The Social Stratification of the Costs of Motoring in France (1984-2006)
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'Classes will always be defined in relation to the goods considered as the most important in each type of society'.

Halbwachs, 1970 (1912); p. III, La classe ouvrière et les niveaux de vie

'The cost of a car is the same for all'.

Peck, 1928; p. 307, 'Civilization on Wheels'

Introduction

The role of the car has been identified as central to post World War Two economic growth. In the Fordist era of regulation the car was a structural element in both supply and demand, based in return on the wage increases enabled by the very considerable gains in productivity during the period [Boyer and Saillard, 2002]. The ‘Second French Revolution’ [Mendras, 1988] thus echoed the spread of the ‘automobile revolution’ [Bardou et al., 1977]. So it is the car, rather than the barbecue, which is one of the symbols of the classless society, a phenomenon referring both to the homogenization of life styles and to the growth of the groups comprising the middle classes in society. The 30 year post-war boom, known as ‘Les Trente Glorieuses’ in France, was an unprecedented period of ‘profit sharing’ [Darras, 1966] thus enabling the mass ownership of numerous material goods, amongst which was the car 1. At a time when the average household expenditure increasingly included the same goods and during which the structure of different social categories was converging 2, it was now to be cultural practices that

1. Jean-Pierre Pagé [Darras, 1966] thus notes that ‘the rise in standard of living observed in France since World War Two has been accompanied by changes in the structure of private consumption, with the amount spent on food falling steadily while that spent on leisure (...) or on culture has risen and (...) and there has been a very significant increase in the purchase of durable consumer goods (...). The proportion of households who own at least one car has risen from only 14% in 1950 to 45% in 1965 (...).’

2. Thus Mendras notes [Mendras, 1988, p. 388] ‘(that) there is little variation in the allocation of expenditure in terms of social categories - it is a direct function of household income. So much so that we can no longer contrast, as Halbwachs did at the beginning of the century, the way of life of the worker, the employee and the bourgeois’. Mendras then refers to Nicolas Herpin’s work [Herpin and Verger, 1991] stating that ‘everything
would differentiate them [Bourdieu, 1973]. Today over 80% of households have a car with the result that the car has now become the typical mass consumption good in a context where the differences between social groups resides in cultural rather than in material consumption.

The hypothesis of a homogenization of life styles of households has nevertheless to be qualified. On the basis of an analysis of the data available in the French household budget surveys ("Budget de Famille" surveys collected in 1989 and 1995), Louis Chauvel [Chauvel, 1999] has shown that the structure of household consumption does still to a large extent differentiate social groups - whether it be a question of material consumption or cultural practices. The author thus demonstrates that the coefficient for the amount spent on bread in the budget enabled the social category of the household to be inferred with an almost 70% success rate. If the coefficient for bread rose above 0.7%, there was a more than 71% chance that the household belonged to the working class. Another key item in the budget is housing; using five dates from the Budget de famille surveys, Fanny Bugeja [Bugeja, 2010] demonstrated that the budget constraints related to housing tended to increasingly differentiate households, in particular the least privileged and the cohorts born after 1960. The car, an everyday item like bread, as important in the household budgets as housing, appears to be an item which is undoubtedly relevant in considering a movement toward homogenization of this type.

In several respects it seems appropriate to consider the question of the homogenization of household consumption using motoring expenditure as a yardstick. The spread of the motor car, along with its prominence in the household budget, leads us to think that the car may be one of these goods 'regarded as the most important in each type of society' [Halbwachs, 1970 (1912), p. III]. Automotive consumption is also interesting due to its very ambivalence. To be sure, historically, the car seems to be a luxury good, thus constituting a discretionary form of expenditure. However, in a period in which vehicle ownership rate is very high, in an age of mobility mainly dominated by automobility [Urry, 2007] motoring expenditure wavers between rationales of social distinction and rationales of constraint, as is demonstrated by the work of Philippe Coulangeon and Ivaylo D. Petev on the characteristics of the cars belonging to French households, using different types of

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3. The social morphology of households without a car and their evolution has been studied previously [Demoli, 2012]. The majority of non-car-owning households are retirees, although the lower income groups are more likely not to have owned a car throughout the period.

4. In 2006, amongst households owning at least one car, the budget line for the car represented the top item in expenditure for almost 30%, and was greater than on housing and food.
transport surveys [Coulangeon and Petev, 2013]. This expenditure may indeed relate to very different realities: an item in the budget referring to the purchase of a second, new car, the expenditure on fuel to go to work or the repairs to an old car - all cover very different realities. This ambivalence in motoring expenditure, noted for example by Louis Chauvel [Chauvel, 1999] who excludes from his study the expenditure associated with the acquisition of vehicles, constitutes both a difficulty but is also at the same time of major interest. In other words, a close analysis of the changes in the car budget and its structures enables us to differentiate the social rationales at work within the same category of expenditure in the homogenization of household consumption.

To begin with, let’s try to understand why the cost of running a car has not been a subject for systematic examination by sociologists and then list the various studies which do attempt to do so. We will then develop the various research questions raised by this type of analysis and describe the material used to respond thereto.

**Difficulties in analyzing the budgetary costs of motoring expenditure**

Analyzing the budgetary costs of running a car and its social distribution poses several problems. The first is that little attention has been paid to the question in the considerable tradition of studies on the sociology of consumption in line with the work of Maurice Halbwachs; the result is that we cannot have recourse to seminal work. The second reason is the very complexity of expenditure on the car which includes both fixed costs and running costs. Finally, the last difficulty, which can be a valuable resource, lies in the work done in other disciplines on this research topic.

**Insufficient recognition of motoring expenditure**  Unlike other budgetary items, motoring expenditure has not been the subject of systematic investigation by the social sciences and, more specifically, by sociology. The first reason for this lack of interest is obviously historical: the fact that cars have become commonplace post-dates the first studies devoted to the structure of household budgets. There is now a long-standing history of analysis of household budgets beginning in the 19th century when transport was still a marginal item for households - when carriages were mainly horse-drawn.

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5. Furthermore, this ambivalence applies to all the budgetary items, as Halbwachs notes [Halbwachs, 1970 (1912), p. 35]: ‘If we wished to differentiate between necessary expenditure and luxury expenditure that would take us very far, because even in expenditure on food, we would need to introduce many categories’.

6. For the initial studies, in France, cf. in particular the studies by Frédéric Le Play [Le Play, 1855]; in Great Britain, cf. the work of Rowntree [Rowntree, 1901]. The introduction of Maurice Halbwachs’ work by Christian Baudelot and Roger Establet [Baudelot et Establet, 1994] provides elements relevant for French history.
As a result of a theoretical hysteresis effect, later research along the lines of M. Halbwachs’ work on the analyses of Ernst Engel\(^7\), thus study the budgetary items already discussed at length by researchers in the sociology of consumption tradition. Housing [Chombart de Lauwe, 1959] [Buğeja, 2010], food [Chauvel, 1999], clothing [Halbwachs, 1970 (1912)] [Herpin, 1986] and leisure [Chauvel, 1999] are central to the analysis. However, in many countries, as from the second half of the 20th century, official statistics have established household surveys which allow us to focus on budgetary items as a whole. It would thus appear to be the asynchronous nature of the developments in sociology of household budgets and the spread of the car which partly explains this lack of interest in the budget line associated with the car. A contrario, the American example demonstrates that the spread of the motor car at an early date was considered of scientific interest as the two phenomena are relatively synchronous [Lannoy, 2003]. The Lynds book on Middletown [Lynd and Lynd, 1929] did take the car - an object which entirely changed the structure of consumption - into consideration, however without resorting to the continental tradition of systematic analysis of budgets.

**An inherently complex expense** The second difficulty lies in the very nature of motoring expenditure, an expense presumed to be complex [Chauvel, 1999]. The budget related to the car is two-fold: the fixed cost, occasional, related to the acquisition of the equipment (driving licence and purchase of the vehicle) and the variable, regular costs which relate to use. The difficulty here is to know how best to grasp an expense which the household budget survey, given the nature of the temporality of its protocol, has difficulty in apprehending\(^8\). A complexity of a different type lies in the fact that the car is different from other consumer goods; like a refrigerator, the fixed cost immediately incurred for its acquisition is much higher than the annual variable costs to run it. However, while the running costs for a refrigerator are relatively independent of its usage, the amount spent on a car is closely linked to use. This item thus includes both expenditure on equipment and expenditure on the services for its use. Now, very frequently, studies on car budgets have often been split; some studies focus on the car as an item of equipment [Herpin and Verger, 1991] [Bodier, 1999] while others focus on other average households.

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\(^7\) Work of this type has made it possible to give a degree of stability to the hypotheses made in the literature concerning numerous goods. Housing and clothing are considered to be normal goods, whereas food is an inferior good. Miscellaneous expenses, typically associated with leisure, have apparently risen faster than income: these appear to be superior goods. It remains to be seen how the car is placed in comparison with these various budgetary items.

\(^8\) A weekly log-book of expenditure is kept by the households for everyday spending. For regular, but less frequent expenses the interviewer uses the various invoices. For domestic durable consumer goods, respondents are asked to list the expenses incurred over the past twelve months. This type of protocol enables an extrapolation of expenditure for other average households.
the variable costs [Collet, 2007]. However, in our view, this difficulty is not insurmountable and exists in other types of spending, which relate to both less frequent expenditure and more regular expenditure, like the example of housing, which has been the subject of systematic and rigorous developments [Bugeja, 2010] 9. Nevertheless the car poses a major problem: unlike housing, which is the sampling unit for the survey, not all households have a car budget. Now, to compare what is comparable in a context of a rise in equipment, the analytical field has to be restricted to those households which owned a car during the period studied.

**Research work produced in other disciplines** The third difficulty is close to that described by Fanny Bugeja in explaining the lack of interest shown by sociologists since Halbwachs for housing related expenditure, namely that this has often been studied by economists. In the case of the car, this type of analysis has often been carried out by transport economists as well as by urban planners, studies which however have limitations for the sociologist. In urban planning studies, the scale is often highly localised and the focus is mainly on the presence of transport amenities and the different types of space in studying the use of the car [Paulo, 2006], with no differentiation of social groups. Economists, who prioritise the income variable, endeavour to construct models of demand for cars per kilometre, without however analysing the amount devoted to motoring expenditure in the different household budgets [Collet, 2007]. Finally, both types of study neglect the considerable differentiation in vehicle equipment of households and often think in terms of an ‘average model of car’ which has every likelihood of being an artificial construct in view of the strong and sustainable structures of social space devoted to the merits of different cars [Coulangeon and Petev, 2013] 10.

9. For example, F. Bugeja has decided to exclude from the category of housing expenditure, expenses related to level of comfort. Thus she does not take into account expenditure on heating, electricity or water. To grasp the relevant effects, we must then make choices in the category of expenditure, choices which we shall specify in the course of our development.

