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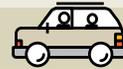
HOW TO KEEP YOUR HEAD BEHIND THE WHEEL

It's the holidays at last! Some are off to the coast, while others prefer the pure mountain air or lush green meadows. For many of us, the holidays will start with a car journey - 30 million journeys to be precise. Read on to find the best ways to stay calm and keep your wits about you during what can be a busy, tiring and even stressful time.

The “Fondation VINCI Autoroutes pour une conduite responsable” and “Cerveau & Psycho” magazine have joined forces to take a closer look at how our fellow citizens behave on the road and identify what characterises their behaviour, whilst suggesting some possible improvements. What difference does the arrival of digital devices in the car make to the driving experience? In what circumstances do we behave in a dangerous or aggressive manner and are we aware of it? What means exist to help improve our driving behaviour?

To this end, the VINCI Autoroutes foundation, which was created in 2011 to inform the general public about questions of road safety, bring about positive changes in driving behaviour, encourage drivers to be more responsible and improve safety, commissioned a survey from Ipsos. The latter questioned a representative panel of 1,000 people from different regions of France and the results of the Responsible Driving Poll were then analysed by psychologists and behavioural specialists. This analysis, which they have shared with us in this special report, will allow us to identify the main difficulties that our brain is confronted with during these long car journeys: distractions, drowsiness, irritability and the illusion of being in total control, to name but a few.

At the end of the day, it is actually often our own brain that plays tricks on us when we are driving. The brain is subject to various cognitive and emotional influences, drawn to the screens that are our constant companions and readily inclined to get angry and blame others. In fact it is not always as reliable as we'd like to think it is. Once you have read the following articles, when you are driving you'll realise straightaway when these factors come into play and will even be able to talk about them with your passengers. As a result, you will become a more aware and responsible driver, doing your very best to get your holiday off to a good start. ▲



TEXT MESSAGES, PHONE CALLS AND SATNAV REPRESENT DEADLY DISTRACTIONS

By **Jean-Philippe Lachaux**, *director of research at the "Centre de Recherche en Neurosciences de Lyon" and a member of the cerebral dynamics and cognition team.*

When we use our cell phone at the wheel, we literally forget that we are driving and put ourselves in danger. How can we reduce this usage?

At a time when a lot of us are taking to the roads to head for our holiday destinations, the Responsible Driving Poll, carried out by Ipsos for the Fondation VINCI Autoroutes, should give cause for alarm. In fact, a quarter of all drivers read or write text messages on their smartphone while driving! Take cover!

What could possibly explain such dangerous behaviour? Of course, we can all think of lots of good reasons for looking at or answering our messages while driving: to contact people we are meeting up with and check they haven't forgotten anything, to make a note of something important that has just crossed our mind, to check that our colleague has read the E-mail we rushed to send before leaving the office... or simply as a way of killing time during a long

journey. But above all there's one real reason that makes us think it's all right to do so: we constantly underestimate the level of continued attention required when driving.

In our defence, it's true that driving a car in normal traffic conditions doesn't seem to require continuous concentration. There are two reasons to this. First of all, the technical gestures of driving (changing gear etc) are more or less automatic and we can still do them efficiently even if we pay them much less attention than when we were learning to drive, something which is inherent to skill acquisition. The second reason lies in the predictive system that allows our brain to anticipate how a situation will evolve in the very short term on the basis of a few key pieces of information. The predictive system is able, based on the

DISTRACTION IN FIGURES

French drivers are aware of the risks of a lapse in concentration at the wheel



55%

recognise that it is one of the main causes of fatal road accidents

7%

declare that they have already had or nearly had an accident because they were using a mobile phone while driving

86%

say they are willing to never use a phone at the wheel again to reduce the number of deaths on the road

But are too distracted by connected objects...



44%

telephone using a Bluetooth system



38%

enter information into their satnav while driving



21%

telephone without a hands-free kit, or use an earpiece, headphones or earphones



26%

write or read text messages and E-mails



21%

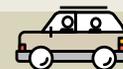
access an app to notify others of events

information we get in the blink of an eye about road conditions and the relative distance and acceleration of other vehicles, to predict their position in the very near future. However there's the rub: the time during which this prediction is valid is extremely short, around one second, i.e. barely enough time to glance in the rear view mirror, to look at a road sign, or for a thought to cross your mind. But not for any longer!

