MAPS

THE ROAD TO BEHAVIOUR CHANGE

by Pascal Bourgeat

The photo of the ‘Vertrauen’ social experiment on page 31 is used with permission of Ralf Kopp. The photo of the three bins in Tokyo on page 64 is used with permission of Joan Bailey.

ABOUT THE AUTHOR

Pascal Bourgeat PhD is director of behavioural science at Ipsos Australia. He designs research and works with private and public sector clients and Ipsos teams in Australia and around the world on a range of behaviour-related issues. Pascal is one of Ipsos' global behavioural science experts. He loves to speak and write on all things behaviour (Fintech, aged care, life in the digital city, machines with brains, retail, social neuroscience and CX, big data, AI and behavioural science, marketing in a digital age, technology and behaviour change, etc.). He is based in the Sydney office.

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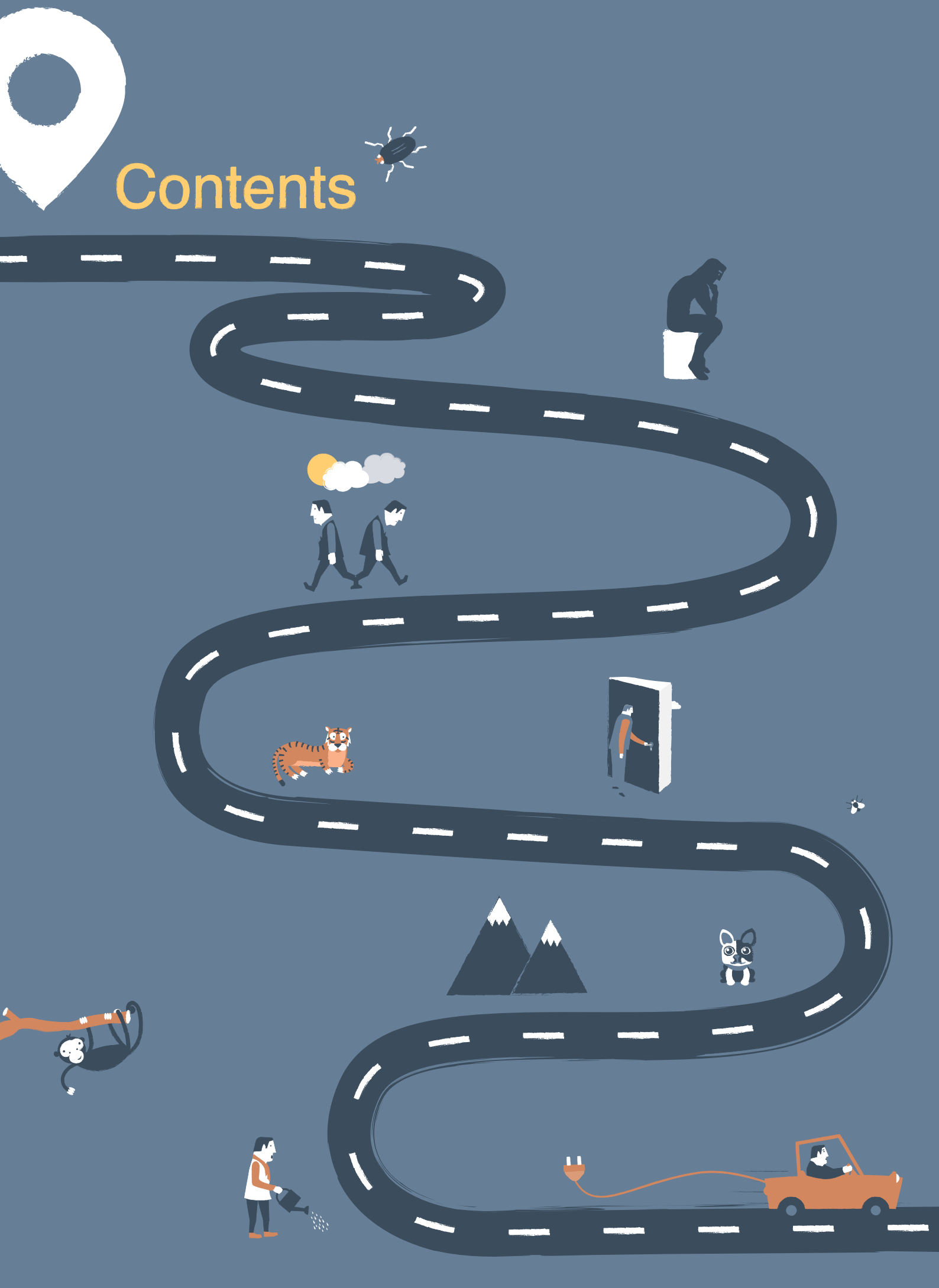
Contents



Foreword

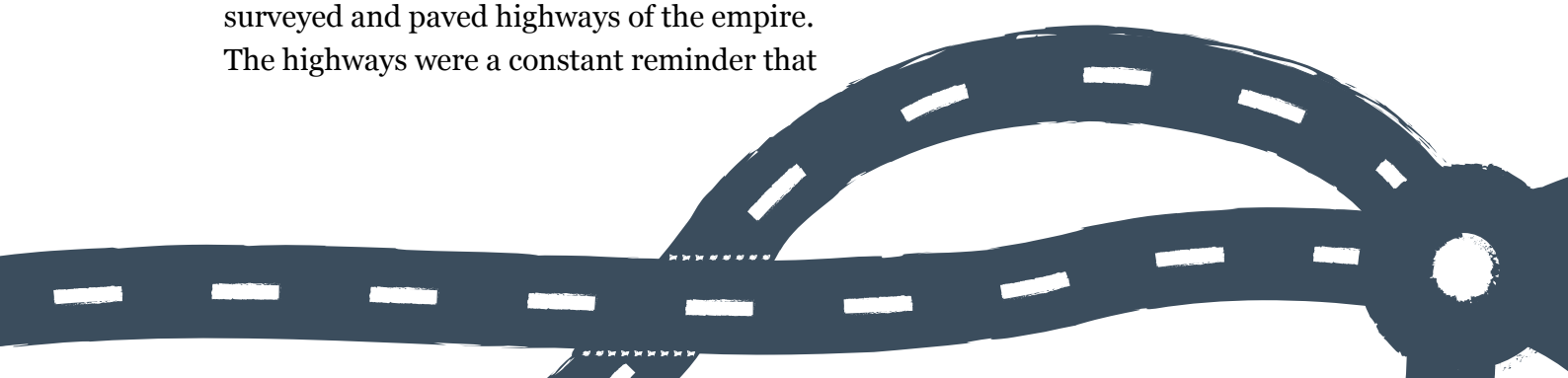
The history of behavioural science looks like a map criss-crossed by many roads. Some roads were charted over time from observation (e.g. sociology, anthropology, ethnography, semiotics, economics, neuroanatomy, etc.) whilst others were painstakingly constructed through myriads experiments (e.g. cognitive, social and mathematical psychology, experimental, behavioural and applied economics, decision neuroscience, ethology, etc.).

Some of the newer roads are sometimes built on top of not so recent roads (e.g. the recent craze for behavioural economics as the newest avatar of experimental psychology). As new roads are discovered, practitioners and others interested in behaviour change are quick to proceed down the new road and ignore other roads. Their behaviour is driven by availability bias and 'bandwagoning': Behavioural economics easily comes to mind because of popular books on display at the airport bookstore or in online reviews, and people hear others around them express opinions or talk about their own experiences or intentions.

Consequently, practitioners may also ignore the richness of the map of all the roads to behaviour change. Medieval travellers used to say that 'all roads lead to Rome' as they travelled on the network of carefully surveyed and paved highways of the empire. The highways were a constant reminder that all roads indeed ended up in Rome. In the same way there are many roads to behaviour change. Some are easy and straightforward, others take longer to walk down, some roads run alongside each other whilst others criss-cross on their way to behaviour change.

Five forces shaping behaviour emerge from a review of various inroads of behavioural science sometimes conflicting, sometimes overlapping. These five forces bring clarity and simplicity to our understanding of behaviour but more importantly they strongly shape our behaviour from within: Goals, pathways, cognitive mechanisms (COGs), effort and (negative) emotion are constantly at work on individual behaviour. These five forces profoundly impact our motivation (consciously or unconsciously), the decision processes we use and our ability to perform specific behaviours. In addition, the social and physical environment acts as a powerful contextual force, enabling or inhibiting behaviour in multiple ways. The 'universal' lens of behaviour is one where personal and situational factors continuously interact. It is an 'ecological' view where behaviour is not simply the product of cognitive mechanisms but the constant interaction of mind and environment.

In the next seven sections, we look at reasoning, the role of emotion, social forces,



how we construct situations, reinforcement of behaviour and attention on behaviour. A section on neuroscience looks at the role of competing forces, mirror neurons, valuation systems in the brain and energy conservation on behaviour. All behavioural insights and principles are presented with relevant examples of public sector campaigns and interventions from around the world. End notes, links to videos, references of research papers and links to PDFs are appended.

From this review, a simpler picture of five forces at work on behaviour emerges. These are the forces that continuously impact our motivation and our ability to perform specific behaviours. In turn these personal forces interact with physical and social forces. They make up the MAPS framework to look at behaviour and gain insight for behaviour change.

Ipsos MAPS creates a framework within which behaviour is best understood, anticipated and influenced through a lens that carefully and systematically looks at personal and situational forces (MAPS for Motivation, Abilities, Physical and Social).

The personal vs contextual articulation of the MAPS framework is crucial to take into account that people are made up of thoughts and beliefs, plans and intentions as well as drive and impulses, hidden cognitive mechanisms, hot buttons, habitual and neural pathways, moods, feelings and visceral emotion, etc. These forces shape people's motivation and constrain, inhibit or facilitate behaviour. At the same time people are part of specific environments and places, times, moments and seasons (the many facets of culture), and social structures that shape individuals and their behaviour as much as individuals create and transform those environments.

Once the behaviour(s) to be changed are defined, MAPS is used to get insight into the behavioural challenge:

- in depth (what forces shape or prevent behaviour from the inside) and
- in context (how does the physical, temporal, social and cultural environment trigger or inhibit behaviour).

MAPS fits within 4 i, a simple and natural behaviour change process:

1. identify the behaviour(s) to change,
2. get insight in depth and in context (MAPS),
3. design an intervention,
4. measure and improve its effectiveness over time.

The 4 i's are the key milestones on the road to behaviour change.

Many lenses, many views of behaviour and behaviour change

The development of behavioural science as a body of knowledge has gained momentum over the last fifty or so years from careful observation and experimentation in many academic fields. Some areas of behavioural science have emphasised the role of 'milieu' or context to account for individual or collective behaviour. Whilst others have relied on tightly controlled 'lab' experiments to identify the cognitive and neural mechanisms underpinning behaviour

All these efforts still come short to fully grasp what it means to be human in all its complexity and paradoxes. However, they provide useful principles and deep insights into the ways we can influence, shape and 'design' behaviour.

FROM PERSUASION TO BEHAVIOURAL DESIGN

If the term 'behavioural design' echoes images from Huxley's Brave New World, there is ample experimental evidence that behaviour, away from coercion or deception, can be changed, for the better and for the worse, by means other than persuasion or at least the way persuasion has been traditionally thought of: a road that starts with beliefs, finds its way to attitudes and intentions to eventually reach

> **how quick come the reasons for approving what we like**
>
> *— Jane Austen, author*

behaviour. In Persuasion, English novelist Jane Austen observed: "how quick come the reasons for approving what we like". She simply observed that we find it hard to persuade ourselves about those things we do not like or want to do. Yet, her last novel shows it can be equally as difficult to persuade others, especially if they are, like Captain Wentworth, captive of their own emotions and the painful experiences of the past.

Appeal to reason and logic (building an argument, presenting 'reasonable reasons') has long been the main road to persuasion. However, it is not the only one. There are other roads to persuasion and this is not as new a road as it may seem despite the current hullabaloo about all things behaviour.

Aristotle significantly contributed to the tools and principles of Rhetoric: Not only using facts, reason and argument (*logos*) but also seeking to engage the emotions of the audience (*pathos*) and aligning the

persuader to the audience (*ethos*). He believed that if at all possible, all three means should be used to influence the views and behaviour of the audience. Aristotle was well aware that one needs not choose a single road and ignore all others in one's quest to change behaviour.

CONTRASTED VIEWS

Behavioural science across its many disciplines sometimes presents contrasted views of behaviour where it is easy for the reader to end up somewhat unsure, even confused about how behaviour works.

On one side, the rational-agent model of economics presents a picture of (value-based) decision making as the quest for the best outcome, a world where people behave as perfect maximisers all the time ("always choose best") through stable and consistent preferences. On the other side, behavioural (or experimental) economics repeatedly shows that preference formation is subject to many effects that make preferences neither consistent (e.g. loss aversion where we value or feel losses much more than equivalent gains) nor stable (e.g. framing effects or asymmetric dominance whereby we respond differently to say, a choice option, depending on how it is presented

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>
> *— Nick Chater, psychologist*

and what other options are available at the time). As Nick Chater, a psychologist at Warwick Business School explains it: "The brain is the most rational thing in the universe but the best way it solves problems is ad hoc and very local"[1].

The inadequacy of the rational-agent model is plainly visible when behaviour is examined from a "mind and logic" perspective as well as a "mind and environment" one. People live busy and complicated lives and make decisions in environments that change rapidly: We manage as best as we can in context, place and/or moment, not as best as we are able (or ought) to do.

Another tension arises between economics and social psychology: Economic choice often emphasises self-interest whilst social psychology shows how our individual decisions and choices are shaped by conformity, compliance, imitation and

reciprocity. Comparative psychology and anthropology also show that competition (selfishness), cooperation and altruism (selflessness) are all adaptive traits that benefit individuals and societies in different circumstances.

Anthropology and ethnography describe much of behaviour by looking at how context shapes individual behaviour. On the other side, cognitive and mathematical psychology look at behaviour from the perspective of the cognitive mechanisms we engage, especially how they shape our perceptions, impressions and judgment. In addition, between human ethology and cognitive psychology the perspective of behaviour as the product of environment, volition and/or autonomous cognitive mechanisms changes substantially. More tensions, more contrasted perspectives.

Finally, neuroscience constructs the biological basis of behaviour looking at cognitive mechanisms on one side and their neural substrates and networks on the other side. Ultimately, beyond individual motivation (conscious or unconscious) as a powerful drive to action, neurophysiology and biochemistry (bioenergetics) look at how cellular nano-machinery constrains or modulates behaviour through the neural networks we engage.

All of these disciplines provide many lenses to look at behaviour. There may not be a detailed map or grand theory of behaviour but the insights from the many lenses available reveal multiple roads to shape and influence behaviour.

These tensions provide insight into behaviour as much as they can create confusion and distortion for those interested in behaviour like social researchers, public policy makers, campaign developers, urban and public service designers and many other professionals. Are people rational? What mechanisms are at work in decision making? What is the role of emotion? To which extent does the environment (social or physical) shape behaviour?

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The reasonable road to behaviour

Auguste Rodin's 'The Thinker' is a tangible example of the place of reason and reflective thinking in Western Thought. The impressive bronze sculpture is that of a man who is both deep in thought while simultaneously ready to act through his powerful body. Despite the uneasy forward balance pointing to the frailty of human existence, the sculpture unmistakably communicates the power of will and consciousness of a human agent.

Throughout centuries, Western thinkers, from Aristotle to Descartes and Kant elevated reason above (almost) everything else. In the process, they created a road to explore perception, knowledge, reason and action (other cultures and traditions have traced their own roads of course[2]). Many thinkers and scientists are the forerunners of psychological theories explaining the formation and role of attitudes and intentions in goal-oriented behaviour (e.g. paying a carpark fee, voting in an election, accepting a new job, signing-up at a gym, etc.).

Building on a range of psychological theories, the theory of reasoned action (TRA) emphasises intentions and voluntary behaviour as the product of attitudes (and social forces as 'subjective norms'). In turn, attitudes are the product of one's beliefs

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about the consequences of the behaviour (the outcome). Decision outcomes are also often uncertain, and are modulated by our subjective estimate of their likelihood.

TRA was further developed by Icek Ajzen into a theory of planned behaviour (TPB) incorporating the concept of perceived behaviour control (or self-efficacy): Our own belief that we can or cannot perform a behaviour.

There have been many criticisms, sometimes unfounded, of the TPB approach, notably that it relies solely on cognitive processing and ignores the role of emotion, and is limited to behaviours under the control of will (i.e. excluding situations where new knowledge or skills are required or external obstacles have to be overcome). Yet, a 1988 meta-analysis of 87 applications of TRA looked at the link between intention and behaviour.

The authors found TRA predicted extremely well in situations of choice between alternatives even when the situations "do not fall within the boundary conditions originally specified for the model". A 1997 meta-analysis of 185 studies using TPB found that the underlying factors in the model accounted for a moderate but sizeable share of the variance of intention and behaviour (27% and 39%). In addition, the authors reported significant correlation between intention and behaviour (.52) and noted that previous meta-analyses of TPB also report significant levels of correlation of intention and behaviour ranging between .46 and .58.

