The MPG paradox. Why car purchasers say they care about fuel economy, but don’t

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Abstract
Previous research undertaken by the authors revealed car purchasers generally claim fuel economy is important, but do not reflect this in their car choice. This was termed the ‘mpg paradox’ (miles per gallon (mpg) being the custom metric in the UK). This paper reports on a study in the summer of 2008 which examined whether this paradox still exists and how systematically new or second-hand car purchasers consider information on fuel economy and carbon emissions.

Based on in-depth interviews with recent car purchasers, the research concludes that the mpg paradox still exists – but it has changed in nature. Whilst there is now strong evidence the car market is responding to rising fuel costs and increased choice, the ‘mpg’ metric itself is not conceptually driving behaviour. Instead, simplistic rules are used to decide on what is ‘good’ or ‘bad’, taking little notice of information provided on the fuel economy label. The mpg metric is complex as it does not map easily on to the way in which people experience their fuel costs – i.e. the cost to fill up a fuel tank or travel a certain distance. Consequently, it is rarely used by motorists to calculate future costs or to systematically compare vehicles. Moreover, only a minority of consumers were aware of their official CO₂ figures even though the UK has recently strengthened the link between circulation taxes and carbon emissions.

Most car buyers believe the only route to better fuel economy is through a smaller car, a new car, or switching to diesel. There is little awareness of the additional benefits to be gained from ‘best-in-class’ comparisons. The paper recommends new information is provided to enable comparison of running costs based on how car buyers conceptualise fuel economy. This information should ideally be updated as available models and fuel prices change and could be an interactive web-based tool also available at the point of sale.

Introduction
Recent shifts in the UK and European car markets (increasing sales in smaller segments and reducing CO₂ emissions) suggest that increases in fuel prices and possibly even a heightened environmental awareness may be having an influence on car purchase patterns. Yet, prior to the recent global increases in fuel prices and the economic downturn, research findings in the area of car purchase behaviour consistently found that, although car purchasers claim fuel economy (commonly referred to as ‘mpg’ or miles-per-gallon in the UK) to be an important factor when choosing a new car, most do not actually prioritise it when finally deciding on which car to buy (Turrentine and Kurani, 2007; Skinner et al. 2006; Lane, 2005). This is the ‘mpg paradox’. This paper reports on research conducted with new and used car purchasers in the UK in 2008 using qualitative, in-depth interviews which set out to understand whether the mismatch between attitudes and behaviour continues to be prevalent in the UK.

Background and rationale for this research
Although it is already well established that environmental issues are not sufficient in themselves to promote the sales of fuel efficient and low carbon cars (for the mass market), fuel
little understanding of precisely how car buyers respond attitudinally to higher fuel prices and fuel costs, how the issue of a car’s fuel economy is conceptualised (if at all), or of how car purchase priorities are changed.

In the light of these recent market shifts and the CO₂-based taxation regime in the UK, this research project aimed to answer the following research questions:

- How important is fuel economy within the car purchase decision?
- What explains any gap between reported importance attached to fuel economy and its actual influence on the purchase decision?
- To what extent are fuel costs analysed in a systematic way before, during and after the car purchase?
- Does fuel economy equate with carbon performance or is the CO₂ (g/km) information becoming a distinct and important metric in its own right?

These questions were investigated by interviewing UK consumers who had recently purchased a new or used car. It should be noted that this research was planned before the steep fuel price rises in early/mid 2008 and was not intended to look specifically at the effects of these increases, but to simply investigate the ‘mpg paradox’ in some depth. Nevertheless, during the course of the research, petrol and diesel prices rose to peaks of around 120 pence and 133 pence per litre respectively; an increase of around 24% (petrol) and 37% (diesel) over the previous 12 months. Given the significance of these increases, it is likely that fuel price influenced some of the car purchases surveyed more strongly than would have been the case had the study been conducted 12 months previously. We comment on these issues in the results to follow.

**Methodology**

The research involved conducting a series of 28 in-depth, semi-structured qualitative interviews (in Aberdeen, London and Bristol) with motorists who had bought a car in the last three months. The interviewees were identified by requesting volunteers to come forward from car dealerships and several large work places in these locations. In the first instance, participants were requested to supply basic details about the car purchased. Using a CarWeB web-based look-up tool, this was used to check the precise model purchased, its date of purchase and the vehicle’s fuel economy and emissions. An in-depth interview was requested from a cross section of the volunteers in order to capture the fullest range of vehicles possible in each location. Almost half of the sample had purchased a brand new car, and the remainder had purchased a second hand car registered since 2001. Interviewees were asked to discuss in detail the criteria and methods used to choose their new car, their understanding of mpg, CO₂, and the link between these and the running costs of their vehicle.

**INTERVIEW DESIGN**

The research method was reflective and ‘deliberative’. This meant that, while the interviews were structured using an interview guide, the discussion could be led to a large degree by...
the interviewee. While the sample size was relatively small (the target sample size was 30), the qualitative and deliberative approach was chosen for its proven ability to provide an in-depth insight of the consumer decision-making process (Owens 2000). This method was chosen to investigate the attitudes of consumers during the car purchasing process, where ‘attitudes’ were taken to include any conceptual, emotional, social or cultural factors found to influence vehicle choice. Instead of establishing national trends (as a quantitative survey would have done), this research was focused more on what happens ‘in people’s minds’ when buying a car. The appropriateness of a qualitative approach in this context was that, if the study could demonstrate important attitudinal-behavioural issues and capture a broad range of these, it would be likely that these would be shared by the majority of consumers.

Interviews typically lasted 1 hour 15 minutes, and were conducted at home or office locations. The discussions were recorded and transcribed in full for later (anonymous) analysis. In return for participating in the project, survey interviewees received a retail voucher worth £25.