Any longer than a second – even in the quietest of driving conditions – and the prediction made by our brain based on the information it has just collected becomes unreliable, or even completely false. The consequences could be fatal should the car in front of you brake suddenly. And yet a second is not enough to glance at an SMS that you have just received or to ask your satnav to find a petrol station along the way, nor is it enough to change a playlist and even less to unlock the tablet of one of your kids, who is insisting on playing his/her game right now! Of course, this holds true when you are driving at full speed on the motorway, but it's just as true in town. Even if you drive more slowly in an urban environment, there is a much wider range of possible events that could require a rapid reaction on your part: a schoolchild getting off the bus and stepping out between parked cars, a cyclist changing lanes, a cat dashing out in front of you etc. Your brain cannot anticipate all the things that could possibly happen and therefore it predicts, by default, that nothing special is going to happen because that's usually the case! That's why you have to pay the most attention during short, daily, urban journeys, which are the very same ones we usually do with about as much attention as when we get up and walk from the bedroom to the bathroom. Help!

TEMPTING DISTRACTIONS

If you sometimes arrive at your destination and can't seem to remember anything about how you actually got there, as if you had driven with your eyes shut, completely lost in your thoughts, don't worry it's just an impression. In fact, your train of thought is not constant to the point that your brain doesn't have time to collect the visual information necessary to drive the car. You did look at the road, but just didn't memorise what you saw. In fact, we only retain a fraction of what we actually see. To simplify, our brain tries to spontaneously reuse any cognitive resources that it doesn't judge necessary for driving. These cognitive resources, or "available brain time" as we could call them, are made available to the brain's amazing cognitive machinery that is not only



It takes much longer to reorient your attention in case of an unexpected event (a pedestrian crossing the road, a car pulling out) when you are busy on your smartphone

capable of focussing on the immediate context at a given moment in time – the car and the road – but also of creating a mental simulation of the wider world we live in, the people who live there and all the important things we need to do.

In spite of everything, there's not much else we can do at the wheel than think about our little world, something our brain can more or less do at the same time as driving. We fix the road ahead and then put our trust in the regions of our brain that make up the ventral attention network, whose function it is to detect unexpected and salient events – eg the car in front braking – and give us time to react. As long as we are not completely lost in our thoughts, we should indeed be able to react in time.

However things get considerably more complicated when there is a telephone within the driver's reach. Smartphones have brought a whole new world into the car interior, one that wasn't there before. Perhaps you remember the joke, how do you get four elephants in a mini (two in the back and two in the front) - with the mobile phone, we have found a way not just of getting four elephants in the car, but also all our colleagues, friends and relatives, the employee at the train station ticket counter, the staff at the library etc and we can now really and truly interact with them at a distance. It is therefore very tempting indeed to make use of all those little moments when nothing in particular seems to be happening and when we have the impression that our attention is no longer required so we can do something more productive or more fun. Telephones are a great way of filling these moments of downtime with the greatest of ease, after all it only takes a few seconds to check

your E-mails or text messages, or even write one. But that's the problem, a few seconds is much, much too long.

The unique thing about driving is that it is one of the few situations in which a delay of a fraction of a second can have dire consequences. Unless you are an Olympic sprinter, your life won't be radically changed by an extra tenth of a second, except when you are at the wheel. And yet it takes much longer to reorient your attention effectively when you are busy with your smartphone.

Interacting with this device requires various manual gestures, as well as looking away from the road and turning your visual attention elsewhere. My team and I recently carried out an experiment that showed how simply reading a short text attentively instantly decreases our awareness of peripheral events because our field of attention narrows. In this experiment, we measured the activity of the part of the brain that treats information coming from the periphery of our field of vision: when the subjects were concentrating on a word displayed in the centre of the screen, this zone in charge of peripheral vision was literally switched off.

BLIND TO WHAT IS GOING ON AROUND US

Next – and more importantly – reorienting attention is slowed down when a smartphone is present, because as soon as you turn to this object, driving is no longer your main intention. Driving is pushed into the background in the prospective memory, which is used to remember to perform actions at a future point in time. As strange as it may seem, you actually temporarily forget that you are driving. This state of forgetfulness can persist as a result of what I call “attention capturing”: a stream of cognitive, motor and emotional reactions that last that much longer if what we are reading on the screen particularly interests us or concerns us personally.

