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### ► To cite this version:

Sophie Hasiak, Fabrice Hasiak, Aymeric Egea. Coach and Train: Differences in Individuals Perception of These Modes. Transportation Research Procedia, 2016, 14, pp.1706 - 1715. 10.1016/j.trpro.2016.05.136 . halshs-01395013

**HAL Id: halshs-01395013**

**<https://shs.hal.science/halshs-01395013>**

Submitted on 10 Nov 2016

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6th Transport Research Arena April 18-21, 2016



## Coach and train: differences in individuals perception of these modes

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### Abstract

This paper aims to understand the perception of train and coach modes for medium and long distance travels that may influence their use. Beyond the criteria of performance and travel cost, our hypothesis is that there are other more subjective criteria related to travel emotions or sensory aspects that might explain the differences of perception. Based on the results of both a qualitative and quantitative surveys of regional travels, it analyses the influence of social characteristics, geographical living environment, past experiences of public transport modes and effective travel uses on the image of these modes. It provides some interesting teachings for transport authorities about the influence of modes perception on modal change predisposition.

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Peer-review under responsibility of Road and Bridge Research Institute (IBDiM)

**Keywords:** Train; coach; perception; image; modal choice

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### 1. Introduction

In France, the coach struggles to take its place on the market of medium and long distance travels. Indeed, this market is mostly covered by rail services which were implemented on different levels: at the regional level, with the

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regional rail services developed by the regional Councils since decentralization in 2002, and at the national level with the high speed network. However, since the coach is considered as a complementary mobility service to rail services, it remains a key concern for both interurban public transport authorities and the French State which recently liberalized long distance coach transport.

Beyond coach service investments issues, the major challenge is also and above all to understand the reasons why French people are not keen to use them. According to media sources, the French coach seems to suffer from a poor public image that might influence the individual modal choice and explain its lack of popularity compared to the rail mode.

Our research focuses on analyzing the differences in perception of these two modes. It aims to understand how these differences may influence their use. Beyond the technical performance of a system and its cost, we also have a look at subjective criteria delivered by individuals to assess their evolution according to their profiles. It focuses particularly on four questionings:

- Is there an influence of the previous lived experience of these modes on their image?
- May we talk about a generational effect on perception?
- Does social anchoring have an impact on transport mode perception?
- Does spatial environment play a role in the image of these two modes?

After providing a literary review on the perception of transport modes, the paper first deals with the global perception of both train and coach. Then, it suggests an in depth analysis of the image through the four questions above. And finally, considering that an image results from a combination of factors, it opens the debate by highlighting the factors that most influence their image. This last analysis may help local authorities to define their mobility management policies. Moreover, it may allow the targeting of specific territorial actions to enhance and promote coach services in a context of sustainable development.

## **2. Current state of scientific knowledge of transport modes image**

In terms of public policy evaluation, elected officials want to understand the use of the different mobility services operated on the territory. The attendance level is closely related to modal choices made by individuals to travel, that is to say, to get from one point to another to do an activity (working, doing shopping, leisure, visiting family, etc.). Many scientific works highlight that the decision-making factors of modal choice are essentially based on two criteria: the cost and the travel time (Crozet 2005, Vleugels et al. 2005, etc.). These results lead to model the modal behavior of each individual on the basis of a typical behavior “standardization”. However, each individual behavior is governed by a complex set of phenomena that cannot be summarized by a function only defined by “instrumental” parameters (Brisbois, 2010). Indeed, the modal choice cannot be easily explained because it is not completely rational (Brisbois 2010, Munafo et al. 2012). It results from a compromise between performance parameters of modes and other criteria that more relate to subjectivity. They concern emotional and symbolic attributes (Brisbois 2010, Flamm 2004, Bourg 2011, Frenay 1997) that depend on the universe of individuals values and habits, and also on their own lifestyle. These factors that are both functional, symbolic, sensory, or even emotional, contribute to the modal image structuring of each individual. This image is therefore a resultant of individual preferences. Based on this finding, one may easily understand that it is difficult to talk about a “typical” image of a transport mode, as this latter is a “socio-technical object resulting from a stable and efficient combination of material, socio-professional and socio-cultural elements” (Amar, 1993).