10. Taking as a starting point that fixed costs are negligible in relation to marginal costs, Richard C. Porter for example suggests evaluating the cost of a car by attributing an average cost, the same for every household - *cf.* boxed text. Limits of this type are to be found a fortiori in grey literature or informally written material. On the Agency for the Environment and Energy Management (ADEME) web site, the cost of the car is evaluated for a model with fixed characteristics, as if all households had the same type of car. To evaluate the budget for a car, the Committee of French Car Manufacturers (the CCFA : Comité des Constructeurs Français d’Automobile) chooses the most recent top selling model - which has considerable structural effects: households which buy a new car are highly specific as we have shown. Similarly, the fiscal system evaluates costs per kilometre at the same rate for all taxpayers, no matter what car they own.
Strengths and weaknesses of the work on motoring budgets

There are however some endeavours to gain a better understanding of motoring expenditure. As far as we know, in sociological literature the first study to raise the issue of the weight of the cost of car ownership - without systematically analyzing it - is the monograph on Middletown by the Lynds [Lynd and Lynd, 1929]. They described in particular the case of several families for whom the car budget was centre-stage at the expense of food or clothes. Other studies are written in a somewhat critical spirit. Amongst these, we have the polemical text of André Gorz, 'L'idéologie sociale de la bagnole' (The social ideology of the car) in which the car is described as a 'luxury good', the costs being particularly exorbitant for the working classes [Gorz, 1979]11. Ivan Illich endeavoured to grasp these types of cost by suggesting the notion of social speed of the car [Illich, 1974, pp.30 -31].

The question then is to take into consideration not only the speed of travel (like the ratio of the distance travelled to the time spent in the car) but to measure the effective speed of the car - that is, the relationship of the distance travelled to the time spent in covering it, including both the actual travel time and the time spent in obtaining and maintaining the means of travel. As a result, the speed of the car and de facto, the mobility which it enables is considerably reduced13. However, there again, the calculations made to evaluate the cost of the car, which are needed to understand the speed of the car, are made at national level without drawing any distinction between the costs incurred by different social groups. The work of R.C. Porter, which is more systematic and eclectic, provides a useful analytical framework for the

11. This long extract demonstrates how the expenditure on the car gained preference over other types of expenditure for several working class families: "We'd rather do without clothes than give up the car", said one mother of nine children. "We used to go to his sister's to visit, but by the time we'd get the children shoed and dressed there wasn’t any money left for carfare. Now no matter how they look, we just poke 'em in the car and take 'em along". "We don't have no fancy clothes when we have the car to pay for", said another, "the car is the only pleasure we have". Even food may suffer : "I'll go without food before I'll see us give up the car", said one woman emphatically, and several who were out of work were apparently making precisely this adjustment" [Lynd and Lynd, 1929, pp. 255-256]

12. Thus André Gorz writes : 'The fact is that both in conception and in purpose, the car is a luxury good. And, by definition, luxury cannot be democratized'. (Translator’s translation)

13. Ivan Illich illustrates the concept of effective speed : overall velocity thus : 'The typical American male devotes more than 1,600 hours a year to his car. He sits in it while it goes and while it stands idling. He parks it and searches for it. He earns the money to put down on it and to meet the monthly instalments. He works to pay for petrol, tolls, insurance, taxes and tickets. He spends four of his sixteen waking hours on the road or gathering his resources for it. And this figure does not take into account the time consumed by other activities dictated by transport : time spent in hospitals, traffic courts and garages; time spent watching automobile commercials or attending consumer education meetings to improve the quality of the next buy. The model American puts in 1,600 hours to get 7,500 miles : less than five miles per hour.' [Illich, 1974, pp. 30-31]
Boxed text 1: The costs of the car, based on Porter.

In his book, *Economics at the Wheel*, Richard C. Porter [Porter, 1999] sets out to list the various costs incurred by households to run a car. The economist begins by separating private costs and external costs - cf. Table 1. Amongst the private costs, he includes the variable explicit costs (such as gas and oil, repairs, tyres, parking fines, parking costs), the fixed explicit costs, (drivers license, purchase of the car, car registration document, various taxes and insurance; costs independent of the distance driven) and the implicit costs (some being variable i.e. dependent on the distance driven, including one’s own time, or life; others being fixed, including depreciation of the car or the interest rate on the loan to buy the car in cash).

Working on the hypothesis that fixed costs are negligible as compared with marginal costs, Porter sets out an equation specifying the Total Variable Private Cost (TVPC) incurred by the car:

\[
TVPC = P_l Q_l + P_t Q_t + p Q_m V_L
\]

With \(P_l\) price per litre of gasoline (petrol in the UK), \(Q_l\) the quantity of gasoline purchased per year, \(P_t\) the price of time (i.e., the opportunity cost of driving time), \(Q_t\) the amount of time spent driving per year, \(p\) the probability per kilometre of killing oneself or being killed while driving, \(Q_m\) the number of miles driven per year and \(V_L\) the dollar value the driver puts on his/her own life.

The total is divided by the distance travelled per year, \(Q_m\) and this gives the average variable private cost (AVPC):

\[
AVPC = \frac{P_l Q_l + P_t Q_t + p Q_m V_L}{Q_m} = \frac{P_C}{mc} + \frac{P_t}{mh} + p V_L
\]

In which \(mc\) is average consumption per litre and \(mh\) the average speed.

The cost of the car is thus a function of:
- The price of gasoline/petrol \(P_l\)
- The fuel efficiency of the car \(mc\)
- The opportunity cost of driving i.e. a function of the driver’s hourly wage
- The average speed \(mh\)
- The probability of a fatal accident \(p\)
- The value the driver puts on his or her own life \(V_L\)
Table 1 – The costs of the car - reproduced from Richard C. Porter

<table>
<thead>
<tr>
<th>Variable, explicit</th>
<th>Fixed, explicit</th>
<th>External costs</th>
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<tbody>
<tr>
<td>Gasoline and Oil</td>
<td>Car registration</td>
<td>Military</td>
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<td>Maintenance</td>
<td>Insurance</td>
<td>Air pollution</td>
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<td>Tyres</td>
<td>Drivers license</td>
<td>Global warming</td>
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<td>Traffic fines</td>
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<td>Variable, implicit</td>
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<td>Water Pollution</td>
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<td>Own time</td>
<td>Depreciation</td>
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<td>Own life</td>
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<td>Police costs</td>
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<td>'Free parking'</td>
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<td>Disposal of car</td>
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Source: Table reproduced from R.C. Porter [Porter, 1999, p. 19].

Materials and research questions

Presentation of the material and of the construction of the various indicators The data at our disposal comes from the French household budget surveys (enquête Budget de famille) conducted between 1984 and 2006, that is to say five survey dates. Carried out at the level of ordinary households, the aim of this series of surveys is to produce information on the expenditure and resources of households, the details of the socio-economic characteristics of the head of household being provided. Moreover certain survey dates enable us to specify the characteristics of the car fleet owned with the result that we can link budgetary constraints and types of vehicle. Finally, the general trends of motoring expenditure and their determining factors will be studied with the aid of data from all five surveys; the second part of the analysis will focus more particularly on the most recent data.

In line with the work of Halbwachs [Halbwachs, 1970 (1912)] on the sociology of consumption, the variable in which we are interested is a budgetary coefficient, i.e. the proportion devoted to one item of expenditure in the total expenditure incurred by a household. The budget for car ownership has been sub-divided into three types of expenditure. Fixed expenditure is defined as the expenditure incurred in the purchase of a car (new or second-hand, in cash or on credit, monthly instalments and leasing agreements, the possible trade-in of an old car), independent of its use. Variable expenditure which, for its part, concerns the expenditure required for running the car which is closely linked to the qua-

14. However, we exclude saving from total expenditure but include it in the category of spending on property, traditionally outside the scope of consumption.
lity of the car (this applies to spending on insurance, but also to spending associated with repairs, for example). Finally, the marginal expenses have the closest correlation with the use of the vehicle; they include mainly expenditure on gasoline, and lubricants as well as spending on parking and toll charges. Unlike R. Porter [Porter, 1999] we integrate variable costs and fixed costs into our analyses, since they represent a sizeable proportion of the household budget - for the details of the construction for the 2006 survey, cf. Tab. 8.

**Hypotheses and research questions** Three research questions will structure this study. The first set of questions aims at grasping the factors determining the cost of the car in the household budget and their evolution. Does the share in the budget rise, or does it fall? At household level, what are the factors determining the volume of an expenditure of this type? Do these factors tend to reside in considerations of budgetary constraint or in considerations of social distinction? Answering questions of this type has a two-fold interest: filling empirical gaps, on one hand, and describing the cost of motoring expenditure on the other (where is the car located in the hierarchy of needs?).

The second path of inquiry endeavours to test a classical hypothesis in the literature, namely the rapprochement of the modes of consumption of different socio-professional categories. In plain language the aim here is to reply to a classical hypothesis with a new object: to what extent do the structures of motoring expenditure enable us to reveal the social structure? What does an analysis of motoring expenditure tell us about the social structure? In a context in which cars have become commonplace, do the phenomena of differentiation not tend to be located in the structure of the budget devoted to motoring expenditure rather than in the ownership of a car? Are material goods as impervious to social differentiation as some studies suggest?

The third set of questions attempts to take advantage of the wealth of information on motoring expenditure, in the same way as Fanny Bugeja [Bugeja, 2010] uses the variations in the spending on housing costs. The same coefficient assigned to housing may in fact conceal very different budgetary efforts in matters of comfort and in particular in terms of average area per inhabitant; similarly, the same coefficient assigned to motoring expenditure may conceal the degree of mobility. In other words, it is not so much a question of studying the budgetary coefficient as the budgetary outlay, by combining the level of expenditure with the intensity of use. These questions are all the more necessary as the spread of the car is the result of the expansion of the second-hand market and the narrowing in ranges of vehicles,

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15. These types of expenditure are often not declared in the expenditure linked to transport, minimising the extent of the costs of car ownership; these expenses are listed under a different heading from that of transport.
leading to an appreciable differentiation in the quality of the cars owned by the different social groups [Coulangeon and Petev, 2013]. Now, variations of this type have an impact on the potential for mobility and on its costs.

1  Evolution and determinants of the budgetary weight of motoring expenditure since 1984

1.1 General evolution of the budgetary weight of motoring expenditure since 1984

The question of the evolution of the budget devoted to motoring expenditure is interesting in several respects. In the first instance this analysis is of empirical interest - frequently, the cost of the car is only studied in relation to transport, an item which combines different types of expenditure and conceals some of them. Then, the analysis of motoring expenditure enables us to gain a better understanding of the very nature of this expenditure. We are well informed as to the evolution of expenditure on food, housing and clothing as a function of the variations in household income. Thus, in keeping with what is known as 'Engel’s Law’ (formulated by the statistician Ernst Engel), food is traditionally considered to be an inferior good, while housing and clothing are normal goods i.e. the income elasticity of the demand for food is between 0 and 1 [Engel, 1857] (for an empirical test of Engel’s Law cf. [Houthakker, 1957]. However, Engel provides no information as to the possible evolution of the coefficient for the proportion of the budget spent on transport. Is motoring expenditure closely related to that on housing and likely to evolve in the same way? Or should motoring expenditure be included in the category of leisure and miscellaneous expenses, a proportion which tends to increase with income? A close study of the proportion of the budget allocated to the car by households will enable us to reply to questions of this type.

Figure 1 provides information on the share of budget allocated to motoring expenditure by households since 1984. We observe an appreciable decline in the motoring expenditure budgetary coefficient, which rises to 16% of expenditure in 1984 and then falls by about 25% over two decades, remaining stable at 12% in 2006. This decrease is equally distinct, although much smaller, when we take the median of the budgetary coefficient : changes of

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16. The case of car insurance has already been mentioned. Louis Chauvel, moreover, chooses not to take spending related to the acquisition of vehicles into account [Chauvel, 1999].