And all of this is amplified by tiredness, which reduces the efficiency of the front part of our brain – the prefrontal cortex – one of whose functions it is to rapidly manage how our attention resources are allotted based on a global view of the current situation. For example, it is the prefrontal cortex that is responsible for limiting the impact on our attention of all these little urges that we feel as soon as we see our phone (I wonder if so and so answered my message, what's happening in the world etc). This is particularly preoccupying at a time when the number of hours adults sleep per night, and therefore drivers, is constantly decreasing from year to year. ▲

Bibliographie

J. P. Lachaux, *Le Cerveau attentif: contrôle, maîtrise, lâcher-prise*, Odile Jacob, 2011.

M. Land et B. Tatler, *Looking and acting: vision and eye movements in natural behaviour*, Oxford University Press, chap. 7, 2009.

M. Corbetta, G. Patel et G. L. Shulman, *The reorienting system of the human brain: from environment to theory of mind*, *Neuron*, vol. 58(3), pp. 306-324, 2008.

THE "BETTER DRIVER" ILLUSION



By **Stéphanie Bordel**, researcher in social psychology at the Centre d'Études et d'Expertise sur les Risques, l'Environnement, la Mobilité et l'Aménagement (Cerema), and **Alain Somat**, professor of social psychology at Rennes-2 University.

All of us, each in our own way, believe we are better and safer drivers than everybody else. It is our psychological biases that are to blame because they colour our judgement. If you realise this, you can reduce the risks.

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people go crazy when they get behind the wheel, they do stupid things and put the lives of other road users at risk! Surely everybody has said something similar at one time or another and yet we are rarely as critical about ourselves. And it is exactly this kind of psychological illusion that is highlighted by the results of the poll commissioned by the Fondation VINCI Autoroutes, which rather like a distorting mirror reflects the problematic behaviour of other drivers, whilst concealing our own negligence. So if 36% of respondents mention speed as the main cause of fatal road accidents, only 11% answered that driving over the speed limit is one of the highest risk behaviours and 89% of those polled admitted to exceeding the limit by a few kilometres per hour. Similar results can be seen for other examples of high-risk behaviour such as inattention, drinking or taking psychotropic drugs.

Nor do drivers consider themselves to be irresponsible or dangerous: such descriptions are not chosen by French drivers to describe how they drive (only 2%). Indeed only 16% of the survey participants chose at least one negative adjective to describe their driving, whereas 98% selected

THE SELF-SERVING BIAS

Complacency is the rule when drivers judge their own driving...

98% use at least one positive adjective to describe their driving



76% say they are alert **47%** calm **29%** courteous

2% judge their driving to be dangerous or irresponsible

... and the danger always comes from the others

86% use at least one negative adjective to describe other drivers

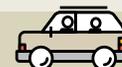


49% consider them irresponsible

27% stressed

29% aggressive

44% dangerous



If we always think that accidents only happen to others it's because we are subject to a cognitive bias: comparative optimism.

at least one positive adjective, notably describing themselves as alert (76%) or calm (47%). On the other hand, when it comes to describing other drivers they are less forgiving: 86% chose to use at least one negative adjective to portray them, seeing them as irresponsible (49%) or dangerous (44%). Unsurprisingly, only 28% of the survey participants used at least one positive adjective to talk about other drivers, who only seemed to be sufficiently alert for 14% and calm for 8% of those polled.

IN THE SNARES OF THE SELF-SERVING BIAS

What is the explanation for this behaviour and these judgements that seem so contradictory at first sight? How can we be aware of the dangers and yet believe that we are not dangerous, even when we are doing the self-same things that we consider dangerous in other drivers? Why are we so indulgent with ourselves and so severe with others? Such are the paradoxes that social psychology has tried, if not to clarify, at least to look into.

In 1930, a study by Richard La Piere, a professor of psychology at Stanford University, highlighted the low correlation between ideas and attitudes and actual behaviour. In one of the first experiments into this type of inconsistency, he canvassed 251 hotels and restaurants across the USA, asking them if they would accept to lodge or serve a Chinese couple and, although 92% replied negatively, they almost all accepted to do so when the couple actually arrived at the establishment. This demonstrated an obvious gulf between declared intentions and actions and the same is to be found in the field of road safety.