STUDY SAMPLE
In total, 32 interviews were conducted between May and September 2008, four of which were subsequently excluded from the study as the cars purchased were registered before 1st March 2001, a cut-off date chosen by the researchers due to changes in the vehicle taxation system on that date. Almost half of the sample of 28 had purchased a new car (including some pre-registered and demonstrator vehicles), and the remainder had purchased a used car (since 2001). The final sample used for the study comprised 13 new and 15 used car purchases. Of these, 5 were purchased by trading in a previous vehicle and 3 used a company loan.

Although UK new and used cars sales are currently in the ratio of approximately 1:3, the sample split was considered appropriate for the survey to provide qualitative attitudinal data for the new and used sectors irrespective of absolute sales volumes. In the project design, London was included with the aim of capturing any additional effects of the congestion charge on awareness and importance attached to attributes such as fuel economy and vehicle CO₂ emissions.

The survey sample represented national trends on many aspects such as gender, the principle use of the car (75% intended to use their newly purchased cars for personal use only) and for mileage (9250 miles p.a. on average) and income. Certain age groups were underrepresented, namely the retired and the youngest (17-24) age categories. With respect to the vehicles purchased, the new car sample only includes cars in the ‘super-mini’ and lower medium segments. Figure 1 represents the range of engine size and CO₂ emissions from the two markets in the sample. While the smaller car classes were the only segments showing any increase in demand during the first two quarters of 2008, it should be noted that this sample significantly over-represents the super-mini class, reasonably reflects sales in the ‘lower medium’ segment, but fails to include any other vehicle class. In contrast, the used car sample better reflected the UK market by including a greater range of classes. Using both 2007 and 2000 new car sales data for comparison, it is likely the used car sample is under-represented in the ‘super-mini’ and ‘upper medium’ classes, and over-represented in the executive ‘dual purpose’ and ‘multi-purpose’ vehicle segments. Other measured attributes of the car samples include age range of between 1 and 7 years and purchase price of between £2,500 and £14,000 for used cars and £7,000 and £20,000 for new cars.
Research Findings

This research reveals the ‘mpg paradox’ has changed slightly in nature, but is still very much prevalent throughout the car buying process. The shift is a result of consumers’ heightened awareness of fuel costs and a reduced inclination to discount future fuel costs. The paradox remains, however, because ‘mpg’ itself is not systematically researched, understood, or used to compare cars in order to secure the ‘best-in-class’ models. A detailed analysis of participants’ responses shows that the exact nature of the paradox is now much less a reflection of the ‘attitude-behaviour gap’ and more a reflection of the limitations in the way car buyers conceptualise fuel economy. It also captures the misplaced intentions often involved in the choice of more fuel-efficient cars. The remainder of this paper analyses the key findings which help to explain the recent changes taking place in the car market and suggest strategies to accelerate the shift to lower carbon cars.

Note that quotes shown in the following sections are taken from the interview transcripts and participants’ and vehicle details are shown in brackets after quotes as follows: [Interviewee’s initials, Make and Model, Fuel Type, New/Used, Combined ‘mpg’, Official CO₂ UK Vehicle Excise Duty (VED) band (2008 banding)].

COST, NOT ECONOMY, IS THE KEY INFLUENCE ON BEHAVIOUR

Many interviewees were able to accurately quote the fuel economy of their newly acquired car. Almost half quoted their car’s mpg to within 10% accuracy of the official (combined) figure and many essentially conceptualised fuel economy ‘correctly’ as relating to the amount of fuel used over a given distance. Moreover, in open discussion, interviewees place ‘running costs/ fuel economy’ as the second most important factor influencing choice of car.

However, despite strong evidence the market is changing in response to rising fuel costs, this research finds it is not the ‘mpg’ metric itself which is conceptually driving behaviour; it is simply the cost to fill up the tank that has instigated the change. We term this the ‘mpg mirage’. Detailed consideration of each of the discussion transcripts reveals only 5 interviewees (at most) actively used fuel economy in terms of ‘mpg’ as part of their decision-making process. Instead, when asked “What does the term ‘fuel economy’ mean to you?”, at least half of the participants distinctly express fuel economy in monetary terms – either as the cost to fill up their tank with fuel, or the average weekly or monthly fuel bill. Moreover, from the manner in which these comments are made, it is clear that this way of thinking about fuel economy is the dominant conceptualisation as illustrated by the following quotes:

How much, how often I fill a tank up, and how much it costs. [GR, Ford Focus Sport, Petrol, New, 39.8, 169, E]

Off the top of my head I can’t remember what the fuel economy was, but it is quite good because we did, when we were comparing models, it was at least as good as anything else, and certainly in terms of the way I work out fuel-efficiency is how much petrol I put in, a week. [WLT, Honda Jazz, Petrol, New, 48, 134, C]

Mpg, yeah. I looked at that when I was looking, as well. Actually, the price has gone up. When you used to only stick in £12 of diesel, and you’d had to stick £20 in, within a month or two. And it was going up. It’s a big difference. You did, I did notice it. [SY, Ford Fiesta, Petrol, New, 47.1, 139, C]

Well, I suppose at the end of the day it does come down to money. I mean, fuel economy is, to me, what kind of mileage you get for your full tank of petrol, if you like. It’s back to you how much does it cost you for a full tank of petrol. [JY, Fiat Stilo, Petrol, Used, 43.4, 153, D]

This raises a key question in the light of the recent observed shift to smaller more fuel-efficient cars: why would fuel cost now be motivating a sudden down-sizing in the UK car market (observed 3.6% drop in CO₂ emissions over first two-quarters of 2008 in contrast to only a 1%-2% annual improvement during the whole of 2007) (SMMT, 2008a)? The first part of understanding this shift in behaviour is the hypothesis emerging from this research that fuel cost (as experienced by the consumer), rather than fuel economy (as conceptualised by the consumer), is driving the purchase of smaller cars.

