Chapter 4

Using behavioural insights to promote more sustainable transport choices

This chapter analyses behavioural interventions implemented to induce consumers to make more sustainable transport and car choices. The behavioural biases at play are highlighted, together with the behavioural levers used by policy makers to tackle them. Behavioural interventions in this area have focused on framing information on cars’ fuel efficiency, emissions and running costs in a clear and salient way.
Unlike in the energy consumption case, the connection between fuel consumption and service obtained (e.g. powering a motorised vehicle) is quite salient in the transport sector. This is due to the clear price-quantity match observed as consumers refuel their vehicles, and to the visible fuel meter in vehicles themselves. However, in the transport realm, three types of behaviour are prone to behavioural biases (see Reader’s Guide for definitions of all technical terms):

First, fuel consumption in motorised transport is associated with driving routines and habits. Framing and social norms can help in turning such habits into a “greener”, more fuel efficient, driving style. Framing can clarify and make more salient the connection between specific driving patterns and fuel consumption. Social norms could play a role as a behavioural lever by providing individuals feedback on their driving behaviour relative to other fellow owners of same-sized vehicles.

Second, the purchase of a motor vehicle is – like the purchase of any other durable good – an infrequent event from the household’s perspective. Hence, it is subject to all the biases characterising investments in energy efficiency improvements such as myopia and inertia induced by perceptions of sunk costs.

Furthermore, as cars can also serve the purpose of status symbols (Kahn, 2007), car choice is more exposed to the influence of social norms. Indeed, fuel efficiency does not always rank high among the attributes considered in the purchase of motor vehicles. For this reason, increasing its salience, especially at the moment of purchase, may be crucial to ensure that consumers take it into account in the choice process.

Third, choice among transport modes (e.g. public transport, motor vehicles, non-motorised modes, such as bicycles) is subject to inertia and social norms. Individuals may stick to car commuting because of inertia, even though they may have to incur substantially higher financial costs (e.g. fuel, car maintenance, insurance) and time costs (due to congestion) in comparison with commuting with other modes.

Framing the private and social costs of car commuting (e.g. contribution to congestion and air pollution; aggregate number of hours spent driving per year; use of public space for street-side parking) in order to make them more salient may help individuals reconsider their routine commuting choices and patterns by weighing their costs and benefits.

**Framing of fuel efficiency, emissions and running costs information**

When it comes to car purchases, consumers often show attitude-behaviour gaps. While being aware of the environmental impact of cars and stating that they see fuel economy as an important criterion for car choice, these attitudes do not ultimately translate into eco-friendly car purchases. This may also be due to a lack of understanding of the link between a vehicle’s fuel efficiency class and the environmental impact of its use.

To better understand their weight on car purchase decisions, in 2013 the European Commission ordered an impact assessment of different types of labels and promotional materials providing information on fuel efficiency, CO₂ emissions and running costs (Codagnone, Bogliacino and Veltri, 2013 – see Annex 4.A1). The study built on a three-fold approach consisting of a cross-country survey, a stated choice experiment rolled out on an online platform (both carried out in 10 EU member states), and a laboratory experiment (carried out in the UK). In the lab, analysts focused on testing alternative designs for environmental impact labels. In the online choice experiment, they also tested different
designs for promotional material. The effectiveness of the different treatments (labels and promotional materials) was measured through various indicators:

- *Willingness to pay:* does the information embedded in labels/promotional material drive consumers to spend more for eco-friendly and/or fuel efficient cars or in spending less for eco-unfriendly and/or fuel inefficient ones?
- *Self-reported and constructed cognitive measures of the noticeability, comprehension and recall of relevant information:* consumers were asked questions on car “greenness” and fuel efficiency. Their answers were used to infer how noticeable and comprehensible information was in labels and promotional material.

Among the most conclusive findings of the experiments, there were two main points. First, labels drawing on fuel economy indicators (e.g. information on foregone fuel savings, fuel costs presented in different formats) were more effective than those drawing on emission-related indicators. Second, the most effective promotional materials (stand-alone leaflets) included the graphic illustration of CO₂ emissions and the use of larger elements indicating running costs per 5 years. In general, interventions involving fuel costs (both in the per mile/km format and in the per 5 years format) were shown to be the most effective among all the tested ones.