For all their shortcomings, models of behaviour like TRA and TPB relying on cognitive processing of beliefs and conscious intentions cannot be easily discarded although the boundaries erected around such models clearly point to their incompleteness. Therefore, the idea that looking consciously anew at a situation can change our attitudes, the intentions or commitments we form and behaviours we adopt resonates in many situations for many of us (but not all situations for all of us). Road safety is one such area where changing drivers' beliefs both about what they actually do and what they are able to do can impact their behaviour on the road. Driver alert systems can address the issue of drivers who don't realise they are speeding. The example below details an intervention that can address the issue of drivers who do not realise they cannot brake in time to avoid an accident when speeding, even at quite low speed.

ROAD SAFETY IN URBAN AREAS

Many countries have adopted reduced speed limit in urban areas (50 km/h instead of 60 km/h) to reduce the numbers and severity of crashes involving other road users, especially unprotected incidents like pedestrians or motorcyclists. Evidence points to the significant effect of this policy in different jurisdictions[3]. The implication of low level speeding (e.g. staying at 60 km/h instead of 50 km/h) is not intuitively clear to road users because insufficient reasoning leads to incorrect beliefs about the consequences of crashing at 60 km/h vs 50 km/h: It's only a marginal difference in speed therefore it would have a marginal impact in the event of a risky situation. The reality is very different as we fail to take into account into our beliefs our initial reaction time (on average 1.5 seconds) and the time to brake down to a stop

To increase motivation among drivers to follow the speed limit in urban areas, road safety agencies have typically used the visual demonstration of two cars, one driving at 50 km/h (A) and the other at 60 km/h (B). The emergence of a child on a bike or an inattentive pedestrian into the situation forces both drivers to hit the brake. With similar reaction times but a longer braking time for B, car A comes down a complete stop whilst car B hits the pedestrian at over 40 km/h, resulting in serious injury or death. The visual demonstration helps people to revise their beliefs about the potential consequences of speeding in urban areas and increase the value they assign to the 'desired' behaviour.

A trial with repeat speed offenders compared the effectiveness of braking time education vs that of disproving the idea of time saved by driving over the speed limit. Repeat offenders were found to value time savings on trips therefore challenging and disproving their beliefs was a better route to behaviour change.

Emotion and Reason

Emotion and reason have long been odd bedfellows. The idea that emotion can bias decision making is not new. Seventeenth century scientist and author Blaise Pascal certainly did not ignore reason: His famous wager looks like an early version of what economists later named expected utility theory and his works in probability theory, physics and mathematics remain impressive works of imagination and logic. Yet he observed that "the heart has its reasons that reason ignores". He may have had in mind dark clouds rather than the rainbow of moods, feelings and emotions that colours our days but he certainly understood that there is more to thinking than 'pure reasoning'.

The more recent debate about rational decision-making has been obscured by ignoring that rationality in decision-making is about outcomes (is that a good or sensible outcome?) while reasoning is about process (what does our mind do in the thinking process?). Hence, whilst economics was often focused on 'coherence rationality' (a strict view where preferences are invariant), cognitive psychology was more interested in 'reasoning rationality' and what reasoning looks like in terms of processes engaged to come to decisions. Although rationality and reasoning are not alien to one another, there are situations where excessive consideration and over-analysis lead to poor decision outcomes (or even paralysis e.g. the choosing-feels-like-losing effect). Conversely, relying on how we feel from past experiences and gut feel with little or no upfront reasoning can lead to sensible, rational outcomes (particularly in situations where avoiding poor decisions is much more important to us than making the best possible decision).

> **"the heart has its reasons that reason ignores"**
>
> *— Blaise Pascal, 17th century scientist*

Evidently, good and bad experiences and decisions can generate positive and negative affective states. This is an enduring perspective which considers feeling as somehow dependent on thinking (e.g. excitement as the result of reading a news article or watching a political debate). The underlying assumption is that affect is always post-cognitive and the result of some kind of appraisal or evaluation. This does not mean that thoughts are necessarily conscious, however, from this perspective, they do precede the affective response.

A contrast to this perspective is offered by Rob Zajonc in his seminal 1980 article on

feeling and thinking. Zajonc reviewed a series of experiments on preferences, attitudes, impression and decision-making and concluded that affect may be "substantially independent of, and precede in time,... cognitive operations assumed to be the basis of affective judgments". In other words, feeling can be the conduit to impression and evaluation not just the result.

THE AFFECT SHORTCUT

A clear example of affect at work before thought is that of carefully constructed experiments on the role of emotion in decision-making: Paul Slovic and his colleagues demonstrated how people's judgment of an activity (e.g. spray pesticides) or a technology (e.g. use of nuclear energy) are based "on what they think about it but also on what they feel about it". In reality benefit and risk may be positively correlated or not correlated at all. However, the use of an "affect heuristic" (a shortcut to decision making based on affect) colours the perception of benefit and risk such that when we like an activity, we see its benefits as high and its risks as low and vice-versa when we don't like it. These experiments support the idea that judgments about risk and benefits are the result, in part, of an overall affective evaluation (like/dislike).

The view from cognitive psychology is that feeling is an essential part of thinking and decision making, not just the result of cognitive operations. This is even more so when cognitive processing is limited (e.g. the situation is complex or we are under time pressure): The affect shortcut is more actively engaged. It also means that a critical road to behaviour change may not be to concentrate exclusively on the thinking (benefits and costs), but in addition consider how people feel about the situation and how those feelings can be altered to influence behaviour (for example through associations working independently of the thinking).

Social psychology also shows that affect plays a critical role in decision-making as part of social situations. The experimental evidence of the Affect Infusion Model (AIM) developed by social psychologist Joe Forgas shows that our mood impacts how we process requests from others more forcefully when thinking is likely to be hard (i.e. "more substantive" or "effortful and exhaustive" processing where we construct the situation through shortcuts like using the available stimulus information and use previous knowledge structures).

It is useless to attempt to reason a man out of a thing he was never reasoned into.

— Jonathan Swift, author

NEUROSCIENCE AND EMOTION IN DECISION MAKING

Neuroscience provides an additional layer to our understanding of emotion in decision making from experiences with people who have suffered brain lesions (in the ventromedial sector of the prefrontal cortex): Their reasoning abilities remain unaffected, but they gain a defect in emotion and feeling which impairs their decision making ability in everyday life situations (those situations were approximated in an experimental setting where people have to deal with uncertainty and associated positive or negative consequences e.g. reward and punishment). Contrary to TRA and TPB which adopt an essentially cognitive outlook on decision making (beliefs about consequences and the likelihood of their occurrence), the 'somatic marker hypothesis' (SMH) acknowledges the role of our feelings, the mental experience of our emotions, and our visceral body states in decision making.

SMH shows that the emotional quality of outcomes is also assessed through emotional signals that serve as the main guide for decisions.

English novelist Jonathan Swift used to lament about his contemporaries to his friends: Gulliver's Travels reflects his conviction that we are not rational animals after all although we clearly have the capacity for reasoning (*"rationis capax"*). The evidence from psychology and neuroscience however is that affect, our emotions and feelings are a key component of our decision making abilities, not something that necessarily competes with reason and rational/sensible outcomes. Yet, there are situations where emotion, feelings or even mood can lead to poor decisions and clearly 'sub-optimal outcomes', especially in situations that are new and where previous experience may prove a poor guide. Too much emotion impairs decision making as Ipsos has found in trauma research with people who are victims of domestic violence or have to deal with the death of a loved one. However so does not enough emotion: Over-analysis often leads to paralysis. As Kahneman explains it in a 2003 summary of his work for the American Economic Review: "Attention and effort by themselves do not purchase rationality or guarantee good decisions. In some instances, too much cognitive effort actually lowers the quality of performance. There are other situations

WOOD HEATING AND PUBLIC HEALTH IN AUSTRALIA

Wood heating can adversely affect the health of communities in winter because of wood smoke pollution. Air pollutants and particulate matter (PM) emitted by wood heaters can trigger or worsen respiratory illnesses like pneumonia and asthma in children and the elderly under specific local conditions. The particles can also enter the bloodstream, raise blood pressure and cause inflammation increasing the risk of cardiovascular disease. On the other side, burning firewood for heating is comparatively inexpensive compared with electricity and gas-based heating.

The local government of Armidale in regional NSW, Australia investigated the affective associations that people had towards wood heating and their impact on the perceived benefits and costs of wood heating. Government wanted to understand the extent to which the affect heuristic would affect risk–benefit judgments about wood heating, which, in turn should influence support for policies like education, incentives and regulation designed to control wood smoke emissions.

These results suggested that respondents who had stronger positive affective associations perceived more benefits and fewer costs related to wood heating. In turn, high anticipated benefits and lower perceived costs were significantly associated with less support for regulatory policies to reduce wood smoke pollution, that is, participants who perceived more wood heating benefits and fewer costs were less likely to support regulatory policies This suggested much stronger support for wood smoke mitigation policies based on education and incentives (e.g. upgrading wood heaters and technology that help fires burn more cleanly). Local government opted for education and incentives to monitor particle pollution levels over time, showing that their concentration in the winter months of 2016 stayed mostly below the maximum allowable concentration of PM2.5 particles.

in which skilled decision makers do better when they trust their intuition than when they are engaged in detailed analysis".

Emotion and reason may look like odd bedfellows at times, but as two different forms of thinking (or at least two essential components), they remain travelling companions on the road to behaviour change as they offer multiple points which impact behaviour.

> **Attention and effort by themselves do not purchase rationality or guarantee good decisions.**
>
> *— Daniel Kahneman, psychologist*

ELECTRIC VEHICLES IN NEW ZEALAND

As part of an ongoing survey conducted by Ipsos for the Energy Efficiency and Conservation Authority of New-Zealand, Ipsos measured the public's disposition towards electric vehicles (EVs). Machine learning algorithms (MLAs) identified a number of specific pros and cons that shaped the public's disposition towards electric vehicles (e.g. driving distance range without recharging battery, time to recharge, easily available recharging points, positive impact on environment, reliability, etc.). However, it also identified the presence of a direct and immediate 'affect shortcut' as 'EVs are the way of the future'. This effect impacts disposition above and beyond that of specific positives and negatives of EVs. As would be expected from such an effect, perceived benefits were enhanced and perceived disadvantages were minimised among people associating EVs with the way of the future.

The implications from the affect shortcut in the case of EVS is that the road to gaining favour with drivers is not simply about promoting the benefits and avoiding the negatives. Negatives such as insufficient autonomy or availability of recharging points are likely to inhibit purchase behaviour but initial perceptions (of positives and negatives) and willingness to engage are coloured by drivers' view of EVs as the way of the future. The way of the future is implicitly linked to what the behavioural norm (choice of EVs) will be at some point in the future. Visible cues of the increasing presence of EVs, information on their penetration of the automotive market and messages designed to reinforce their overall image as the way of the future all contribute to faster take-up of EVs.

Three men make a tiger

A popular classification of cultures is that of individualism vs collectivism. In individualist cultures personal goals and achievements are highly valued whereas in less individualistic cultures, family and the goals of the group are more important.

However, despite personal goals and our belief that we are 'our own person', individual behaviour remains influenced by the social environment. Many experiments in social psychology highlight how we comply with the opinions and conform to the behaviour of the group. In Asch's seminal 1951 experiments, 75% of participants aligned their opinions to those of others in the group at least sometimes (but only 5% did it all the time) even though the opinions of others in the group were designed to be always incorrect and clearly against reason. These experiments show the impact of social forces although the strength of human independence and self-determination (e.g. only a very small number of participants complied all the time) is often played down in reports (probably in an attempt to magnify the power of social forces).

The Asch experiment directly echoes a famous Chinese proverb. Three men make a tiger: one man's report to have seen a tiger in the marketplace is a lie, two men reporting

Many experiments in social psychology highlight how we comply with the opinions and conform to the behaviour of the group.

is a worry but three men means it is time to run. Beyond reasons of personal safety, the primary argument to explain conformity is that of affiliation: We want to fit in and maintain good relations with others (social safety) and consequently are willing to publicly accept the absurd as true (or that which we don't agree with on grounds of personal beliefs or values) as long as enough people hold the opinion or belief.

From a review of five years of research in compliance and conformity, Cialdini and Goldstein propose authority, credibility and social norms as key reasons for compliance and conformity:

- In organisations, individuals are often rewarded for behaving in accordance with the opinions and instructions of those in position of authority.

- The credibility of others (e.g. experts or social media celebrities) acts as a soft form of social influence on our opinions and behaviour unlike authority which stems from a more formal social structure (e.g. corporate hierarchy).
- Social norms impact us through what we think others will approve or disapprove of (injunctive norm) and what we see others do (descriptive norm). Situations of uncertainty or when time to make a decision is short, people's behaviour is informed by their assuming that what other people do is the correct way to behave (social proof).

From their review, Cialdini and Goldstein also propose reciprocity, liking, consistency and commitment as powerful social influences which can be used to shape opinions and behaviours.

A 2015 Ipsos study of social norms in six countries from NA and EU[5] plus Australia measured the extent to which residents in each country believed people in their country engage in specific behaviours (e.g. avoid paying full tax, eating more than the recommended amount of sugar, not savings enough for retirement, etc.). In all countries, we observed that people's perception of their countrymen is much worse than the reality of their behaviour actually reveals: In the UK, behaviours were typically overestimated by 20+ percentage points. In other words, the descriptive social norm is much worse than what it ought to be if people formed correct impressions. Ultimately, the exaggerated impression validates the behaviours and makes it more difficult for people in situations that require moral judgment or personal effort and discipline. On the other side, addressing distorted perceptions may increase the pressure from the social norm and encourage people to engage in more desirable behaviours (for themselves and/or the community).

In the UK, a positive behaviour like doing the recommended amount of physical activity was also overestimated. However, in this case it would be a positive norming effect on individual behaviour and encourage more people to engage in physical exercise.

THE EYE CLINIC AND SOCIAL FORCES

The eye clinic experiment is a striking example of how a group can shape the behaviour of a new member and how the behaviour of the group endures although none of the original members of the group who created the behaviour remain at the end of the experiment. In this experiment, one of the subjects whose behaviour is being shaped through social forces subsequently admits: "When I saw everybody stand up (the behaviour that was being shaped) I felt like I needed to join them, otherwise, I am, like, excluded. Once I decided to go with it then I felt much more comfortable"[4].

THE EYE CLINIC EXPERIMENT

https://www.youtube.com/watch?v=o8BkzvP19v4

Click play button above to watch the video

PARENTS SEEKING HELP AND SUPPORT IN AUSTRALIA

In 2015 Ipsos conducted a study for the Queensland Family and Child Commission (QFCC). QFCC contributes to building a new child and family support system with a greater focus on supporting families to provide a safe home for their children. Over 50% of the population reported having been in a situation where they found it difficult to cope with the stress of being a parent, most of them at least once in the past month. Parents are often stressed and worried but are not always confident to make effective parenting decisions and carry out parenting responsibilities. Most individuals were found to be more comfortable offering than asking for help and support. The research found a strong association between parental efficacy (own sense of ability to perform the desired behaviours) and being comfortable asking for help and support from others (e.g. friends, family or neighbours) and organisations (e.g. GP, Early Years centres, school counsellors, Lifeline phone support services, community centre counselling services, government website, etc.). Social forces however impact help seeking behaviour irrespective of parents' sense of ability. On one side, the perceived social norm is negative: Almost three quarters of parents worry that others will see them unfavourably if they seek help (because of their struggle with parenting). On the other side, over 90% of parents who did seek help believe they were treated fairly by others who knew they used parental services and 95% found their friends supportive and understanding. Parents think they will be stigmatised and as a consequence are reluctant to seek help; yet, the experience of those who do seek help remains overwhelmingly positive. The perception of what is the 'right' behaviour is a serious impediment to parents seeking help when most people are actually willing to offer help and support.

STUDENT AND ALCOHOL ABUSE IN THE US

Addressing distorted perceptions of social norms has been one of the angles adopted to curb excessive alcohol drinking amoung university students. A US review of empirical studies in the US on students' adherence to social norms about alcohol drinking found widespread misperceptions (overestimations) of peer norms regarding drinking attitudes and behaviours. "These misperceived norms, in turn, have a significant negative effect promoting and exacerbating problem drinking". The review concluded that "interventions to reduce these misperceptions have revealed a substantial positive effect in several pilot studies and campus experiments".

A similar review conducted in the UK found that most of the evidence for social normative interventions (to address alcohol abuse among students) came from the US and questioned its transferability (at least to the UK). Besides, the authors recognise the consensus amongst experts that students misperceive drinking norms, but question the principle that simply changing misperceptions will result in positive changes in student drinking behaviour. They note, however, that injunctive norms (what others approve of) is a better predictor of future drinking behaviour than descriptive norms (what we think or see others do). The authors recommend a multi-modal approach including personal feedback of drinking effects and efficacy training rather than a purely social normative approach which they fear has been somewhat oversold as a universal solution.