The second hypothesis to emerge is that consumers are less prepared to discount future fuel costs and absorb any fuel cost increases than they have been previously. This study was unable to directly quantify the apparent change in consumer discount rate. However, in order to understand why fuel costs might be impacting disproportionately more now that then have in the past, previous research undertaken by the RAC can be used to identify a threshold annual fuel cost above which people would begin to think about shifting to a more fuel-efficient/ alternatively fuelled/ smaller vehicle (RAC 2004). The RAC survey found motorists were prepared to endure an increase in annual costs of (on average) around £1,100 (£2,004) before switching to an alternative fuel or smaller engine (both of which are preferred to a smaller car).

Taking recent fuel price increases into account and adjusting for the proportion of fuel costs as a fraction of total household income, this equates to approximately £800 in current terms (2008) (this uses figures for fuel costs as percentage of household expenditure of 3.6% in 2004 and 5.9% in 2008 using Retail Price Index correction). Given fuel costs increased by around £400 in the six months to July (2008), together with a reduction in overall disposable income, and the media coverage potentially leading to even greater perceived cost increase, this research suggests that, for some motorists, this annual cost threshold was being reached; and goes some way to explaining the concurrent step-change in car-buying behaviour towards smaller, more efficient cars. These quotes capture this ‘threshold’ effect:

I was doing, what, £26 a month. Now, I’m doing, like, £40, lately, on, I think, because the price has gone up so much, near enough doubled for me….That’s about my limit, I won’t put no more than that in it. [SY, Ford Fiesta, Petrol, New, 47.1, 139, C]

I find myself thinking, petrol is one, diesel is about … 1.40 a litre, whatever it is, and I think, do I need to make that trip? I don’t. You know, they are knocking people off the road right now and they’re, you know, not going to collect as much tax. [TC, VW Touran, Diesel, Used, 47.1, 162, D]
It was clear some participants had difficulty in utilising fuel economy data. For many, the mpg metric is too complex and, as we have indicated above, does not map easily on to the way in which people experience their fuel costs – i.e. the cost to fill up a fuel tank or travel a certain distance. Likewise, the litres per 100 kilometre figure which is also included on advertisements and in published data and is more commonly used in continental Europe, was not quoted by any of the participants. This may seem surprising as fuel is sold in litres in the UK, not gallons but it clearly does not relate to the way in which people in the UK think about fuel expenditure and distance – i.e. in terms of the number of times they make a journey of a certain number of miles.

The other thing is, this thing is always all in litres and kilometres so you’ve got to convert, and I… It’s just too much hassle. [PK, Mazda ZT, Petrol, New, 52.3, 129, C]

Although not a common complaint among the sample, confusion and fatigue with the fuel consumption metrics may also be created by the fact that various figures can be presented for the same car according to the driving cycle.

And we did look at these, when we were comparing the cars, and after a while it becomes a bit of a, sort of a nonsense … One seemed to be a bit better than the other, for shorter drives, but… for city, but, better. At the end of the day, I felt they were all much of a muchness. [AD, Toyota Yaris, Petrol, New, 52.3, 127, C]

While this research did not employ specific calculations in the interview questions in order to ‘test’ people’s understanding of mpg, it is fair to say that the findings resonate with a USA study which found the mpg metric is frequently misunderstood and can lead to inaccurate judgements (Larrick and Soll, 2008). For instance, the idea that upgrading a car from 18mpg to 28mpg saves twice as much fuel for the same distance of driving as upgrading from 34mpg to 50mpg generally tends to catch people out. This reflects the fact that mpg does not capture the way people generally conceptualise fuel economy.

Although out of the scope of this study, it is also worth noting that volume based performance indicators such as those tied to litres or gallons are essentially meaningless for grid-connected vehicles – e.g. what does a litre of electricity look like? (WWF, 2008) There is the potential, therefore, for this complexity to increase as the vehicle fleet changes to reflect new technologies. This might suggest that the gCO₂/km metric as a proxy for fuel efficiency represents a more preferable, level playing field on which to compare vehicles. However, this measurement will also be essentially irrelevant for so called ‘zero emission vehicles’ which will score zero on the tank-to-wheel gCO₂/km metric but will not be guaranteed to be energy efficient.

USE OF PREVIOUSLY OWNED CAR AS KEY BENCHMARK

In at least a third of the interviews, the performance of the previously owned car is used as the primary benchmark on which to base an assessment of the new car’s fuel economy and/or road tax credentials.

I just based it on… [the] last car we had. [JY, Fiat Stilo, Petrol, Used, 43.4, 153, D]

If consumers predominantly have previously owned vehicles in mind, they are unlikely to aspire to greater efficiency or appreciate the full range of possibilities that may exist to maximise the fuel-efficiency of their next car purchase (i.e. they are unlikely to be aware of ‘best-in-class’ performance). This is particularly the case where the previous car was old or had poor fuel economy. Thus, the tendency to use the previous car as a benchmark identifies a key limitation in the decision-making process and adds to the set of conceptual factors which act to limit the number of options considered when aiming to buy a more fuel-efficient car.

SMALL CARS OR DIESEL CARS ARE SEEN AS THE ONLY ROUTE TO FUEL ECONOMY

As identified in previous surveys (Turrentine and Kurani, 2007; Lane, 2005), this research confirms that most car buyers assume the main routes to better fuel economy are either by purchasing a smaller car, or switching to diesel. These quotes are typical of this misconception:

Well, a smaller car I would have thought. A smaller engine size, it’s not got so much work to do, has it? [JY, Fiat Stilo, Petrol, Used, 43.4, 153, D]

I don’t know much about the other cars, but I would imagine anything that’s diesel would be quite economical. [SW, VW Golf, Petrol, Used, 38.2, 173, E]

These same benchmarking behaviours occur in both the new and used-car markets. In the used-car market, however, there is an additional perception that further narrows people’s focus; the belief that they cannot significantly improve their fuel economy because they cannot afford to buy a new car:

If we’d had a bigger budget we might have looked at a newer car which would have less CO₂ emissions, and stuff like that. [JY, Fiat Stilo, Petrol, Used, 43.4, 153, D]

The implication of this self-restricted set of behavioural responses is that the majority of car buyers are not seeking or aware of best-in-class information that might lead them to choosing a high ‘mpg’ car in the class they are currently in, or avoiding a poor ‘mpg’ car in a smaller class. Underlying this position is the assumption that all cars in the same class have roughly the same fuel economy.