While the European Commission’s project tested the impact of salient information provision on consumer understanding and willingness to pay for fuel efficient cars, in June 2015 the Israeli Ministry of Environmental Protection ran a stated choice experiment to test the impact of alternative fuel efficiency labels on car choice (see Annex 4.A2). The experiment was run by the Ministry’s unit dedicated to the design and implementation of behavioural interventions. More specifically, the experiment tested the extent to which different types of fuel efficiency labels induce consumers to purchase more fuel efficient cars.

Consumers were asked to make a car purchase decision in a simulated retail environment. In this setting, they were shown 7 pairs of cars, with each pair differing in price, fuel consumption and pollution emissions. In each pair, one car was more expensive but also more efficient, to the extent that this option would represent a better economic choice in the long run. Consumers in the control group were shown solely the price tag and the standard fuel efficiency label, including information on fuel consumption per 100 km and pollutant emissions. All the other consumers were exposed to different combinations of the following additional pieces of information according to the treatment group they were assigned to:

- the tax benefit that the car owner could be granted upon purchase of a car of a certain fuel efficiency class;
- the estimated fuel costs for a period of 5 years;
- a comparison of fuel consumption and costs with respect to the best-in-class (most fuel efficient) or the average car of the same category.

The label comparing long-term fuel costs to those required by the best-in-class car in the same category was found to be more effective in inducing consumers to opt for more fuel efficient car models than the standard label. More precisely, about 77% of consumers exposed to this label opted for the more efficient car in the pair, compared to about 71% in the control group. This was likely due to the impact of loss aversion: such comparison effectively underlined the financial costs of driving a car that is less fuel efficient than a given benchmark.
While these findings have not yet prompted changes in fuel efficiency labels in Europe and in Israel, scientific evidence on the advantages of making fuel costs more salient has informed concrete policy change in the United States. Traditionally, car fuel efficiency figures in the United States have been expressed in miles per gallon. However, Larrick and Soll (2008) showed that the non-linearity of this indicator makes its interpretation difficult for consumers, who ultimately may fail to grasp its meaning and thus choose less energy efficient vehicles.

Taking stock of scientific evidence, in 2011 the US Environmental Protection Agency updated the regulations regarding fuel efficiency labels. The new labels are required to depict vehicles’ fuel efficiency with two linear measures: gallons per 100 miles and estimated annual fuel costs. This is an example of behaviourally informed policy. It remains to be assessed whether car labels including two alternative indicators for the same concept are clearly understood by consumers.

Conclusion on transport choices

In the field of transport, the applications of behavioural insights reviewed in this report have thus far revolved around simplifying and framing information, in order to increase the effectiveness of fuel efficiency labels and their role in car choice.

While not numerous, stated choice experiments have been a common methodology in the transport-related behavioural interventions reviewed in this report (2 interventions). The reason why this may be the case is that such experiments are particularly convenient for the simulation of purchase decisions on online shopping platforms, which provide an information mine for consumers prior to making their final choice at car dealers’ shops.

The main results from behavioural interventions in this field show that translating fuel efficiency indicators into expected fuel costs throughout a period of multiple years can be highly effective in driving consumers towards the purchase of more fuel efficient vehicles, as the experiment developed in Israel has shown. This finding mirrors similar evidence from the energy efficiency sector: just as pointing out energy costs for the use of domestic appliances can make the value of investing in energy efficient ones apparent, making running costs of cars more salient will induce consumers to assign a higher weight to fuel efficiency at the moment of car choice.

This insight has already driven policy change in at least one case: a concrete behaviourally motivated policy change has been implemented in the United States. In 2011, the US EPA mandated a change in the framing of fuel efficiency labels to include information on the fuel costs associated with car use.2

Another policy-relevant result from these interventions is that indicators of pollution and CO₂ emissions from car use are too complex for synthetic labelling. They are better understood by consumers when explained in a more detailed and salient way in elaborate promotional materials such as stand-alone leaflets. This result points to the need to further develop tools to convey information about the pollution externalities from the use of motor vehicles (Codagnone, Bogliacino and Veltri, 2013).