ORGAN DONATION

The Behavioural Insight team (BIT) in the UK government looked at ways to increase the number of people signing up for the Organ Donor Register. The team designed a large random trial through the Vehicle Licensing Agency website varying the message displayed on the page. They used the statement "Please join the NHS Organ Donor Register" where no attempt at persuasion is made as 'control'. One message tapped into reciprocity "If you needed an organ transplant, would you have one? If so, please help others". BIT however also expected social proof to be effective at encouraging people to sign up for the Register. They created a statement that emphasises the social norm "Every day thousands of people who see this page decide to register". They developed two additional variants of the social norm page using the same statement but one with a picture of a group of people and one with a picture of the logo of NHS Blood and Transplant with the intent of increasing the salience of the stimulus (i.e. they tapped into attention as an adjunct mechanism to that of social norms). Other statements used gain or loss framing of organ donation and did not tap specifically into social forces to influence behaviour.

The best performing statement was that of reciprocity and is the statement that the NHS subsequently implemented. The projection from the trial was that this would see an increase of approximately 100,000 more people signing up for the Organ Donation Register. The statements tapping into social norms however yielded disappointing results with one version performing lower than the 'control' statement. With the loss-framed statement "Three people die every day because there are not enough organ donors" performing better than the gain-framed "You could save or transform up to 9 lives...". This suggests the gain-loss asymmetry can also apply to group/community outcomes just as it applies to monetary, temporal and personal status gains and losses.

A similar RCT conducted in a North American jurisdiction on 10,000 people asked to register for organ donation as they get or renew their driving license[7] demonstrates that the gains in organ donation registrations increased vs the current base rate when using:

- A simplified form (i.e. making it easier cognitively for people to process the situation)
- More time to consider their decision and the provision of an informational brochure (i.e. addressing the due diligence effect whereby people can pull out of decision making if they feel that somehow they have not given some situations enough time or thought).

This combination increased the organ donation rate by a factor of 2.3 vs 2.1 for the UK reciprocity statement with more time to make a decision. In a country that has a relatively low proportion of registered donors (24%), this intervention has the potential to increase donors to 55% of the relevant population.

VIOLENCE TOWARDS WOMEN IN INDIA

Cultural and social norms support different types of violence in many countries (e.g. a man is socially superior to a woman, a man has the right to 'correct' female behaviour, a man's freedom should be respected, violence is an acceptable way to resolve conflict, reporting bullying is unacceptable, etc.). No country or culture seems to be immune. The World Health Organisation (WHO) reports[8] that the descriptive norm around risky or negative behaviour is usually overestimated whilst that of prosocial behaviour is normally underestimated. With regards to violence, this affects people in two ways: It justifies and increases the prevalence of violent behaviour whilst decreasing the likelihood that people will say something in response to displays of violent behaviour. The latter acts as an indirect reinforcement of violent behaviour by supporting its social tolerance.

When a young physiotherapy student was gang-raped in Delhi in 2013, the uproar in the population against the perpetrators helped shift an often-held belief that in such cases the victim is to blame. This case along with others alike have spurred several campaigns to confront the issue of victim blaming and empower women to take on long standing social norms. The confronting campaign from NGO Save our Sister used life-like images of Hindu goddesses with black eyes, bleeding lips and bruised check bones. The campaign eschews the traditional separation between the sacred and the worldly to convey the idea that no woman deserves to be abused[9].

HONESTY IN THE PUBLIC EYE IN GERMANY

A series of social experiments in the public space was conducted in 2014 by German video and photo artist Ralf Kopp. In his 'greed eats trust' experiment, Kopp wrote the word trust (Vertrauen in German) with 540 one cent coins on the ground in the midst of Frankfurt the financial capital of Germany, and filmed the result in public space for fourteen hours[6]. Kopp found that a few people took money away, but the vast majority of people did not take any money away. Some people put money in, including late at night, some people helped reshaping the letters after a bicycle rider rode over the word and some youths even took some of the money to give to a nearby homeless person when the word was not legible any longer.

The same experiment was conducted in other significant places with positive words like freedom and responsibility with similar results in terms of generating more positive feelings over negative ones from the experience. This was reflected in the mass of discussion and comment on social media (and possibly in situ) that the social experiment generated. The trust experiment was also conducted in the marketplace of a small town (Jever) where social forces were expected to be stronger than in anonymous Frankfurt. Overnight, people only took away less than ten percent of the money on the ground. The social force put more pressure on individual behaviour in a small town where people feel that everyone knows everybody else (either directly or with a single degree of separation).

Click here to watch the full video.

I construct therefore I am

Seventeenth century scientist and thinker René Descartes based his methodological and scientific quest for knowledge on his "I think, therefore I am" (*cogito, ergo sum*). His reflections on 'how we know' question how we form perception, impressions and judgment. Over the last forty years, cognitive psychology has been making much deeper inroads into how we form perceptions and impressions, form judgment and preferences. All of these shape our behaviour.

Cognitive psychology applied to consumer behaviour long established that preferences formed in response to a situation (e.g. going to the grocery store with a shopping list) are 'constructed'; that is information processing and decision strategies depend on the information people perceive at the time (any sensory input including sounds, smells, visual cues, words, images as well as 'hard information'). This contradicts the view of classical economics that depicts people as using all available information and preferences as consistent and invariant. Tversky and Kahneman's research on framing effects in preference formation as well as asymmetry in our response to equivalent gains and losses are two striking examples of clear violation

> **The behaviour of agents is not guided by what they are able to compute, but by what they happen to see in a given moment**
>
> *— Daniel Kahneman, psychologist*

of the rational-agent model. Other effects identified from experiments and observation like asymmetric dominance, confirmation bias, availability bias, etc. all violate key tenets of the rational-agent model. Kahneman's response to economists unhappy with what some see as a "pile of quirks" is that "psychological theories of intuitive thinking cannot match the elegance and precision of formal normative models of belief and choice, but this is just another way of saying that rational models are psychologically unrealistic".

Many behavioural situations however are not economic or 'value-based' decisions. Yet, the constructive nature of decision processes underlying behaviour is at the heart of a realistic representation of how behaviour works. What people 'construe' has implications for virtually all behavioural situations relevant to public policy makers. Beside attention which is

What people see in a given moment often looks like what they have encountered before...

selectively driven by goals (conscious or unconscious) and salience, we use schemas and categories to make sense of the world around us. These can be quickly brought to mind (or not), but their accessibility is highly influenced by the context we happen to be in. The process is not about using all (sensory) information potentially available to us. As Kahneman states: "The behaviour of agents is not guided by what they are able to compute, but by what they happen to see in a given moment".

What people see in a given moment often looks like what they have encountered before or so it seems at first glance (when we process the situation quickly 'on the fly'). We use past experience to guide future decisions. Episodic memory (memory of an event and its context in time) is what enables us to "travel back into the past in our own minds" and imagine our future (including the possible outcome of our choices). The brain structures we use to recall past experiences and imagine future experiences overlap to a large extent, but with a few notable differences (e.g. the right hippocampus may be engaged in the construction of future events only because of their novelty). Experience (or lack there of) plays a major part in decision making.

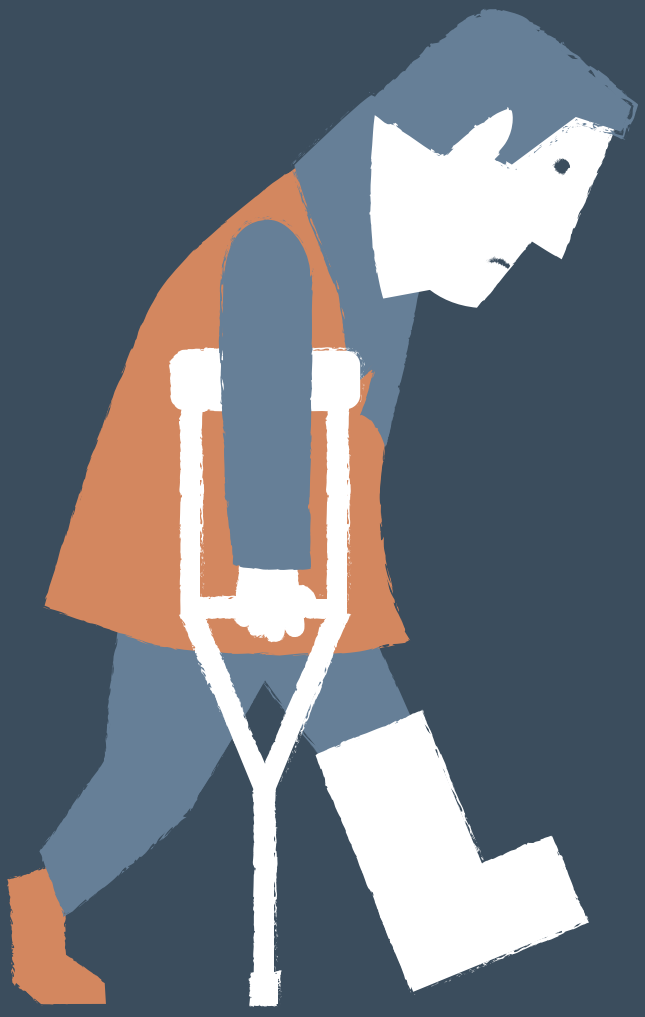
As a shortcut to decision-making, experience works well when we can accurately foresee that we will like or dislike the outcome of our decisions. This is a view of decision-making that makes people look irrational at times (i.e. leading to poor outcomes when we cannot foresee the outcome of our choices). Yet, Gigerenzer and Goldstein showed that "fast and frugal" cognitive shortcuts can lead to as good or better outcomes than more complex processing (and in less time). These mental tools are "the tools that make us smart" as much as the tools that can let us down (e.g. experience is often a poor guide in really new situations).

We tend to favour the experiential (intuitive) route rather than the more effortful (at least cognitively) analytical or logical route. The former appears to run autonomously (i.e. on auto-pilot without consciously doing it or even wanting to do it) whist the latter is consciously engaged.

RETURN-TO-WORK AFTER INJURY

In 2013, the NSW Behavioural Insight Unit (BIU) conducted a randomised control trial (RCT) in partnership with the Department of Education and an insurance company to evaluate the impact of alternative interventions to improve the 'safe return to work' process[12] given that:

- Long-term absence from work is harmful to physical and mental wellbeing whilst
- Safely returning to work quickly benefits the individual, their family, their employer and the broader sustainability of the workers compensation system.



A suite of interventions was designed to create a more collaborative relationship between workers, the Department and the insurer. Simplification and personalisation of the process were a key part of the interventions tested making it easier for workers to understand their key responsibilities and creating a feeling of ownership. A subtle change of language, priming workers' minds differently, was used to frame the situation more positively for workers: e.g. replacing "Injury Management Plan" with recovery-oriented words like "Work and Health Plan". Results from the RCT showed that the workers with whom the new intervention was tested returned to full work capacity 27% faster than the control group.

PICK-POCKETS IN LONDON

The UK police has to deal with pickpockets in areas popular with visitors such as Covent Garden in London. Informing the public about the presence of pickpockets is not effective as people think it would not happen to them (illusion of control) and if it did, they would notice (illusion of superiority). To circumvent these cognitive effects, Crimestoppers UK developed their 'Putpocket' campaign whereby 'magicians' and ex-pickpockets surreptitiously inserted leaflets the size of a purse or a phone device into visitors' backpacks, bags or pockets and subsequently confronted them about it[11]. The encounters were filmed and put on the internet to multiply the reach of the campaign. Putpocket primarily works by disrupting entrenched schemas that we use to infer personal safety. In addition, it help visitors to popular or crowded places in the UK rethink their vulnerability and readily process the information made available by Crime stoppers through multiple channels about how to protect oneself from pickpockets.

PUTPOCKET
https://www.youtube.com/watch?v=OpsbHht9M6E

Click the play button above to watch the video

SERVICE DELIVERY AND BEHAVIOUR CHANGE

Negative and positive words (and their impact on thoughts, mood or feelings) can colour situations quite differently, impacting motivation and behaviour change. Positive and negative words in framing can also make use of a direct sense of gain or loss in people (i.e. situation with a point of reference). Ipsos conducted an experiment for a financial institution who wanted to charge a fee (in effect, penalise) clients who contacted the call centre for issues that could easily be addressed online. It was suggested that the situation could be framed as either punishment (fee for contact) or reward (e.g. five dollars' deposit if no contact over three months) and could be tested. When the idea was tested on two random samples of customers (one for the 'fee' scenario, one for the 'reward' scenario), we found out that:

- For the 'fee' scenario, two-thirds of customers said they would view the bank less positively and 3% more positively, whilst
- For the 'reward' scenario, 8% of customers said they would view the bank less positively and almost two-thirds said they would view the bank more positively.

The economics did not make a large difference because the reward scenario also had the potential to save on call centre resources. The only difference was the impression and feelings each scenario created towards the bank and the adverse behavioural consequences among customers responding to a negative scenario.

Psychologists have put forward multiple reasons to account for this preferential bend, from energy conservation to a mere reflection of our poor analytical abilities. Our RAM-like working memory is limited to about seven plus or minus two (7 ± 2 bits) although for the brain seven words we remember are seven bits, but so are seven images or seven short sentences[10]. In comparison, laptops and desktops routinely run on RAM of twenty billion bits. Therefore, for reasons of energy conservation, built-in cognitive limitations and demands on effort, the experiential route is used as a default processing mode and cognitive psychology has made much of describing this 'dual processing' (e.g. Stanovitch and West's system 1 vs system 2). A critical point of discussion in the research is the extent to which system 1 inferences are overruled by analytical reasoning if the two conflict. Again the context of the situation is likely to shed some light: Contrary to an experimental setting where reasoning is evaluated through, say, a math-like numerical problem, real-life situations often involve modest levels of reasoning or fact processing (e.g. communication about healthy eating like the traffic light system, new public transport services or energy-efficient home improvement).

...real-life situations often involve modest levels of reasoning or fact processing...

The same people shopping at a grocery store or online website will equally be able to involve both experiential reasoning (e.g. habits from previous shopping trips or online purchases) as well as analytical and reflective reasoning (e.g. easy price or value comparisons, benefits expected) given the modest requirements for reasoning like weighing or comparing.

In the more subdued view of dual processing (type 1 vs type 2) now favoured by psychologists, the defining functional characteristic of type 1 is that it does not involve working memory whilst type 2 does. The dominant role played by processes not using working memory (of which we have little) points to efficiency and energy conservation as being a key force on behaviour.

The view from social and cognitive psychology regarding how we perceive

KERBSIDE DUMPING IN AUSTRALIA

As part of an Ipsos study on kerbside dumping in an Australian jurisdiction, a range of factors were identified as to why people end up dumping unwanted items on the kerbside, particularly people living in apartments or multi-dwelling units. Ability is one factor: People want to recycle at the time but there are not enough recycling bins. Another factor is lack of knowledge as people are simply not clear as to what is allowed and what is not allowed for council kerbside pickups. Another factor is misunderstanding intentions: People put items on the kerbside with the intent of making them available for others to pick-up (one man's trash is another man's treasure). However, other people take the item as a signal to add their own rubbish. These factors encouraging dumping behaviour are relatively easy to address (accessibility, education, identification). Other interventions designed to inhibit or discourage kerbside dumping revolve around the moment, time or period during which kerbside dumping is more likely to take place:

- Ensure the shortest possible lag time between booking a pickup service and collection of material. People want their old material gone as they move new items to their dwelling (e.g. mattress, furniture, etc.).
- Provide information to tenants at critical times (e.g. when they move in or provide their notice to vacate).
- Partner with retailers of large items to provide waste disposal information when people buy new item.

The above measures are likely to be effective to reduce kerbside dumping because they change people's perception of their options in the moment or close to the moment where dumping behaviour may take place.

situations, form impressions and preferences has replaced Descartes's motto with I construct (or I construe), therefore I am. It is a view that accounts for the role of:

- Previous experiences (e.g. making mental representations and emotional tags available, priming our mind, etc.).
- Reflective and limited analytical processing/reasoning.
- The specific context we encounter at the time (e.g. morning or evening, relaxing at home or on the way to work, alone or with friends, high-level or low-level sensory input, physiological state, social and cultural habits and of course time pressure).

This has profound implications for communication and behaviour change programs. Information and facts that speak to our reflective selves are just one road to change our impressions (e.g. through education). Attention, emotion and anything that challenges the schemas we recall from memory have the potential to deeply impact our impressions of a situation and our behaviour.

Empathy goes a long way to remove barriers to behaviour...

How we constantly construct situations in daily life, the role of what is mentally available and how information such as words, images or other cues is processed also point to a wide range of opportunities to shape impressions, preferences and behaviour away from the arsenal of persuasion.

Many interventions benefit from systematic 'design thinking' and looking at the situation from the perspective of the service user or buyer. Empathy goes a long way to remove barriers to behaviour and help people navigate forms and processes easily, avoid feeling overwhelmed by complexity or handle choice options without feeling uncertain and uncomfortable.

A key dimension of how people construct situations of judgment and decision making is time: Looking backwards, we often need to create memories for future use, recall memories at the right time and looking forward we also often need to plan and form intentions. Both use limited mental resources so we end up constructing decision in the moment using "what we happen to see in a given moment".

PEDESTRIAN SAFETY AND CONSCIOUS CROSSING IN NZ

Many pedestrians walk through rail-crossings on auto-pilot: They don't actively pay attention and engage with their environment, putting their life at risk at rail-crossings. Together with their agency Clemenger BBDO, Tracksafe New Zealand and KiwiRail have developed an innovative way to avoid risky crossing habits and 'nudge' pedestrians to engage with their environment. They designed a series of movable gates for Rail Safety Week which create a different obstacle path every day. Pedestrians become more likely to pay attention, process their environment more actively and avoid risky behaviour. Constantly changing physical pathways help prevent forming unhelpful mental pathways and habits. Besides, the movable gates are cost-effective and can also be used where expensive warning signs cannot be installed.

