

## CHAPTER 3

### Improving public health prevention with a nudge

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By equating market development and some individual decisions, economists inform world leaders on the trends to come and the decisions to be taken. They are therefore at the heart of policy-making, both public and private, which they have controlled for several decades.

However, **standard economic theorists (or neo-classical theory) and their rationality models have thrown up some “anomalies”**: individual behaviours that these models are unable to predict. In order to understand them better, new alternative disciplines emerged. It is to one of these, **behavioural economics**<sup>5</sup>, which combines social psychology and economics, that this chapter is devoted.

#### 1. Behavioural economics

When in the presence of their friends, it is not uncommon for someone to announce in the middle of the conversation that they want to stop smoking, eat balanced meals or start (or resume) regular physical activity. However, during the next meeting, he or she will still be smoking and eating unhealthy food, and his or her new pair of running shoes will still be carefully packed away. These everyday life situations have at least two things in common: they are all incredibly ordinary and, above all, they all violate the axioms of the standard economic theory.

##### 1.1. The unbearable rationality of being

Standard economic theory studies the decisions of an individual equipped with many strengths (from an economics point of view that is to say). He or she is intelligent,

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<sup>5</sup> Camerer C. F., Loewenstein G. and Rabin M. (2003), *Advances in Behavioral Economics*, Princeton, Princeton University Press.

logical, patient, analytical, with unfailing self-control, has unlimited knowledge and willpower and rationality in the face of any test, making it possible for him to avoid being influenced by their emotions. Add on top of selfishness that makes him or her totally impermeable to social influences, and you have *homo æconomicus*.

**All these features enable him to make only “optimal” decisions informed his purely utilitarian approach.** Such a vision of human beings is very practical for the development of economic models because it standardizes individuals by fixing their personality. However that might be, the economic sciences cannot escape a sizeable problem. **Despite all of his virtues, this (economically) ideal being has a crippling defect: he does not exist!**<sup>1</sup>

Who can say that they are not emotional, impulsive, distracted, altruistic, prone to procrastination and decision making guided by instant gain? The optimal economic result is not really a major issue for human beings. **Having the relevant information regarding risky behaviour, for example, is not enough to make an individual give it up: quite the contrary.**

**All of these characteristics specific to humans have been studied and integrated for years in the decision-making models of psychologists, while the dominating trend in economics has been unaware of them or, best case scenario, underestimated them.**

However, it has not always been like this.

## 1.2. From mathematics to psychology ...

Before this galloping mathematical and rationalising approach to economics arose, certain economists, more than two centuries ago, had already described the role of emotional factors in economic decision-making<sup>2</sup>. Among them, Adam Smith, known for his “invisible hand” concept, published his work called “*Theory of Moral Sentiments*”<sup>3</sup>, which laid the foundations for certain concepts of behavioural economics<sup>4</sup> from as early as the XVIII century.

Not much later, Jeremy Bentham, the father of utilitarianism – keystone of neo-classic economics –, also addressed certain psychological biases.

What transpired in the meantime, meaning that psychology was put in the same category as economics? **The desire to strengthen a field considered as less rigorous than other disciplines had its founding in the Humanities.** At the end of last century, the physicist’s approach to economics triumphed and held sway for several decades, still being the dominating trend, even today.

Notwithstanding, work was carried out and made it possible to update, in a systematic way, certain behaviours contrary to current rationality hypotheses for

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<sup>1</sup> Kirman A. P. (1992), “Whom or what does the representative individual represent?”, *Journal of Economic Perspectives*, 6(2), p. 117-36.

<sup>2</sup> They were to some extent the “psychologists of their time”, to use the expression of Camerer and Loewenstein, insofar as psychology as a field of study did not yet exist in their time.

<sup>3</sup> Smith A. (1759), *Theory of Moral Sentiment*.

<sup>4</sup> Aversion to risk, for example.

decision making . The two articles co-written in the 1970s by Amos Tversky and Daniel Kahneman (who would later become the winner of the Nobel Prize for Economics in 2002) are regarded by many as key elements in the development of behavioural economics.

The first, published in 1974<sup>1</sup>, showed that the probabilistic judgments put forward do not fulfil statistical criteria. The second, dating back to 1979<sup>2</sup>, is certainly one of the most influential articles of the end of the last century. It describes the asymmetry between the pain caused by loss and the pleasure felt from gain. It offers a theory for loss aversion more than two centuries after the first intuitions of Adam Smith.

### 1.3. ... and application for public policies

Since these seminal contributions, behavioural economics has continued to develop, fed by observations of the behaviour of real human beings, in their daily life as well as in laboratory experiments, making it possible to obtain statistics on famous **economic anomalies**<sup>3</sup> (decisional or behavioural).