I suppose it’s the same as any other two-litre car. I didn’t do any comparisons, I didn’t. [GR, Ford Focus Sport, Petrol, New, 39.8, 169, E]

I knew there wasn’t going to be any difference in the cars I was looking at. So it wasn’t something I thought about. [HW, Toyota Yaris, Petrol, New, 47.1, 141, C]

I decided on this, that I was going to buy a sports car, so I just thought, it’s not going to have good fuel consumption, I wasn’t comparing between sports cars because they’re all going to be as bad as each other. [JH, Audi TT, Petrol, Used, 30.8, 226, F]
Consequently fuel economy is treated superficially by car buyers and quickly drops out of focus once an (apparently) favourable comparison to their previous car has been made and the vehicle class has been chosen. Thus, fuel economy considerations are still only influencing the choice of car up to a certain point in the process. Once a ballpark ‘mpg’ figure has been identified near the beginning of the search for a new car, this factor is then forgotten as other factors (safety, comfort, convenience, etc) begin to be more important:

Roughly I [calculated costs], yes, when I was going on the Internet, working out the prices, I wrote it all down and had a big, ah, say, notepads ... and then it still come down to, like, ooh, I’m going to buy that car; still an impulse, kind of thing, really, in the end, but I still researched a lot. [SY, Ford Fiesta, Petrol, New, 47.1, 139, C]

CAR BUYERS ARE NOT MOTIVATED BY ENVIRONMENTAL ISSUES

This survey confirms that environmental issues per se are not important motives in purchasing a lower carbon or more fuel-efficient car; ‘reducing environmental impact’ is mentioned only by one participant as a motive for buying her car; and only one interviewee names low CO2 emissions in their top five most important purchasing factors. Instead, like this quote shows, cost to run is the primary motive:

It wasn’t necessarily the environmental consideration, it was again the financial side of things that was the driver on that. [WLT, Honda Jazz, Petrol, New, 48, 134, C]

This holds true despite the direct link between annual road circulation tax (VED) and CO2 in the UK. In 2008, all new vehicles registered on, or after March 1, 2001 are charged based on CO2 emissions performance differentiated by bands (A-G). Nevertheless, very few buyers knew the official CO2 figure of their vehicle – when asked the question ‘Do you know the car’s official CO2 emissions figures?’ only 3 out of 28 respondents gave this to within 10% accuracy of the official figure, and 24 respondents did not know and were not able to hazard a guess at what their car’s CO2 emissions might be. Unsurprisingly, very few understood the link between CO2 and the environment:

I didn’t really look at them [CO2 emissions] to be, to be quite honest... But then I don’t know what’s good, bad, or what’s middle, or... I haven’t a clue. I’m not interested, probably is why. If I was interested, I would, you know... [M&B, Land Rover Freelander, Diesel, Used, 37.2, 205, F]

Nah. We didn’t even look into it.... I’m sure they [CO2 figures] would have been quoted at us but it wouldn’t have registered on my decision process... It was just a case of we were aware that it wasn’t any better/any worse than other cars. [WLT, Honda Jazz, Petrol, New, 48, 134, C]

Furthermore, while almost of the sample are aware that VED is linked to CO2, most cannot correctly identify their new car’s VED band (A-G) – when asked the question ‘Do you know your ‘road tax’ (VED band)’? only 3 out of 28 respondents knew accurately which band their car was in. Interestingly, of the 21 who were wrong in their estimate or unable to guess, 12 talked (spontaneously) about road tax in monetary terms, and 10 of these interviewees were able to estimate this to within 10% accuracy of the official £ figure. The key finding here is that, for the majority of car buyers, road tax (as well as fuel economy) is perceived primarily in monetary terms:

Well, the higher they are the more running costs you’ll have, because you’ve got a higher road tax, basically. [SY, Fiat Stilo, Petrol, Used, 43.4, 153, D]

I’d just got my new road tax, and that was, the tax didn’t cross my mind when I bought the car, but it was a lot more than I thought it was going to be, it was like £280 or something, it was over £200..... but that wasn’t influencing me at all when I bought it. [IH, Audi TT, Petrol, Used, 30.8, 226, F]

These findings suggest that, compared to the influence of fuel (and running) costs, the level of differentiation between road tax bands in 2008 was having little or no discernable impact on purchase choice. Although consumers generally aspire to not be in the worst road tax category, only one interviewee lists lower ‘road tax’ per se as one of their top five most important purchasing factors:

It would have made a difference if it had been an F instead of a C, but I knew it wouldn’t be. [HW, Toyota Yaris, Petrol, New, 47.1, 141, C]

Probably wouldn’t sway it too much, but I can’t say I would be happy/ecstatic if it was too high. [CD, Peugeot 207 Sport, Petrol, New, 46.3, 145, C]

Based over a year, it’s quite negligible. [GR, Ford Focus Sport, Petrol, New, 39.8, 169, E]

Again, the common benchmark for the environmental credentials of a newly purchased car is how it compares to the previously owned car, or to other vehicles in the same class (which are assumed to have a similar level of road tax). Either way, road tax currently fails to influence car choice as the consumer admits that the decision had effectively already been made before road tax was a factor:

The old car before was throwing out a lot more. So, I think I’ve improved. [SY, Ford Fiesta, Petrol, New, 47.1, 139, C]

I know there’s a link between a car that has the same size engine, will cost you a certain amount to fill up and will be in a certain rate tax bracket and will have, therefore the same amount of CO2 emissions. And because I was only looking at certain cars, it wasn’t something I took into account, because they were all similar. [HW, Toyota Yaris, Petrol, New, 47.1, 141, C]