So is this inconsistency due to a lack of rationality, or because of a different kind of rationale which leads a person to be convinced that, on the one hand, it is dangerous to exceed the speed limit, while on the other hand continuing to exceed these limits themselves? In fact the reason lies in a psychological bias called the self-serving bias that leads people to explain positive events by internal factors and to use external factors to justify negative ones. This phenomenon was first identified in 1964 by the American psychologist Thomas Johnson and his colleagues. They observed that teachers tend to explain that their students' successes are the result of their vast pedagogical skills, but evoke learning difficulties to explain their students' failures. In the same way, pupils who pass an exam give themselves all the credit, whereas if they fail they complain that the subject didn't correspond to the programme, or blame their lack of success on a migraine or an unforeseen event during revision time.

We are also subject to this bias when driving. We judge ourselves to be careful drivers - an internal characteristic (and we are indeed careful most of the time) - and yet we simultaneously engage in forms of behaviour that are not safe, because

44%

OF DRIVERS

consider that other drivers are dangerous, but only 1% think they themselves are dangerous! This is the powerful demonstration of the self-serving bias, which encourages us to recognise thousands of positive attributes in ourselves, whilst denying them to other people.

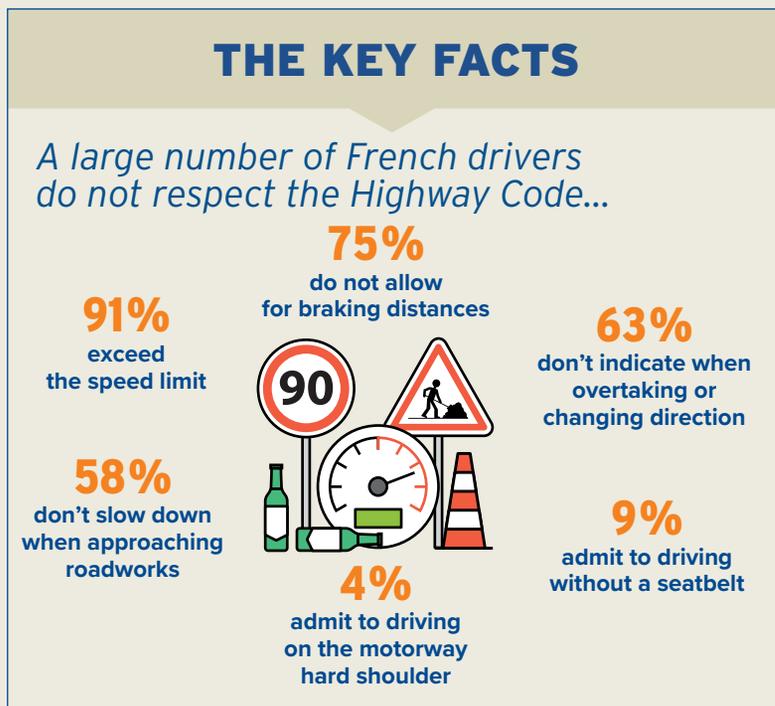
they are dictated by the circumstances in which we find ourselves i.e. external factors. In short, I am a careful driver, but on that particular day I had to drive faster because otherwise I was going to miss my plane. I was not responsible; it was the fault of the time of my flight or the traffic jam etc.

THE OPTIMISM BIAS

Another type of biased reasoning is one that leads a driver to believe that positive events are more likely to happen to him/her than to others. This “comparative optimism” can be seen in every field of life, as was explained in 2002 by the psychologists Isabelle Milhabet, Olivier Desrichard and Jean-François Verlhac, from Nice-Sophia-Antipoli, Geneva and Paris-Nanterre Universities. You can, for example, observe this phenomenon by giving a group of volunteers a list of possible, fortunate events, such as “being successful in business”, “receiving an award or a prize” and “living until the age of 80”, in addition to a list of unfortunate events, such as “developing cancer”, “losing your job” or “having a car accident”. For each event, the subject has to indicate the probability that it will happen to them or to another person. Comparative optimism is manifest in the fact that the subjects think it is more likely that happy events will happen to them than to others. Conversely, they consider that negative events are more likely to happen to others. This bias can have unfortunate consequences when driving. In 2004, the psychologists Patricia Causse and Dongo Rémi Kouabenan from Pierre-Mendès-France University in Grenoble and Patricia Delhomme from Ifsttar demonstrated the connection between manifestations of comparative optimism and the risk of having an accident. They found that, compared to drivers who had never had an accident or had never been caught drink-driving, people who had had an accident when driving under the influence, or who had been controlled positive, had a higher level of comparative optimism as far as their ability to drive when over the legal limit was concerned!