This approach is totally different from standard economics. It does not consist of developing abstract models with which you might try to predict the behaviour of hypothetical (non realistic) individuals. This discipline observes and analyzes the characteristics of very real human behaviour to then try to work out models starting from certain non-variable factors.

As stated by Colin Camerer and George Loewenstein : *“At the core of behavioral economics is the conviction that increasing the realism of the psychological underpinnings of economic analysis will improve economics on its own terms -- generating theoretical insights, making better predictions of field phenomena, and suggesting better policy”*<sup>4</sup>.

Accordingly, would it not be possible to use knowledge resulting from the experiments and observations in behavioural sciences in order to help individuals to adopt practices that are less risky for their health? **These strategies have already been used successfully in areas such as financial<sup>5</sup> and energy savings<sup>6</sup>**. Working with framing or anchoring effects or the tendency towards inertia when faced by change and compliance to social norms, to name but a few examples, could make it possible to improve the wellbeing of individuals without depriving them of their freedom of choice.

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<sup>1</sup> Tversky A. and Kahneman D. (1974), “Judgment in uncertainty: Heuristics and biases”, *Science*, 185, p. 1124-1131.

<sup>2</sup> Kahneman D. and Tversky A. (1979), “Prospect theory: An analysis of decision subject to risk”, *Econometrica*, XLVII, p. 263-291.

<sup>3</sup> See in particular the articles devoted to these anomalies published in *Journal of Economic Perspectives* : <http://faculty.chicagobooth.edu/richard.thaler/research/Anomalies.htm>.

<sup>4</sup> Camerer C. F. and Loewenstein G. (2003), “Behavioural economics: Past, present, future”, *Advances in Behavioral Economics*, p. 3-51.

<sup>5</sup> Thaler R. H. and Bernatzi S. (2004), “Save more tomorrow”, *Journal of Political Economics*, 112, S164-S187.

<sup>6</sup> Hallcot H. and Mullainathan S. (2010), “Behavior and energy policy”, *Science*, 237, p. 1204-1205.

## 2. Libertarian paternalism

The idea of making deliberate use of behavioural biases in order to improve the wellbeing of people is based on three concepts. The first is *libertarian paternalism* which defines the approach itself. The second is represented by the *influence* strategies to be implemented to achieve it, the latter being fed by both the results of behavioural economics and those of social psychology. The third is that of *nudge*: the implementation of these strategies.

### 2.1. Libertarian paternalism

The authors of the concept of libertarian paternalism, Cass Sunstein and Richard Thaler<sup>1</sup>, refute the contradiction that some may see in the association of these two terms<sup>2</sup>. **With paternalism, they call for a policy to guide the choices of individuals with the purpose of improving their wellbeing. In its libertarian character, they refer to the need to respect the freedom of each person to act, or to even decide to change their opinion as they see fit.** In this sense, the approach is different from a regulation which would leave no other alternative but to comply.

In their most recent book, the two authors admit that this approach does not just consist of anticipating the decisions of individuals but rather of directing them in a deliberate way. They add, however, that “*libertarian paternalism is a relatively weak, soft, nonintrusive type of paternalism because choices are not blocked, fenced off, or significantly burdened. If people want to smoke cigarettes, to eat a lot of candy, to choose an unsuitable health care plan, or to fail to save for retirement, libertarian partnalists will not force them to do otherwise –or even make things hard for them*”<sup>3</sup>.

### 2.2. Influence and *nudge*

In order to be able to practice a libertarian paternalism policy, it is thus advisable to develop strategies that will direct the choices of individuals in order to improve their wellbeing. These strategies will add to behavioural economics results but also those of social psychology, developed in the influence theory by Robert Cialdini<sup>4</sup>.

Starting from this theoretical knowledge and empirical results, it will be possible to **implement suitable means to induce behavioural changes and influence the**

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<sup>1</sup> Sunstein C. and Thaler R. H. (2003), “Libertarian Paternalism”, *The American Economics Review*, 93(2), p. 175-179.

<sup>2</sup> Sunstein C. and Thaler R. H. (2003), “Libertarian paternalism is not an oxymoron”, *University of Chicago Law Review*, 70(4), p. 1159-1202.

<sup>3</sup> Thaler R. H. and Sunstein C. (2008), *Nudge. Improving Decisions about Health, Wealth and Happiness*, Londres, Penguin Books.