Many scientific studies question transport mode image. But they mainly focus on perceptions of private vehicles compared to public transport whatever the mode (Rocci 2007, Kaufmann et al. 2010, Potomac 2000, Cain et al. 2009). So, there are few works dealing with the analysis of perception differences within public transport services (Cain et al. 2009, Megel 2001). However, first lessons may be highlighted from these works. Thus, they confirm that there are contrasted perceptions of public transport modes. In particular, the operating system technology seems to strongly influence the image of public transport modes. A preference for rail technology (light rail, tramway, train) is clearly expressed, so that we may talk about a “psychological rail factor” (Scherer et al., 2012). This superiority of the train is most often justified by arguments of regularity, comfort, speed and space in carriages. In contrast, the

works talk about a negative image of coaches due to various attributes such as comfort (crowded), speed and accessibility (Cain et al., 2009). However, all these findings are related to the service supply. For that reason, they may hardly be transposed in other areas and be generalized. Moreover, existing research primarily focus on urban public transport mobility services (tramway, suburban light rail, bus, BRT) implemented in urban areas and suburbs. The comparison between train and coach for medium and long distance trips is poorly studied. While the image of the train is the subject of various investigations, in particular individualized marketing methods (Bahn.Ville 2 project, Picardie region council project), the image of the coach is less known. It is described in negative terms linked to its technical performance which is inferior to train ones but also to a discriminatory social factor. Van de Velde (2009) talks about a segmentation of its use according to individuals' profiles: and so, the coach would be a transport mode for poor populations. Cain et al. (2009) brings to light that people consider the coach as "an inferior way to travel", suffering from low prestige, a "social service for the elderly, disabled, and poor".

The scientific literary review therefore emphasizes the existence of a power balance between train and coach in favor of the train. Our paper aims to continue and deepen these works to underline the factors that influence the image in a comparative way. Beyond the functional attributes of these modes, we want to highlight the nature of social, emotional, sensory or even spatial factors that explain their contribution to a positive or negative image.

### 3. Our methodology

Our research is based on the use of two surveys carried out in the Picardie region in 2014. A qualitative survey of residents of two railway station areas highlights their point of view about the train. 43 people were interviewed. This survey allows us to identify the corpus universe of train and private vehicle qualifying terms. However, there is no equivalent data available for the coach. The other data source comes from a quantitative survey on the regional trips of the locals. A regional travel would be a trip of more than 10 kilometers from home with the particularity that at least one end of the trip is located outside the urban transport perimeter. Approximately 14.350 people over 10 were surveyed. Among the many questions about travel practices of the previous day, the respondent was required to give two adjectives for each of the following modes: private vehicle, coach and train. In contrast to the qualitative survey, this one was based on a predefined list of 38 potential adjectives. The investigating officer was in charge of classifying the spontaneous answers of the interviewer in this list of adjectives.

The comparison of these two universes of train adjectives (Fig. 1) underlines that some affective and cognitive dimensions are not considered in the quantitative survey.

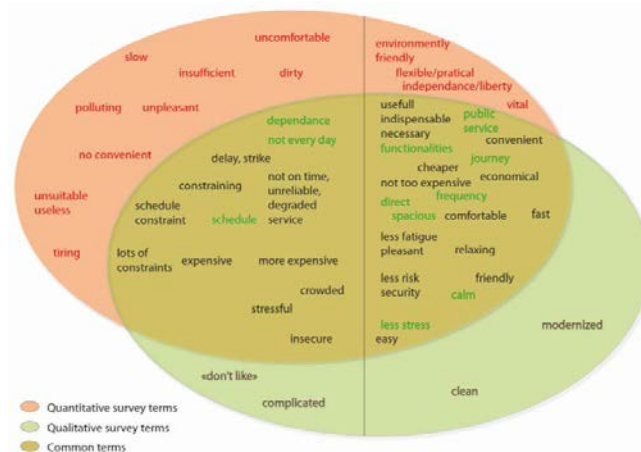


Fig. 1. List of adjectives according to the survey method.

We gathered these 38 adjectives together into 6 attributes categories (Fig. 2). These attributes are closely related to modal choice criteria that have been underlined in the scientific literature. Indeed, they distinguish the functional characteristics of a mode (performances, cost) from symbolic, sensory factors (qualifying terms of atmosphere, well-being). Additionally, they differentiate the objective element (e.g. the technical performance of the system) from the subjective one (for example the utility of the travel). They also allow us to identify the individual interest (convenience, constraints) and the collective one (especially environmental considerations).