17. In most publications, transport related budgetary coefficients include all households, even if they do not have a car. To ensure that our analyses are comparable, we distinguish two fields here : households with a car, and all households. In the rest of the analyses we will only refer to the field of households with at least one car.
this type in the structure of the budget thus potentially apply to all households and are not restricted to certain types of households.

At first sight, changes of this type appear somewhat counter-intuitive given the evolution in car equipment over the past quarter of a century. Car ownership has become commonplace in all households and multiple ownership is very widespread\(^\text{18}\). One would think that more frequent and denser ownership would go hand in hand with higher expenditure. Furthermore, there is no indication of a decline in use of the car over the period\(^\text{19}\). In order to explain the fall in this coefficient, we can use the argument suggested by Marianne Juillard: ‘(...) both technological progress and changes in consumer behaviour have acted simultaneously in reducing the volume of consumption associated with the car’ [Juillard, 2007, p. 1]. In fact, several

\(^{18}\) In 1984, the average number of cars per household was 1, compared with 1.24 in 2006.

\(^{19}\) The data from the different dates in the series of the national transport surveys show that after having risen between 1981 and 1993 from 10,500 to 14,000 kilometres, the annual average mileage done by a car fell a little and stabilised at about 13,000 kilometres.
factors combine to contain car ownership costs. First, as regards fixed costs, the growth throughout the period of resort to the second-hand market should be noted. In 1990 the ratio of registrations of second-hand cars to new cars was 2.5, as compared with 4.3 in 2004. Furthermore, the use of diesel fuel by household cars has reduced the growth of part of the marginal costs incurred by households. Only the costs related to spare parts and repairs have risen more rapidly than the consumer price index - cf. Figure 7 in the appendix. However changes of this type do not seem to have had much impact on the structure of motoring expenditure - cf. Figure 2.

**Figure 2** – Structure of the fixed, variable and supplementary costs in motoring expenditure between 1984 and 2006.

[Diagram showing the structure of fixed, variable, and supplementary costs from 1984 to 2006.]


*Field*: All households equipped with at least one car

*Note to the reader*: In 1984, of every 100 francs spent on motoring expenditure, 15 were allocated to fixed costs, i.e. the acquisition of a vehicle.

The fall in the motoring expenditure item in the budget would seem to indicate that the car does not constitute a discretionary expense; the volume

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20. As from 2001, the majority of new registrations were diesel engines.
21. Above all, we notice that the structure of these different costs tends to remain constant. Throughout the period, the fixed costs are rather a small proportion - apart from the year, 1995, which was very specific in the cycle of the new car market, stimulated by the Balladurette [Adda and Cooper, 2000]. Marginal costs fall to the benefit of variable costs: over the period, direct spending on running a car declines in prominence.
of discretionary spending tends to rise more rapidly than the level of income.

Let us now go on to a synchronic analysis and consider how the different levels of household income modulate the budgetary coefficient allocated to motoring expenditure.

**FIGURE 3** – The budgetary coefficient for motoring expenditure according to quintile of income per unit of consumption between 1984 and 2006 for households with a car.

![Graph showing budgetary coefficient for motoring expenditure](image)


*Field*: All households equipped with at least one car.

*Note to the reader*: In 1984, on average 15% of the budget of car-owning households in the 1st income distribution quintile was allocated to motoring expenditure.

### 1.2 The distribution of the budgetary coefficient for motoring expenditure as a function of constraints in income and localisation

The distribution of the budgetary coefficient for motoring expenditure as a function of household income leads us to confirm the previous finding: motoring expenditure does not seem to rise steadily with income - cf. Fig. 3. True, in 1984, as in 1989, there is no clear trend; the budget allocated to the car would appear to be relatively independent of level of income. However, since the 1990s the analyses reveal a wholly original pattern: the
motoring expenditure budget seems to fall as the level of income rises. On the basis of the 1994 survey, one does indeed observe a trend to a decoupling between the budgetary coefficient of the 80% of the lower income households from that borne by the top (richest) quintile, a decoupling which would seem to be fairly similar to what Fanny Bugeja observed in the budgetary input allocated to housing [Bugeja, 2010]. Moreover, the preceding findings demonstrate that this lower coefficient could not be explained by a decline in quality, nor in use of the cars available to households of this type. However, the structure of motoring expenditure does vary as a function of incomes (cf. Fig. 8 in appendix), regardless of the year considered. Thus we observe a strong positive correlation between level of income and level of fixed costs: motoring expenditure for the richer households is much more concentrated on the acquisition of cars. Inversely, direct and indirect running costs are more prominent for the lower income households to the detriment of fixed costs. In other words, within the motoring expenditure category itself, we have to differentiate the costs. Their relative weights demonstrate that motoring expenditure may prove to be discretionary for some, the richer, and relatively more onerous for others, the lower income groups.

The constraints pertaining to geographical location and income are traditionally listed as being important determinants in the demand for transport [Collet, 2007]. How do the budgetary constraints for the car vary with different types of geographical location? The following results (cf. Fig. 4) are in line with what would be expected; the budgetary coefficient varies negatively in relation to the density of place of residence, although the correlation remains weak. Not surprisingly, the ranking of marginal costs in motoring expenditure falls with the size of the residential area. However, all things being equal, we still have to propose an analysis enabling us to sort out the effects specific to each of the variables on which we focus and to grasp their evolution over the past thirty years.

1.3 A regression analysis of the budgetary constraints of the car.

In order to understand the specific effects of the various determinants listed, we shall undertake a multiple regression analysis for each of the survey dates, modelling the motoring expenditure budgetary coefficient (as a percentage). The independent variables describe the levels of income per household, the geographical location, the household size, and the number of cars owned...

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22. This decrease is much lower than that observed for British households by J. Froud [Froud et al., 2005]; the households in the top quintile income spend on average more than 34% of their budget on their car, as compared with 9% for the households in the lowest quintile.

23. This finding is totally consistent with what has been demonstrated above; the preference for new cars and the rapid renewal of cars owned increases with rise in income: "In the automobile market, for example, the level of income may be taken as the major explanatory variable for the decision to buy a new or used car" [Jullien, 2008, p. 187].
Figure 4 – Budgetary coefficient allocated to motoring expenditure according to density of place of residence between 1984 and 2006 for households with cars.

Field: All households equipped with at least one car.
Note to the reader: In 1984 a household equipped with at least one car, living in a rural areas, spent 17% of its budget on motoring expenditure.
N.B.: In 2006, it is not possible to separate the households in the inner suburbs from the households in Paris. For this date the last column in the histogram includes households in both areas.

Consumption Unit (Reference : 1st quintile), place of residence according to density (Reference : rural space), the number of actively employed and of individuals in the household (Reference : one actively employed and one individual), the age of the reference person (R.P.) in age groups (Reference : less than 25 years old), the profession and socio-occupational category (S.O.C.) of the R.P. (Reference : unskilled worker) and the number of cars at the disposal of the household (Reference : one car).

A regression analysis enables us to confirm and refine the intensity of

24. Originally designed by a group of French statisticians, the Profession and socio-occupational classification combines three distinct criteria: status (employees vs. self-employed), occupation and skill.

25. We have tested other models, the conclusions being fairly similar. In particular, we tested a regression model coding the interactions for each of the variables with the year of the survey, a model which was not very conclusive.
the constraints on the budgetary coefficient related to the car. In the first instance, for income, the analyses do not reveal a very distinct correlation. However, the findings for the three last surveys do tend to lead us to think that the budgetary coefficient falls with income, especially for the (top) quintile. In 2001, all things being equal, belonging to the 20% of the richest households means the budgetary coefficient falls by 2.7 points; in 1995 this gap rose to 3.1 points. An increase in income would therefore seem to contain motoring expenditure rather than increase it. In other words, the budgetary effort devoted to motoring expenditure does not rise with level of income; when the level of equipment and the socio-demographic variables present in the model are controlled, motoring expenditure would therefore neither rise nor remain constant, but instead, would fall. This is the first indication that motoring expenditure is more of a constraint than a discretionary expense.

With regard to localization, our findings confirm what the statistics suggested: an urban location, compared with a rural one, clearly reduces the motoring expenditure budgetary coefficient. In accordance with the analyses carried out by Alain Chenu and Nicolas Herpin, in the analysis of consumption patterns, as in those of personal schedules, a clear distinction has to be made between urban and rural ways of life [Chenu and Herpin, 2002]. Moreover, the effect is clearly amplified for a location in the greater Paris area (Ile de France) whether it be the inner or outer suburbs, or Paris intra muros.

Further observations can be made on the effect of the control variables used in the model. We note that, all things being equal, young age groups are associated with higher budgetary coefficients; moreover, along the lines of M. Bodier’s [Bodier, 1999] analyses, for whom the car is ‘a habit made at an early age’ [Bodier, 1999], Nicolas Herpin has thus recently demonstrated that equipment costs are particularly high at the beginning of the life cycle [Herpin and Marcel, 2012]26. The number of persons in the household also varies with the direction expected, i.e. varies negatively with motoring expenditure. Two reasons may explain this type of observation. The car is a consumer durable and, as such, is likely to benefit from economies of scale. In contrast, other items which are less sensitive to economies of scale are likely to take precedence over the car in the budgetary items when there are more people in the household. Finally, the number of cars may vary positively with the budgetary coefficient: running two cars rather than one, (all things being equal), does imply a heavier constraint in the budget.

The introduction of the variable of profession and socio-occupational category shows extremely interesting effects, which are significant and durable throughout the period. We observe a somewhat original social gradient in

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26. This age effect may however conceal considerable generational effects in relation to motoring expenditure as the paper on generational dynamics has endeavoured to show [Demoli, 2013].
the distribution of the motoring expenditure budgetary coefficient, which tends to fall as the social hierarchy rises. The weight of the car in the household budget of an unskilled working class reference person was 3.5 points higher in 2006 than that of a manager in the private sector. How should we interpret this type of social stratification in the budgetary constraints related to car ownership? The first hypothesis recalls that formulated by Fanny Bugeja concerning housing: over the past thirty years, lower income households have been subject to increased budgetary constraints with the result that discretionary spending has suffered [Bugeja, 2010]. As we have seen, for each survey date, the car does not seem to cost more, but this expense is particularly high for the lowest income social groups. The intensification of this expense is perhaps explained by the spatial factors affecting the different social groups: the phenomena of peri-urbanization and relegation [Donzelot, 2004] have particular relevance for the less skilled, along with a form of dependency on the car [Dupuy, 1999], the use of which is essential and daily [Coutard et al., 2002]. Now this type of differentiation in localisation, according to social group, is poorly grasped by the only geographical variable at our disposal. The second hypothesis is farther from an explanation in terms of constraint by suggesting that the working class have an attachment to the car. Considerable investment in car ownership, a symbol of integration in mass consumption, would thus reflect a mode of compensation in the face of ‘statutory frustrations’ [Caplovitz, 1963] 27.

The social gradient in car expenditure is therefore quite remarkable and deserves an in-depth analysis. To respond to an alternative suggested above, we propose to construct a social space for motoring expenditure, articulating it with other items of expenditure. The aim is to show the different budgetary constraints of motoring expenditure and to understand the social rationales.