A DENIAL OF DANGER

In the same vein, in 2006 at Dinan high court (Côtes d’Armor, France), we were able to observe first hand that if repeat drink-driving offenders did indeed accept some responsibility for getting behind the wheel after drinking, they also refused to admit that their actions were dangerous. Their comparative optimism led them to believe that they were perfectly capable of driving even when they had been drinking, sometimes even when they were well over the limit. These repeat

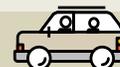


offenders often evoked external causes to justify why they had been stopped and controlled positive (for example that the police were lying in wait near the bar), thereby denying the evidence that the breathalyser was positive simply because they had been drinking before getting in the car.

How can we avoid such illogical actions, which sometimes mean that although we are aware of the danger, we do not adopt what we ourselves judge to be safe behaviour? Let's start by no longer saying it's not our fault: if we drive too fast it's our choice and not because of external events. Let's also stop believing that everything will always be alright, on the pretext that we have great reflexes or that we can hold our drink better than others. Self-serving and comparative optimism biases are traps that are part of human psychology. Sometimes you need to remind people of the evidence again and again, but sometimes you have to oblige virtuous behaviour, either by putting into place clear constraints (such as equipping cars with breathalysers that won't let the driver start the car if he/she is over the legal limit), or by calling upon techniques that make it possible to obtain the right behaviour without the person feeling that his/her freedom of choice has been affected. From this point of view, the “nudges” (see the article on page 72 of this special report) provide some good examples. ▲

Bibliographie

- P. Causse et al.,** Perception du risque d'accident lié à l'alcool chez des jeunes automobilistes : quelques déterminants de l'optimisme comparatif, *Le Travail humain*, vol. 67(3), pp. 235-256, 2004.
- T. J. Johnson et al.,** Some determinants and consequences of the teacher's perception of causation, *Journal of Educational Psychology*, vol. 55, pp. 237-246, 1964.



WHEN CARS CAUSE AGGRESSIVENESS

By Laurent **BEGUE**, member of the Institut Universitaire de France, professor of social psychology at Grenoble-2 University and director of the Maison des Sciences de l'Homme - Alpes.

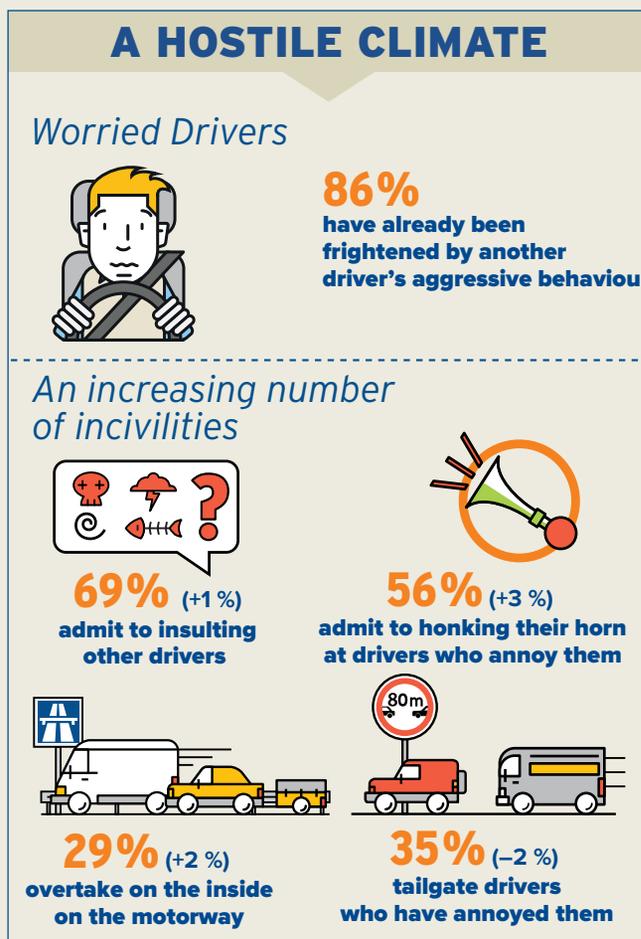
Dangerous behaviour is on the rise on our roads. The reasons are an exacerbated form of narcissism, the feelings of anonymity and impunity we experience when we are in our car and the accumulation of frustrations caused by traffic conditions.