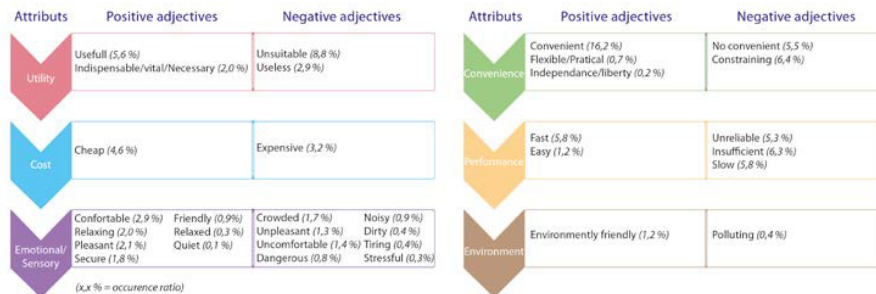


Fig. 2. The 6 attributes categories.

To answer our questionings, we will firstly analyze the influence of each criterion on the image of train and coach. Then, we will focus on how all these factors interact in the image structure by applying a logistic regression method. This predictive method allows us to explain the values of the qualitative variable, the image of train or coach, from a set of explanatory variables  $X_i$  which are specific to each individual (age, social roots such as primary occupations, gender, mobility characteristics, ...).

#### 4. Field of study: the Picardie region

Our field of study is the Picardie region, located North of Paris (France). With a population of more than 1.9 million (3% of the metropolitan French population), this region has a density of 99 inhabitants per  $\text{km}^2$ , which is below the metropolitan average. It is made up of a network of small and medium-sized towns. Served by road and railway networks, it is characterized by a large number of commuters travelling towards the regional capital (Amiens), and also towards the southern region and the Paris region.

Every day, there are nearly 1.3 million regional travels (more than 10 km). This result represents 2.4 trips per person per day. The private car is the major mode used (80% of travels). The modal share of interurban public transport is about 12%. And 67% of these interurban public transport travels are made by train (33% by coach).

In France, the fragmentation of public transport authorities has led to the existence of two types of coach services which provide these regional travels. On the one hand, there are coach services organized by the departmental institutions in their geographic perimeter, and on the other hand, there are other coach services implemented by the Regional Council in the regional area. If we take this differentiation into account, the regional coach trips are mainly made on departmental coach networks (87%). And on the regional public transport network mainly structured by the train supply (82% of trains.km), travels are rather made by train (94%) than by regional coach (6%).

#### 5. Key lessons

Overall, regardless of the individuals under consideration, the images of both train and coach are mainly based on negative characteristics (respectively 51% attributes for the train and 54% for the coach). This section deals with the assessment of the influence of individuals factors on the perception they have on train and coach. These factors depend on their social roots, as well as on their lived experience of transport modes or on their spatial environment.

### 5.1. How do people talk about the train and coach?

Before considering these previous questionings, we first examine whether the images of train and coach might be defined from the same basis of major attributes, whatever the individual characteristics. And the results show that they are essentially made up of a quadrupling of attributes (fig.3 (a), (b)): convenience is combined with transport mode utility, performance and emotional and sensory aspects. These perceptions are also defined by an opposition between functional criteria (convenience, performance) and subjective ones, especially related to the feelings of each individual. The economic criterion does not appear as a major attribute mentioned by the respondents. This result might seem surprising because the cost is said to be a major criterion involved in the modal choice. The survey method based solely on two adjectives for each mode may partially explain this result. While the coach is overwhelmingly considered as a cheap mode, it is more nuanced for the train. Indeed, 51% of qualifying terms are related to an expensive mode and 48% to an economical mode. Furthermore, the collective interest is not well expressed in the results. Regardless of the mode considered, the percentage of environmental attributes is very low (2%). When it is mentioned, it promotes the train as an environmentally friendly mode compared to the coach which is either seen as an ecological or polluting mode.