<sup>4</sup> The latter is based on six major principles: Reciprocity, sympathy, adherence to social norms, commitment and associated coherence, authority and scarcity; Cialdini R. (2004), *Influence et manipulation. Comprendre et maîtriser les mécanismes et les techniques de persuasion (Influence and handling. Understanding and controlling the mechanisms and techniques of persuasion)*, First Editions : Paris ; Cialdini R. (2008), *Influence: Science and practice* (5<sup>th</sup> edition), New York, Allyn & Bacon.

choices of individuals, while leaving the possibility of not following the suggested direction. The latter thus remain the “architects of their own choices”<sup>1</sup>.

This is what Richard Thaler and Cass Sunstein call a “*nudge*”, cognitive strategies to make a person **do something ... And especially to make good choices for herself**.

Let us consider the example of a *nudge* based on the principle of compliance to social norms. In a hotel bathroom, if you display information on the percentage of people who, having occupied the room previously, used their towels several times instead of having them changed every day, customers are encouraged (without however being forced) to refrain from using the towels just once<sup>2</sup>. Because the statistics they were given were high, it becomes the social norm for them to re-use the towels. This inexpensive strategy has led to an increase in the re-use of the towels, which at the same time brought obvious ecological benefits, and also economic ones for the owners of the hotels that applied it.

### 3. Some *nudges* for public health prevention<sup>3</sup>

This section includes a brief illustration of some examples of *nudges* that have led to behavioural changes in various sectors of public health prevention<sup>4</sup>.

#### *Organ donation*

A strategy often employed for commercial subscriptions is to offer a free service to consumers for a few months specifying that they can suspend it simply by mail before it becomes a service that has to be paid for. However, many people forget or then balk at taking the administrative steps, however simple they may be, and spend money for a service that they did not initially want. This is known as a “default subscription” strategy.

Although the stakes are very different, a similar method can be used for organ donation. What would happen if a person was a donor by default? Such an initiative forces individuals to take steps to stop being a donor, contrary to what is done in countries where it is necessary to go through certain formalities to become a donor. Work published in 2003<sup>5</sup> compared the consequences of the two strategies: in the end, less than 20% of the population is a potential donor when it is necessary to take steps to become one, against more than 80% when organ donation is by the default strategy. To go to an institution and officially state that one does not want to be an organ donor firstly involves filling out the administrative forms and then (to a certain extent) going against a strong influence: that of social norms, such a position being likely to be regarded as selfish.

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<sup>1</sup> Thaler R. H. and Sunstein C. (2008), *Nudge. Improving Decisions about Health, Wealth and Happiness*, Londres, Penguin Books.

<sup>2</sup> Cialdini R. (2005), “Don’t throw in the towel, use social influence research”, *Observer*, 18, 4-4; [www.psychologicalscience.org/observer/getArticle.cfm?id=1762](http://www.psychologicalscience.org/observer/getArticle.cfm?id=1762).

<sup>3</sup> Most of the examples of *nudges* presented in this section have been taken from the work *Nudge* by Richard Thaler and Cass Sunstein.

<sup>4</sup> The *nudges* more particularly directed towards the fight against obesity and nicotine addiction were developed in parts 2 and 3 of this work.

<sup>5</sup> Johnson E. J. and Goldstein D. G. (2003), “Do defaults save lives? ”, *Science*, 302, 1, p. 338-1339

This example may raise ethical questions as to its nonlibertarian aspect. However, in fact, in the vast majority of countries where such a method is implemented, application is far from being rigid. Let us remember that, in France, the law considers that everyone is an organ donor by default. However, in reality, before harvesting the organ the transplant teams always consult the close relatives of the deceased to make sure that (s)he had not expressed any opposition to organ donation, or that he or she had confirmed agreement.

### *Hygiene*

A very simple idea made it possible to make men's toilets cleaner. It was enough to **place a sticker representing a fly in a strategic place on the urinal**. Wherever the fly is, it becomes a target that men will always aim at<sup>1</sup>. This example, which may appear commonplace or even laughable, nevertheless had far from negligible consequences on the cleanliness of the toilets. Indeed, this simple approach alone made it possible to decrease urine being sprayed on the wall or the ground by almost 80%.

Still within the framework of maintaining cleanliness, several experiments have shown that a clean smell in a room encourages people to behave more respectfully. Thus, during an experiment, subjects were asked to sit at a clean table and to eat cookies from this table. These had been especially selected to be extremely brittle so that crumbs would fall systematically on the table. Two conditions were tested. One group carried out the task when no smell was present in the room. For the other group, a cleaning product smell was sprayed around. The results showed that a much greater proportion of individuals spontaneously cleaned the table before leaving the room when the ambient air had been scented<sup>2</sup>. This result, reproduced several times, might be one of the reasons why cleaning products with strong smells are used in large canteens.