Hostile gestures, obstructing and using the horn for the wrong reasons are some examples of the incivilities that have a negative effect on our driving experience and significantly increase the risk of accident. Thanks to the recent poll commissioned by Fondation VINCI Autoroutes, we can now better measure the prevalence of such behaviour in France and Europe. As far as discourteous and aggressive conduct is concerned, the survey showed that 69% of French people have already insulted another driver, 55% have honked their horn at people who were annoying them and 35% have deliberately tailgated the car in front of them. Moreover, 29% of drivers admit to overtaking on the inside, whereas 16% have gone so far as to get out of their cars to argue with another driver. Overall, almost 9 in 10 drivers have already been frightened by the aggressive behaviour of another road user.

IRRITABLE DRIVERS

To understand this aggressiveness – and if possible to implement measures to limit it – it is vital to grasp its root causes. Two types can be identified; the first is related to the driver's personality and the second to the context.

Not all drivers are equal when it comes to behaving aggressively and discourteously. Research shows that young men and people from the most disadvantaged socio-economic categories are clearly overrepresented.



Source : Baromètre de la conduite responsable, Fondation VINCI Autoroutes et Ipsos.

Certain personality traits also play a role, such as a person's general level of irritability or an inclination to get bored easily (which leads the person to engage in excessive types of behaviour in search of stimulation). In a French study carried out in collaboration with the sociologist Sébastien Roché, we observed that impulsiveness, i.e. making rapid decisions without thinking about the consequences, was also a relevant statistical predictor.

Narcissism, which can now be measured using verified psychological questionnaires, is another important psychological aspect that has been identified by scientists. People characterised by feelings of superiority, a highly marked sense of their own worth and who consider that they deserve respect from others are particularly inclined to be aggressive when this self-image is challenged, whether or not they are at the wheel. Thinking that a driver deliberately refused to give way, or that the driver who just cut in front of you was actually showing a lack of respect, are attitudes that are probably exacerbated in overly narcissistic people

AIR CON COOLS DOWN TEMPERS

Driving conditions also play a role: several studies have shown that traffic density is in correlation with feelings of driver frustration and less courteous kinds of driving, such as cutting people up, overtaking on the inside, using the horn and flashing headlights. Research in experimental psychology has proven that when an obstacle prevents us from reaching an objective, we experience a series of negative emotions that give rise to hostile thoughts and memories, as well as motor and physiological responses that all contribute to these feelings of hostility and make us more likely to act in an aggressive manner. And this is exactly what happens in traffic jams or heavy traffic. Heat is a contributing factor. Robert Baron, a psychologist from Oklahoma State University, measured the time it took for drivers at traffic lights on a stiflingly hot day to impatiently toot their horn at a driver in front who was slow to move when the lights turned green. His observations took into account whether or not their car was equipped with air conditioning. The results showed that people whose cars did not have air conditioning tooted their horns in a shorter lapse of time, most probably made more irritable by the temperature inside the car. A Spanish epidemiological study of almost 120,000 accidents confirmed that there is an increase of 7.7% in the number of road accidents during a heat wave.

Bibliographie

L. Bègue, *L'agression humaine*, Dunod, 2015.

P. Ellison-Potter et al., The Effects of Trait Driving Anger, Anonymity, and Aggressive Stimuli on Aggressive Driving Behavior, *Journal of Applied Social Psychology*, vol. 31, pp. 431-444, 2008.

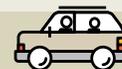
S. Roché et al., *Délinquance de rue et risques routiers chez les adolescents. Parallèles et spécificités chez les préconducteurs et les conducteurs, Rapport pour la Délégation Interministérielle à la Sécurité Routière*, 2004.

THE "COCKPIT EFFECT" MULTIPLIES OUR WORST INCLINATIONS

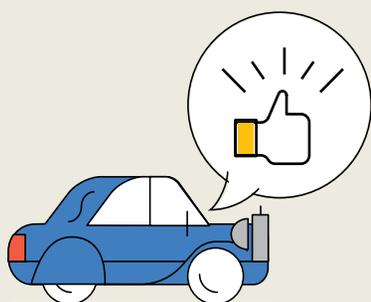
The simple fact of finding oneself sitting in a closed space gives rise to a feeling of anonymity and establishes a psychological distance with others that can have important consequences. This is something we could call the "cockpit effect" and it is a factor that increases the risk of aggressive behaviour. The psychologist Patricia Ellison-Potter from the National Highway Traffic Safety Administration in Washington counted the number and duration of horn blasts directed at a person blocking a junction when the lights turned green. She observed that statistically drivers of convertibles whose top was down (i.e. they were more visible) honked their horns less often than others. The contrary was observed when cars had tinted windows or the driver was alone (i.e. increased anonymity). In another experiment, Ellison-Potter even observed the same phenomenon in a driving simulator. She asked participants to imagine they were driving in a convertible, either with the top up or down: when the roof of the car was "up", drivers drove faster, had more collisions and paid much less attention to road signs.