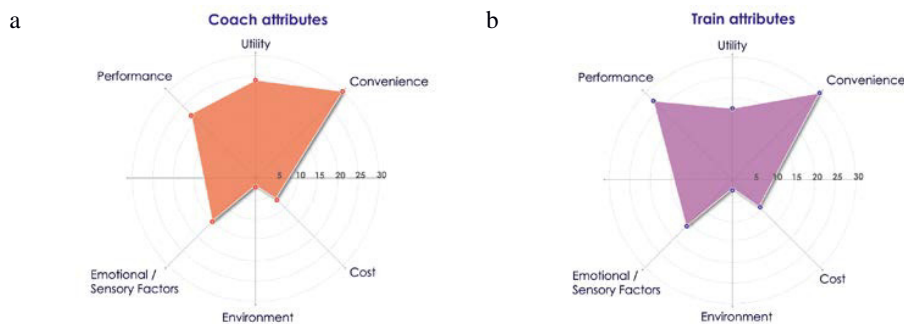


Fig. 3 (a) Coach attributes; (b) Train attributes.

Among these four attributes, convenience is the most commonly cited criterion. However, it is difficult to define the term of convenience because it depends on each individual according to the benefits he will have (living or working near a train station, travel time, utility of the travel time, ...). In the quantitative survey, it reflects the idea of the practical aspects (or not) and the notion of constraint by using the mode. Similarly, the utility attribute is also characterized by the same indicators for the train and coach. The notion of mode utility is thus based on an opposition between its unsuitability for the travel needs and its usefulness.

However, there are some differences for the other two types of attributes. The train's functional characteristics are evoked from the angles of speed, lack of regularity or insufficient supply. In contrast, when people talk about the coach in terms of its performance, the objective is to criticize the lack of coach supply and its slowness.

### 5.2. Does the lived experience of modes have an influence on the train and coach image?

The lived experience of transport modes is here assessed by the use frequency. The different frequency of use has been gathered to reflect three types of use:

- the routine traveler, who regularly uses the same mode, every day or several times a week. This notion refers to the issues of constraints and lifestyle;
- the occasional traveler who only makes a few trips with the mode per year. This frequency level refers to journeys and so is more linked to the idea of leisure, break or holidays;
- and the non-user who never takes the mode.



Whatever the use level of train and coach, all people talk about these modes with functional and subjective terms such as feelings and emotions. Our findings converge with the conclusion of Cain et al. (2009) who notes that each individual gives an image resulting from a combination of tangible factors (measurable factors) and intangible ones.

But the lived experience of these modes changes the priorities of these factors. First, non-users of both modes more address the negative aspects than the positive ones. In contrast, train or coach users will further talk about the positive aspects. So, as some scientific works have done, we can underline that there is an influence of the lived experience of modes on their perception (Clochard et al. 2008, Marchand et al. 2009, Flamm 2004, Thomann et al. 2002).

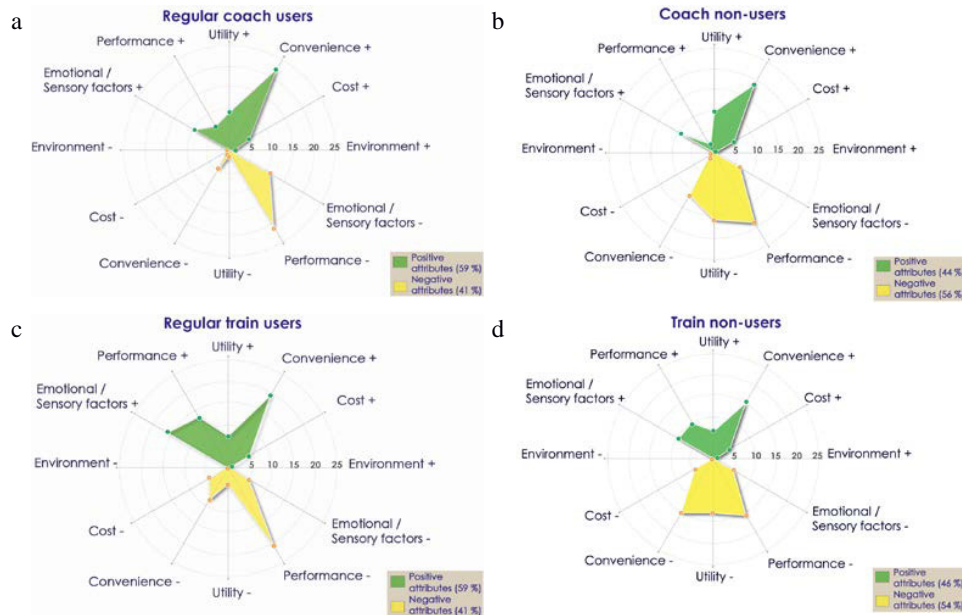


Fig. 4 (a) Regular coach users; (b) Coach non users; (c) Regular train users; (d) Train non users.