Behavioural insights could also contribute to policies aimed at shifting the choice among transport modes towards more sustainable options (e.g. biking, public transport): this is an area in which the potential of behavioural insights is still largely underexploited.
Annex 4.A1

Testing CO₂/Car labelling options and consumer information – European Commission

<table>
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<tr>
<th>Context</th>
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<tr>
<td><strong>Who?</strong> Study realised by Cristiano Codagnone (Università degli Studi di Milano and Universitat Oberta de Catalunya), Francesco Bogliacino (Fundación Universitaria Konrad Lorenz) and Giuseppe Veltri (University of East Anglia) on behalf of the European Commission (DG Clima).</td>
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<tr>
<td><strong>Where?</strong> 10 EU countries (Belgium, Germany, France, Italy, Netherlands, Poland, Romania, Spain, Sweden, United Kingdom).</td>
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<td><strong>When?</strong> 2013</td>
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| **Why?** The objective of this intervention was to test with an experimental approach:  
  • the effectiveness of variants of car eco-labels, both related to their content and to their layout;  
  • the effectiveness of mandatory information on fuel efficiency and CO₂ emissions in promotional material. |

<table>
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<th>Behavioural intervention</th>
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<td><strong>Environmental policy objective</strong> Promote private investment in more efficient technologies</td>
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| **Behavioural issue** Lack of understanding of indicators of environmental impact and fuel efficiency of cars.  
  Attitude-behaviour gaps: consumers may be aware of the environmental impact of cars – e.g. air pollution, greenhouse gas emissions – but this may not necessarily translate into the purchase of more fuel efficient and environmentally friendly cars.  
  This is also due to myopia in intertemporal choices. |
| **Behavioural lever** Simplification and framing of information |

Evaluation of the intervention: methodology

**Relevant population:** Perspective car buyers in the EU.

**Sample size and sampling method(s)**

- **Preparatory phase (preliminary survey):** N = 8000 respondents (representative random sample of 800 respondents from each of the following 10 countries: Belgium, Germany, France, Italy, Netherlands, Poland, Romania, Spain, Sweden, United Kingdom).
- **Laboratory experiment:** N = 405 respondents recruited by the London School of Economics (LSE) Behavioural Lab from a panel of respondents; not representative of the general population.
- **Online choice experiment:** same sample as in the preparatory phase.
Method

The study included 4 phases:

1. **Preparatory phase**: review of the literature and preliminary survey in 10 countries. The objective of this phase was to understand:
   a. What parameters affect the car-purchase process (e.g. price, fuel efficiency, self-reported attitudes)?
   b. What is the level of consumers’ awareness regarding the environmental impact of car usage, both in absolute and relative terms (e.g. environmental impact of a car relative to similar cars)?

2. **Laboratory experiment** testing the effectiveness of labels and promotional materials.

3. **Stated choice experiment** in a simulated online environment, re-testing labels’ effectiveness (as in the lab experiment) and testing promotional material.

4. **Analysis and recommendations**: econometric and multivariate statistical analysis aimed at deriving policy implications and recommendations.

Both the laboratory experiment and the stated choice experiment were designed as randomised controlled trials with between-subjects design: participants were randomly allocated to a treatment or to a control group (placebo). In the lab experiment, the control condition was the car label in use in the UK, since the experiment was run in London.

The treatments tested in the lab and the simulated online environment involved variations on the content and layout of labels and promotional material for cars (conventional, electric and hybrid cars):

- **Labels**: the trial tested both standard elements normally found in car labels (e.g. CO₂ classification systems, in absolute terms or relative to a car belonging to the same class) and additional elements (e.g. information about fuel costs in per mile/km format and in per 5 years format, carbon taxation, savings relative to fuel efficient benchmarks). These treatments have been tested both in the lab and in the online experiment.

- **Promotional material**: general layout, additional elements (e.g. combinations of CO₂ emissions indicators with information on fuel costs) and presence of weblinks. These treatments have been tested in the online experiment.

The authors of the study used regression analysis to estimate the difference in means between treated groups and control groups with respect to the response variable used (see below, **Units of measurement**): this pins down the causal effect of the treatment considered.

**Units of measurement**

Difference in means between treated and control groups with respect to different response variables:

- Willingness to pay: does the information embedded in labels/promotional material drive consumers to be willing to spend more for lower emission (in terms of type approval CO₂ emissions per km/mile) and/or fuel efficient cars or in spending less for more environmentally damaging and/or fuel inefficient ones?

