authorities, autonomous driving is neither a societal topic nor an established public problem. Used in debates in a way whose validity is questionable (legitimacy of speed limits, the French SNCF railway strikes, investment in public transport), at present the autonomous vehicle is used as a diversion when talking about tense industrial relations or public policies and services that are deemed to be deficient.

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