The UK’s system of VED is set to change once again in April 2009 to include a finer gradation between CO2 bands (with more bands from A-M) and a new higher first-year rate based on CO2 emissions from 2010. In this system, the standard rate of VED will be reduced in 2009-10 for all new and existing cars that emit 150 g CO2/km or less while increasing the standard rate of VED on the most polluting cars to £425. This research suggests a greater gradation in VED bands may be necessary to encourage consumers to pay attention to the bands. However, the participants in this study were confused about the pending changes, concerned about penalties for the highest polluting...
DELEGATION, DENIAL AND DRIVING LESS

When discussing environmental issues, many participants exhibit signs of cognitive dissonance. This is manifested through a tendency to justify their actions (to the interviewer and to themselves) as they become aware of the discrepancy between their behaviour (in this case car purchase) and their attitudes (towards the environment):

\[ CO_2 \text{ emissions, cars have all, have always emitted, I suppose, } CO_2 \text{ and always will. If they were going to do something about it, they should have done it many years ago, before there were so many cars on the road. [M&B, Land Rover Freelander, Diesel, Used, 37.2, 205, F] }\]

Any car has an impact, it doesn’t matter how badly or how big it is or how much fuel we put in it, we still sit in the road, we’re still using it. [Purchasing a better car] helps a little bit but all cars are the same [SY, Ford Fiesta, Petrol, New, 47.1, 139, C]

One manifestation of dissonance is the deferral of responsibility to people who drive the most polluting vehicles. For instance, the existence of highly inefficient or ‘gas guzzling’ cars are often used as a comparison against which almost any other car is deemed to be ‘environmentally friendly’. This is yet another benchmarking behaviour. It is also consistent with other attitude-behaviour research which reveals pro-environmental behaviour is often hindered by people’s lack of a sense of efficacy (Kollmuss and Agyman, 2002). In other words, there is a tendency to believe that whatever positive contribution can be made as an individual is bound to be eroded by the actions of others:

\[ It’s not the best in the world but there’s people driving around in big gas guzzlers…. [SY, Ford Fiesta, Petrol, New, 47.1, 139, C] \]

Yeah, I did check before I bought it [the CO\textsubscript{2} emissions], I did have a look, but like I say, it wouldn’t have stopped me. Because I knew it wasn’t going to shock me. I knew it wasn’t going to be, you know, in the region of one of these 4X4’s. [HW, Toyota Yaris, Petrol, New, 47.1, 141, C]

I’m not a Green Warrior, I’ve got to say, but in saying that..., as long as it was not more polluting than any other car, than in it’s kind of class, I wouldn’t have bought something that was horrendous to the environment, but I think that if you own a car, you just have to live with that, it’s not any worse than anybody else’s car. [WLT, Honda Jazz, Petrol, New, 48, 134, C]

Another way in which the problem is deflected is in relation to ‘offsetting’ behaviours which are perceived as a way of excusing the purchase of a more polluting car:

\[ We use public transport. So yes, of course, psychologically, we can offset it a bit on that side. … And we’ve got the caravan, so we don’t go holidays abroad at the moment, so we’re not flying, jetting off, so you know. Why should we be penalised then for… albeit having a… having a larger car. So we can tow the caravan, yeah, and be supporting the, the UK economy…. [M&B, Land Rover Freelander, Diesel, Used, 37.2, 205, F] \]

Some interviewees also express the belief that buying a fuel-efficient car has a negligible impact on the environment compared to driving less. This does not mean that these people are actually driving less or necessarily intending to do so. However, it is an indication that some car buyers use this as an argument to relieve themselves of the responsibility to choose a low carbon car. Nevertheless, separate evidence in the UK of traffic levels in the first half of 2008 indicate that fuel price may indeed be having an impact in reducing car mileage (DfT, 2008). Whilst this is a minority view across the survey sample, it is an indication that many motorists are seeking ways to cut down on fuel use.

\[ I find myself thinking, petrol is one, diesel is about 1.40 a gallon now, or 1.40 a litre, whatever it is, and… I think, do I need to make that trip? I don’t. [TC, VW Touran, Diesel, Used, 47.1, 162, D] \]

\[ We’re trying to cycle more. He’s [son] on the back of it. My husband takes the train. I’ve been taking the train in, going up to North Bristol quite a bit, instead of driving. [TH, Ford Mondeo, Petrol, Used TH, Ford Mondeo, Petrol, Used, 35.3, 192, F] \]

In addition, on several occasions, interviewees volunteer information about their driving style or their tendency to use the car less in order to save fuel.

\[ No, [the fuel economy] it’s less. I mean I find that worse, it’s worse, it’s not as good as I thought. So this is why we try to improve our driving. [KB, Honda Jazz, Petrol, New, 47.9, 139, C] \]

\[ Once upon a time I would’ve just thrashed it and regardless, and just run through the gears to get to 70. Now I just stick it in, just go to first, second gear, then drop to fourth, then go into fifth gear and take the overtaking out. [SY, Ford Fiesta, Petrol, New, 47.1, 139, C] \]

The research concludes, therefore, that there are a variety of car buyer segments each exhibiting different behavioural responses, and only some of these responses are a direct reaction to fuel costs and the environment. Some consumers are resistant to changing their car purchase and may employ denial tactics to justify their behaviour. Another response is to pay less attention to car choice but to limit the impact of this choice on their wallet or the environment by adjusting the way they drive and possibly how much they drive.

While it is not possible in a small qualitative sample (as used by this survey) to unpick issues such as cognitive dissonance and social norms, or to produce a meaningful segmentation based on the likely behavioural and motivational combinations which exist, it is nevertheless possible to indicate that these issues prevail and highlight the complexity of behavioural responses which exist.