- Self-reported and constructed cognitive measures of the noticeability, comprehension and recall of relevant information: consumers were asked questions on car “greenness” and fuel efficiency. Their answers were used to infer how noticeable and comprehensible information was in labels and promotional material.
Findings

Regarding labels, most findings from the lab and the stated choice experiment are inconclusive (inconsistent across treatments, indicators and engine types). However, a few more conclusive findings are worth mentioning:

- There is evidence that information on CO₂ emissions in an absolute format (i.e. where a vehicle is rated compared with vehicles from all classes) is more easily processed than information in relative format (i.e. where a vehicle is rated compared with other vehicles in the same class) or in a format combining the two.

- Treatments providing information on fuel economy seem to be more effective than treatments providing information about CO₂ emissions.

Regarding promotional materials, evidence was more robust from a statistical point of view. The most effective treatments were found to be a graphical illustration of CO₂ emissions and the salient indication of fuel costs per 5 years.

Source

Annex 4.A2

Framing of fuel efficiency information – Israel

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<td><strong>Behavioural lever</strong></td>
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Evaluation of the intervention: methodology

**Relevant population:** Israeli potential car buyers.

**Sample size and sampling method(s):** 350 participants (52% women), all adults (ages 25 and above, average age was 48, with a 12.5 standard deviation), were recruited from a panel of respondents. Participants were potential buyers of a new family car (i.e. those who reported either purchasing a family car within the past two years, or planning to purchase one soon). Forty per cent of participants had academic education, and 53% high school education. Participants received a small pay in exchange for their participation (regardless of their answers).

**Method:** Stated choice experiment with within-subjects design.

Participants received a link to an internet website, where they answered a questionnaire. Part of the questionnaire was dedicated to hypothetical scenarios, where respondents were instructed to imagine that they were about to buy a new car and had to choose between the different vehicles presented to them. For each scenario of the choice experiment, two cars were shown to the participant. Altogether, participants were shown 7 pairs of cars throughout the experiment. Within each pair, the two cars differed in terms of price, fuel consumption and pollution levels (all data were based on actual details of popular car models in Israel). Participants were asked to assume that the cars were similar on all other attributes (e.g. reliability, comfort, safety, etc.).
For every pair of cars, information was presented in a different way, forming the 7 different conditions of the experiment:

- **Control 1**: fuel consumption per 100 km and pollution levels (as shown in fuel efficiency labels for cars according to current regulation).\(^4\)
- **Control 2**: price only (in order to make sure participants understood the task).

The next 5 conditions showed the information given on conditions 1 and 2, plus additional information as follows:

- **Condition 3**: Green tax benefit. In this case, participants were shown the amount of tax benefit associated with the purchase of a given car according to its fuel efficiency level.
- **Condition 4**: Estimated fuel costs over 5 years.
- **Condition 5**: Relative loss due to additional fuel costs, as compared with the *most fuel efficient car* in the same car category/class. This leverages loss aversion.
- **Condition 6**: Difference in fuel consumption (relative loss/gain), compared to the *average car* in the same car category/class.
- **Condition 7**: Joint application of conditions 3 and 6, i.e. information on green tax benefits and difference in fuel consumption compared to average vehicle in the same class.

All participants went through all conditions at a changing and random order, including the control condition. For every pair, participants were asked to mark their preferences between the two cars on a 1 to 7 scale (1: I would certainly choose car A; 7: I would certainly choose car B).

Within each pair, one car would have a higher price, but taking into account the fuel consumption over 5 years would make it an overall better investment. For example:

<table>
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<tr>
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<th>Car A</th>
<th>Car B</th>
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<tr>
<td>Car cost (in New Israeli Shekel)</td>
<td>132 000 NIS</td>
<td>128 300 NIS</td>
</tr>
<tr>
<td>Fuel cost for 5 years (in New Israeli Shekel)</td>
<td>31 610 NIS</td>
<td>39 520 NIS</td>
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**Units of measurement**: Percentage of participants choosing the most fuel efficient car under each condition.

**Findings**

Figure 4.A2.1 shows the percentage of participants choosing the more fuel efficient car in each condition.

Linear regression provided evidence for a statistically significant positive effect only for condition 5, which involved exposing participants to a label comparing the long-term fuel costs of each car to those required by the best-in-class car in the same category.