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27. The example of ‘tuning’, a practice mainly the preserve of young working-class bachelors, is an obvious example [Cornu, 2010].
Table 2 – Estimate of the parameters of the multiple regression model. Forecast of the motoring expenditure budgetary coefficient (in percentages) for households with at least one actively employed person.

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<tbody>
<tr>
<td></td>
<td></td>
<td>Intercept</td>
<td>21.3</td>
<td>***</td>
<td>19.4</td>
<td>***</td>
<td>19</td>
<td>***</td>
<td>15.8</td>
<td>***</td>
<td>16</td>
<td>***</td>
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<td></td>
<td>Income per UC</td>
<td>2nd quintile</td>
<td>−0.6</td>
<td>ns</td>
<td>−0.8</td>
<td>ns</td>
<td>0.6</td>
<td>ns</td>
<td>−0.8</td>
<td>ns</td>
<td>0.9</td>
<td>*</td>
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<td></td>
<td></td>
<td>3rd quintile</td>
<td>−0.4</td>
<td>ns</td>
<td>−0.4</td>
<td>ns</td>
<td>−1.6</td>
<td>***</td>
<td>−1</td>
<td>*</td>
<td>0.4</td>
<td>ns</td>
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<tr>
<td></td>
<td></td>
<td>4th quintile</td>
<td>−1</td>
<td>*</td>
<td>−0.4</td>
<td>ns</td>
<td>−1.5</td>
<td>***</td>
<td>−1.2</td>
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<td>−1.1</td>
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<td></td>
<td></td>
<td>5th quintile</td>
<td>−0.3</td>
<td>ns</td>
<td>0.1</td>
<td>ns</td>
<td>−2.7</td>
<td>***</td>
<td>−1.1</td>
<td>*</td>
<td>−2.7</td>
<td>***</td>
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<td></td>
<td>Reference : 1st quintile</td>
<td>Under 25</td>
<td>6.3</td>
<td>***</td>
<td>6.9</td>
<td>***</td>
<td>4.2</td>
<td>***</td>
<td>5.9</td>
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<td>5</td>
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<td></td>
<td></td>
<td>25-34 years</td>
<td>1.1</td>
<td>ns</td>
<td>1.8</td>
<td>***</td>
<td>1.8</td>
<td>***</td>
<td>1.7</td>
<td>***</td>
<td>0.7</td>
<td>ns</td>
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<td></td>
<td></td>
<td>35-44 years</td>
<td>−0.8</td>
<td>ns</td>
<td>0.2</td>
<td>ns</td>
<td>−0.1</td>
<td>***</td>
<td>−0.2</td>
<td>ns</td>
<td>0.1</td>
<td>ns</td>
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<tr>
<td></td>
<td></td>
<td>45-54 years</td>
<td>−0.4</td>
<td>ns</td>
<td>1.1</td>
<td>*</td>
<td>0</td>
<td>ns</td>
<td>0.4</td>
<td>ns</td>
<td>−0.7</td>
<td>ns</td>
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<tr>
<td></td>
<td>Reference : 55-64 years</td>
<td>65 years and over</td>
<td>2.1</td>
<td>*</td>
<td>2.9</td>
<td>***</td>
<td>0.8</td>
<td>ns</td>
<td>0.3</td>
<td>ns</td>
<td>−1</td>
<td>ns</td>
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<tr>
<td></td>
<td>Place of residence</td>
<td>Urban area &lt; 20000 inhabitants</td>
<td>−0.6</td>
<td>ns</td>
<td>0</td>
<td>ns</td>
<td>−1.1</td>
<td>**</td>
<td>−0.6</td>
<td>ns</td>
<td>−0.8</td>
<td>**</td>
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<tr>
<td></td>
<td></td>
<td>Urban area &gt;20000 inhabitants</td>
<td>−0.4</td>
<td>ns</td>
<td>−0.4</td>
<td>ns</td>
<td>−1.1</td>
<td>**</td>
<td>−0.9</td>
<td>**</td>
<td>−1.2</td>
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<td></td>
<td></td>
<td>Outer suburb</td>
<td>−0.7</td>
<td>ns</td>
<td>−0.9</td>
<td>*</td>
<td>−1</td>
<td>***</td>
<td>−1.7</td>
<td>***</td>
<td>−2.1</td>
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<td></td>
<td></td>
<td>Inner suburb</td>
<td>−2.1</td>
<td>***</td>
<td>−2.6</td>
<td>***</td>
<td>−2.1</td>
<td>***</td>
<td>−2.4</td>
<td>***</td>
<td>−2.9</td>
<td>***</td>
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<td></td>
<td>Reference : Rural area</td>
<td>Paris intra muros</td>
<td>−5.2</td>
<td>***</td>
<td>−3.7</td>
<td>***</td>
<td>−4.7</td>
<td>***</td>
<td>−4</td>
<td>***</td>
<td>−4.4</td>
<td>***</td>
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<tr>
<td></td>
<td>Occupational category of R.P.</td>
<td>Farmers</td>
<td>1.4</td>
<td>ns</td>
<td>2.5</td>
<td>**</td>
<td>−3.7</td>
<td>***</td>
<td>−2.2</td>
<td>***</td>
<td>−4.2</td>
<td>***</td>
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<tr>
<td></td>
<td></td>
<td>Artisans, shopkeepers</td>
<td>−0.9</td>
<td>ns</td>
<td>−0.1</td>
<td>ns</td>
<td>−1.9</td>
<td>**</td>
<td>−2.2</td>
<td>***</td>
<td>−2.1</td>
<td>***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Professions, Business owners</td>
<td>−3.8</td>
<td>**</td>
<td>−3.7</td>
<td>**</td>
<td>−5</td>
<td>***</td>
<td>−5.2</td>
<td>***</td>
<td>−3.5</td>
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<td></td>
<td></td>
<td>Public service executives</td>
<td>−5</td>
<td>***</td>
<td>−3.8</td>
<td>***</td>
<td>−2.3</td>
<td>***</td>
<td>−2.1</td>
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<td>−3.5</td>
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<tr>
<td></td>
<td></td>
<td>Private service executives jobs</td>
<td>−3.3</td>
<td>***</td>
<td>−2.6</td>
<td>***</td>
<td>−2.6</td>
<td>***</td>
<td>−1.4</td>
<td>**</td>
<td>−3.5</td>
<td>***</td>
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<td></td>
<td></td>
<td>Professional adm. in public function</td>
<td>−2.1</td>
<td>***</td>
<td>−2.5</td>
<td>***</td>
<td>−0.9</td>
<td>ns</td>
<td>−1.7</td>
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<td>−2.1</td>
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<tr>
<td></td>
<td></td>
<td>Professional adm. in commercial institutions</td>
<td>−0.9</td>
<td>ns</td>
<td>−1.8</td>
<td>*</td>
<td>−2.9</td>
<td>***</td>
<td>−1.3</td>
<td>**</td>
<td>−1.5</td>
<td>**</td>
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<td></td>
<td></td>
<td>Technicians, supervisors</td>
<td>−1.9</td>
<td>**</td>
<td>−1.1</td>
<td>ns</td>
<td>−1.3</td>
<td>***</td>
<td>−0.3</td>
<td>ns</td>
<td>−2.3</td>
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<tr>
<td></td>
<td></td>
<td>Skilled employees</td>
<td>−0.7</td>
<td>ns</td>
<td>−1.9</td>
<td>***</td>
<td>−0.9</td>
<td>ns</td>
<td>−0.1</td>
<td>ns</td>
<td>−2</td>
<td>ns</td>
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<td></td>
<td></td>
<td>Unskilled Employees</td>
<td>−1.4</td>
<td>ns</td>
<td>−2.7</td>
<td>**</td>
<td>0.8</td>
<td>ns</td>
<td>−1.9</td>
<td>**</td>
<td>−2.2</td>
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<td>Skilled workers</td>
<td>−0.9</td>
<td>*</td>
<td>−0.3</td>
<td>ns</td>
<td>−0.2</td>
<td>ns</td>
<td>−0.2</td>
<td>ns</td>
<td>−1.9</td>
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<tr>
<td></td>
<td>Number of actively employed persons</td>
<td>2 actively employed persons or more</td>
<td>0.5</td>
<td>ns</td>
<td>0.6</td>
<td>ns</td>
<td>1.3</td>
<td>***</td>
<td>−0.1</td>
<td>ns</td>
<td>0.2</td>
<td>ns</td>
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<td></td>
<td>Reference : One actively employed person</td>
<td>2</td>
<td>−5</td>
<td>***</td>
<td>−4.2</td>
<td>***</td>
<td>−2.3</td>
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<td>−1.1</td>
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<td>−2.4</td>
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<td>3-4</td>
<td>−5</td>
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<td>−4.8</td>
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<td>−2.7</td>
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<td>−2.1</td>
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<td></td>
<td>Reference : One personne</td>
<td>5 and over</td>
<td>−6.1</td>
<td>***</td>
<td>−6.1</td>
<td>***</td>
<td>−4.2</td>
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<td>−3.5</td>
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<tr>
<td></td>
<td>Reference : One vehicle</td>
<td>Two vehicles or more</td>
<td>5.8</td>
<td>***</td>
<td>4</td>
<td>***</td>
<td>4.2</td>
<td>***</td>
<td>4</td>
<td>***</td>
<td>4.9</td>
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</table>

Field: All car-owning households with at least one actively employed person.
Note to the reader: In 1984, a household in the first quintile of income distribution, comprising a bachelor aged between 55 and 64 years who is an unskilled worker, the owner of one vehicle and residing in a rural area, according to the regression model, had a budgetary coefficient for motoring expenditure of 21.3%. For an individual with similar characteristics in the model but living in Paris intra-muros, the model forecasts a budgetary coefficient of 5.2 points. ***, ** and * refer to parameters which are significant at thresholds of 1, 5 and 10%; ns refers parameters which are not significant.
Nota Bene: The 2006 survey does not enable us to differentiate the Parisians from the inhabitants of the inner suburbs in Ile de France. A single coefficient refers to both modalities.
2 Share of budgetary effort devoted to motoring expenditure: a new factor in social stratification?

It is clear from the above that motoring expenditure is particularly onerous for the lower income groups, with the result that it appears to be highly constrained. However, studies have shown that the question of motoring expenditure goes beyond the alternative between choice and constraint [Froud et al., 2005]. Furthermore, the details of the differences in the household car fleet lead us to consider a fairly heterogeneous level and structure of costs depending on household choice of car. These two issues lead us to reformulate the questions posed in the first part: how does motoring expenditure structure household budgets? Does it play a crucial role? Does it differentiate patterns in spending specific to social groups or socio-demographic constraints independent of social class? Or does it reveal forms of polarization? How do the characteristics of the car fleet differentiate the costs assumed by the different social groups?

In response, three possible paths will be suggested. In the first instance to gain a better understanding of the rationales and nature of motoring expenditure we shall situate it in relation to other costs which structure the budget, such as housing, food or leisure - this will be done using data analysis methods in 2.1. On the basis of these methods, we will then see whether standard or reference budgets specific to social groups emerge and whether motoring expenditure plays a significant role, or not. Finally, the aim is to show that, despite equivalent budgetary constraints, the car does not incur the same cost for comparable travel requirements: to sum up, the aim is to compare for any given mobility, the cost of motoring expenditure for different households depending on the characteristics of the vehicle owned.