THE CONSCIOUS CROSSING
https://www.youtube.com/watch?v=T_DZPdOhjNM

Click the play button above to watch the video

Behaviour in the natural box

American novelist Mark Twain said that "if you pick up a starving dog and make him prosperous, he will not bite you". This did not work with dingoes, the lean wild dogs of Outback Australia. As people fed dingoes (or left food within their reach) in national parks or recreation areas, it conditioned the dingoes to expect food whenever they saw people and shaped a very aggressive behaviour.

'Behaviourist' psychologist B.F. Skinner is famous for his 'lever box' where an animal (e.g. a rat) is subject to stimuli (e.g. light, sound or image) and has access to a lever that delivers food as a reinforcement of the behavioural response to stimuli. Sometimes the box's floor is designed to provide an electric shock. The box acts as a controlled environment to determine which positive reinforcement and punishment pattern leads to the desired behavioural response.

Experience of pain or pleasure does indeed play a major role in the Behaviourists' view on learning and behaviour from different types of conditioning. They focused on behaviour as the product of people (and animal) interaction with their environment and how it is shaped through incentives and reinforcement (e.g. reward or negative consequence) to encourage or inhibit behaviour. They clearly saw behaviour as adaptive to its environment through habit formation. Their purpose was to replace undesirable behaviours with more desirable ones by shaping the environment with the right stimuli.

CASE STUDY

SEAT-BELT WEARING

A few decades ago, many countries made wearing seat-belts in cars compulsory given the evidence that they could save lives in car crashes. Yet, today, people sometimes do not wear their seat-belt for various reasons (e.g. “it’s only a very short trip”). Law enforcement (fines for not wearing a seat-belt) are one way to force compliance. Some automotive manufacturers also design cars in such a way that every time ignition is on and a passenger does not put their seat-belt on, an annoying beep is heard. This ‘aversive stimulus’ only stops and provides relief when people eventually put their seat-belt on to stop the sound driving them mad: a simple and effective negative reinforcement of seat-belt wearing.

HONKING IN KOLKATA

In cities like Kolkata, Delhi or Mumbai in India, many drivers honk (the louder, the better) to make their way among other buses, motorcycles and other users of clogged-up roads creating high levels of noise pollution. To address the issue of non-stop honking local engineers have developed a red button on the car's dashboard which beeps and shows a frowning face every time the horn is used. Other devices include a 'horn usage meter' which limits the amount of honking and enables police to issue fines as well as the distribution of "Do not honk!" stickers to motorists.

In his introduction to The Principle of Utility eighteenth century English social reformer Jeremy Bentham says: "Nature has placed mankind under the governance of two sovereign masters, pain and pleasure". Bentham's view has a distinct behaviourist flavour although one where the lever box is a natural one, not an experimental environment like the Skinner box. Actor, author and commentator of early twentieth century US political life Will Rogers observed drily that "good judgment comes from experience, and a lot of that comes from bad judgment". Rogers shifts the perspective from the environment back to us and judgment as springboard to future voluntary behaviour. What is the link between reinforcement and voluntary behaviour in shaping behaviour? What role do they each play? In contrast to Skinner's Behaviourism, social-cognitive learning theory changes our view of the role of experience in acquiring and maintaining behaviours. It recognises that people learn by observing others but learning may or may not lead to behaviour because people have their own goals. This perspective looks at behaviour not so much as the direct product of external reinforcement but as people's regulation of their own behaviour. Forming expectations about the consequences of future behaviour based on how their current behaviour is reinforced (positively or negatively) or punished. With those expectations being shaped by observing the consequences of other people's behaviour.

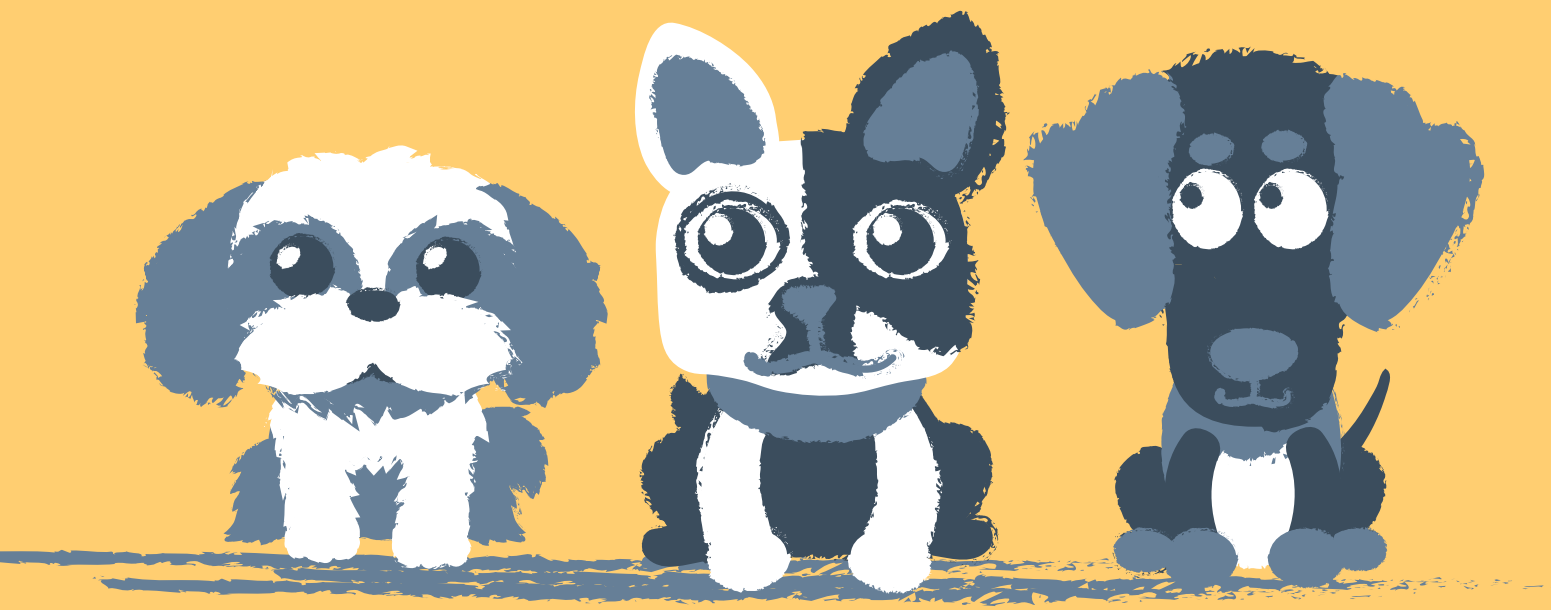
Zooming in on more specific (choice) behaviours, consumer psychologists highlight that people may have goals driven by needs (conscious or unconscious) in decision-making, but at the same time, the decision-making process (hence the decision) is influenced by the environment (complexity, time pressure, etc.) as well as previous experiences (positive and negative). The picture is one where behaviour is adaptive and contingent: It does not always end up with 'optimal outcomes' but intelligent or sensible outcomes given the context. These outcomes reinforce our use of the same processes in future decision-making situations.

So the social-cognitive perspective recognises the effect of reinforcement (and punishment) on shaping goal-directed behaviour. Reinforcement, however, takes place because we use the outcome of behaviour to build our sense of self-efficacy (sense of competence or belief in our own abilities) and self-regulation (engaging in behaviours that are in our interest).

KEEPING THE DINGOES LEAN AND WILD

In the case of the dingoes conditioned through feeding, human behaviour was not primarily changed through reinforcement. Education of the public (e.g. at visitor centres, tourism operators but also signage in situ) was a key road to behaviour change beside law enforcement (e.g. rangers issuing fines). In addition, as less people fed the dingoes, it provided a powerful visible indirect reinforcement for the group to not feed the dogs. In other settings, 'thank you for not feeding the wildlife' signs work as a positive reinforcement unlike the more direct 'don't feed the wildlife'.

Attention and behaviour



THE INVISIBLE GORILLA

What gorilla? This is the typical response of about half the people who participate in a classic experiment[13] about attention and are asked afterwards if they noticed a gorilla. These participants fail to see the gorilla because their mind is too busy with the task assigned to them by the experimenter: Watching a short silent video where people pass a basketball to each other. Half wear a black t-shirt and the other half a white t-shirt. Participants are asked to count the number of times people wearing a white t-shirt pass the ball to other white t-shirt people. This is not a immensely difficult task and many people come up with the right answer or very close to; but only half of them notice the person dressed in a gorilla suit crossing the room as people pass the ball to each other. Participants are astonished because they don't feel their mind was overloaded by the task and believe they would have noticed the gorilla. Often people ask for the short film to be played back in slow motion because they remain incredulous. How could they miss a gorilla crossing the room beating its chest?

THE INVISIBLE GORILLA
https://www.youtube.com/watch?v=vJG698U2Mvo

Click the play button above to watch the video

A variation of the experiment promises the audience that the first person to give the correct number of passes at the end of the film will receive an expensive gift. The incentive appears to focus the audience's attention even more. It does not increase the proportion of participants who get the correct answer but it reduces the proportion who notice the gorilla to almost zero. The gorilla becomes entirely 'motivationally non-salient'.

This is probably one of the most famous experiments about attention. As participants have a well-defined goal (counting the number of times the ball passes around), attention selects what we see that is relevant to the task (the ball moving between white t-shirt players) and ignores what is not (the gorilla). In other words, attention is limited (we only perceive and remember what has received our attention). In addition, the reaction of participants to such experiments reveals that we have no idea our own attention is selective and we can miss out what is right before our eyes because of 'inattentional blindness'.

The same blindness has been observed among expert observers. Radiologists failed to see the image of the gorilla 48 times larger than the lung nodules they were tasked to detect on a series of x-rays.

...attention is limited...

The radiologists did not know and expect to find a gorilla and their attention was entirely focused on finding small nodules.

Our characteristic and pervasive inattentional blindness is the result of:

- Our built-in limit on the amount of information on the retina that can be used for processing and behavioural control and
- Our ability to filter out information that is unwanted or irrelevant.

Undoubtedly, psychologists are interested in the precise mechanism of attention. Do we select visual sensations before processing them to make a picture of the situation? Or do we actually take everything in and then somehow ignore some parts of the perception our mind constructs? There is experimental evidence for both 'early selection' and 'late selection'. Regardless, neuroscientists are busy trying to untangle the neural networks that regulate orienting and executive control (focusing and sustained attention) attention and those that actively suppress other signals.

LITTERING IN EU

Littering is a problem in many places for all kinds of reasons. Having rubbish bins in places where people are likely to want to get rid of their rubbish (e.g. food wrappers) is one step to enable the desirable behaviour. Ensuring that people notice the bins and see them positively is another one. Both examples below use humour to increase visibility and attention: The photo on the left by association with basketball and the photo on the right by morphing the bin into a policeman asking “your papers, please”.

However, in many day-to-day situations (orienting in transport, workplace, sport and recreation, etc.) particular cues and features in our environment become salient given our goals and the context. They come to our attention because they are motivationally salient.

In many other day-to-day situations, stimuli in our environment are not necessarily aligned with the goals driving our behaviour at the time or they may be far too many things going on for us to pay attention to everything (e.g. watching TV and busy with friends on message apps and talking to partner all at the same time or driving on the road in an urban environment).

In situations of strong competition for our attention, a stimulus must have some salience of its own to capture our attention: sound, contrast and movement are basic but can be very effective to trigger an 'orienting' response (i.e. to pay attention). Attention can be triggered by much more complex social-cognitive stimuli: Humour is no stranger to the advertising industry intent on getting our attention, but it is also harnessed by public campaigns in many countries.

> **...a wealth of information creates a poverty of attention...**
>
> *— Herbert Simon, cognitive scientist*

There is no end to demands on our attention from a complex urban environment and everything available on portable and fixed devices. Cognitive scientist and Nobel Prize winner Herbert Simon anticipated the exponential growth in information available to corporations: "what information consumes is rather obvious: It consumes the attention of its recipients. Hence, a wealth of information creates a poverty of attention and a need to allocate that attention efficiently among the overabundance of information sources that might consume it". The same evidently holds true for almost every aspect of our life, not just life at work.

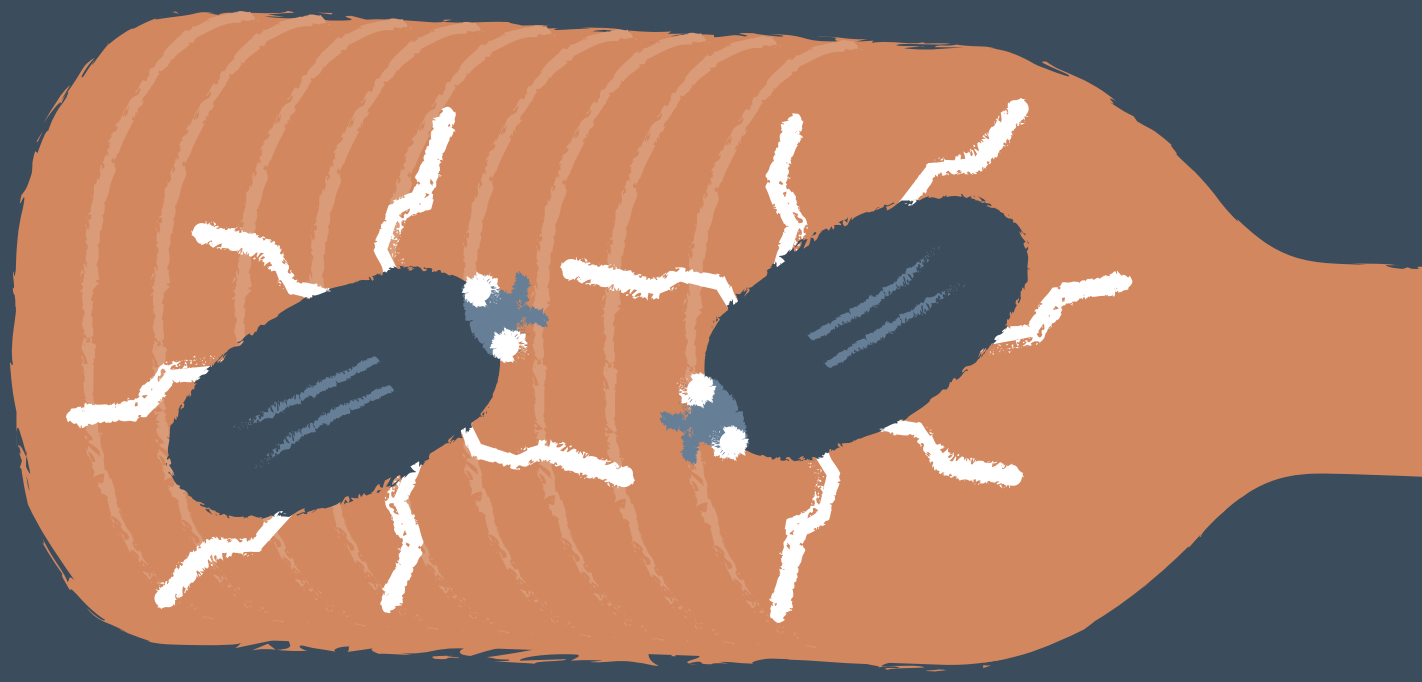
FLIES AT AMSTERDAM'S SCHIPHOL AIRPORT

The urinal fly (from the eponymous company) mixes humour with men's automatic desire for accuracy in aiming at a target. The company produces small fly stickers that are placed in the middle of urinal bowls of public toilets. The fly automatically attracts the attention of men and improves their aim whilst standing in front of the bowl. Economist Aad Kieboom implemented the idea when he was in charge of the expansion of Amsterdam's Schiphol Airport. Reportedly, trials with the urinal fly saw a decrease in spillage by 80% at the airport's men toilets. To date, the company making the fly stickers advertises cleaner bathrooms in minutes and up to 85% reduction in spillage.

CASE STUDY

THE JEWEL BEETLE AND SUPERNORMAL STIMULI

A recent example of supernormal stimulus in a public campaign is that of the Australian jewel beetle and the beer bottle[15]. Male jewel beetles were found agglutinating on dark brown, ribbed beer bottles ('stubbies') thrown off the road into the Australian desert. The bottles got the attention and affection of the male beetles because they looked like supersized female jewel beetles whose back is just as dark brown and ribbed as the bottles were. Once attracted, the male jewel beetles would not move away, threatening the species' numbers and the fragile desert ecosystem. With the help of beer companies which opted for a different bottle, the supernormal stimulus was eliminated and the male jewel beetles returned to the females.



SUPERNORMAL STIMULI

https://www.youtube.com/watch?v=t1pOZbytOhE

Click the play button above to watch the video

THE NEW WORLD OF SUPERNORMAL STIMULI

Reflexes are part of human behaviour from the start. Babies and infant have dozens of muscle-based reflexes which help them survive (e.g. blinking, suckling, etc.). These reflexes take place when babies are touched in particular ways or held in particular positions. One of parents' favourites is when they touch the tiny open palm with their finger and the baby claps their finger with surprising strength. It is as if the baby wanted to hold on to us but it is only a reflex. Over time, like many others, this reflex disappears as more and more behaviours become intentional rather than purely reflexive.