SYMBOLIC ASPECTS OF CAR CHOICE

Modern Western lifestyles demand car ownership; personal mobility is a virtual necessity. Cars are also highly visible, whether moving occupants around or parked in public spaces where they can be seen by all. Consequently, cars as product can be described as a ‘public necessity’ as opposed to a privately consumed non essential item or ‘luxury’. When a product is a necessity the symbolism of ownership of the product ‘cat-
ers whose opinion one values. Should fuel-efficiency become... of identity and lifestyle construction. In addition to asking,... that it has, you know, I suppose it, it’s not as bad as most cars, but just the style, I think, if I went and bought a Prius, I think most people would laugh [unclear] that my mates would laugh. [BT, Seat Ibiza, Petrol, New, 42.8, 157, D]

I mean I’m thinking to myself I know I’m a bit old to be driving a Mini… it’s sort of branded as being fun, rather than this is a nice economical thing, if you like… [RB, BMW Mini Cooper, Petrol, New, 52.3, 129, C]

It is also the case that fuel-efficiency or a vehicle’s CO₂ emissions take on symbolic associations and so are also used in the process of identity and lifestyle construction. In addition to asking, ‘What can this car do for me?’ car buyers ask, ‘What does the car say about me?’ Consequently, fuel-efficiency is traded off against other symbolic benefits or outright rejected if it is felt to be incompatible with the buyer’s lifestyle or social identity:

I wrote off the Mazda quite early on. Talking to my friends, who I considered to know a lot about cars, said they wouldn’t buy the Mazda. They just didn’t like it, and I came round to the idea that I preferred the look of the TT. And they, you know, they used phrases like, you know, ‘Mazda is a bit of an old man’s car’, that sort of thing. [JH, Audi TT, Petrol, Used, 30.8, 226, F]

The survey also reveals the role of car choice in signifying social group membership and the importance of the opinions of others whose opinion one values. Should fuel-efficiency become associated with desirable social characteristics, for example, modernity or youth, then these messages would be dispersed through social networks or friends and family as described above. However, the study found no evidence that fuel-efficiency currently holds these associations:

So I just thought Golf [the car] was the next step really, because I’d heard so much about Golfs and all the girls at work, nearly all the girls who work here have got Golfs and they’ve been saying to me for a couple of years now, get a Golf. [SW, VW Golf, Petrol, Used, 38.2, 173, E]

The importance of branding and image issues also features in the survey findings. Based on previous surveys with car purchasers (SMMT 2008b; Lane, 2005) and accepting that ‘image’ and ‘brand’ are generally second order considerations for the majority of car buyers buying small or medium sized cars, these factors are generally used to distinguish between otherwise similar vehicles within a vehicle class – once primary considerations, including price, comfort, safety and other critical utility factors such as size, have been satisfied.

I was definitely clear that it had to be cheaper on petrol… That kind of became clearer as I was doing more research. And obviously things got eliminated because of price and things got eliminated because of looks. But those were kind of always there; they constantly channelled my focus. [NU, Citroen Zara Picasso, Diesel, Used, 51.4, 147, C]

It is likely the importance of image will differ when particular sectors of the car market are assessed. For example, luxury and sports car buyers are unlikely to have price and fuel economy as first order considerations. Brand and image will be much more important for this sector. Nevertheless, for some participants it is clear that even when choosing amongst small cars, looks and image were as important as fuel economy or even more so.

Nobody would want to buy a car – an economical one, just because it’s economical. When you’re spending that amount of money, you have to like driving it. I think people are more interested, especially with how things are going now, by price and looks rather than efficiency and stuff like that. [CD, Peugeot 207 Sport, Petrol, New, 46.3, 145, C]

When participants were asked to respond to a series of car magazine adverts (including a VW Polo, VW Touareg and a Peugeot 308), the relatively high fuel consumption of the Touareg was remarked on by many respondents. What is revealing is that the least efficient vehicle of the three was considered to have the highest status; its high fuel consumption is mirrored in the presumed ability of the owners to consume as they wish through being wealthy and it is presumed they have achieved a higher social status.

[Q: What do you thing they are trying to portray?] R: Its [the VW Touareg] up-market, quite sophisticated, for someone older. Big. Safe. Expensive. [PR, Audi A3 TDI, Diesel, New, 62.8, 119, B]

This importance of second order considerations such as image, brand and status in the small and medium sized vehicle market is further highlighted as a choice criterion because, despite wide variations within each class (i.e. the lowest emitter of CO₂ in the super-mini class emits 30% less CO₂ than the
Again this seems to be partly generated by the assumption that emitting cars also do not seem to galvanise most respondents. In the means to save it. Symbolic associations of low CO₂ of social or personal identity construction and the ability to fuel-efficiency remains a relatively weak element in the process model range. 'EfficientDynamics' advertising campaign across their new vehicles. BMW may have started this process with their recent manufacturers to position themselves as a provider of fuel-efficiency. For example, respondents rarely make explicit linkages between relative fuel economy and desirable signifiers such as modernity, innovation and technological development. Instead fuel economy is generally spoken about in more prosaic terms - as an important feature of car choice required to reduce the cost of motoring.

Furthermore, it is notable that throughout the discussions no single brand is associated with fuel-efficiency. This contrasts with other aspects of the car which are conventionally used as decision-making criteria. For example reliability is usually associated with Volkswagen, safety with Volvo, BMW with quality, status with Mercedes etc. The fuel-efficiency ‘niche’ seems to be as yet unclaimed although a number of respondents do mention the Prius (rather than Toyota) in this respect. With rising fuel prices this seems to offer an opportunity for car manufacturers to position themselves as a provider of fuel-efficient vehicles. BMW may have started this process with their recent ‘EfficientDynamics’ advertising campaign across their new model range.

In summary, it seems that for most car buyers, the notion of fuel-efficiency remains a relatively weak element in the process of social or personal identity construction and the ability to spend money remains more symbolically powerful than investing in the means to save it. Symbolic associations of low CO₂ emitting cars also do not seem to galvanise most respondents. Again this seems to be partly generated by the assumption that vehicles within a class will have very similar emissions. Moreover, the notion of a ‘low carbon car’ seems indistinct and is generally associated with a small car. As smaller cars are generally considered to be a compromise – offering the functionality of relatively cheap transport without the multiple benefits of greater size and comfort, low carbon cars are similarly categorised as something that respondents must, perhaps reluctantly, accept.