2.1 Social space and motoring expenditure

Principles of the construction of a social space of expenditure. Following the model of La Distinction [Bourdieu, 1973], we have constructed a space of modes of consumption (and more specifically related to motoring expenditure) and a space with the positions of individuals.

In order to represent the social space of expenditure, we use here a Principal Component Analysis (PCA) and not a Multiple Correspondence Analysis (MCA), since the data for expenditure are budgetary coefficients - random variables ranging between 0 and 1\(^2\). As it is not our aim to provide a complete picture of household expenditure, but instead to understand the role

28. Using a greater number of budget variables, Fanny Bugeja [Bugeja, 2010] ranks the budgetary coefficients in deciles, to enable comparability of coefficients which are frequently extreme. The budgetary coefficients in our data are less numerous and present for almost all households with the result that we can keep the uncorrected budgetary coefficients.
and weight of the motoring expenditure budget amongst other major household expenses, we have only selected the four items usually discussed in the literature (food, housing, leisure and clothing - for the construction of the various items, cf. Annex) and the three sub-items in the car budget (fixed costs, variable costs and marginal costs). The analysis aims to give a better understanding of the rationales of the articulation of the different major budgetary items and the sub-items in motoring expenditure. One of the first aims of the PCA is to set out an 'assessment of the liaisons between variables' [Escofier, Pagès, 2008] 29.

To identify the similarities between households, we use a set of supplementary socio-demographic variables which are of two types. The first set (of supplementary variables) includes the classical socio-demographic variables (level of income per CU (consumption unit), breakdown of professions and socio-occupational categories into twelve groups, age group of the reference person, place of residence, household composition, housing occupation status), enabling us to associate spending patterns and social position broadly speaking. The second set shows some of the important characteristics of the level of vehicle ownership per household (age of the vehicle, type of acquisition, variable combining age and type of acquisition, type of engine), to gain a better understanding of how the quality of the vehicle structures motoring expenditure and to link quality of vehicle, social position and pattern of spending.

Furthermore, in the analysis we have selected only households with at least one actively employed person and with one or more vehicles. This restriction to households with at least one actively employed person, similar to the choice made by Louis Chauvel [Chauvel, 1999], aims at comparing households with comparable life cycle constraints. In particular, the number of cars per capita, like the spending on capital goods, is very specific in the life cycle [Bodier, 1999]. More generally, the structure and level of consumption varies substantially at the time of retirement [Herpin and Marcel, 2012], therefore we do not include households of this type in the analysis.

**Remarks on the PCA findings.** According to the three criteria generally defined in the Principal Components Analysis, the choice of three axes appears to be relevant. 30.

29. According to the authors : "The questions raised by the PCA are : which variables are positively correlated with one another? Which variables are negatively correlated? (...) Are there groups of variables which are correlated? Is it possible to demonstrate a typology of variables?" [Escofier, Pagès, 2008, underlined by the authors, p. 8].

30. The data clearly show a break between the 3rd and the 4th eigenvalue. Kayser’s criteria, leading us to restrict our choice to the axes whose inertia is greater than the average inertia, ie. 1, confirms our choice of these three axes. Finally the criteria of the Scree-test, proposing to select the axes for which the second differences are positive, also give a space structured by three axes. *cf.* the details of the different criteria in table 9.
The first axis basically contrasts the budgetary coefficient assigned to food and the share of the fixed costs associated with the car - cf. Tab. 3. It can be read as an axis defining a frontier between traditional fixed commitments and discretionary spending, separating inferior goods from superior goods. The first component demonstrates the dominance of the motoring budget in the differentiation of the budgetary structure of the various households. The two variables which contribute the most to the second factor are expenditure on housing and the spending associated with the fixed costs of the car: housing and the purchase of a car are significant outlays which often appear to be mutually exclusive. The coordinate for the variable of spending on leisure is negative, as is the variable for spending on fixed costs and amplifies the opposition between discretionary spending (either classical, on leisure pursuits or, more original, on the purchase of a vehicle) and traditional fixed costs. Here the axis appears to define a contrast between normal goods and superior goods. Finally, the third factor is highly structured, on the one hand by the two highest costs in motoring expenditure which are the marginal costs and the variable costs and, on the other hand, spending on leisure. This opposition, which is very clear in the contribution of the different variables to the construction of the axis, becomes very interesting when we realise that the usual expenditure (in the two meanings of the term, the most frequent expense and the running costs) on the car seems to be incompatible with discretionary spending on leisure. In other words, while traditionally the car would appear to side with the leisure activities to which it enables access [Lynd and Lynd, 1929], it would appear that if we take the example of France today, the major share of the budget allocated to it seems to constitute a fixed rather than a discretionary expense (for a representation of the different budgetary item variables in the map of the first two axes, see figures 9 et 10).

On reading the PCA findings, it becomes apparent that usual, or habitual, expenditure on a vehicle never comes under discretionary expenditure. However, a sub-item - fixed costs - tends to qualify the above observation: buying a car, or renewing a car seems to be part of a rationale which is closer to a discretionary expense, which occurs when spending on food or housing have become less dominant in the budget.\textsuperscript{31}

Now let's consider the distribution of the categories of the supplementary variables in axes 2 and 3 of the graph focusing more specifically on the various dimensions of motoring expenditure.\textsuperscript{32} The projection of the centres of gravity of the Socio-Occupational Category (S.O.C.) clearly shows a social gradient along axis 3, contrasting a motoring budget structured by marginal

\textsuperscript{31} However this type of configuration conceals very different realities; for older, lower income households, food often has a significant position; for younger households, living in high density areas, where the price of property is relatively high, it is housing.

\textsuperscript{32} The probabilities of exceeding the supplementary variables are all lower than 0.05, as are also the probabilities of exceeding the coordinates of the various modalities.
Table 3 – Coordinates, contributions and quality of representation of the active variables in the PCA, or Principal Components Analysis

<table>
<thead>
<tr>
<th>Active variable</th>
<th>Axis 1</th>
<th>Axis 2</th>
<th>Axis 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coordinates</td>
<td>Contribution</td>
<td>Cos²</td>
</tr>
<tr>
<td>Fixed costs</td>
<td>-0,59</td>
<td>27,8</td>
<td>35,2</td>
</tr>
<tr>
<td>Variable costs</td>
<td>0,14</td>
<td>1,5</td>
<td>1,9</td>
</tr>
<tr>
<td>Marginal costs</td>
<td>0,34</td>
<td>8,9</td>
<td>11,3</td>
</tr>
<tr>
<td>Food</td>
<td>0,63</td>
<td>31,4</td>
<td>39,7</td>
</tr>
<tr>
<td>Housing</td>
<td>-0,39</td>
<td>12,2</td>
<td>15,4</td>
</tr>
<tr>
<td>Leisure</td>
<td>0,45</td>
<td>15,7</td>
<td>19,8</td>
</tr>
<tr>
<td>Clothing</td>
<td>0,18</td>
<td>2,4</td>
<td>3,1</td>
</tr>
</tbody>
</table>

and variable costs with a leisure expenditure structured budget. The categories of the variable for the perceived financial situation confirm such a reading. The position of the categories of the type of vehicle variable (crossing mode of acquisition - new or second-hand - with the age of the vehicle) reinforces the reading of Axis 2, as being one which separates budgets enabling access to ‘material comfort’ goods (relatively new cars) and budgets which are more restricted in choice of car. This structuring of space can be explored further with the help of classification methods.

2.2 Construction of a typology of three relationships to motoring expenditure

To make the best use of the above analysis, we propose to prepare a typology of household budget structures on the basis of the information for those in the three chosen axes of the PCA. This typology will enable us to
Figure 5 – Representation of the centres of gravity of the categories of supplementary variables in the graph of axes 2 and 3 in the principal components analysis.

Field: All households equipped with at least one car.

Gain clarification as to the links between the various items in the budgets; it will also afford a better understanding of these profiles - cf. Tab. 4.

Differentiations in motoring expenditure budgets. The typology, compiled from an Ascending Hierarchical Classification (AHC), based on the findings of the 2006 PCA (for the construction of AHC, see the appendix) shows six distinct consumer profiles associated with the budgetary
items selected - cf. Fig. 6. Three of these appear to be highly structured by expenditure on car ownership.

The first segment (15% of households) concerns households devoting a significant proportion of their budget to the car and, more specifically, for the purchase of a car - see Figure 6. These are middle-income households (almost one-third are located in the top quintile of income distribution) in which the amount spent on food is amongst the lowest for all segments while the budget spent on housing is not excessive. Managerial occupations and intermediary occupations in the private sector are over-represented here - cf. Tab. 4. These types of households seem to have the benefit of comfortable cars: 70% of the cars bought are new or less than 8 years old second-hand cars; almost three-quarters have comprehensive insurance and diesel cars are by far the majority - Tab. 5.

The second segment (21% of households) is characterised by a fairly high amount of spending on food while spending on housing is not excessive. This class is over-represented amongst farmers, skilled and unskilled workers and is also characterised by a fairly typical position in the life-cycle, since these are households much more likely to be in the over-50 years' age group. This group confirms the specificity of the structure of working-class budgets, while stressing its concentration amongst older people. These households often run fairly old second-hand cars, with motoring expenditure mainly concentrated on variable and marginal costs.

33. As B. Jullien noticed, "(...) The second-hand good cannot simply be defined as a lower-priced version of the new product"; the second-hand market can provide to consumers high quality cars [Jullien, 2008].
Figure 6 – Budgetary structure of the different classes in the AHC in 2006.