Surprisingly, a statistically significant negative effect was found to be associated with condition 3. Showing the tax benefit associated with the purchase of a highly fuel efficient car led to a mere 64% of consumers opting for such models. This result may seem counterintuitive, as tax benefits should incentivise the purchase of fuel efficient cars.
However, this effect may have been caused by a misunderstanding of the concept of “tax benefit” on the part of the consumers. All other conditions had no significant effect (p<0.05).

Intervention costs were estimated to be close to zero.

Figure 4.A2.1. **Percentage of participants choosing the most fuel efficient car under each condition**

![Figure 4.A2.1](image)

Source: documentation provided by the Israeli Ministry of Environmental Protection.

**Source**

Information retrieved from e-mail exchanges with the Israeli Ministry of Environmental Protection.
Notes


3. A panel of respondents is an online data base of potential participants to surveys and experiments. Candidates register voluntarily, submit their personal socio-economic details, and are often approached and offered to participate in surveys, experiments and other types of research, whether academic, commercial or governmental. Participants normally receive a small pay for the time they dedicate to participate in the study.


References


Reader’s guide

The objective of this report is twofold: first, to understand the extent to which behavioural insights are being incorporated in environmentally relevant policy making, as well as the outcomes of this process; and second, to provide policy makers with concrete examples of successful as well as unsuccessful applications of behavioural insights to the design and implementation of relevant policies.

This reader’s guide presents all definitions of terms related to behavioural biases, interventions and levers, as well as those related to the methods used to test and assess the impact of behavioural interventions. While the definitions of these terms are also presented in Chapters 1 and 2, this guide mainly aims to support the reading of the chapters reviewing applications of behavioural insights to various policy areas: energy consumption and energy efficiency, water consumption, food consumption, transport and car choice, waste management and resource efficiency, and compliance with environmental regulation. These chapters make frequent use of the terms defined here.

Which behavioural biases affect environmental policy outcomes?

**Behavioural biases** are the features of human behaviour that, if observed through the lens of standard economic theory, can be defined as deviations from rational decision-making. Following Mullainathan and Thaler (2000), behavioural biases can be grouped into three categories, depending on the behavioural deviation from the characteristics of *homo economicus*: bounded rationality, bounded willower and bounded self-interest. While behavioural sciences have provided evidence for many more behavioural biases, the focus here is on the biases which have the potential to impact environmental policy and its effectiveness.

**Bounded rationality**

“**Bounded rationality** reflects the limited cognitive abilities that constrain human problem solving.” (Mullainathan and Thaler, 2000)

- **Framing effect**: the way an option is presented (or framed) affects individual choice among alternatives. More specifically, individuals can draw different conclusions from the same amount of information, depending on how it is presented and the relative salience of its elements.

- **Loss aversion** arises when the cost associated with giving up something is perceived as greater than the benefit that would accrue to the acquisition of the same thing (Gsothbauer and van den Bergh, 2011). Loss aversion can help explain the endowment effect and the status-quo bias:

  - **Endowment effect**: “The value of a good to an individual appears to be higher when the good is viewed as something that could be lost or given up than when the same good is evaluated as a potential gain” (Kahneman, 2003)
- **Status-quo bias**: “Because the reference point is usually the status quo, the properties of alternative options are evaluated as advantages or disadvantages relative to the current situation, and the disadvantages of the alternatives loom larger than their advantages. This leads to inertia.” (Kahneman, 2003)

**Bounded willpower**

“**Bounded willpower** captures the fact that people sometimes make choices that are not in their long-run interest.” (Mullainathan and Thaler, 2000)

- Inconsistencies between individual beliefs and behaviours can be denoted as **cognitive dissonances**. This phenomenon leads to an attitude-behaviour gap, a mismatch between beliefs and concrete behaviours. Sometimes, people may react to this mismatch by aligning their beliefs to their behaviour instead of the opposite (Carlsson and Johansson-Stenman, 2012).

- **Myopia in intertemporal choices**: individuals tend to show time-inconsistent preferences when considering decisions characterised by time-varying discount rates. This means that they will apply discount rates that are higher in the short run than in the long run (hyperbolic discounting), rather than constant over time. In other words, individuals with this type of preferences would rather obtain one Euro today than one Euro tomorrow, but when presented with the choice between receiving one Euro in one year and the same amount in one year and one day, they will gladly wait for an extra day. This type of discounting drives short-sighted decisions, placing disproportionate weight on immediate costs and benefits relatively to long-term ones (Gsottbauer and van den Bergh, 2011).