We’re all going to have to get used to driving smaller engined, small fuel-efficient, less toxic emission cars. Yes there is an element of that reluctantly. [PK, Mazda ZT, Petrol, New, 52.3, 129, C]

While discussions of alternatively fuelled vehicles and hybrids aroused a certain amount of interest (amongst car buyers in this survey sample), this was tempered by concerns over the availability of fuel and convenience. However, it is notable that these technologies are not generally dismissed as marginal or associated with extreme environmental groups. This is an area that merits more research.

THE FUEL ECONOMY LABEL

European legislation requires dealers selling new passenger cars to display useful information on these vehicles’ fuel consumption and CO₂ emissions (Directive 1999/94/EC as amended by 2003/73/EC). This information must be displayed on the car, on posters and any other promotional material, and in specific free guides. Although the display of fuel consumption and emissions data is mandatory, the format of the label is voluntary. Colour coded fuel efficiency labels matching the graduated VED structure were introduced into UK car showrooms in 2005. This shows the VED category and cost of the vehicle, and the average mpg and fuel expenditure over 12,000 miles of typical use.

Although not initially the main focus of the research, when survey participants are asked if they have seen the new car fuel economy label when buying their car, 9 of the 13 in the sample who had purchased a new car are aware of the label (as are 4 of the 15 who had bought a used vehicle). However, only 4 of the new car buyers clearly remember seeing the car label during their latest car purchase. That said, most comments are positive regarding the label and it is common for it to be associated with ‘white goods’, the sector in which it was first used.

Yes I think it’s [the fuel economy label] helpful because when I had to search for stuff like this on [the www] it was a bit annoying, checking one thing then going to another page and checking another thing. So if these things are advertised with the car then it’s probably helpful. [NU, Citroen Zara Picasso, Diesel, Used, 51.4, 147, C]

Um... I’d certainly look at it, if... there was a choice. But the thing is, I don’t, I don’t choose by the Vehicle Excise Duty, or I don’t choose by the CO₂ emissions: it’s not a, a relevant thing that I consider [Q: If you were just choosing within a class, thought?] If there were two the same, then I’d probably choose the one that was the lower CO₂ [JW, Saab 9.5, Diesel, Used, 37.2, 202, F]

Recent surveys of car dealerships in the UK suggest compliance with the label is high (LowCVP 2008). However, only a minority of buyers of new cars in the sample remember seeing the label during their recent car purchase. This suggests the label is not registering in consumers’ minds. It may be the case that it is seen by car buyers but not noticed. Furthermore, when asked if the label would actually influence their car choice, participants give little indication that it would:

Maybe subliminally, I don’t think it would – I don’t think I would go and look and go oh that’s a B Band. It maybe subconsciously and it maybe one of the things we would use to compare and contrast. [WR, Fiat Punto Grande, Petrol, New, 46.3, 139, C]

Furthermore, although broadly accepted as a useful addition to the information environment of the car buyer, the energy label is probably most effective in influencing choice amongst medium sized cars because (as reported previously) small cars are all assumed to be relatively fuel-efficient whilst fuel economy or
Environmental performance is less important or not considered in large or prestige vehicle classes.

Of particular relevance to this survey are comments regarding the information content of the label, with some participants being unclear about the figures provided. A few comments suggest a proportion of car buyers are confused by the inclusion of environmental, fuel economy and fuel cost information (as currently included on the label). Given the finding that the fuel cost metric is a more effective signal than fuel economy in motivating behaviour, there may be good reason to amend the information content and design of the ‘fuel economy’ label to match more closely to consumers’ cognitive requirements.

I think people look at cars more on economy than the actual greenness. I know it says fuel economy there [on the label], yes, and everybody wants to know about economy, but this is linked to being greener, isn’t it, in your emissions, not just fuel economy. The CO₂ and it’s not, not just economy so that is a misnomer. s a con. If it was just fuel economy I would. I’d see which one was more economical... [MB, Land Rover Freelander, Diesel, Used, 37.2, 205, F]

The finding that the most common conceptualisation of fuel economy is the ‘cost to fill the tank’, together with the consumer focus on monthly or weekly fuel expenditure and other payments, suggests that the best metric to provide to prospective car purchasers is fuel cost; ideally on a weekly, monthly or annual basis. This has implications for the ways in which information might be displayed on the car ‘fuel economy’ label, and suggests that it may be more effective to downplay the CO₂ emissions and provide a stronger focus on the monetary savings that could be secured from alternative purchases.

Someone tell me, tell me how much is it going to cost, tell me what my running costs are going to be, tell me what the bottom line is. Don’t tell me it’s a good car, tell me what I can do with it, you know? [ES, Mercedes C2-20, Diesel, Used, 42.2, 177, E]

I think if it had been set out more plainly and clearly, yeah, yeah, it may not have changed what I bought, but it would have been a consideration [MB, Ford Focus, Petrol, Used, 42.1, 159, D]

Conclusions

This study set out to answer the following questions:

How important is fuel economy within the car purchase decision? This research shows that despite the emerging shifts taking place in the UK car market, the disconnect between the reported importance attached to fuel economy, and the actual influence of fuel economy on the purchase decision (the ‘mpg’ paradox) still prevails – but it has changed in nature. Although, there is now strong evidence that car choice is changing in response to rising fuel costs, this research concludes that it is not the fuel economy metric itself which is conceptually driving behaviour; it is simply the cost to fill up the tank that has instigated the change. It seems that for most car buyers, the notion of fuel-efficiency remains a relatively weak element in the process of social or personal identity construction and the ability to spend money remains more symbolically powerful than investing in the means to save it.