Source: Enquête Budget de famille 2006.
Field: All car-owning households with at least one actively employed person.
Note to the reader: In 2006, the budgetary outlay on housing for households in segment 1 of the classification was 12%.
Table 4 – Socio-demographic composition of the different classes. Frequency of categories within the different classes and frequency of classes within different categories.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Category (X&lt;sub&gt;i&lt;/sub&gt;)</th>
<th>Class 1 (C&lt;sub&gt;1&lt;/sub&gt;)</th>
<th>Class 2 (C&lt;sub&gt;2&lt;/sub&gt;)</th>
<th>Class 3 (C&lt;sub&gt;3&lt;/sub&gt;)</th>
<th>Class 4 (C&lt;sub&gt;4&lt;/sub&gt;)</th>
<th>Class 5 (C&lt;sub&gt;5&lt;/sub&gt;)</th>
<th>Class 6 (C&lt;sub&gt;6&lt;/sub&gt;)</th>
</tr>
</thead>
<tbody>
<tr>
<td>S.O.C. of the R.P.</td>
<td></td>
<td>N&lt;sub&gt;1&lt;/sub&gt; / N&lt;sub&gt;T&lt;/sub&gt;</td>
<td>N&lt;sub&gt;2&lt;/sub&gt; / N&lt;sub&gt;T&lt;/sub&gt;</td>
<td>N&lt;sub&gt;3&lt;/sub&gt; / N&lt;sub&gt;T&lt;/sub&gt;</td>
<td>N&lt;sub&gt;4&lt;/sub&gt; / N&lt;sub&gt;T&lt;/sub&gt;</td>
<td>N&lt;sub&gt;5&lt;/sub&gt; / N&lt;sub&gt;T&lt;/sub&gt;</td>
<td>N&lt;sub&gt;6&lt;/sub&gt; / N&lt;sub&gt;T&lt;/sub&gt;</td>
</tr>
<tr>
<td>Farmers</td>
<td>-</td>
<td>11 / 14</td>
<td>+ 41 / 22</td>
<td>- 17 / 20</td>
<td>+ 14 / 13</td>
<td>- 3 / 12</td>
<td></td>
</tr>
<tr>
<td>Artisans, shopkeepers</td>
<td>-</td>
<td>14 / 17</td>
<td>+ 22 / 17</td>
<td>- 25 / 17</td>
<td>- 7 / 17</td>
<td>+ 10 / 7</td>
<td></td>
</tr>
<tr>
<td>Professions, Business owners</td>
<td>+ 25 / 16</td>
<td>- 13 / 20</td>
<td>+ 28 / 17</td>
<td>- 28 / 17</td>
<td>- 1 / 17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public service executives</td>
<td>+ 20 / 16</td>
<td>- 13 / 20</td>
<td>+ 20 / 17</td>
<td>- 25 / 17</td>
<td>- 7 / 17</td>
<td>+ 10 / 7</td>
<td></td>
</tr>
<tr>
<td>Private service executives jobs</td>
<td>+ 18 / 17</td>
<td>- 19 / 14</td>
<td>+ 5 / 12</td>
<td>- 17 / 14</td>
<td>+ 10 / 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professional adm. in public function</td>
<td>+ 18 / 20</td>
<td>- 17 / 14</td>
<td>+ 35 / 17</td>
<td>- 17 / 14</td>
<td>+ 10 / 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Professional adm. in commercial institutions</td>
<td>+ 18 / 20</td>
<td>- 17 / 14</td>
<td>+ 35 / 17</td>
<td>- 17 / 14</td>
<td>+ 10 / 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technicians, supervisors</td>
<td>16 / 24</td>
<td>- 12 / 14</td>
<td>+ 37 / 17</td>
<td>- 12 / 14</td>
<td>+ 10 / 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skilled employees</td>
<td>13 / 22</td>
<td>- 15 / 12</td>
<td>+ 38 / 17</td>
<td>- 15 / 12</td>
<td>+ 10 / 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unskilled employees</td>
<td>- 11 / 22</td>
<td>- 12 / 14</td>
<td>+ 43 / 17</td>
<td>- 12 / 14</td>
<td>+ 10 / 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skilled workers</td>
<td>13 / 24</td>
<td>- 12 / 14</td>
<td>+ 35 / 17</td>
<td>- 12 / 14</td>
<td>+ 10 / 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unskilled workers</td>
<td>13 / 24</td>
<td>- 12 / 14</td>
<td>+ 37 / 17</td>
<td>- 12 / 14</td>
<td>+ 10 / 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age of the R.P.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under 25 years</td>
<td>+ 20 / 15</td>
<td>- 10 / 12</td>
<td>+ 40 / 17</td>
<td>- 5 / 12</td>
<td>+ 10 / 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25-34 years</td>
<td>15 / 13</td>
<td>- 12 / 14</td>
<td>+ 48 / 17</td>
<td>- 5 / 12</td>
<td>+ 10 / 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35-44 years</td>
<td>14 / 19</td>
<td>- 16 / 12</td>
<td>+ 39 / 17</td>
<td>- 6 / 12</td>
<td>+ 10 / 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45-54 years</td>
<td>15 / 25</td>
<td>- 16 / 12</td>
<td>+ 30 / 17</td>
<td>- 9 / 12</td>
<td>+ 10 / 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>55-64 years</td>
<td>15 / 27</td>
<td>- 18 / 12</td>
<td>+ 23 / 17</td>
<td>- 9 / 12</td>
<td>+ 10 / 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>65 years and over</td>
<td>- 12 / 20</td>
<td>- 16 / 12</td>
<td>+ 32 / 17</td>
<td>- 10 / 12</td>
<td>+ 10 / 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income per C.U.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st quintile</td>
<td>- 8 / 24</td>
<td>- 12 / 14</td>
<td>+ 41 / 17</td>
<td>- 12 / 14</td>
<td>+ 10 / 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd quintile</td>
<td>14 / 20</td>
<td>- 13 / 14</td>
<td>+ 37 / 17</td>
<td>- 10 / 12</td>
<td>+ 10 / 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd quintile</td>
<td>14 / 24</td>
<td>- 14 / 12</td>
<td>+ 34 / 17</td>
<td>- 14 / 12</td>
<td>+ 10 / 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4th quintile</td>
<td>15 / 23</td>
<td>- 17 / 14</td>
<td>+ 33 / 17</td>
<td>- 17 / 12</td>
<td>+ 10 / 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5th quintile</td>
<td>+ 21 / 17</td>
<td>- 20 / 14</td>
<td>+ 32 / 17</td>
<td>- 20 / 14</td>
<td>+ 10 / 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Place of residence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural area</td>
<td>17 / 27</td>
<td>- 11 / 12</td>
<td>+ 26 / 17</td>
<td>- 12 / 14</td>
<td>+ 10 / 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban area &lt; 20000 habitants</td>
<td>16 / 24</td>
<td>- 15 / 12</td>
<td>+ 31 / 17</td>
<td>- 8 / 12</td>
<td>+ 10 / 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban area &gt; 20000 habitants</td>
<td>15 / 24</td>
<td>- 13 / 12</td>
<td>+ 36 / 17</td>
<td>- 9 / 12</td>
<td>+ 10 / 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outer suburbs</td>
<td>13 / 18</td>
<td>- 17 / 14</td>
<td>+ 41 / 17</td>
<td>- 5 / 12</td>
<td>+ 10 / 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paris and inner suburbs</td>
<td>14 / 12</td>
<td>- 22 / 14</td>
<td>+ 43 / 17</td>
<td>- 3 / 12</td>
<td>+ 10 / 7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financial position</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>'Affluent'</td>
<td>+ 21 / 17</td>
<td>- 23 / 14</td>
<td>- 28 / 17</td>
<td>- 4 / 12</td>
<td>+ 7 / 12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>'OK'</td>
<td>17 / 21</td>
<td>- 19 / 14</td>
<td>+ 31 / 17</td>
<td>- 6 / 12</td>
<td>+ 7 / 12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>'Tight'</td>
<td>14 / 23</td>
<td>- 14 / 12</td>
<td>+ 35 / 17</td>
<td>- 8 / 12</td>
<td>+ 7 / 12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>'Difficult'</td>
<td>- 9 / 22</td>
<td>- 9 / 12</td>
<td>+ 47 / 17</td>
<td>+ 10 / 12</td>
<td>- 3 / 12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>15 / 21</td>
<td>16 / 35</td>
<td>7 / 6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Enquête Budget de famille 2006.
Field: All car-owning households with at least one actively employed person.
Note to the reader: The variable $\frac{X_i}{N_j}$ expresses the under- or over-representation (+/- 20%) of the sub-population $i$ within the class $j$. It is calculated by dividing the frequency of the sub-population $i$ in class $j$ by the frequency of the sub-population in the general population. The variable $\frac{C_j X_i}{N_i}$ expresses the frequency class $j$ within the sub-population $i$. 
The third segment (16\%) is specific given the substantial amount devoted to spending on leisure (16\%, or at least twice as much as all the other segments) and the small size of the car budget (5\%, the lowest observed for all the groups). Typically this segment is composed of relatively well-off urban households with the reference person in the 35 to 45 years age group, in the managerial socio-occupational category. Thus we find here 28\% of the households in which the reference person belongs to the professions or senior executives. Resident in the Parisian region more frequently than the other segments, these are households in which the use of the car is the least structured by the daily journey from home to work. Motoring expenditure is not very onerous even though the car is high quality - cf. Tab. 5.

The fourth segment which is modal since it includes 35\% of households is characterized by the amount spent on housing (29\%) which is extremely high. The structure of the budget does seem to be fairly constrained by home ownership or by a high rental budget. With an over-representation of the group of skilled workers, this category is however made up of households at the beginning of the life-cycle, living in the high density urban areas which are the most expensive for housing. This is the category in which, in most cases, the cars are relatively old, run on petrol (gasoline) and the owners have third-party insurance. This class tends to be made up of households which are particularly constrained and have financial difficulties - Tab. 4.

The fifth segment, 7\% of households, is characterised by a distinct cumulation of constrained expenditure. The car, food and housing are particularly high budgetary items. Further still, the bulk of motoring expenditure is mainly due to maintenance and running costs: this is the group in which the marginal and the variable costs for the car are the highest. Thus motoring expenditure accounts for, on average, 24\% of the budget of such households. This group is most frequently made up of owner-occupiers, but is nevertheless highly restricted in these budgetary choices: almost 70\% of these households admit that their budget is tight or difficult to manage. On average, this group owns the oldest cars and spends a large proportion on the maintenance and repair of their car. The members of this group are very frequently workers or farmers and are over-represented in rural areas.

The last segment, 6\% of households, also has budgets which are highly structured by motoring expenditure. As in the first segment, this expenditure is primarily linked to the one-off expense, the purchase, which temporarily distorts their budgetary structure. These households spend relatively little on the other items of constraint (food, housing), they tend to describe themselves as financially 'at ease' more frequently than the others. Their cars tend to be the most recent, showing considerable use of a car: the estimate for annual mileage is the highest in this category. Motoring expenditure seems to be a matter of taste rather than a constraint.
Three relationships to expenditure on car ownership  The typology thus set out shows two particularly interesting findings. In the first instance, contrary to the thesis which postulates a standardisation in household budgetary structures [Mendras, 1988] [Herpin and Verger, 1991], patterns of consumption remain fairly specific to social groups, as Louis Chauvel observed for the 1989 and 1995 surveys. True, some segments do appear to be relatively trans-class, like class 4 which is modal and recruits from all the social groups who have opted for property ownership. However, budgets highly structured by food (class 2, typical of working-class households [Halbwachs, 1970 (1912)] or, on the contrary, by leisure (class 3, typical of managers and intermediary professions [Chauvel, 1999] include a considerable proportion of the households studied. Thus, as Louis Chauvel observes, the remarks of Pakulski and Waters should be qualified when they state that: 'The chaotic state of culture in post-modernism promoted by growth in wealth (has left) everyone totally free to choose strategies, genres and life-styles' [Pakulski, Waters, 1996] [Chauvel, 1999]. Choices in terms of life-style seem to be adopted by households in different social groups; their similarities are perhaps more striking in life-cycle and generation, particularly in their attitude to housing expenditure [Bugeja, 2010].

Thereafter, and this is what particularly interests us here, motoring expenditure, far from being homogeneous, proves to play a structuring role for three classes (representing more than a quarter of the households studied) since it represents their largest item of expenditure. But the size of this item masks very different rationales. For classes 1 and 6, motoring expenditure seems to constitute spending on an item for personal convenience [Froud et al., 2005]: the size of the motoring budget does not seem to increase the financial constraints, while the quality of the cars is particularly high. The extent of fixed costs assumed by this type of household must be understood as a purchase intended to renew a high quality car (cf. the average age of the second car) and will probably be a transitional expenditure; it is likely that once the car has been renewed, households of this type will have patterns of consumption closer to class 2. The differences between classes 1 and 6 are primarily based on the choice in purchasing a car: in class 6, the cars bought are usually new and in class 1, second-hand - cf. Tab. 5.