**Bounded self-interest**

“**Bounded self-interest** incorporates the comforting fact that humans are often willing to sacrifice their own interests to help others.” (Mullainathan and Thaler, 2000)

- Individuals are not motivated exclusively by their own utility: **altruism, fairness and social norms** also affect individual decision-making. While altruism and fairness need not be defined, social norms and their impact on consumer behaviour deserve further scrutiny. People conform to behaviours which are perceived as the norm in society, and compare their own behaviour to these ideal benchmarks.

**What are behavioural interventions?**

A recent report from the European Commission (Sousa Lourenço et al., 2016) provides a typology of the extent to which behavioural insights have been taken into consideration and have informed the policy process:

- **Behaviourally tested interventions** are “initiatives based on an ad-hoc test, or scaled out after an initial experiment”;

- **Behaviourally informed interventions** are “initiatives designed explicitly on previously existing behavioural evidence”; and

- **Behaviourally aligned interventions** are “initiatives that, at least a posteriori, can be found to be aligned to behavioural evidence”.
This report focuses solely on behaviourally informed and behaviourally tested interventions, as they are the outcomes of deliberate efforts of policy makers to draw upon behavioural insights when developing and implementing policies. Here, these two types of interventions are denoted as *behavioural interventions*. Conversely, while behaviourally aligned initiatives may be effective in delivering policy results, they are not based on a good understanding of the behavioural mechanisms upon which they act. This limits the possibilities to replicate them in the future or in other contexts.

**What types of behavioural levers can policy makers use?**

Policy makers can use a range of behavioural levers to design and roll out an appropriate policy intervention. These levers are, in fact, the building blocks of behavioural interventions and, as such, constitute concrete tools for policy makers. Extending the classification provided by Mont, Lehner and Heiskanen (2014), seven main types of *behavioural levers* can be distinguished:

- **Simplification and framing of information**: simplifying complex information can prevent information overload. Framing aims at representing information by consciously activating certain values and attitudes of individuals. The way information is framed can also affect how it is processed by its recipients. For example, energy efficiency labels can be framed to provide a sense of the relative ranking of an electric appliance with respect to the best-in-class one, and the savings that one could enjoy when switching to the latter.

- **Changes to the physical environment**: the physical environment can substantially affect individual decision-making, especially in contexts in which choices are made spontaneously, on the basis of automated mechanisms and habits. Examples of such interventions are changes in the location and appearance (e.g. colour) of recycling bins, or the installation of automatic (sensor-based) water taps to curb water consumption.

- **Changes to the default policy**: as individuals are prone to status-quo bias, they often postpone making decisions until or unless it becomes inevitable to do so. Defaults can, thus, have a great impact in contexts in which people are resistant to change. An example of such interventions is a change to the default setting of thermostats (i.e. to a lower baseline temperature in order to foster energy savings).

- **Use of social norms and comparisons**: as individuals are social beings, not solely driven by their own payoffs, they are affected by the way people surrounding them behave (social norms), by how they compare to their peers (social comparison) as well as by moral injunctions. An example of this type of intervention is the comparison of a household’s energy or water consumption to the consumption of a same-sized household in the same neighbourhood.

- **Use of feedback mechanisms**: several routine behaviours, such as energy consumption or waste disposal, have considerable environmental impacts. However, these impacts are often not sufficiently salient for consumers. Providing them with timely feedback can make such contexts more transparent, increasing awareness of environmental externalities stemming from daily consumption choices. For example, real-time in-home displays connected to smart energy meters can provide real time feedback on energy consumption and costs.

- **Reward and punishment schemes**: can be used as “carrots and sticks”, associating a salient, material payoff to consumers’ achievements. For example, rewarding...
households who have been particularly savvy with water consumption during scarcity periods may generate a positive norm for water conservation.

- **Goal setting and commitment devices**: as individuals are bound by status-quo bias and inertia, effortful behaviour changes can be encouraged by setting specific and measurable goals and using commitment devices to regularly follow up on progress. One such example involves pinning down an objective of energy savings and following up on the objective with regular feedback and tips.