### *Keeping to commitments*

To try to encourage individuals to follow a good diet or quit smoking, the site [stickk.com](http://stickk.com), developed from an idea by two professors of Yale University, Dean Karlan and Ian Ayres. It offers to let them pay an amount of money and commit to a result over a given period. The process is carried out in partnership with a doctor who will weigh the person regularly or will make her take urine tests to be sure that she have not smoked again. Money is refunded to any person who keeps to her commitments. On the other hand, if the person does not reach the goal, the sum is used for charity. This *nudge* that exploits the aversion to losses has an unquestionable advantage, and voluntary take-up is part of the approach.

### *Nutrition*

A simple strategy makes it possible to encourage people to vary their diet. A study compared two types of choice of food. For one month, a group chose the menu to be

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<sup>1</sup> People familiar with James Gibson's work will certainly see here the concept of affordance (or possibility of action), a key concept in his ecological approach to perception and action in psychology. He had certainly not imagined such an application!

<sup>2</sup> Holland R. W., Hendricks M. and Aarts H. (2005), "Smells like clean spirit: Non-conscious effects of scent on cognition and behaviour", *Psychological Science*, 16, 689-693.

eaten for that day's lunch every morning. Another group, on the other hand, had to plan its menus for all of the following month. The results show that the group that plans varies its menus more than the group that makes its decisions from day to day. **The act of visualizing the sequence of the meals in a meal plan encourages the person to avoid choosing the same combination on several consecutive days and also to diversify his or her food choices.**

**Decreasing the variety of food offered in a cafeteria encourages people to eat less.** A 2005 study showed that if people can serve themselves yoghurt in a bowl and they are offered three varieties, they will tend to consume 23% more than if only one flavour is available. This is due to the fact that the reduction in the appetite and acceptability of a food that has been eaten until reaching satiety is specific to this food. In fact, "there is room left" for another type of food. Research on specific sensory satiety thus suggests that meals made up of food with similar sensory qualities (for example, similar taste, shape and colour) might reduce the amounts ingested<sup>1</sup>. It remains to be seen whether the pleasure of eating, which is essential, would also decrease.

This last following fully illustrates the goals of Pierre Chandon – a French specialist in food psychology – when he declares that one *"eats with the eyes, not with the stomach"*<sup>2</sup>. In an experiment, a red *crisp* was inserted at regular intervals in cardboard packing in the shape of tubes<sup>3</sup>. Compared to a tube in which all the crisps are identical, the use of visual markers made it possible to decrease average consumption by approximately 50%<sup>4</sup>. In fact, these colour separators **draw the attention of the eater, provide him or her reference marks with regard to consumption and make him or her pause during eating.**

### ***Wastage***

The Alfred University in New York conducted an experiment in which people lunching at a *self-service* restaurant on the campus **no longer had plates available to them.** This measure immediately caused the portions that they served themselves to decrease. While no data is available regarding the possible consequences on the body mass of the students, it is interesting to notice that the needless waste of food decreased significantly. This measure was then implemented by several universities in the United States, with an average of 50 % less waste being recorded.

### ***Road safety***

It is also possible to use *nudges* in the field of road safety to force drivers to slow down. On a very busy road on the outskirts of Philadelphia, **the public authorities decided to paint fake speed bumps on the ground** that would look like real ones from the perspective of the drivers. Over a period of one month, the speed radars set

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<sup>1</sup> Heshmat S. (2006), "Applying behavioral economics to changing health behaviour: The case of weight loss management", *Californian Journal of Health Promotion*, 4, p. 21-29

<sup>2</sup> Interview given at Rue 89 on March 5th, 2009.

<sup>3</sup> Wansink B., Geier A. B. and Rozin P. (2009), "Packaging cues that frame portion size: The case of the red potato chip", *Advances in Consumer Research*, 36, 1p. 95-195;

<sup>4</sup> In a control experiment, researchers showed that consumers ate the crisps without discrimination if all in the same box were beige in colour (natural for crisps) or red.

out on the road in question showed that the average velocity had decreased from 38 to 23 miles per hour<sup>1</sup>. An interesting effect for a strategy three times less expensive than putting real speed bumps. The second benefit, is that this optical illusion allows health vehicles, such as fire trucks or ambulances, to pass over them quickly without damages.