However, are the main highlighted attributes the same according to the frequency of use? For the routine traveler, whether traveling by train or coach, the principal positive attribute relates to convenience (Fig.4 (a), (c)). And this convenience is associated with emotional criteria. The adjectives "comfortable", "pleasant" and "relaxing" essentially characterize these sensory criteria. It refers to the field of well-being, which takes here multiple dimensions. A third attribute only concerns the train: the railway performance (speed).

In summary, the positive perception of these two modes is made up of a pair of converging priority attributes: the functional attributes (convenience, performance) are associated with more subjective ones (sensoriality, emotion). While the negative image of the train is primarily due to performance attributes (unreliability), the coach negative one results from a combination of performance aspects (slowness) and feelings (crowded, noisy).

The structure of the image of both train and coach as given by routine travelers, is also the same for occasional users. For a non-user, it is not the same because he primarily gives a negative image (Fig.4 (b), (d)). Besides, the attributes used to qualify the modes are not quite identical: the performance, convenience and sensory points are also associated with the utility character. Thus, when he talks about the train, a non-user evokes the poor performance level (service inadequacy and unreliability) as well as its lack of convenience. On the contrary, the negative image of the coach is built on the combination of qualifying terms about performance, convenience but also useless.

These results strengthen the influence of a lived experience of these modes on the perception given by individuals. They allow us to bring to light the many differences in perception according to the functional knowledge of the system and also according to the beliefs one might have depending on one's living environment and the media influence. These results also highlight the important role of emotional and sensory attributes in the

positive image. On the contrary, the negative view of each mode is essentially explained by the functionality and utility criteria.

### 5.3. Is there a generational effect on train and coach perceptions?

The results of the regional mobility survey show that the coach is mainly taken by young people (under 25 years). 88% of coach users are school or secondary-school pupils and students. By contrast, the train is used by all age segments of the population. 71% of train users are in active life, and 27% are secondary-school pupils and students. In terms of mobility practices, we can talk about a generational effect on coach use.

The attributes analysis according to the respondents age highlights three different profiles (Fig.5 (a)):

- the youths under 18 years, pupils and students, primarily talk positively about the two modes. There are about 70% of positive attributes for the train.
- the individuals aged 19 to 65 years, belonging to the age group of potential persons in active life. They rather talk negatively about the train and coach. The maximum threshold of positive attributes does not exceed 49%. It is particularly low for the age group between 19 and 25 years old.
- the senior citizens (more than 65 years) rather express themselves with positive attributes for the train, their point of view is quite more nuanced for the coach. The percentage of positive attributes is just below 50%.

Except for the 19 to 25 years old group, whatever the age, the percentage of positive attributes is greater for the train than for the coach. That leads us to question the assumption of train superiority, of the existence of "a psychological rail factor" mentioned in the scientific literature.

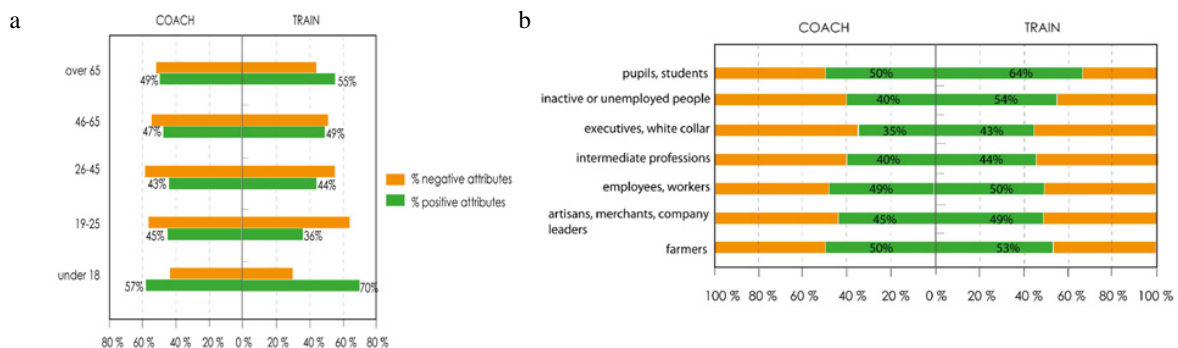


Fig. 5. Coach and train attributes (a) according to the age; (b) according to the socio-professional category.