On the contrary, for class 5, the intensity of motoring expenditure is explained primarily by the weight of marginal costs and variable costs. The car, which often has third party insurance, was bought second-hand and is quite old, is used regularly (see Table 5) in households frequently living in rural areas and incurs numerous repair costs. The issue here is one of an attitude to motoring expenditure as a 'risk' in Julie Froud’s terminology [Froud et al., 2005]. Our results confirm Bernard Jullien’s analysis: "[These] lower-income households, who hold on to their older cars for longer, are thus the main clients for spare parts and car repair. One consequence of this distinction is that the expenditure of the richer households is relatively controlled and se-
Table 5 – Characteristics for the car fleet in different segments in the AHC (Ascending Hierarchical Classification) in 2006.

<table>
<thead>
<tr>
<th>Class</th>
<th>Engine Gasoline</th>
<th>Engine Diesel</th>
<th>Insurance Third party</th>
<th>Insurance Comprehensive</th>
<th>Estimated Mileage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 1</td>
<td>35.1</td>
<td>64.9</td>
<td>28</td>
<td>72</td>
<td>22198</td>
</tr>
<tr>
<td>Class 2</td>
<td>40.5</td>
<td>59.5</td>
<td>38.5</td>
<td>61.5</td>
<td>19399</td>
</tr>
<tr>
<td>Class 3</td>
<td>46.4</td>
<td>53.6</td>
<td>33.6</td>
<td>66.4</td>
<td>18309</td>
</tr>
<tr>
<td>Class 4</td>
<td>49</td>
<td>51</td>
<td>45.4</td>
<td>54.6</td>
<td>16703</td>
</tr>
<tr>
<td>Class 5</td>
<td>42.2</td>
<td>57.8</td>
<td>41.6</td>
<td>58.4</td>
<td>19953</td>
</tr>
<tr>
<td>Class 6</td>
<td>21.1</td>
<td>78.9</td>
<td>12.1</td>
<td>87.9</td>
<td>23430</td>
</tr>
<tr>
<td>Total</td>
<td>42.7</td>
<td>57.3</td>
<td>37.2</td>
<td>62.8</td>
<td>19029</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Class</th>
<th>Purchase and age of 1st vehicle 2nd hand</th>
<th>New &gt; 8ans</th>
<th>Second hand</th>
<th>New &lt; 8ans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class 1</td>
<td>26.5</td>
<td>4.3</td>
<td>40.5</td>
<td>28.6</td>
</tr>
<tr>
<td>Class 2</td>
<td>40.6</td>
<td>11.6</td>
<td>22.7</td>
<td>25.1</td>
</tr>
<tr>
<td>Class 3</td>
<td>32.3</td>
<td>11.4</td>
<td>24.5</td>
<td>31.9</td>
</tr>
<tr>
<td>Class 4</td>
<td>43.7</td>
<td>9.3</td>
<td>25.2</td>
<td>21.9</td>
</tr>
<tr>
<td>Class 5</td>
<td>42.5</td>
<td>9.9</td>
<td>22.2</td>
<td>25.4</td>
</tr>
<tr>
<td>Class 6</td>
<td>10.4</td>
<td>2.4</td>
<td>43.6</td>
<td>43.6</td>
</tr>
<tr>
<td>Total</td>
<td>36.5</td>
<td>8.9</td>
<td>27.8</td>
<td>26.7</td>
</tr>
</tbody>
</table>

Source: Enquête Budget de famille 2006.
Field: All car-owning households with at least one actively employed person.
Note to the reader: In 2006, the probability that the engine of a class 1 household’s first car would run on gasoline (petrol) was 35.1%.

cure while the spending of poorer households on cars is relatively larger and far less predictable" [Jullien, 2002, p. 122]. Can we assimilate these types of household to the ‘motoring poor’ described in these British studies [Froud et al., 2002]? Defining this type of household a priori as belonging to the first quintiles in income distribution, the authors focus on one hand on quantifying this type of phenomenon and, on the other, on interviewing these lower income households about their budgetary choices. The authors show that in the United Kingdom in the years 2000, car-owning households in the lowest quintile (of income) spent more than 27% of their income on motoring expenditure, or 10 points more than the 20% of households with the highest incomes. Like these less privileged households, the motoring expenditure of those in class 5 of our typology is primarily devoted to fuel costs, insurance and ongoing maintenance, costs which put a strain on the budget at the expense of other items of expenditure. To explain the intensity of this item

34. While the first question was asked at national level, the second question focused solely on households living in Outer London.

35. Quotes from respondents in the studies referred to above: "Petrol and tax, repairs... they all limit my daughter’s expenditure patterns", "Cars are getting dearer to run. I’m cutting out things here and there to keep the car on the road", "I would spend the money
in the budget, the authors stress primarily the need to have a car, rather
than it representing some form of irrationality or indulgence: "The costs of
motoring are transparent and obvious to lower income households who often
buy petrol (gasoline) for cash at service stations, while the middle classes
can buy a full tank any day of the month using a debit or credit card. The
obvious question that arises is, why are lower income households prepared to
make this sacrifice? The short answer is that they make the sacrifice because
this is now a motorised society where home, shopping, cinema or work are
all routinely accessed by car and sometimes can only be conveniently acces-
sed by driving. (...) It establishes conclusively that poorer households do not
run cars because they seek status or self-expression through conformity with
mainstream social norms; they run cars because they need a car to get to
work" [Froud et al., 2005, p. 103].

Instead of being a typical mass consumer durable, for a significant pro-
portion of households the car can appear to be a very burdensome expense.
The expansion in car ownership thus demonstrates not so much a process
of homogenization as a form of polarization illustrated here by the extremes
of motoring expenditure devoted to renewal of a high quality car for some
and the maintenance and use of a rather dilapidated one for others. Poverty
is not merely restricted to deprivation of consumption but, more generally,
to highly restricted choices in consumption [Lazarus, 2006]. Finally, for the
other classes (2, 3 and 4) the motoring budget is relatively contained, constit-
tuting on average the third item of expenditure. Defined in negative terms,
this attitude to motoring expenditure does not appear to be particularly due
to the level of comfort (the characteristics of the car fleet reveal vehicles fre-
quently bought second-hand), nor to the risk (expenditure on repairs is low
and the insurance policy is frequently comprehensive) : it is described as a
constraint [Froud et al., 2005].

The typology based on the principal components analysis enabled us to
show that motoring expenditure covers very different realities, depending on
social group, levels of income and geographical location. Motoring expend-
iture plays an important role in the differentiation of budgets and can be
understood as demonstrating rationales of comfort, constraint or risk which
are not randomly located in social space.

Similar budgetary expenditure may however conceal different degrees of
mobility potential, as the highly differentiated characteristics of the cars in
the various segments lead us to think. When intensity of use is taken into
account, what is the cost of automobility and how does it vary amongst social
groups?

saved on a car on the kids (...)" [Froud et al., 2005, p. 103]. In the Family Budget Survey,
when asked what they would spend their money on if their income increased by 10%,
households in class 5 replied, more than any other class, that they would spend more on
food and housing.
2.3 The costs of automobility

For fairly similar proportions of income devoted to housing, Fanny Bugeja has shown that the quality of housing, in terms of the number of rooms per person, is well differentiated [Bugeja, 2010]. When one examines this type of indicator, it becomes apparent that the most working-class households have heavier financial charges, for an equivalent quality of housing, than the better-off households. A similar observation had already been made for working-class American households [Caplovitz, 1963], in particular in relation to their spending on food. Jeanne Lazarus [Lazarus, 2006], focusing on consumption patterns of the poor since the mid 20th century, demonstrates that while working class households share middle class consumption practices, their access to the market and in particular to quality goods, remains restricted.

To evaluate the quality of motoring property, an in-depth study of intensity of car use is required. Contrary to numerous capital goods, the provision of a car is not sufficient to account for the intensity of its usage and therefore of the cost incurred in using it. In the above comments we measured the budgetary constraints imposed by car ownership, without taking into consideration the variations - sometimes considerable - in use by different households. It is thus a question of comparing for any given mobility - i.e. the annual mileage travelled - the budgetary outlay made by the different groups of households.

For some dates in the household budget survey, we can precisely assess the outlay devoted to automobility. Thus the data for 1984 and 1989 give the annual mileage travelled by each of the cars in the household. The aim is to calculate the ratio below (referred to as Budgetary Outlay on Automobility) expressed as a percentage of total expenditure, and describing the budgetary outlay per 1,000 kilometres travelled by car per household; this shows the cost of automobility:

\[
BOA = \frac{\text{Car ownership budgetary coefficient} \times 1,000}{\text{kilometres travelled per year}} \times 100
\]

For the other survey dates, for which we do not have the annual distance, the mileage travelled is estimated on the basis of the age and the type of engine of the car owned. The annual distance travelled by the vehicle(s) in each household is not therefore collected by the interviewer but is estimated on the basis of data from the national survey on transport and travel, 2008, which includes the variables required for this type of modelling (cf. the appendix for the imputation of the number of kilometres travelled for the 2006 Enquête Budget de famille).

\[36. \text{This is the choice adopted by other studies on modelling of car ownership and car use [Bourdeau, 1997}.\]
In 1984, as in 2006, the budgetary outlay on automobility rose markedly: the outlay on travelling 1,000 kilometres and the occupational status varied inversely - cf. Tab. 6. In 1984, 50% of administrative and sales managers in the private sector spent less than 0.5% of their budget per 1,000 kilometres travelled, while the median rose to 0.9% for skilled workers, which is 80% more. In 2006, although the gaps narrowed, they continued to exist between the different social groups.

Table 6 – Median of the motoring budgetary outlay as a function of the socio-occupational category of the reference person in 1984 and 2006.

<table>
<thead>
<tr>
<th>Category</th>
<th>1984</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farmers</td>
<td>1.12</td>
<td>0.82</td>
</tr>
<tr>
<td>Artisans, shopkeepers</td>
<td>0.85</td>
<td>0.72</td>
</tr>
<tr>
<td>Professions, Business owners</td>
<td>0.48</td>
<td>0.43</td>
</tr>
<tr>
<td>Public service executives</td>
<td>0.49</td>
<td>0.63</td>
</tr>
<tr>
<td>Private service executives jobs</td>
<td>0.51</td>
<td>0.55</td>
</tr>
<tr>
<td>Professional adm. in public function</td>
<td>0.73</td>
<td>0.76</td>
</tr>
<tr>
<td>Professional adm. in commercial institutions</td>
<td>0.65</td>
<td>0.73</td>
</tr>
<tr>
<td>Technicians and supervisors</td>
<td>0.72</td>
<td>0.69</td>
</tr>
<tr>
<td>Skilled employees</td>
<td>0.96</td>
<td>0.8</td>
</tr>
<tr>
<td>Unskilled employees</td>
<td>1.12</td>
<td>0.91</td>
</tr>
<tr>
<td>Skilled workers</td>
<td>0.91</td>
<td>0.78</td>
</tr>
<tr>
<td>Unskilled workers</td>
<td>1.17</td>
<td>1.01</td>
</tr>
</tbody>
</table>

Field: All car-owning households with at least one actively employed person.

Note to the reader lecture: In 1984, 50% of households whose reference person belonged to the occupational category of farmer spent over 1.12% of their budget to travel 1,000 kms by car.