Another strategy, implemented in Australia, was to remove the centre line of a two-way road. This not only resulted in decreasing the average speed on this road but also increased the distance between the cars travelling in each direction. **With the road no longer having any surface markers, it became less safe in the eye of the drivers, who adopted more careful behaviour.**

A different measure that is well-known in the United States for reducing speed is the implementation of detectors that display the speed of passing vehicles on large screens. Drivers are thus informed of their speed and are more respectful of the driving rules. In Italy, these information panels show a smile when the driver respects the speed limit and an angry face when the limit is exceeded. **The use of these facial expressions improved the effectiveness of this measure still further in terms of respecting the speed limits.**

Lastly, a town in Australia noted that panels requiring drivers to slow down when approaching schools did not have the desired effect. Not being able to dispatch policemen with radars for all the establishments, various methods were tested (meters displaying speed on a large screen, false radars). The one that proved to be the most effective was the installation of **cardboard silhouettes of children at the edge of the road**, with a significant reduction of speed noted at school entrances.

#### 4. What is the future of behavioural sciences in public policy?

The power of behavioural sciences lies in that they have put human beings, their body, their moods, their desires and their propensity to be influenced by others at the heart of economic concerns. The few examples presented in the previous section illustrate how small changes in the environment can lead to major positive effects on health and economics, and that it would be a shame to not take them into account in public health prevention strategies.

However, the goal of this chapter is not to recommend a systematic application of the strategies developed all over the world to our own country, but rather to inform people in charge of their existence and nurture the debate on their potential effectiveness and ethical implications. Moreover, even if it were to be considered, reviewing, developing and using behavioural sciences in public policies is no easy undertaking.

An initial problem lies in the fact that, while taking account of many human factors, **behavioural economics can only provide such clear cut answers as standard models. This careful behavioural approach is better from a scientific point of view, but both public authorities and citizens prefer to hear firm solutions (even if**

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<sup>1</sup> It may be that this effect is temporary for residents who frequently travel through and quickly understand the stratagem. On the other hand, for people not living in the area, this measure could prove to be effective in the long-term.



those or not realistic), at least in order to be reassured. Hence, the context dependence approach (“it depends”) of public health prevention by behavioural economics although more realistic and honest, turns not to be always seductive, if not perceived as weak, on the political front.

The second difficulty concerns **going from the individual to the aggregate level**. While initiatives for individuals are essential, those on a broader scale are also necessary. Admittedly, work on behavioural economics has been directed at group dynamics and the rapid transfer of information and emotion (“contagion”) within a community<sup>1</sup>. Collective changes have been observed due to the use of *nudges* to increase the rate of participation in voting<sup>2</sup> or fundraising<sup>3</sup>. But, for the moment, with rare exceptions, the care used in the application of behavioural sciences does not allow them to propose viable alternatives or equivalence to the macro-economic models on the markets, however imperfect or wrong those might be.

Finally, we have the ethical concerns libertarian paternalism can raise. **Do we have the right to influence the behaviour of our citizens?** It is necessary to remain vigilant, so that the wish to encourage for the good of the individual does not become a desire to constrain. As long as citizens remain the free to choose, we think this policy is good. In other words, as long as a person has the possibility of choosing a way that is not the one towards which she is being directed by the *nudge*, this policy can be legitimately applied. Moreover, since this work is devoted to public health prevention, it is difficult to ignore strategies that would make it possible to improve the wellbeing of individuals.

\* \* \*

But the truth is that before being able to face such difficulties, the behavioural sciences have a primary task to fulfil: **to find the *nudges* that will convince administrations to consider them** in public policy, such as is already the case in the United States and Great Britain.



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<sup>1</sup> Oullier O., Kirman A. P. and Kelso J. A. S. (2008), “The coordination dynamics of economic decision-making: A multi-level approach to social neuroeconomics”, *IEEE Transactions on Neural and Rehabilitation Systems Engineering*, 16(6), p. 557-571.

<sup>2</sup> See for example a ruling issued by the municipal council of Los Angeles, stipulating that if a person is absent from voting at the poll, his or her vote will be taken as “yes” by default: <http://nudges.org/2010/03/11/at-the-los-angeles-city-council-yea-is-the-default-rule/>; or the use of the social constraint that the behaviour of a neighbor constitutes in inciting people to go to the ballot boxes; <http://nudges.org/neighborly-nudges-to-do-your-civic-duty/>.

<sup>3</sup> <http://nudges.org/2009/04/06/the-behavioral-science-behind-barack-obamas-fundraising-strategy/>.



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# Improving public health prevention with behavioural, cognitive and neuroscience

Supervised by  
Olivier Oullier and Sarah Sauneron

Rapports et documents

# Improving public health prevention with behavioural, cognitive and neuroscience

Report handed to Nathalie Kosciusko-Morizet, Secretary of  
State for Strategic Planning and the Development of the Digital  
Economy

Supervised by Olivier Oullier et Sarah Sauneron



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