These results prove that people do not have the same image of train and coach modes depending on their age, in other words, according to their position in the life cycle. And the perception structure also varies. Thus the positive image of the train given by young people is essentially based on its functional characteristics (30%): the train is considered as a fast and convenient mode (19%). For the coach, it combines convenience (18% of positive attributes) with the well-being dimension (15%) expressed in terms of safety, comfort and friendliness.

We also find this couple convenience/sensory feelings for the train image expressed by seniors. For them, the coach is rather seen by its convenience criterion. Although divided on the image of this mode, they negatively talk about it because they especially evoke its lack of performance (insufficient supply). Finally, the population aged between 19 and 65 years (in active life age), expresses their negative image of train and coach by attributes related to their lack of performance and their constraining use.



#### 5.4. *Is there an influence of social anchoring on perception of train and coach?*

We also tested the hypothesis of an influence of the respondents socio-professional class on how they talk about these modes (Fig5(b)). We note that the gender does not show difference on the perception structure, as Scherer et al. (2012) also proves in their work on the train preferences.

Whatever the socio-professional category, the coach suffers from a lack of positive image compared to the train. But differences in the way to talk about the coach can be put forward. First, pupils and students stand out because they talk about the two modes in a positive way: the attributes they give are mainly positive ones. This result was predictable considering the generational effect on mobility practices. Then, workers, employees or farmers have relatively differing views on each mode. They contrast the convenience of these modes with their lack of performance (unreliability and insufficient services) and utility (inadequate services). Inactive people, including the unemployed, evoke a rather favorable image for the train but a quite negative one for the coach. For the latter, the image is due to its functional characteristics (slowness, lack of services and unreliability) and their feelings (crowded, unpleasant). Finally, the last group includes executives, intermediate professions and artisans, merchants. Most of them talk negatively about these two modes. The percentage of negative attributes given by executives is the strongest. And those three professional categories evoke these modes using the same terms. The points that most often appear in their discourse are about their performance and usefulness: the train is certainly convenient, but it is not reliable, its supply is not sufficient and its use is constraining; meanwhile, they think that the coach can be convenient but the services are still insufficient. It is considered as a slow mode of transport that is unsuitable to their needs.

#### 5.5. *Does spatial environment play a role in the image of these two modes?*

One of our questionings is to appraise if the spatial living environment may have an influence on the image of both train and coach. According to the data of our study field, the distinction between rural and urban environment does not lead to an identification of differences in perception. Whatever the living environment, the majority of attributes given to the coach are negative and focus on the functional aspects and the utility mode (insufficient services, slow mode, unsuitable and constraining mode). The only noticeable difference concerns the notion of non-utility. While an individual who lives in a rural area will mainly talk about an inadequate system to travel, an urban person will complete this point of view with the characteristic of useless. It is true that when you live in an urban area, you may have some urban bus services and so you may judge that a coach is unnecessary.

Considering the train mode, its perception is divided between a favorable and an unfavorable image wherever you live in a rural or urban area. Overall, urban and rural populations give a perception on the basis of the same positive and negative attributes. However, we note that there is a greater emphasis on the negative performance attribute among urban people while their percentage of useless attributes is a little lower.

### 6. Discussion and conclusion

The previous analyzes bring to light first findings elements to our working hypotheses. Especially, this paper emphasizes the influence of different individual factors on the image of both train and coach modes. Besides, it reaffirms the lack of the coach image compared to the train mode.

This transport modes perception inevitably affects the individuals' predisposition to change their modal behavior. Our analysis focuses on some thematic criteria without claiming to totally explain the image of modes. Beyond a thematic approach, it seems to be interesting to evaluate the combined influence of several factors characterizing individuals (socioeconomic, spatial and mobility data) on the image of these two modes. This new step of analysis aims to identify the factors on which it would be appropriate to primarily act to encourage a modal shift. It is based on a logistic regression method to calibrate a logit function. The challenge is to explain the structure of train and coach images according to individual variables as it has been revealed by the regional mobility survey.