What explains any gap between reported importance attached to fuel economy and its actual influence on the purchase decision? The following observations were found to explain this disconnect:

- The ‘mpg’ metric is only treated superficially in the decision making process, and in some cases performs other functions (e.g. checking engine is in good condition);
- ‘Mpg’ is too complex a metric to be used to compute running costs or compare cars.
- Assessments of fuel economy are most commonly made by using a previously owned car as a benchmark (whether it had good ‘mpg’ or not), not by comparing with best-in-class;
- Car buyers only consider a small range of behavioural options when considering a more fuel economic model – switch to a smaller car and/or switch to diesel;
- Buyers still assume a similar ‘mpg’ for all cars in each vehicle class;

To what extent are fuel costs analysed in a systematic way before, during and after the car purchase? The key issue identified by this research is that ‘mpg’ is not the most helpful metric to aid the decision making process when buying a new or used car. It is not used by the majority of car buyers to calculate future fuel costs or to systematically compare different cars in terms of their fuel economy. Instead motorists use over-simplistic rules of thumb to benchmark ‘good’ and ‘bad’ cars. The inference is that, while some good decisions are being made (in terms of considering smaller cars), choice opportunities are being missed through over-simplification.

The survey also clearly shows that the performance of the previously owned car is commonly used as the primary benchmark on which to base an assessment of the new car’s fuel economy, CO₂ emissions and/or road tax credentials. This has implications where the previous car was old or had poor fuel economy, and identifies a key limitation in the decision-making process; if consumers predominantly have previously owned vehicles in mind, they are unlikely to appreciate the full range of possibilities that exist to maximise the fuel-efficiency of their next car purchase, and are unlikely to be aware of ‘best-in-class’ performance.

Does fuel economy equate with carbon performance or is the CO₂ (g/km) information becoming a distinct and important metric in its own right? Despite the link in the UK between annual car circulation tax and CO₂ emissions, very few people could offer an accurate figure or even an estimate for the emissions of their vehicle. The key finding here is that, for the majority of car buyers, road tax (as well as fuel economy) is perceived primarily in monetary terms and not in terms of CO₂ emissions. This survey confirms that environmental issues per se are not important motives in purchasing a lower carbon or more fuel-efficient car. There is a general tendency to defer responsibility for environmental
issues to those who drive the most polluting vehicles and to believe that all medium and smaller sized vehicles ‘pollute’ essentially the same amount as each other. However, some consumers who are resistant to changing their car purchase may be starting to limit the impact of their choices on their wallet or the environment by adjusting the way they drive and possibly how much they drive.

Policy Implications
The main implication of this study for policy is that communicating fuel economy information (in terms of ‘miles-per-gallon’ or equivalent) is not the most effective metric with which to influence the car purchasing process and promote the adoption of smaller and/or lower carbon cars. While the information is necessary, it is not sufficient to bring about significant behavioural change or to help accelerate the changes already taking place. A more effective metric would be to provide (up-to-date) fuel costs for each particular car, and/or the potential financial savings that could be gained by choosing the vehicle considered as best-in-class.

This research therefore supports the provision of more precise fuel cost information to car-buyers to enable them to compare fuel costs of different cars. Although the annual absolute fuel cost is shown on the existing car label in the UK, it is not updated to reflect the latest fuel prices, nor is it the most prominent figure presented. The key issue here is that, as fuel costs inevitably change over the longer-term, regularly updated fuel cost data is required to properly represent the potential financial savings offered by the lower carbon models (or the financial penalties associated more polluting cars); out-of-date fuel prices could tend to underestimate the magnitude of the comparisons. Thus information should be updated as fuel prices change – possibly through the provision of a web-based tool preferably on the vehicle, or nearby in the vehicle showroom. Furthermore, the fuel cost information as recommended should include best-in-class fuel costs to provide consumers with a relevant benchmark for fuel cost comparisons. The evidence suggests that the used-car market, which represents 75% of annual car sales in the UK but currently falls outside the labelling directive, would also benefit from the same information.

While it is recognised that forthcoming legislation (such as much higher the ‘first year’ VED tax rates from 2010 in the UK) is likely lead to significant behaviour shift in car purchasing patterns, it is clear that (in the first two quarters of 2008) the cost of fuel was driving the increased sales in smaller cars with improved fuel economy. That said, this research finds that it is the consumer’s ‘cost experience’ of paying for fuel, as opposed to the ‘mpg’ metric per se, which is the main driver of new buying behaviour. Therefore, by providing more precise fuel cost information on a per model basis, it may be possible to amplify emerging behavioural and market shifts to maximise financial gains for the consumer, and reduce vehicle carbon emissions to the greatest extent.

The survey also highlights the influence of social factors which have key roles in the construction of car buyers’ social and personal identity, and shows that symbolic aspects of car purchase and ownership can powerfully frame and constrain the range of choices considered. Paradoxically, the purchase of smaller classes of vehicle may be particularly influenced by consideration of symbolic aspects because relative fuel-efficiency within these classes is already taken for granted.

Furthermore, it is notable that the survey finds no single brand is associated with fuel-efficiency. This contrasts with other aspects of the car which are conventionally used as decision-making criteria (e.g. reliability is usually associated with Volkswagen, safety with Volvo, and BMW with quality). The fuel-efficiency niche seems to be as yet unclaimed although a number of respondents do mention the Prius (rather than Toyota) in this respect. With rising fuel prices this seems to offer an opportunity for car manufacturers to position themselves as a provider of fuel-efficient vehicles.

In summary, it seems that for most car buyers, the notion of fuel-efficiency remains a relatively weak element in the process of social or personal identity construction; fuel-efficient and low carbon vehicles are not, as yet, associated with aspirational or high status values. Moreover, the notion of a ‘low carbon car’ seems indistinct and is generally associated with a small car. As smaller cars are generally considered to be inferior (high functional value, low comfort level), low carbon cars are similarly categorised as products that respondents must reluctantly accept. Improving the image and status of fuel-efficient and low carbon cars is therefore a key issue that has yet to be addressed. For this reason, this survey recommends that further research on the symbolic aspects of low carbon cars be conducted to more fully understand consumer choice in this developing market.

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