Finally aggressiveness is made worse by the consumption of alcohol. The study commissioned by Fondation VINCI Autoroutes indicates that in France 17% of drivers admit that they sometimes drive when they are over the legal limit and 7% when they are actually feeling the effects of the alcohol. It is only in excess of 2.4 glasses of alcohol on average that they refrain from driving. The European average in this respect is 1.9 glasses of alcohol and the risk of exceeding the legal alcohol limit (0.5 g/l) increases after drinking 2 alcoholic drinks, a figure that can vary depending on body weight and gender. However alcohol slows your reaction time and, at the same time, makes you more inclined to take risks by reducing your perception of danger. Its contribution to increases in aggressive behaviour and incivility can also be observed in scientific studies.

It is therefore in everybody's best interest to identify the factors that make us irritable (traffic jams and traffic in general, heat) or lower inhibitions (alcohol, or the simple fact of being enclosed within the car). Effective air conditioning, soothing music (for traffic jams) and feeling rested when you get behind the wheel are some solutions, as well as realising that cars definitely do not always bring out the best in us. ▲



HOW TO IMPROVE DRIVERS' BEHAVIOUR



By **Coralie Chevallier** and **Nicolas Baumard**, *behavioural science researchers at the cognitive neurosciences laboratory at the École Normale Supérieure, Paris.*

In order to change drivers' behaviour for the better, psychologists have come up with some new solutions: optical illusions, methods of gentle persuasion (the famous nudges) and inciting passengers to intervene.



A radical solution: in South Africa, the authorities install trompe-l'oeil stickers to create the illusion that there are holes in the road!

More than one million people die every year in road accidents worldwide. Almost one third of these deaths is the result of driver error, a driver who did not respect the rules of the highway code or who took too great a risk, more often than not because of an error of perception, or a wrong appreciation of the situation. Excessive speed is notably the most common cause of death and, according to the opinion poll commissioned by Fondation VINCI Autoroutes, is perceived as such by 45 % of the French population. So how exactly can we encourage improvements in driver behaviour?

SAVED BY AN OPTICAL ILLUSION

For the moment, governments and car manufacturers have above all implemented technical (improvements to the braking system, airbags) and legal solutions (making seatbelts obligatory, limiting speed). However, since the problem is often the result of driver behaviour, there's a pretty good chance that behavioural science can also contribute to reducing the number of road accidents.

The simplest approach consists in using optical illusions. Even if we know they are only illusions, we can't ignore them, or stop our visual system from believing them to be real. One of the best-known optical illusions was made popular in *Nudge*, a book co-authored by Richard Thaler, the winner of the Nobel Prize in Economics and Cass Sunstein. The City of Chicago painted white stripes at the entrance to a tight turn on the four-lane highway around Lake Michigan; at first they are evenly spaced, but get closer as the car approaches the most dangerous point creating a sensation of increased speed. Despite knowing that it is actually the stripes which are getting closer and closer, the driver cannot resist the impression that the car is going faster. As a result, drivers automatically ease off the accelerator or touch their brakes and slow down. Six months after these white stripes were added in 2006, the municipality reported a 36% decrease in the number of accidents on this stretch of the road.

Since *Nudge* was published, this type of action has become very popular and many councils around the world have developed similar optical illusions, for example planting trees that get closer and closer together as you arrive at the start of a village, drawing fake holes in the road or painting three-dimensional pedestrian crossings, as can be seen in the village of Cysoing in France.

PASSENGERS, IT'S TIME TO TAKE CONTROL!

Social pressure constitutes another powerful tool. In Kenya, James Habyarimana from Georgetown University and William Jack from the University of California have worked to reduce the number of minibus accidents, as the latter is a very popular form of transport in the country. Moreover, minibus drivers tend to drive too quickly and take reckless risks. Many passengers are aware of the dangers, but don't dare to intervene believing they are the only people who think the driver is acting dangerously.