Note that “hybrid” interventions can be designed by building upon several of these insights at once. For example, energy conservation can be prompted by reframing energy bills in order to make them more intuitive and by using social comparisons therein.

Price-based policies, instead, leverage the most traditional form of market-based tools, such as taxes, to induce economically rational changes in individual behaviour. They should, thus, not be confused with policies building upon behavioural insights, which aim at tackling behaviours that are not consistent with the model of rational economic behaviour.

### What methods can be used to test and assess the impact of behavioural interventions?

**Experiments** enable the estimation of a policy’s causal effect. The cornerstone for credibly identifying the causal effect of a policy is the construction of the correct counterfactual (List and Price, 2016). The idea behind the establishment of a counterfactual is to compare the impact of the policy of interest on a group that is exposed to it (or, in the experimental jargon, “treated” with it), with its impact on a control group, which is unaffected by the policy intervention. The empirical findings of experiments can inform policy makers, motivating the launch of new policies or changes in existing ones.

Harrison and List (2004) argue that “[c]ontrolled” experiments, which include laboratory experiments and field experiments, represent the most convincing method of creating the counterfactual, since they directly construct a control group via randomization” (p. 1014). In fact, randomisation ensures that the individuals or groups of people exposed to the policy to be tested and those exposed to the control condition are truly comparable (Haynes et al., 2012). Experiments based on the randomised assignment of participants (individuals, households, firms…) to treatment or control groups (in short, randomised treatment allocation) are called randomised controlled trials or, in short, RCTs (see also Haynes et al., 2012; Gertler et al., 2016). According to the type of randomisation process, Charness, Gneezy and Kuhn (2012) distinguish two different types of design:

- **“In a “within-subject” designed experiment**, each individual is exposed to more than one of the treatments being tested, whether it be playing a game with two different parameter values, being treated and untreated, answering multiple questions, or performing tasks under more than one external stimulus. With such designs, as long as there is independence of the multiple exposures, causal estimates can be obtained by examining how individual behavior changed when the circumstances of the experiment changed.

- **In a “between-subject” designed experiment**, each individual is exposed to only one treatment. With these types of designs, as long as group assignment is random, causal estimates are obtained by comparing the behavior of those in one experimental condition with the behavior of those in another.” (Charness, Gneezy and Kuhn, 2012, p. 1)
Likewise, one can talk about between-group and within-group experimental design, if the randomisation is carried out at the level of groups of individuals (e.g. a village, a cohort of students...) rather than at the level of single individuals. According to the experimental context, one can distinguish between:

- **Laboratory (lab) experiments** are conducted with volunteer participants in a controlled laboratory facility (Levitt and List, 2009; Noussair and van Soest, 2014).

- **Field experiments** are carried out in naturally occurring settings, often with subjects that are unaware of being part of an experiment. Field experiments also include experiments carried out on real online platforms (e.g. e-commerce websites or social networking platforms), which are becoming increasingly popular. Such experiments are denoted in this report by the term online field experiments (Chen and Konstan, 2015). These should not be confused with experiments carried out on simulated online environments specifically designed for experimental purposes.

**How to assess policy impacts when treatment allocation is not randomised?** For some of the interventions described in this report, impact evaluation is not based on the randomised assignment of experiment subjects to a treatment or control group. In such cases, causally identifying the impact of the policy intervention requires different methodological approaches based on the analysis of what Levitt and List (2009) call “naturally-occurring data” or “uncontrolled data” (see e.g. Blundell and Costa Dias (2009) for a technical overview of such methods and Gertler et al. (2016) for a non-technical one). This approach to causal identification of policy impacts works as long as the policy is introduced as an “exogenous shock”, and randomly – in a statistical sense – allocates subjects to control (unaffected by the policy) and treatment (affected by the policy) groups.

**What about stated preference studies?** An entirely different category of policy interventions involves stated preference studies, such as stated choice experiments. In this type of experiments, subjects are presented with hypothetical choice scenarios where they have to select their preferred alternative among a menu of hypothetical options (see also Alpízar et al., 2003). This type of experiment can be carried out in the context of a survey (with the help of a questionnaire), or in simulated online environments. The aim of this type of studies is to elicit individual preferences and willingness to pay for specific goods or attributes – usually for those not yet available in the market or those for which no market exists.

**References**