Reflexes still play a major part in adult behaviour. Nikolas Tinbergen, a Nobel Prize winning Dutch ethologist named supernormal stimulus, a kind of exaggerated or larger-than-life stimulus which triggers a stronger than normal behavioural response. By developing enlarged mock-ups of particular features of fish, butterflies and birds' eggs, Tinbergen managed to get a much stronger reaction from animals than the one triggered by the normal (rather than the supersized 'supernormal') stimulus. The effect on behaviour was compounded by the number of features of the stimulus that could be enlarged or exaggerated at the same time (e.g. egg size, spots and colour).

People are just as subject to the effect of supernormal stimuli. The main reason is that we are able to design an environment for ourselves which is packed with supernormal stimuli. Drinks and food with additives enhance the appearance and/or experience beyond their normal capability: Sodium glutamate is a naturally occurring amino acid in some foods but at much lower concentration than that of the popular MSG additive found in many popular food items). Media content, movies and video games create experiences that are supersized in every possible way compared with reality. Evolutionary psychologist Deirdre Barret attributes some of the attraction of porn to its visual supernormal features. She also argues that social media is a type of supernormal stimulus, for example the number of people that we can interact with and receive feedback from at any time which is far superior to that of normal social interactions, without all the constraints and headaches of real social interactions[16].

Supernormal stimuli have become an omnipresent feature of our environment and an effective tool of the commercial

sector to get our attention and shape strong but sometimes unhelpful habits[14]. Supernormal stimuli also have an impact on the effectiveness of campaigns and communication from the public sector because these stimuli make it more difficult for everything else in our environment to get our attention. In addition, constant exposure to supernormal stimuli leads to habituation and we fail to respond because the threshold beyond which we respond keeps increasing. The use of supernormal stimulus to change and shape behaviour is a road that always needs to be travelled an extra mile.

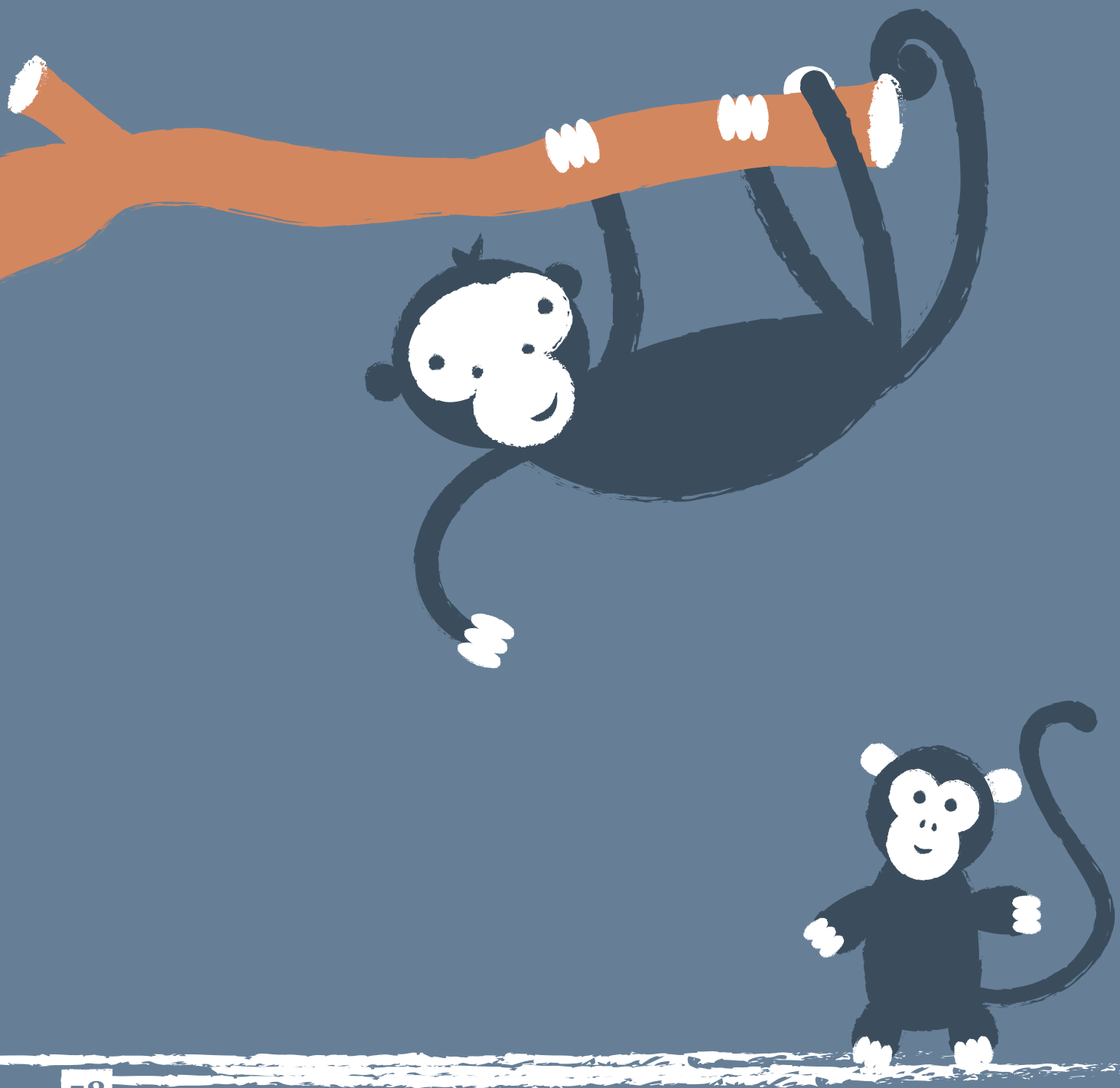
There seems to be no end to the strength of supernormal stimuli with technology such as computer-generated imagery (CGI) and augmented reality (AR). AR in video games may increase the threshold beyond which stimuli outside the virtual environment may get our attention. However, behaviour is sensitive to context above and beyond supernormal stimuli: Looking at the impact of the use of AR/VR on our mind, researchers suggest that heavy use of the technology may "trigger symptoms associated with depersonalization/ derealisation disorder (DSM-5 300.14)".

At the same time, the technology offers new ways to change the environment to

There seems to be no end to the strength of supernormal stimuli with technology such as computer-generated imagery (CGI) and augmented reality (AR).

shape behaviour (e.g. enabling people to form realistic impressions of proposed infrastructure and other public works to get communities on board). Public sector campaigns and communication may benefit from the rise of AR to shape impressions and preferences as much as they face new challenges to get any sort of attention. Technology can indeed do more than simply power our ability to create supernormal stimuli and tap into our reflexes. The rapid development of technology in the area of motion, perception and cognition (from AR to artificial intelligence and robotics) enables us to create vastly different contexts, and for a moment, a new reality to generate attention, impression, social interaction and shape behaviour.

Neuroscience: The last frontier of behaviour?



Neuroscience provides a unique avenue to ground cognition and behaviour in the biology of the brain. Indeed, the astronomical numbers of one hundred billion neurons and one hundred trillion axonal connections wiring neurons with each other makes the brain a near infinite research ground to investigate the mysteries and wonders of human behaviour even though the human condition remains largely elusive to the tools and methods of science.

Neuroscience has been powering the research effort over the last fifteen years as a growing number of cognitive, social and behavioural experiments involve neuro-measurement of one kind or another (e.g. imaging, facial coding, galvanic skin response, eye tracking, etc.) to better understand what the brain is doing and how it is doing it (i.e. both cognitive processes and their neural substrates) within the environment and conditions created by the experimental design[17].

COMPETING FORCES AT WORK

Irish novelist Oscar Wilde believed that "the only way to get rid of temptation is to yield to it". Public policy makers keen on preventing and limiting the prevalence of harmful behaviours will make up their own mind on his advice. Yet, Wilde's aphorism captures something of the difficulty people have with conflicting 'forces' on motivation and behaviour.

> **the only way to get rid of temptation is to yield to it**
>
> *— Oscar Wilde, author*

Impulse control disorders and compulsive disorders are well-known psychological mechanisms. The former is positively reinforced by the sense of pleasure ensuing the behaviour whilst the latter is negatively reinforced by the sense of relief (from stress or anxiety) following the behaviour. One perspective looks at addiction as disorder from substance dependence (e.g. alcohol, illicit drugs). A different perspective is that of addiction as bad habits reinforced long enough to become harmful.

Neuroscience provides insight into the reinforcing effect of neurotransmitters like dopamine, GABA and serotonin and natural body opiates at work in the medial forebrain bundle[18] on the use of substances like alcohol or illicit drugs.

In one model, repeated activation of the mesolimbic dopamine system leads to 'incentive salience', a hypersensitive neural state which produces the experience of craving or seeking. Opioid neuropeptides also reinforce the use of substances (endorphins is one such peptide and is well known to sports people who experience its euphoric feeling during and after strenuous exercise). Together the two systems create a 'seek and reward' mechanism at the heart of compulsive disorders like addiction. The seek and reward behaviour is not the single domain of substance abuse. It can take place with various rewarding non-drug related behaviours (e.g. gambling, food, video games, social media, etc.).

...behaviour is the result of motivation that seeks pleasure or satisfaction and/or avoids physical (e.g. pain) or mental (e.g. negative emotion) discomfort.

Neuroscience is useful to understand the micro-view of 'forces' such as impulses and their strength on motivation and behaviour. At the other end, psychologists interested in behaviour change provide a macro-view of such forces as competing effects on motivation and behaviour: PRIME[19] is a well-established framework (simple at one level but much more complex in its detail) to understand forces at work on motivation and behaviour including:

- feelings about ourselves,
- self-control,
- beliefs about what will lead to positive or negative outcomes,
- conscious intentions and goals,
- impulses (and inhibitions)

Within this perspective, behaviour is the result of motivation that seeks pleasure or satisfaction and/or avoids physical (e.g. pain) or mental (e.g. negative emotion) discomfort. Conscious awareness, efforts and intentions to keep away from harmful behaviours may give way at that moment to stronger impulses driving us to seek relief through those behaviours.

SMOKING CESSATION

My QuitBuddy is an app developed by the Australian Government to help people quit smoking. The app was designed to address the issue of competing forces on behaviour: When users have the urge to smoke, they can easily access their own words about why they wanted to quit in the first place or photos and recordings of loved ones. In that moment, the app also offers games to distract the user and access to the Quitline to help them stay quit. The app also uses multiple positive and negative reinforcement devices (social platform to share success stories and milestones, new health benefits revealed as people stay smoke free).

MONKEY SEE, MONKEY DO

Curious George is the name of a monkey (or an ape) created by Hans Augusto and Margret Rey in 1939[20] and an immensely popular series of children's books (as well as animation TV series and films). In his adventures, George always gets in trouble, taking inspiration from what he sees others around him do. Mirror neurons, a class of neurons first identified in the 1990s from a series of experiments with monkeys, are at work in the brain of Curious George. These experiments show that some of the same groups of neurons are activated both when monkeys perform a particular action (e.g. hand movement) and when they see others perform the same action. Hence, these neurons appear to 'mirror' the actions of others, as if the monkey was performing the action itself.

The same class of neurons is likely to also be at work in people. Over 800 papers report experimental research with humans and mirror neurons: Neuroimaging of brain areas active in humans during action-observation are broadly consistent with those areas where mirror neurons have been reported in monkeys. However, the 'monkey see, monkey do effect' cannot be directly observed in humans through neuroimaging because fMRI cannot be used to examine brain activation if people move.

...the cognitive and neural processes behind actions and learning by imitation remains highly relevant to behaviour change practitioners...

Although the functional significance of mirror neurons is still not clear (are they a distinct class of cells or do they have other functions, do they arise out of associative learning as we grow up?), it has lead neuroscientists to change the thinking around how "we generate our own actions and monitor and interpret the action of others". Mirror neurons would account for how we can learn new skills by imitation as well as understanding the actions of others and their intentions behind those actions. Despite the media hype surrounding mirror neurons as one of the biggest discoveries from neuroscience, understanding the cognitive and neural processes behind actions and learning by imitation remains highly relevant to behaviour change practitioners keen on developing effective communication and interventions.

MIRROR NEURONS AND ADVERTISING

Mirror neurons potentially have significant consequences for a range of public policy communication programs (e.g. food, alcohol or tobacco) involving actions and movements that may facilitate impression and learning among viewers through either positive or negative affect-based associations.

An experiment presented subjects with one ad inserted in a 15 minutes' documentary:

1. the ad involved no product handling (condition 1) or
2. the same ad included product interaction through grasping and drinking (condition 2).

The two ads were the same in all other respects (e.g. text of voice over, moment and duration of product presentation). The experiment revealed that condition 2 elicited twice the amount of advertising recall and product recognition. Although the reason as to why these results are observed remains unknown apart from advocating the role of mirror neurons in the process, the difference in effect size between the two conditions makes the role of learning by imitation through the action of mirror neurons compelling.

NEUROMODULATORS OF DECISION-MAKING

Value-based decision-making is pervasive in nature and is not limited to monetary (economic) behaviour: "It occurs whenever an organism makes a choice from several alternatives based on the subjective value that it places on them".

THREE SYSTEMS

Mental representation plays an important part in decision-making along with internal and external variables (e.g. a person feels tired, conveniences-store nearby provide a range of mostly unhealthy and a few healthy pick-me up options). All of these variables inform the valuation process by which we end up with one option rather than another. Although the entire computational and neurobiological tenets of valuation are still largely unknown, the body of human and animal experimental evidence from neuroscience points to three valuation systems at work in the brain. These systems however do not map directly onto three neural systems, although they may share some neural equipment. In addition, the systems can be engaged at the same time and may be in agreement (or not).

1. A reflexive system of innate or hard-wired responses to specific configurations of stimuli (e.g. a cue signalling a negative outcome or an aversive stimulus leading to avoidance). More generally, the reflexive system applies automatically to a limited range of behaviours and triggers approach for positive outcomes and withdrawal for negative ones.

The municipality of Tokyo developed recycling bins that have typical cute or baby features ('Kindchenschema'). The features trigger an automatic response because of the perception of a particular configuration (here the big head and the round eyes) that elicits a nurturing behaviour in people and prosocial motivation whereby people intentionally engage in behaviours likely to help or benefit others.

Image: © Joan Bailey www.japanfarmersmarkets.com

MIRROR NEURONS AND SUNSCREEN

Damage to skin from sun exposure is a significant health issue in many countries including those where people enjoy spending time at the beach during hours of maximum UV intensity. Protecting children through the regular use of sunscreen may help them develop good sun protection habits and reduce the future burden of disease (mortality, morbidity, healthcare costs, etc.). At the beach parents often struggle with young children who wriggle away from their reach whenever they try and put sunscreen on their face and body. Good habits with sunscreen is the behavioural meeting point of public health and the commercial interest of sunscreen manufacturers. The marketer of Nivea in Brazil developed a plastic doll that goes red when exposed to the sun but does not when covered with sunscreen (the dolls are made with UV-sensitive material).

The manufacturer handed out dolls (of both genders) to children and their carers on a popular beach of Rio de Janeiro and filmed the interaction of children with the dolls: The children took care of the dolls like their parents take care of them with sunscreen. The experiment showed clear behavioural change among children who became more patient and cooperative with their parents (at least at the beach). It also revealed mirror neurons at work helping children to learn by imitation as they often do in play mode (i.e. they took care of their dolls using sunscreen). More importantly, the experiment revealed how imitation was instrumental to help children understand the actions of their parents and the caring nature of their intentions[21].

NIVEA DOLL

https://www.youtube.com/watch?v=wiv8W68YMH4

Click the play button above to watch the video

2. A habit system where we learn to assign values to a specific course of action by trial and error response to stimuli. Because this system is based on training, it applies to a much larger number of behaviours than the reflexive system. Its limitation is that it relies on generalisation to assign values to actions/behaviours in situations that have not been experienced before.

In cross-cultural or multicultural settings, associations formed from cultural habits can vary widely in their interpretation and cause unwarranted generalisations about the character or behavioural intentions of other people (e.g. use of left hand, sneezing and coughing habits, staring, resting chopsticks at the table, interpersonal distances for personal, social and public interactions, use of time in cultures and environments where time is rigid, sequential and scheduled (monochronic) or fluid and multifaceted (polychronic).

3. A goal-directed system where we assign values to alternative courses of actions "by computing action-outcome associations and then evaluating the rewards associated with different outcomes". The goal-directed and habit system mostly differ from each other in how they respond to the environment: The habit system learns relatively slowly whilst the goal-directed system updates the value associated to our actions or behaviours as those values change. A strong limitation of the goal-directed system is that we may assign incorrect value to the course of action we follow because of biases in our valuation and decision-making processes (e.g. stronger mental availability of particular information, temporal discounting, overweighing uncertainty, etc.).

For example, the choice of restaurant or home-delivered meals (vs other eating options) may be influenced by immediate rewards (e.g. salt/fat/sugar) more than the cost to health. Health effects are delayed (e.g. gradual build-up to overweight and obesity or insulin resistance leading to diabetes) so in this situation, there is no quick update to the 'value' of people choices until the behavioural consequences are much harder to reverse (e.g. physiological changes from obesity or neurophysiological changes from addiction-like behaviours).