The scientists placed stickers in the minibuses that encouraged passengers to speak up if the driver was going too fast. To evaluate the impact of this campaign, they equipped a large number of vehicles with a GPS system, which revealed that those vehicles with stickers encouraging passengers to take action drove more slowly on average and with lower peak speeds than vehicles equipped with neutral stickers (for example, wishing passengers a good journey). The two scientists also joined forces with a local insurance company to measure the number of



In the village of Cysoing (Nord), the first 3D pedestrian crossing in France was inaugurated in October 2017. Even if drivers know it is an illusion, their visual system automatically incites them to slow down.

accidents. For the 8,000 vehicles involved in the survey, the number of accidents decreased by 25%. The two men estimate that some 140 accidents were avoided in this way in one year and that 55 lives were saved. Comparing different messages used on the stickers shows that messages combined with strong images are more effective than words on their own.

DRIVERS GIVEN MARKS ONLINE

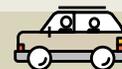
Another solution based on the idea that social comparison can be a powerful tool for changing attitudes was used in Boston. The municipality developed an app, Safest Driver, which inhabitants could download onto their phone. The app takes five road safety criteria into account (speed, use of telephone at the wheel etc) to mark the user's driving on a scale of 0 to 100. The resulting score can be shared with your family, friends and colleagues.

There are already numerous applications of the sort for people who want to exercise or lose weight. They make use of our desire to improve on our score and constantly do better and better. In Boston, the idea seems to have met with success! During the first development phase of Safest Driver, almost 5,000 Bostonians took part in the competition and the first trends reveal clear-cut changes in behaviour with a 47% reduction in the use of phones while driving and a 35% reduction in speed. Behavioural science can therefore help us to change for the better and, as far as road safety is concerned, these nudges, or gentle methods of persuasion certainly represent a way forward in the battle to save lives. ▲

Bibliographie

J. Habyarimana et W. Jack, Results of a large-scale randomized behavior change intervention on road safety in Kenya, *Proceedings of the National Academy of Sciences*, vol. 112, E4661-E4670, 2015.

R. Thaler et C. Sunstein, *Nudge: The gentle power of choice architecture*. New Haven, Conn., Yale, University Press, 2008.



4 KEYS TO BECOMING A RESPONSIBLE DRIVER

At a time when a lot of people are on the road en route for their holiday destinations, how can we make the best use of the results of this enquiry to limit the risk of accidents? This survey highlights the crucial role played by passengers in offsetting drivers' excesses. 82% of people present in the car remind the driver to slow down, 69% ask him/her not to answer a phone call or text message and 77% suggest that the driver take a break after driving for two hours. The latter is important as, on average, French drivers only take a break after driving for 2 hours and 48 minutes. So listen to your passengers!

The next point underlines the importance of sleep. Drowsiness at the wheel is the first cause of death on motorways. We suggest you take heed of the following recommendations:

- 1 Have a good night's sleep the day before your planned departure
- 2 Avoid driving at night (between 22 pm and 6 am)
- 3 Take regular breaks throughout the journey - at least every two hours - and make sure to stop at a rest area as soon as you feel tired
- 4 Do not hesitate to share the driving

These precautions are even more vital seeing that we accumulate an even greater sleep debt as we get ready to go on holiday: 26% of French drivers declare they usually sleep 6 hours a night or less during the week, in other words 1 hour less than the time recommended by sleep specialists. In addition to our chronic sleep debt, during the major holiday departure periods we suffer from a temporary lack of sleep: 84% of drivers go to bed later or get up earlier when they are setting off on a long journey, 70% finish preparing everything for their departure late in the evening and 68% set off at night. As a result, 42% of drivers declare that they set off even though they are too tired, often with dire consequences: one third admits to having already nodded off at the wheel and one in ten has already had an accident, or narrowly avoided an accident, because they dozed off while driving.

Getting a good night's sleep increases your chances of arriving safe and sound and our information also shows that by reducing tiredness, you also reduce the risk of behaving aggressively towards other drivers. ▲

THE FRENCH PASSENGER IN 2018

Keeping an eye on and looking out for the driver

82%

remind the driver to slow down if they are breaking the speed limit

85%
of women



79%
of men

77%

suggest the driver take a break after 2 hours

75%
of men



79%
of women

69%

ask the driver not to answer a phone call or text message