How can these differences be explained? In the first instance, the characteristics of the car fleet have powerful effects on potential mobility. There is thus more than simply a symbolic dimension to the rationales of differentiation in car ownership [Boltanski, 1975]: paradoxically it is less expensive to run a new car, when one takes level of usage into account (see Tab. 7). In the first instance, technical progress minimizes fuel consumption. Furthermore, vehicles which are purchased new often have the benefit of guarantees, enabling maintenance and repair costs to be minimal. On the contrary, owning an ageing second-hand car, goes with relatively high mobility costs. High in energy consumption, these vehicles are only rarely protected by guarantee even though they show the wear and tear of age. These cars are less reliable and impose a dual restriction on their owners: the volume of driving is limited, since it is expensive; and it is precisely because the car is not used very much that it is a car which is particularly expensive. On the contrary, owning
an ageing second-hand car, goes with relatively high mobility costs. High energy consumption, these vehicles are only rarely protected by guarantee and impose a dual restriction on their owners: the volume of driving is limited, since it is expensive; and it is precisely because the car is not used very much that it is a car which is particularly expensive.

Table 7 – Median of the motoring budgetary outlay as a function of the type of vehicle owned in 1984 and 2006.

<table>
<thead>
<tr>
<th>Type of Vehicle</th>
<th>1984</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Second hand &gt; 8 years</td>
<td>1.11</td>
<td>0.54</td>
</tr>
<tr>
<td>New &gt; 8 years</td>
<td>0.97</td>
<td>0.43</td>
</tr>
<tr>
<td>Second hand &lt; 8 years</td>
<td>0.9</td>
<td>0.61</td>
</tr>
<tr>
<td>New &lt; 8 years</td>
<td>0.74</td>
<td>0.44</td>
</tr>
</tbody>
</table>


Field: car-owning households with at least one actively employed person.

Note to the reader: In 1984, 50% of households whose car ownership consisted of a second hand car, over 8 years old, spent more than 1.11% of their budget to travel 1,000 kilometres by car.

Paradoxically, working class access to a car, via the second-hand market or keeping a car which was bought new for a very long time has not enabled cheaper automobility; instead this is an expensive form of automobility and may even impose a considerable constraint on their budget. This costly mobility could make spatial inequalities even more acute, since distance is additional to the high cost of the car.

Conclusion

Since the 1980s the fall in the motoring expenditure budget seems to indicate that the car is a ‘normal’, or even ‘inferior’ good: the upward trend in household incomes has been accompanied by a fall in the share of expenditure on motoring. Despite the car continuing to be commonplace and the rise in multi-ownership, the costs on motoring expenditure have remained relatively contained. This first index leads us to believe that the car is not a discretionary item of expenditure but instead a constraint which tends to be located in the expenditure on necessities. An indispensable item for mobility,

37. Here we cannot refrain from referring the reader to G. Akerlof’s [Akerlof, 1970] analyses of the second-hand car market. The ultimate in asymmetric information, this type of market seems to procure relatively more expensive vehicles than firsthand cars.

38. For example, Anne Lambert was able to observe that some households on becoming owner-occupiers in the outer suburbs of Lyons had to give up one of their cars when they moved [Lambert, 2012].
the car occupies a dominant and structuring role in the household budgets of
the less privileged, while the higher income groups can reduce its importance.
This fall in the importance of motoring expenditure with the rise in level of
income is the second indicator confirming that for many, the car is not a
social status expenditure but one of necessity which is a constraint. This
finding points to the paradox of the car which enables leisure pursuits [Lynd
and Lynd, 1929], while at the same time has a negative effect on leisure
expenditure.

The car is an item in the majority of household accounts but its rank in
the structure of the expenditure of different social groups is not the same.
Symbolic of mass consumption, far from having a homogenizing effect on
household budgets, the car is a source of a certain form of polarization. True
the typology we have elaborated shows that a considerable proportion of house-
holds make relatively comparable budgetary choices within which the car
occupies an important position, while not being crucial. It nevertheless high-
lights the very considerable weight that this expenditure can represent for
two types of households which are very different. In these instances, the com-
position of motoring expenditure (devoted almost entirely to the purchase
of new cars or to maintenance and running costs) is evidence of differing
rationales. Motoring expenditure thus reveals a three-fold rationale; a ratio-
nale of constraint, one of choice and one of risk. The presence of the car in
the majority of household budgets is a good indication of the disappearance
of a class-based consumption - since, gradually, different groups have access
to the car; however car ownership involves mass consumption which does
not have the same constraints for all. This burden of motoring expenditure
once again confirms that poverty does not only consist in exclusion from the
world of consumption but that it also acts as a constraint on the choices in
consumption [Froud et al., 2005]. Automobility entails costs which are une-
qually distributed and, according to J. Urry [Urry, 2007] are amongst the
most rigid.

Further still, the car underscores the multiple observations made con-
cerning consumption costs for the lower income groups. In his study, D. Ca-
plovitz demonstrated that the 'poor paid more' for food; F. Bugeja made
a similar observation for housing in present-day France, comparing budget-
ary coefficients for a similar quality of housing [Bugeja, 2010]. The cost of
similar goods and services are not the same within society. As far as moto-
ring expenditure is concerned, this type of finding seems to be confirmed :
the automobility to which different social groups have access imposes very
different costs. Paradoxically, the groups with the highest global volume of
capital enjoy relatively cheap mobility : thus, for groups of this sort, the mo-
toring budget does not appear to correspond to the conspicuous consumption
rationale traditionally attributed thereto. While the cars in different social
classes may be increasingly similar from the design point of view [Gartman,
1991], we should bear in mind that this conceals considerable material dif-
The spread of car ownership via the second-hand market, in which the vehicles are rather older [Coulangeon and Petev, 2013], does not lead to an averaging of costs, but, instead, to their segmentation.

To gain a more detailed understanding of our findings, it would be important to examine how the geographical constraints operate for the different classes of household highlighted. There is not the slightest doubt that the re-configurations of the spatial inequalities impacting on distance from place of work and amenities impose financial constraints which are heavier for some households whose professional activity, and more generally speaking, social activity, is based on the car, than for others. Gaining a better understanding of the rationales of constraint and symbolic distinction would demand an improved articulation of levels of expenditure, usage and geographical determinants; the data bases used here do not enable us to do so.

Appendix

TABLE 8 – Construction and position of the variables in the costs of motoring expenditure for the 2006 Enquêtes Budget de famille (Household budgets survey)

<table>
<thead>
<tr>
<th>Denomination</th>
<th>Variable File Item</th>
<th>Item</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fixed costs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Car loan</td>
<td>D133313_D Depmen</td>
<td></td>
</tr>
<tr>
<td>Trade-in for old car</td>
<td>VMAUTO Menage</td>
<td></td>
</tr>
<tr>
<td>New purchase</td>
<td>C07111 C05d Item 7</td>
<td></td>
</tr>
<tr>
<td>Second-hand purchase</td>
<td>C07112 C05d Item 7</td>
<td></td>
</tr>
<tr>
<td><strong>Variable costs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spare parts</td>
<td>C07211 C05d Item 7</td>
<td></td>
</tr>
<tr>
<td>Repairs, maintenance</td>
<td>C07231 C05d Item 7</td>
<td></td>
</tr>
<tr>
<td>Insurance</td>
<td>C12441 C05d Item 12</td>
<td></td>
</tr>
<tr>
<td>Fines and penalties</td>
<td>C13151 C05d Item 13</td>
<td></td>
</tr>
<tr>
<td><strong>Marginal costs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil and gasoline</td>
<td>C07221 C05d Item 7</td>
<td></td>
</tr>
<tr>
<td>Parking (excluding personal parking space)</td>
<td>C07241 C05d Item 7</td>
<td></td>
</tr>
<tr>
<td>Motorway toll fees</td>
<td>C07242 C05d Item 7</td>
<td></td>
</tr>
</tbody>
</table>
Figure 7 – Evolution of consumer prices for certain motoring expenses as well as for all goods and services between 1984 and 2006.

Source: INSEE and CCFA.
Note to the reader: Index 100 in 1984. In 2006, the index of prices for spare parts rose to 235.

Table 9 – Choice of the number for the PCA eigenvalues

<table>
<thead>
<tr>
<th>Eigenvalue $v_i$</th>
<th>$v_i - v_{i-1} = \delta_i$</th>
<th>$\delta_i - \delta_{i-1}$</th>
<th>Total inertia (in %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1.263</td>
<td></td>
<td>18</td>
</tr>
<tr>
<td>2</td>
<td>1.217</td>
<td>0.046</td>
<td>0.046</td>
</tr>
<tr>
<td>3</td>
<td>1.179</td>
<td>0.038</td>
<td>-0.008</td>
</tr>
<tr>
<td>4</td>
<td>0.995</td>
<td>0.184</td>
<td>0.146</td>
</tr>
<tr>
<td>5</td>
<td>0.982</td>
<td>0.013</td>
<td>-0.171</td>
</tr>
<tr>
<td>6</td>
<td>0.890</td>
<td>0.092</td>
<td>0.079</td>
</tr>
<tr>
<td>7</td>
<td>0.474</td>
<td>0.416</td>
<td>0.324</td>
</tr>
</tbody>
</table>
Figure 8 – Structure of the fixed, variable and marginal costs of motoring expenditure by quintile of income per consumption unit between 1984 and 2006.

Field: All households with at least one car.
Note to the reader: In 1984, out of 100 francs spent on motoring by a car-owning household in the first quintile of income distribution, 12 francs went on fixed costs i.e. the purchase of a car.
Figure 9 – Representation of the budgetary coefficient variables in the plane of axes 1 and 2 of the principal components analysis.

Field: All households with at least one car.
Figure 10 – Representation of the budgetary coefficient variables in the plane of axes 2 and 3 of the principal components analysis.

Field: All households with at least one car.
Figure 11 – Semi-partial $R$ squared (SPR) of the Ascending Hierarchical Characteristics calculated on the basis of the axes of the Principal Components Analysis

*Note de lecture*: The semi-partial $R$ squared (SPR) measures the interclass loss of inertia produced by combining the two classes. The aim being to achieve a maximum interclass inertia, we seek a low SPR followed by a high SPR in the following combination. The peak for 5 classes followed by a dip for 6 classes is evidence of a satisfactory classification in 6 classes.
Modelling of mileage travelled To model the distance travelled by the cars owned by the households in the 2006 Enquêtes Budget de famille (Household budgets survey), we used the data from the Enquête National Transports et Déplacements, 2008. First, we estimated the parameters of the linear regression below, for each of the vehicles with the two types of engine (Diesel-D or Gasoline - G):

\[
\text{travelledkilometres}_2008^G = \beta_{0,G} + \beta_1 G \cdot \text{VehicleAge}_G + \mu
\]

\[
\text{travelledkilometres}_2008^D = \beta_{0,D} + \beta_1 D \cdot \text{VehicleAge}_D + \mu
\]

We obtain:

\[
\beta_{0,G} = 11369 \quad \text{et} \quad \beta_{1,G} = -220,49
\]

\[
\beta_{0,D} = 18274 \quad \text{et} \quad \beta_{1,D} = -299,44
\]

On the basis of the age of the cars owned by households, we estimated the mileage travelled by each of the cars in the various households in the 2006 survey using the following equation:

\[
\text{travelledkilometres}_2006^G = 11369 - 220,49 \times \text{VehicleAge}_G
\]

\[
\text{travelledkilometres}_2006^D = 18274 - 299,44 \times \text{VehicleAge}_D
\]
Références


Le Play, F., (1855), *Ouvriers européens. Études sur les travaux, la vie domestique et...*