QUEENSLAND YOUNG FEMALE SMOKERS CAMPAIGN

The Queensland department of Health found that young female who smoke are also anxious about losing their looks. As the effect on appearance may only be dramatic after ten or more years of smoking, temporal discounting makes this prospect distant and recessive. The second obstacle is that smokers who are shown pictures of what other people look like after many years of smoking tend to be unaffected because of 'dissociation from future self', a cognitive effect which prevents them to accept that they will end up looking like that too.

To circumvent the effects of temporal discounting and dissociation, Queensland Health recruited top special effect make-up artists, set up make-over stations across Queensland and filmed the experience of young female smokers discovering what they would look like if they continued to smoke[22]. The 'hot state' of emotion experienced at the discovery of their future-self leads to new thinking, intentions and behaviour around smoking.

QUEENSLAND GOVERNMENT ANTI-SMOKING MAKE-UNDERS
https://www.youtube.com/watch?v=nSUJ_2uTq6I

Click the play button above to watch the video

Four neuromodulators

Different factors affecting how we form impressions and preferences have been identified in behavioural economics and (consumer) cognitive psychology, especially how we see outcomes in risky or uncertain situations and the impact of effort on decision-making processes. Neuroscience adds insight into key neuromodulators at work in the reflexive, habit and especially goal-directed systems through their neural substrates (i.e. which brain areas are engaged in the process):

- Expected reward or punishment (e.g. gains and losses when there is a reference point) involving the amygdala.
- Risk and variance (subjective estimate of likelihood of reward) involving the orbitofrontal cortex (OFC).
- Temporal discounting (reward decreases with time delay to reward) involving OFC and other areas of the prefrontal cortex (PFC) as well as the anterior and posterior cingulate cortex (ACC and PCC).
- Cost and effort (e.g. larger rewards lead to more vigorous effort) involving ACC.

Ascertaining the modulating role of each of these decision factors remains tentative given the decision environment and the previous experiences of the decision-maker also impact their decisions. Behaviour remains the interaction of personal forces within a specific physical and social context. Although this renders accurate measurement of the impact of each factor difficult to predict, these neuromodulators remain valuable levers to consider when developing interventions to encourage or inhibit behaviour based on positive vs negative consequences or reward vs punishment.

In the same type of reward and punishment situations as (operant) conditioning, neuroscience provides a crucial insight into the associations formed through our experiences and how we subsequently use them: Conditioning creates multiple associations in the brain, each capturing different aspects of the cues/situation we perceive. As a result, the perception of cues has a very strong impact on the representation of the outcome that will come to our mind (especially its sensory features) and the value attached to it. This is significant because it reinforces the perspective of decision situations being constructed (rather than simply recalled from memory) and the mental representation being malleable if we can emphasise particular cues in communication, messaging and decision situations (e.g. through priming).

THE COST OF BEHAVIOUR

Cost inhibits behaviour

Ethologists discovered decades ago that animal behaviour is shaped by both expected reward as well as the action's potential costs. Consumer psychologists have similarly observed that effort plays a significant role in value-based choices. Neuroscientists have also identified the brain areas that reflect the net value of a course of action (benefits or expected reward on one side, amount of effort to be invested on the other side of the sum) and additional brain areas reflecting the interaction of benefit and cost.

These are not surprising findings and are consistent with the first (and long standing) principle of behaviour change practice: Don't make it difficult! Practitioners know that making behaviour difficult by erecting barriers (e.g. skills are hard to develop or the demand on attention is too great or the number of alternative course of actions is too large or the reinforcement to behaviour is inexistent or insufficient) is the surest way to 'kill off' the desired behaviour. Motivation does however play a strong modulating role on the impact of effort on behaviour. BJ Fogg from the Persuasive Technology Lab summarises the role between effort and motivation:

Practitioners know that making behaviour difficult by erecting barriers (e.g. skills are hard to develop or the demand on attention is too great ...) is the surest way to 'kill off' the desired behaviour.

- When the desired behaviour is made attractive (i.e. people are motivated), barriers frustrate people and at a given threshold, frustration inhibits behaviour.
- When the desired behaviour is not difficult (i.e. no barriers) but the desired behaviour is not particularly attractive, people end up annoyed and at a given threshold, annoyance inhibits behaviour.

However, practitioners often underestimate the extent to which making behaviour really easy by reducing effort (including any kind of cognitive costs) can facilitate behaviour change. Thus the first principle of behaviour change could read as: don't make behaviour difficult and do make behaviour easy, too easy.

Energy efficiency

Both cognitive psychology and neuroscience provide insight into the link between the cognitive processes we engage, the neurophysiological processes of bioenergetics (production and consumption of energy) and what the contribution of this link is to our understanding of how behaviour works. In essence, behaviour has a cost and neural processes are driven by energy efficiency.

The organic molecule ATP is the main source of energy to the brain through the metabolism of glucose (glycolysis and mainly oxidative phosphorylation processes[23]). The rate of energy consumption in the brain is exactly balanced by that of ATP production.

For its size (two percent of body mass) the brain consumes a whopping twenty percent of our resting metabolic rate (RMR), the amount of energy our body needs to keep itself going at rest. Yet, to keep billions of neurons in good shape and ready to fire, the energy required is about 12 watts compared with the 60 watts consumed by a laptop and LCD monitor when the operating system is going. To put the brain's energy efficiency in perspective, the IBM Watson supercomputer which

...behaviour has a cost and neural processes are driven by energy efficiency.

defeated the team of two best ever players in the Jeopardy quiz game used ten racks of ten IBM Power 750 servers consuming about 2400 watts each. The supercomputer won the game, but the humans won the efficiency contest: The two brains combined only used 24 watts vs 240,000 watts for Watson (or is that Wattson?)[24].

Apart from neurons which sense the internal and external environment, process information and plan and execute behaviour, star-shaped brain cells (astrocytes), among other functions, hold the largest reserve of glycogen (a form of glucose storage) in the brain, uptake glucose and distribute energy to neurons. Astrocytes are endowed with particular features which give them "exquisite sensitivity to detect increased synaptic activity". In addition, their glycogen reserves are inversely correlated with the amount of synaptic activity in local neurons. In other words, astrocytes are a very

responsive (i.e. on demand) and effective storage, energy production and energy transport substrate for use in the neuronal power station (most neurons are 'computing neurons' and their energy requirement is higher than that of astrocytes.).

Given the energy needs of neurons for a range of neurochemical functions (e.g. production of neurotransmitters), the assumption has been that the more active a cell is, the more energy it will consume. Several experiments indicate that indeed brain areas which are functionally more active consume more glucose and produce ATP energy more rapidly than non-firing brain areas where the energy requirement stays at baseline (housekeeping level).

To identify whether glucose utilisation impacts brain areas associated with executive functions (e.g. reflective thinking, problem solving and planning) cognitive psychologists developed experiments to measure the impact of glucose supplementation on people: Are they moving away from cognitive shortcuts to reflective and analytical thinking when performing a large number of successive tasks? From a series of experiments, glucose supplementation shows that people:

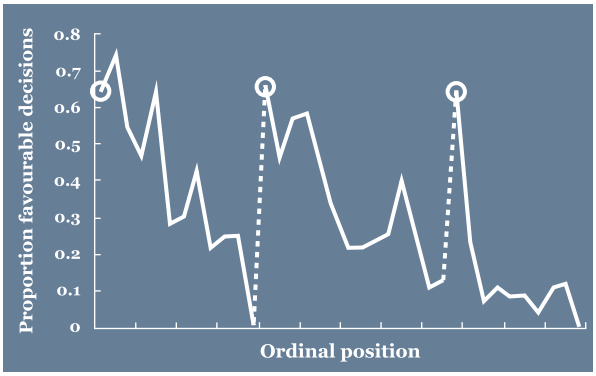
- Are less influenced by irrelevant contextual factors when forming preferences.
- Reduce the use of stereotype in forming impressions.
- Shift preference away from immediate monetary reward towards delayed payments.
- Are less likely to make errors on harder tasks and more likely to make errors on easy tasks (i.e. tasks that require people to do some thinking on outcomes based on given information).
- Spend more time to complete the tasks at hand initially taken as evidence that they employ more deliberative processes (but people become faster at the end of the experiment).

One of the direct implications of these experiments for behaviour change practice is that processing situations in which we

For its size (two percent of body mass) the brain consumes a whopping twenty percent of our resting metabolic rate...

have to choose a course of action or pay attention and respond to an instruction (e.g. traffic information signage), a decision situation (e.g. health and safety hazards in the workplace) or a message (e.g. a health message posted at the gym before lunch) are potentially indirectly influenced by glucose levels through the cognitive processes that are actually engaged. This is significant if the stimulus requires some level of reflective or deliberative thinking or the context requires ignoring information that is irrelevant or distorting, but very salient.

Judicial decisions are expected to be made based on extensive consideration of facts and reasoning and not be driven by "what the judge ate for breakfast". A 2011 study from behavioural psychologists at Columbia University and Ben-Gurion University of the Negev analysed the parole decisions made by judges for 1,000 parole applicants over a period of ten months. The researchers found that applicants not enrolled in a rehabilitation program and recidivists were less likely to be given parole. However, they also found out that the more cases a judge had decided over in a session, the more the judge opted for the status quo (i.e. the less likely an applicant was to be granted parole): The percentage of favourable rulings dropped from 65% at the start of a session down to near zero at the end just before a meal break. The data also revealed that the likelihood to get parole returned to 65% right after each of the two meal breaks in a day. The circles on the graph below indicate the first case in each session and the dotted lines the time for a meal break. The horizontal axis shows the number of cases handled by a judge in increments of 3:



The pattern of the likelihood to receive parole throughout the day is consistent with the pattern observed for blood glucose level: Steady decrease over time and sudden jump after a meal. The researchers note that low blood glucose level (i.e. before a meal) is concurrent with the high likelihood of status quo (i.e. no parole) at the end of a session. However, given the meal break is also a rest time the observed effect may be the results of changes in blood glucose levels as well as other factors (e.g. mental

FINTECH AND EFFICIENCY

As the emerging disrupter of financial services, Financial technology (Fintech) companies operate on the acceleration-optimisation-efficiency business model developed by the tech firms of the Bay area. Efficiency is clearly seen at work in the levers that Fintech companies use to pull customers to their digital services (e.g. wealth management platforms, peer-to-peer lending, money transfer, payment systems, personal day-to-day management, etc.):

- The benefits they offer (e.g. lower fees, better return, mixing self-interest and community perspective/ altruism, radically new financial products and services).
- The negative emotion they remove or circumvent (e.g. lack of transparency in fees or credit scoring, no access to some asset classes, perceived unfairness or asymmetry, etc.),
- The ease to perform the behaviour (e.g. ultra-simplicity of interface design, no up-front cognitive costs to access/ register, etc.).

A 2016 Ipsos review of 104 Fintech companies around the world[25] shows that Fintech companies are attractive because they use technology to provide more attractive products and services to customers much more efficiently: 61% of the companies reviewed leverage rewards and benefits, 48% design services that remove negative emotion but almost all of them (91%) designed their offer to make everything easy, in most cases 'ultra-easy'.

rest and/or change in mood). An alternative analysis of the same data shows that the observed pattern is consistent with rational choice behaviour based on judges' optimal time management but cannot exclude the effect of mental depletion. Thus, the effect of mental depletion is potentially overestimated and irrational-looking behaviour largely explained by rational factors (e.g. how judges prioritise cases to manage load and time).

Blood glucose level varies substantially throughout the day for judges and for everyone else: It peaks after breakfast, lunch and dinner and decreases at mid-morning, mid-afternoon and closer to midnight (in the Western meal pattern). Besides, the peaks and troughs are longer for people who do not eat breakfast or skip lunch and higher/lower for people who consume large amounts of sucrose-rich foods (e.g. sugary snacks and drinks).

The use of snack and/or rest time may help tip the scales of justice to the advantage of parole applicants at the end of the queue and possibly the decisions of experts and everyone involved in "important sequential decisions or judgments" (e.g. legislative, medical, financial, HR/job application) and possibly any kind of reflective or deliberative decision-making.

...the brain operates with constrained energy availability in most conditions...

The evidence across multiple decision situations points to variation in processing of stimuli throughout the day. This creates opportunities for behaviour change practitioners to adjust the time and/or content of stimuli (messages, signals, alerts, notifications, etc.)

Nevertheless, when we measure the brain's actual energy consumption, the observed increases in energy consumption from baseline level are very small (although neuroscientists have so far been reluctant to put their subjects through a really long and gruelling schedule to see the effect on brain energy consumption). Again, the emerging picture is one where the brain operates with constrained energy availability in most conditions which would account for the bend towards energy efficiency (the brain's preference for automatic or autonomous processes rather than more effortful deliberative or reasoning processes).

GLASS RECYCLING IN FRANCE

Ultimately, making behaviour easy is not the monopoly of digital life. The Wine Institute reports the French as some of the biggest consumers of wine in Europe (forty four litres on average per capita per year) in 2014. Only 62% of domestic glass is recycled in France compared with 90% in some of its neighbours. Most people must take their bottles and glass containers to nearby collection points (only 20% of domestic glass is collected through other means like kerbside collection). Perhaps from personal experience, designers of new collection points made the process of recycling all those glass bottles easier for the public. They added a small hook for people to hang their bags right below the mouth of the container to make glass collection easier and faster.

SPEED OR EFFICIENCY

These processes are often described as fast, and faster than controlled, deliberative ones, which they are indeed at the level of observable behaviour. However, automaticity resulting in faster observable behaviour does not necessarily translate into faster processing at the neural level. Faster processing implies more brain activity but the observation from imaging is that automatic processing is less demanding in effort and resources. Instead, the same studies show a change in brain activation from "cortical to intermediate cortical and subcortical structures". The decrease in energy requirements can be accounted for by the much lower density of neurons at subcortical levels. At the level of behaviour, time is often of the essence (e.g. quick reaction time in a dangerous situation or choice under time pressure) but at the neural level, it is efficiency from energy conservation, not speed per se which matters: Behaviour has a cost and underlying processes naturally move towards efficiency.

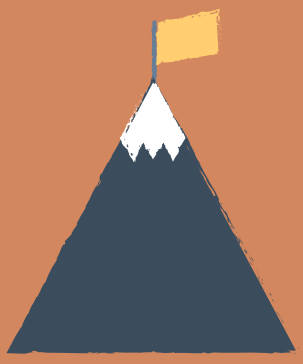
Downplaying energy conservation and overestimating the impact of motivation (or behavioural designers' ability to increase motivation) has not been lost on technology companies developing digital interfaces that designed to achieve more than just pulling down barriers to behaviour. Their quest for ultra-simplicity makes behaviour minimally 'costly' in all underlying cognitive processes (e.g. attention, perception, impression, comparison, evaluation, selection, decision). In turn this shapes the expectations of everyone who lives a digital life (not just Millenials) and has implications in terms of interface and service design for all organisations like government, public services and the third sector, not just the technology and service sectors like financial services.

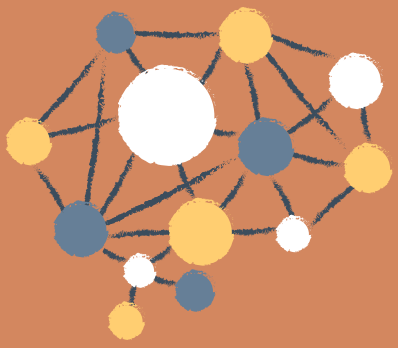
Downplaying energy conservation and overestimating the impact of motivation ... has not been lost on technology companies...

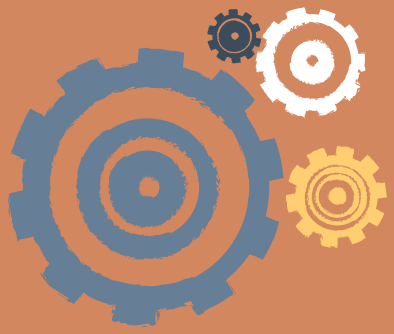
SPEEDING AND ATTENTION

Psychologist Vanessa Bowden conducted an experiment in Western Australia with drivers using a driving simulator. By varying the speed level at which drivers were told they could be fined for speeding (1, 6 or 11 km/h), the researchers observed that the stricter speed limit had a strong impact on people's ability to detect objects in their peripheral vision. The researchers concluded that "drivers' mental and visual resources were being used up by paying extra attention to the speed monitoring task". After the experiment was completed, subjects that were given the stricter speed limit also rated their driving task as more demanding. In other words, the cost of the desired behaviour (monitoring one's speed) is that a concurrent behaviour (monitoring the roadside for possible danger) is potentially compromised because attention resources are limited. Above and beyond motivation (engaging executive control) as an obvious factor to monitoring one's speed, the results seem to point to ability as a second factor affecting behaviour.
A typical example would be urban areas where speed limits can change frequently (e.g. between 50 and 70 km/h) and drivers have to attend to and process a large number of stimuli at all times including noticing the signs signalling speed change and monitoring their speed.