The main results show that the most relevant variables that influence the positive image of the coach concern the criteria of use frequency and socioeconomic characteristics of the individuals (Table 1):

- *the non-use of the coach* is an influential variable with a negative coefficient. The probability that an individual who never takes the coach gives a positive image is twice lower than an individual who has already taken it;
- *the occupation / profession* of individuals plays a role in the image structure. This criterion has a negative weight for executives and intermediate professions. However, it has a positive role on workers and inactive people. And more precisely, the probability that an executive gives a positive image of the coach is here also twice lower than other professions (Table1);
- *the daily use of the private car* negatively affects the image;
- *the age* has an effect which is different according to generations. While the probability of having a positive image decreases for people under 40 years, it is different for the 40-54-year-old age group who positively play in the logit function;
- and *the non-motorized household*, that is to say when there is no private car in the household, is positively involved in the explanation of the positive image.

Table 1. Statistical indicators – coach image predictive model.

step		forward selection score Chi-square	Maximum likelihood analysis estimated value	Odds ratio estimates
1	Coach use frequency = never	97.5392	-0.5926	0.553
2	Profession = executive/full time	86.9321	-0.6100	0.543
3	Profession = intermediate professions/full time	43.9401	-0.3011	0.740
4	Car use frequency = every day	15.3505	-0.1794	0.836
5	Age = 40-54 years	14.0955	0.0346	1.035
6	Profession = workers/full time	9.5139	0.2597	1.297
7	Age = 18-24 years	7.0237	-0.3136	0.731
8	Age = 25-39 years	5.6765	-0.1788	0.836
9	Profession = inactive people	6.4706	0.2087	1.232
10	Cars number in the household = 0	4.1177	0.2536	1.289

We find the same type of factors for the function calibrating the model of the train image, with the exception that the spatial anchoring has also an influence:

- *the daily use of the private car*, with a probability of having a positive image decreasing with the use frequency of the car;
- *the use frequency of the train* is differently involved in the logit function: it has a negative influence for the individuals who never take the train and a positive one for the others (regular and occasional users);
- as for the coach, *the age* is also included in this model but the influence is different according to the age groups: young people under 18 years play a positive role in the explanation of a positive image of the train, while those who are between 25 and 39 years have a negative weight;
- *the profession* also interacts in a negative way for three classes (executives, intermediate professions and employees).
- and finally, *the place of residence* takes part in the model. We have seen before that the differentiation between rural and urban areas has a very small influence on the image. Here, it is rather the type of urban environment which is concerned. Indeed, the regression here highlights a positive role of the residential environment located in small and medium-sized towns.

Even if our modeling approach only reconstructs about 60% of the field survey observations for each mode, it has the advantage of being able to identify the main factors on which local actors of sustainable mobility could act to try to change the perception of these modes. Some territorial actions have already been launched on train perception. But only acting in this way for the train and the coach does not appear sufficient since these actions, based on the

principle of individualized marketing method, essentially concern volunteers. If some priorities may have to be defined, the key lesson of this paper is that there is a need to take action using different strata of the population, by implementing various and varied ways of action such as awareness, promotion, or even targeted communication processes. Our work highlights the particular case of executives and intermediate professions who talk about the convenient aspect of the two modes, and at the same time, compare it with constraints, inadequate services and unreliability. It also underlines that stakeholders have to consider the different generations, in particular young people and people of working age.

This exploratory work focuses on understanding the image of both train and coach. It proves that the image structure of these modes is not only built on performance and cost criteria which are often cited by elected representatives and technicians. The notion of image includes other important attributes such as convenience and even well-being felt during the trip.

On the French territory, the cohabitation of these two modes mainly concerns the supply of regional services. It tends to be developed on medium and long distance routes since the recent liberalization of coach services. Taking into account what happens in neighboring European countries which have already had a previous experience of coach services (implementation of several services, development of their use), we may therefore wonder whether this French liberalization of coach services, characterized by low-cost services, will revitalize this mode of transport on any level, including the regional one. However, the issue is to understand if its use will only concern occasional trips or if it will correspond to daily transport needs. And another point is to question the best way to persuade individuals to take this mode for daily trips. These are the main challenges of territorial actors, both public and private.

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