Five forces on behaviour







When all the lenses of various behavioural science fields are superimposed, a simpler and clearer view of the internal forces at work on behaviour becomes apparent: **five key forces work together to shape our behaviour:**

1. Goals

The huge variety of goals-directed behaviours that we can engage in is one of the hallmarks of being human. Some of these goals are conscious (getting a new job, finding a destination for a holiday, deciding to join a local volunteer group) and they shape our behaviour through our plans and intentions. Many of our goals and motivations may be hidden but our behaviour is still influenced by self-reflection and future planning. We may want to join a community group (e.g. Lifesavers at the beach) to socialise with other people, serve the community and get fit, but unconscious goals may include boosting relationship prospects. Though we may be oblivious to the motivation behind our goals, these goals inform our conscious plans for action and our intentions. Commitment (especially when shared with others) exerts strong influence on behaviour because of our tendency to behave consistently with our commitments.

Many of our goals and motivations may be hidden

2. Pathways

Mental pathways are created from recurring experiences, familiar situations and environments, the memories we create and recall, the behaviours we stick to and reinforce over time. Associations, schemas, habits, urges and 'addictions' all use pathways. Pathways make behaviour easy. Pathways also make behaviour rewarding, especially if the reward is immediate rather than delayed.

3. COGs

Pathways are individual and shaped by our unique experiences but we all share many cognitive mechanisms (COGs) that make behaviour efficient. We all used the same reflexes as infants and as adults we still turn our head and pay attention to sound, contrast and movement and our attention runs selectively by intent or necessity. Many cognitive mechanisms, not narrowly

reflexive in nature are constantly at work to shape our behaviour, particularly judgment and decision making: We are biased towards the status quo and default choices, we feel losses more than equivalent gains[26], we overvalue the present and discount the future, etc. In social interactions, regardless of culture or environment, we share similar hot buttons like fairness, status and autonomy: We respond strongly to unfair situations, other peoples attempts at belittling us or their efforts to control our behaviour if not our life. We use these buttons and mechanisms as they have enormous adaptive value for individuals as part of families, communities, workplaces and other organised groups and societies. They serve us well but not always.

we all share many cognitive mechanisms ... that make behaviour efficient

4. (Negative) emotion

Behaviour can be strongly reinforced by rewards and it can be equally reinforced by removing a negative state of mind. Of course, motivation can also be impacted by positive states of mind including mood; but we go to great length to avoid negative 'affect' (e.g. mood, feelings and emotion such as uncertainty and disappointment). Our behaviour including our choices and decision processes reflects the strong impact that negative states have on us[27]. The 2001 review of over 200 studies by social psychologist Roy Baumeister and colleagues conclusively shows "bad to be stronger than good in a disappointingly relentless pattern" whether it be close relationship outcomes, social network patterns, interpersonal interactions, learning processes, memory, self-image, etc[28]. Negativity bias (negatives resonate much longer and stronger than positive experiences) exerts significant force in shaping behaviour. Thus, there are many more ways people use to escape negative states than to induce positive ones as the above authors have noted. Many cognitive mechanisms are often engaged to avoid negative affect, for example:

- Because of confirmation bias (and its ostrich effect cousin) we tend to search for, pay attention to and remember information in a way that confirms our existing opinions and perceptions. We are often annoyed at the idea of changing our opinions, abandoning a stereotype and updating how we size

up and look at a situation as well as the mental structures that keep everything in memory for future use.

- With choice-supportive bias we tend to remember our choices as better than they were in reality and cognitive dissonance pushes us towards consistency: We try and avoid the discomfort of a gap between opposite beliefs or unaligned attitude and behaviour.
- We use anticipated regret to inform our decisions because we want to make 'right' choices and not feel the judgment of others about our decisions: We automatically process situations to reduce or eliminate the likely negative emotion from regret, whichever way regret sets in.
- Present bias and temporal discounting causes us to give more weight to negative consequences that are immediate and ignore negative consequences that will only be experienced in the future.
- Because of illusion of control, we overestimate our level of influence over our environment: It is emotionally less stressful to think that we are in control rather than admit that our control is limited.
- We prefer to pull out and defer some choices rather than having to deal with choice overload and feeling overwhelmed about all the options available to us.
- Engaging zero-risk bias plays to our dislike of uncertainty and our desire to minimise negative outcomes.

there are many more ways people use for escaping negative states than to induce positive ones

5. Effort

Energy conservation shapes behaviour. Given limited energy resources, the impetus to minimise effort (physical or cognitive) remains strong and is only balanced by the strength of motivation. We have a tiny RAM-like memory so we are made to run on auto-pilot and not think everything through every time. Pulling down barriers to behaviour is paramount but making behaviour really easy is difficult. Yet, it may be easier than finding ways to increase motivation given that we have to face cognitive costs that are pervasive but often unnecessary (e.g. the result of poor process design).

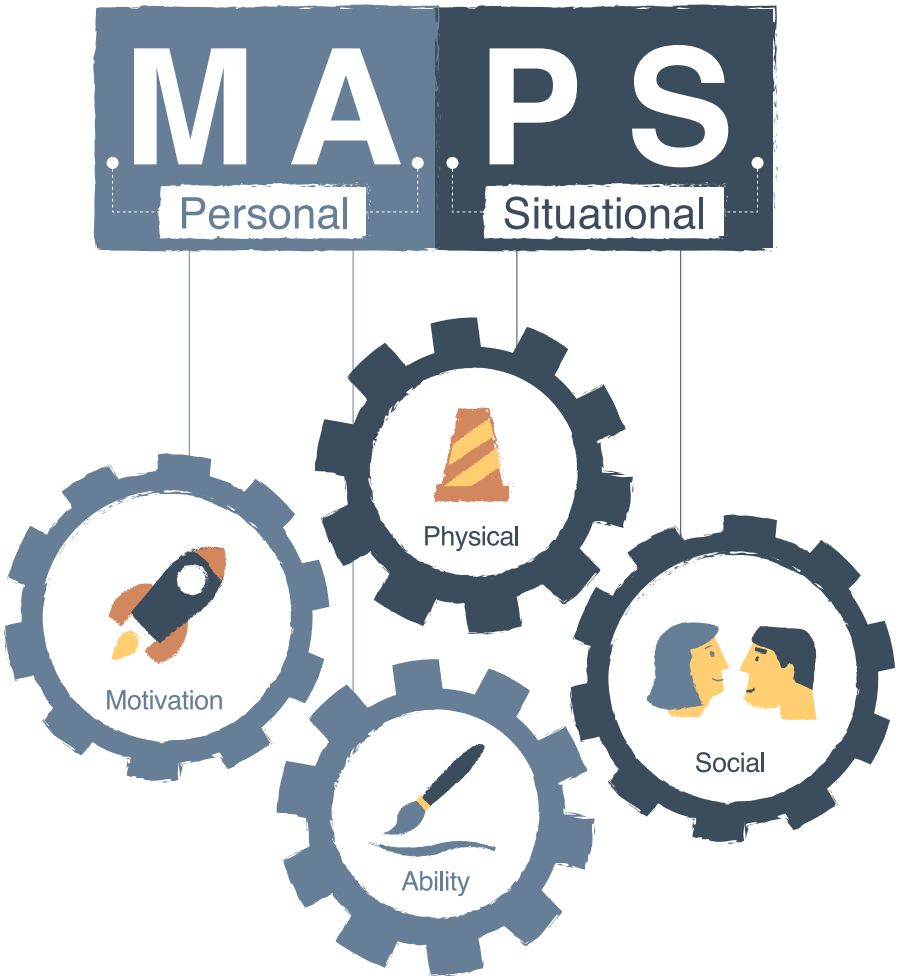
MAPS: Personal and situational

Behaviour is the result of the interaction of personal and situational or contextual forces.

The five internal forces (goals, pathways, COGs, negative emotion, effort) shape behaviour from the inside as they interact with the physical, social and cultural environments that make up the context of behaviour.

The Ipsos MAPS framework (Motivation, Ability, Physical, Social) looks at:

- Personal factors articulated around the forces that reflexively, habitually and reflectively impact our motivation and those that inhibit or constrain and trigger or enhance our ability to perform a behaviour.
- Situational factors that reflect the social forces bearing on our behaviour as well as the physical and temporal (moment, time, season, etc.) environment that can greatly impact our perceptions of a situation, the impressions we form, and the behaviour we engage in through various triggers.



Motivation

There are many roads to increase or decrease motivation. Tapping into hidden motivations or conscious goals, intentions and commitment is one road. Relying on an incentive or a reinforcement mechanism (e.g. reward or negative consequences) to initiate and shape a new habit is a different road. Using cognitive mechanisms like present bias, temporal discounting or our aversion to losses can also greatly impact motivation.

Because motivation can be short-lived, inconsistent and fickle, the more roads to motivation that can be mustered the better. Technology as well can be harnessed to shore up motivation: Augmented reality (AR) is being used to create experiences and impressions for professional carers to better appreciate what it is like to live with Alzheimer disease. In this situation motivation is directly impacted from self-reflection upon the AR experience as well as emotion stemming from a sense of enhanced sympathy with the patient's situation.

Ability

Some behaviours are hindered by our physical abilities (walking ten or more minutes to the bus stop or station to take public transport). Others are simply hindered by lack of awareness (not being aware of healthy options) or lack of skill (being able to decipher detailed product and ingredient information). Cognitive mechanisms can also hinder our ability to change behaviour (e.g. natural bias towards the status quo). In many situations, people need to take new information or cues on board to change their impression and their behaviour and confirmation bias becomes a cognitive obstacle to our ability to perform the behaviour. The environment we create also plays a part in ensuring we have the ability to perform a behaviour: Many devices provide a way to self-regulate our behaviour (e.g. an app that takes pictures of our plate and counts calories or a GPS-based app that tracks the number of steps we make every day). In Queensland, beach goers can check themselves under a UV ray light to check that they have enough

sunscreen on. Hovering over people using digital technology is showing to have great potential to help patients in healthcare and people in everyday life (from brushing teeth to calorie counting at lunchtime to sleep monitoring at night). Technology can increase our physical and cognitive ability to perform specific behaviours.

Physical environment

The physical environment not only provides cues as to why behaviour is not happening (e.g. the bus stop is too far, the road sign is not visible, the healthier products are not located at eye level, the people at my workplace binge drink on Fridays, etc.) it also offers myriads opportunities to encourage behaviour: For example by unobtrusively encouraging people to imitate other people (a reference group or a specific messenger) or by adding visuals to text information or by priming people with a visual or sound or scent so that thoughts or options become more available to their mind and more likely to bear on their impressions, preferences and behaviour at the right moment. The environment can also influence behaviour by changing the architecture of the choice environment (e.g. people must make active choices) or creating cues that make desirable default choices more visible and/or more attractive (e.g. use of contrast or movement or colour on screen).

Time can also be used as clock time (e.g. commuting hours), moment (a quiet moment at the park at lunch time) and season (Spring, tax time, public holidays, nearing retirement, moving house or jobs, etc.) to disrupt existing patterns and behaviours, create meaningful associations leading to new behaviours or encourage relevant behaviours because we can change impressions and preferences in situ and closer to the moment.

Social environment

Although everyone thinks they are their own person, individual behaviour is very strongly shaped by the group, the neighbours, the family, the colleagues at work, the other club members and society

at large through a range of social norms. We can be influenced by what we see other people do or what we think they expect us to do. We are more likely to follow-up on commitments if they happen to be made publicly (or at least in the eye of significant others). Our impressions, judgment and decisions are influenced by an innate sense of fairness or a learned sense of obligation to reciprocate.

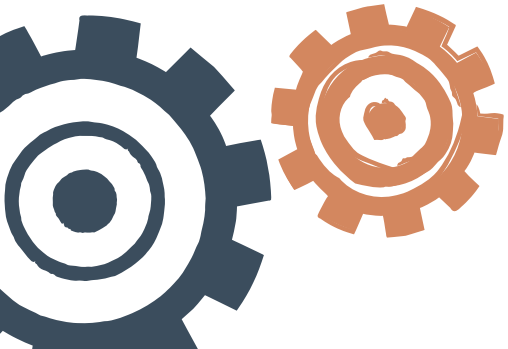
The social environment is also shaped by the shifting sands of attitudes (e.g. the role of women, the place and welfare of children, the rights, visibility and role of minorities, the acceptable sexual mores). This is compounded by the tsunami of social media as the combined force of hyper-connectivity, a fresh sense of activism and the demands for transparency and a voice in more areas of commercial and public life. All these provide new avenues to harness social forces in our quest for behaviour change.

what needs to change so that behaviour changes?

Ipsos has developed a set of behavioural cards for self-education as well as use in workshops and brainstorms. The cards do not reflect every possible cognitive and behavioural mechanism, but they help users avoid the pitfall of availability bias by making many important and oft-encountered behavioural forces and mechanisms equally available to mind. The cards use the MAPS categories of Motivation, Ability, Physical and Social plus an additional category for the different types of intervention mechanisms that can be considered (e.g. re-framing, priming, choice architecture, habit formation, commitment).

The key question along the path to behaviour change is always "what needs to change so that behaviour changes?". Six basic questions form an easy guide to the MAPS process:

1. Which people show the behaviour or make the decision more than others?
2. What is the context of the behaviour and when does the behaviour take place (and needs to take place)?
3. How are choices and options presented to and perceived by people?
4. What information, knowledge and skills do people have (and need) in relation to the behaviour?
5. What motivates the behaviour, reflexively, habitually or experientially, and reflectively (i.e. consciously)? Are people's impressions and judgment affected by known biases? Are they adopting shortcuts in the decision process?
6. What social forces bear upon the decision or behaviour?



4 i: A process to successful behaviour change

4 i AND THE ROAD TO BEHAVIOUR CHANGE

The 4 i's **(identify, insight, intervention, improve)** are an easy and simple process to design successful behavioural interventions. The process is easy because it is natural and intuitive starting with identifying the behaviour that we want to change.

1. IDENTIFY BEHAVIOUR:

In some cases, this is straightforward (e.g. not watering except on weekends in times of drought). In other cases, it requires some work because behaviours may come in chains (all the behaviours we need to change on the way to changing the one of most interest to us) or there may be too many behaviours that we can try changing at the same time (e.g. there are more than fifty behaviours that are relevant to an energy-efficient household) and we need to work out which are likely to be most effective or most feasible. Regardless of whether the relevant behaviours are identifiable, another question is whether those behaviours clearly relate to the policy outcome or some sort of public good. For example, government policy may be to reduce the number of sport injuries among children and youth by half and key behaviours identified are warm up exercises and cooling down.

An additional question to raise at the time behaviours are identified is how change in those behaviours will be evaluated objectively. The gold standard in experimentation is a randomised controlled trial but this is not always feasible for a variety of reasons (e.g. legal or practical). Conclusive evidence of behaviour change may be more elusive with other designs like pre-post or quasi experiments.

2. GAINING INSIGHT:

MAPS provides a lens to look at behaviour, its constraints and levers, its hurdles and opportunities in a systematic and comprehensive manner. Regardless of which framework is used, the most important perspective is to understand behaviour in depth and in context. In depth means to understand people on the inside, how different internal forces shape their motivation or their attention or the decision making processes they engage and don't engage. In context means that the behaviour of the person is always considered in its particular situation (e.g. place, time and social environment). Behaviour that looks irrational because it does not meet the normative benchmark of what behaviour ought to be, suddenly makes sense when we start looking at

people's environment (at home before going to work, in public transport on the way to work or on their way for the school pick-up, at the park, the gym or a local café on the week-end or on vacation or special holidays). From this perspective, place and moment may well provide the key to finding a trigger to behaviour.

Within the Ipsos 4 i process, insight is the critical component to developing successful interventions, actions or campaigns. The creativity at the heart of many interventions relies first and foremost on insight. When interventions fail or are insufficient to change behaviour, the reason is almost always that the behavioural analysis was neither systematic (looking at all facets of the person interacting with the physical and social environment) nor perceptive: Whatever needed to be seen was overlooked. Creativity and the success of interventions and actions depend on both.

Many sources of information can feed into a behavioural analysis and provide insight into behaviour. It is rare that all types of sources are available for a given behavioural issue but more often than not there is more at hand to inform our understanding of why the behaviour is happening (or not).

Surveys are sometimes maligned because they can distort our understanding, but this is almost always the case when surveys try to elicit what they were never meant to elicit. For example, survey quickly lose validity when used to elicit deep motivation or uncover memories of sequences of moments or events. In reality, some of our motivations always stay below our radar and we do not remember life as a film but rather as a series of snapshots. However, surveys, especially short mobile surveys closer to the moment of behaviour can provide valuable insight into thoughts, feelings, intentions and behaviour (albeit reported behaviour). The easy capture of photos and video in situ also makes visual mobile anthropology a valuable addition to mobile surveys.

Surveys are usually well suited to measuring beliefs and attitudes within a population as well as the social norms that influence their behaviour. Besides, survey data from sufficiently large samples can also provide insights into population subgroups whose specific beliefs and attitudes lead to different behavioural patterns (or population subgroups who share the same behaviour but for entirely different reasons in terms of their beliefs, attitudes, social and environmental forces). Different groups in the population may require different

interventions to change their behaviour. More complex behavioural challenges are generally unsuitable to the development of 'one size fits all' interventions.

Ethnography taps into context (place, time, social) to shed light on behaviour whether it be workplace, home, computer screen, shopping mall, supermarket aisles, doctor's surgery or the bank's local branch (or its online avatar). Ethnography shows how apparently small details can provide the key to unlock a behaviour.

During the course of an Ipsos ethnographic study on savings among disadvantaged groups in the population, we found out that one of our participants kept their savings in tins of syrup high up on a shelf. As a saving device, the tins remain visible but out of reach providing a simple but powerful mechanism to reinforce saving behaviour as more tins are added on the shelf. As we move towards digital everything, how can digital technology create simple yet effective mechanisms to reinforce saving and other behaviours?

Passive monitoring, as a continuous and inexpensive form of ethnography, collects huge amounts of data on location, web site visits, app use and an increasing array of behaviour-based as well as mind and body metrics.

The creativity at the heart of many interventions relies first and foremost on insight.

The astronomical amount of data captured everyday from more and more facets of our lives is food for machine learning algorithms (MLAs). Machine learning is still the workhorse of artificial intelligence and is peerless at finding patterns in data. Those patterns often provide real insight into behaviour, uncovering configurations of factors that modulate, inhibit or enable behaviour. Other tools like Bayesian networks can disentangle the complex links between our thoughts and our overall impressions, preferences or behaviours. They enable us to peek into cognitive structures and provide (visual) insight into behaviour and how to change it.

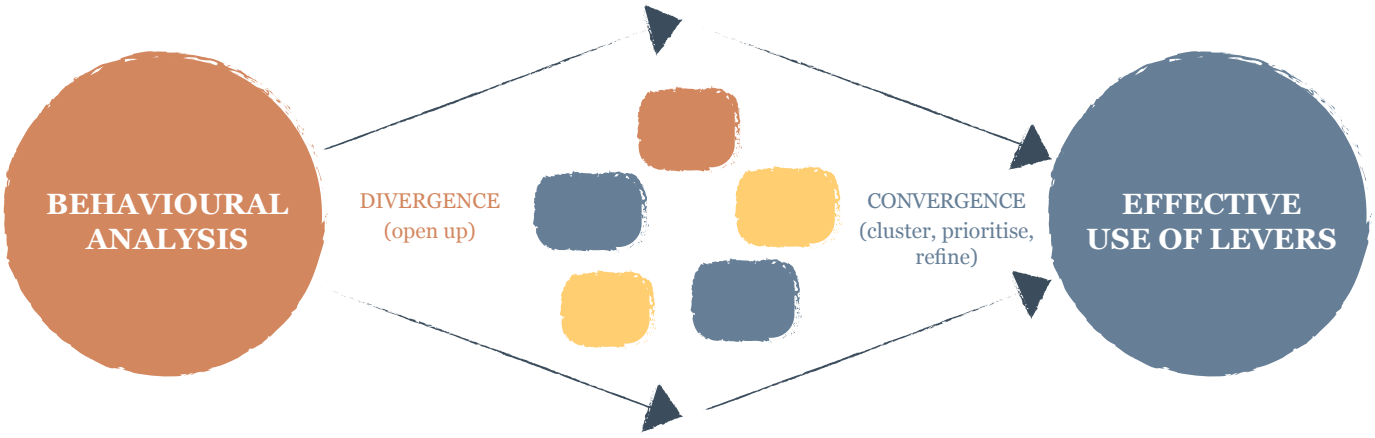
MLAs and other tools however do not make sense of patterns. They are the eyes that see. Patterns and structures plus knowledge of how behaviour works enable those engaged in behavioural analysis to be more perceptive.

3. INTERVENTIONS:

We organise workshops with stakeholders to share MAPS-generated behavioural insights and discuss possible intervention modes. We conduct divergence-convergence creativity sessions to develop a large number of ideas as to how a particular lever could be used in different types of intervention. At the start of the divergence session we conduct creativity exercises designed to switch participants' brain networks from conscious reasoning to a more relaxed and creative state (from beta to alpha and theta waves). At that point participants (often from different backgrounds and occupations) discover radically new ideas. The convergence section is designed to tap into reasoning by prioritising the ideas that were elicited, evaluate their feasibility and how they can be implemented in a particular context.

There are other roads to creativity that are not corporate or collective in their *modus operandi* and do not require creativity exercises to switch our creative brains on. Once insights into a behavioural problems have been identified, constraints, blocks, possible points of leverages, etc. a single individual can come up with creative ideas and solutions to behavioural challenges through several avenues:

1. Choose a place that is clear of distraction, bright lights and noise (including devices). Get comfortable, focus on the behavioural issue for a while and then let your mind relax and drift off. As ideas or possibilities come up to consciousness, make sure you write them down or record them or they'll disappear, sometimes for ever.



2. Focus on the behavioural challenge before you go to bed and use the relaxed time before you fall asleep (hypnagogic state) or in the wee hours of the morning (hypnopompic state) to let your mind wander off to possible solutions and ideas. Harvest the results in the morning. Again make sure you write ideas down or they may disappear if you are not fully awake and trying to retain them.
3. Go for a walk. Don't try hard to think, just relax and be mindful of your surroundings so the behavioural challenge can simmer on the backburner of your mind.
4. Do something that uses your hands as this activates the whole of your brain. Cooking, knitting, clock fixing, mechanical work with fine motor control and all sorts of manual hobbies and activities are suitable to induce a relaxed state, and let our mind wander off. Solutions, breakthrough and ideas will rise up to consciousness seemingly from nowhere.
5. Gardening may be the most effective avenue because it combines moving around and manual work, and the environment of trees, plants and flowers is conducive to a relaxed state.

The chief enemy of creativity is good sense.

— Pablo Picasso, artist

4. IMPROVING:

Design thinking and its fast loop around prototyping and testing has injected more speed into designing and improving products or services (real life or digital). However, improving an intervention is conditional to determining the effectiveness of the intervention in the first place. Randomised controlled trials (RCTs), long used in the private sector from medical to marketing research, have gained traction as evidence-based mechanisms of evaluating and improving the effectiveness of public service delivery and generally improving the outcomes and cost-efficiency of government processes and initiatives.

Behavioural challenges may not be suitable to RCTs, the gold standard of experimentation, but other types of design may still provide enough evidence of effectiveness depending on how stable the broader environment is (e.g. for pre and post design) and how treatment and control groups can be formed if randomisation is not feasible. Many factors can affect the extent to which an experiment has external validity (i.e. can be generalised from — ideally a live — experiment with a sample to total population).

In this maelstrom of constant change, the behavioural mechanisms underlying behaviour are not changing any time soon

Behavioural change problems can also be complex and RCTs limited in terms of accounting for all underlying change beyond well-defined behavioural metrics. In many situations, behavioural change is not the short term result of a single intervention neatly captured by the short term results of a RCT. A more sophisticated evaluation framework is required along with a more developed theory of change (ToC): A "comprehensive description and illustration of how and why a desired change is expected to happen in a particular context" as the result of a particular intervention or program.

Behaviour in a changing environment

The course of history shows that every technological revolution changes people's lives as individuals and groups (small or large). The environment shaped by

the activities of commercial and NGOs organisations and the policies and programs of public sector organisations uses evermore digital technology embedded in more communication devices and more connected objects than we can think of. The environment in which behaviour takes place will continue to change unabated for some time if we are indeed at the cusp of a new age in how some human societies operate. Therefore, as we change our environment, our behaviour is changing in response to new environments.

Digital technology is no different of course, sometimes for the better, sometimes for the worse: Digital toothbrushes help people form better oral care habits, social media groups help people to connect and exercise together at the local park but smartphones also endanger their lives and the lives of others when crossing the road or text-driving. The possibilities to use technology (and not just digital) to shape behaviour are only matched by the extent of human imagination.

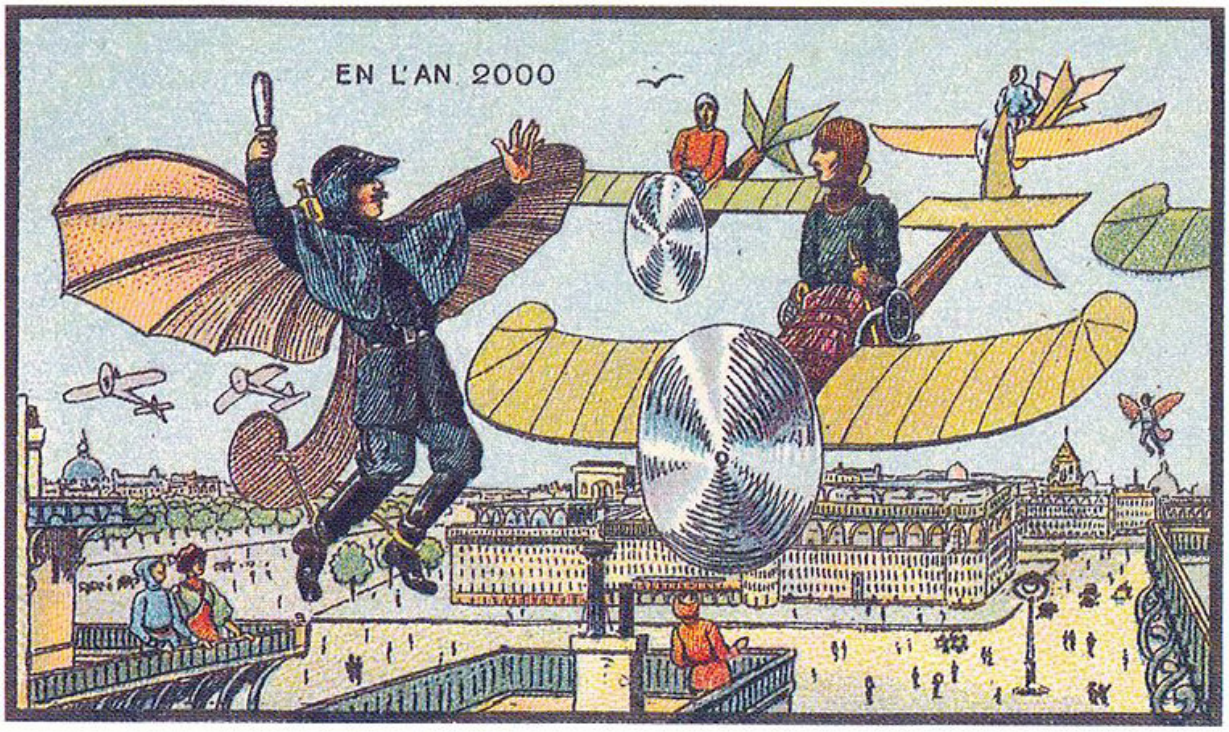
In conclusion, people may well change from adaptation to new environments on the very long phylogenetic time scale but in the shorter time scale of our lives, we are unlikely to change much, if at all. In this maelstrom of constant change, the behavioural mechanisms underlying behaviour are not changing any time soon. For behaviour change practitioners, these mechanisms are possibly the only thing that does not change between sunrise and sunset. Making sense of behaviour in context, anticipating behaviours, creating environments through technology or otherwise that encourage behaviour and leveraging social forces to shape behaviour all rely on a razor sharp understanding of how we are made. As we charter a way (but multiple roads) to behaviour change, behaviour will continue to reflect the (now fast) changing dance of people and their context, whoever the people are and whatever their context is.

Five key behavioural levers for the digital cognitive era

At the turn of the twentieth century, a number of French artists were asked to create a series of artworks illustrating how they thought life would look like in the year 2000[29]. Unsurprisingly, many of these artworks describe the use of autonomous machines replacing or assisting many everyday jobs like tailors, barbers, firemen and policemen, house cleaners, farmers, and, expectedly, the military. Some artworks however are off the mark not so much because people from 1900 got twenty-first century technology wrong, but because they did not take into account behavioural mechanisms.

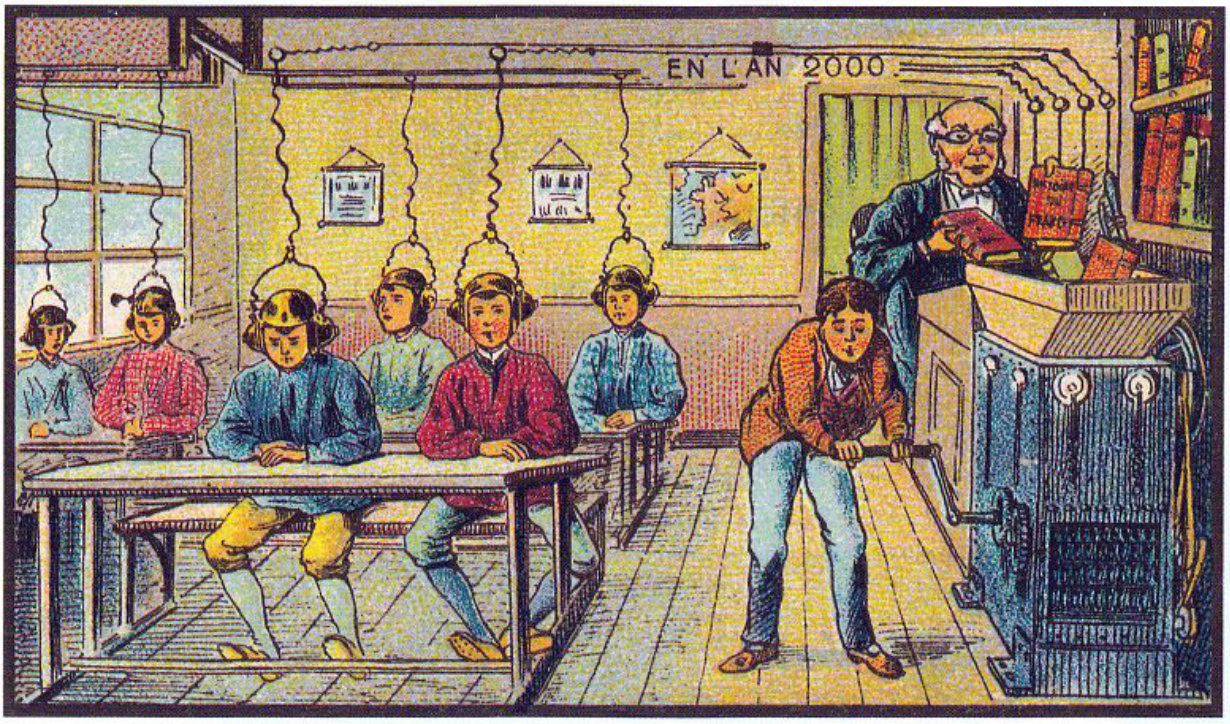
The artwork showing individual and public transport in the city moving up (leaving city streets to pedestrians only) fails to appreciate that attention mechanisms and our processing abilities make this move highly dangerous for us but entirely feasible for drones delivering the latest fashion items or Friday night's pizza straight to our door.

...artificial intelligence (AI), and AI-enabled robots and autonomous machines are about to profoundly reshape the way people live their lives...



The illustration imagining the modern classroom captures the idea that textbooks and learning material are somehow crunched into a machine and knowledge delivered straight into the ears of eager students. The reality of course is that computers have a visual interface because people are primarily visual. Thus high definition computer screens are the ideal vehicle to capture attention through supernormal stimuli. Teachers standing at the front of the classroom may find it near impossible to compete for attention against video games and other highly stimulating content that appears and disappears from students' screens with a quick and unnoticeable 'swipe'. In this case, the technology may lead to less rather than more or learning in the classroom.

At the dawn of the cognitive era where artificial intelligence (AI), and AI-enabled robots and autonomous machines are about to profoundly reshape the way people live their lives, understanding how behaviour works looks more important than ever for social researchers, public policy makers, campaign developers, urban and public service designers and many other professionals.



Here are five behavioural mechanisms that potentially offer substantial scope and leverage to impact and shape behaviour through the use of digital technology in many moments of our lives:

1. **Attention** (e.g. constant renewal of stimuli, supernormal stimuli and increased in-the-moment motivational salience).
2. **Perception and impression** (e.g. augmented and virtual reality to see and feel options differently).
3. **Social forces** (e.g. social media and hyper-connectedness).

...computers have a visual interface because people are primarily visual.

4. **Reinforcement** (e.g. rewards in patterns that avoid habituation).
5. **Energy conservation** (e.g. outsourcing cognitive functions like search, memory, comparison, self-regulation, evaluation and making everything easier in-the-moment with AI and robotics).

End notes

1. In Tim Harford, the undercover economist: What's next for behavioural economics http://timharford.com/2014/04/what-next-for-behavioural-economics/

2. For example, the Chinese tradition puts strong emphasis on reflective thinking as evidenced by the writing of Confucius on gaining wisdom (e.g. making good choices) in three ways: "first, by reflection which is noblest, second by imitation which is easiest and third by experience which is bitterest".

3. In the state of Victoria, the implementation of the policy in 2001 had led to a sustained reduction of casualty crashes of 12% overall and between 25% and 40% for fatal and serious injury crashes involving pedestrians.

4. The social norm experiment is available at https://www.youtube.com/watch?v=o8BkzvP19v4

5. Normative messages and pluralistic ignorance: being wrong on the norms matters, Ipsos Mori, Behavioural Exchange, London 2015.

6. Videos of all public space experiments in the 'greed eats' series are available at http://www.gierfrisst.de/index.php (click on Gier frisst Vertrauen to watch the trust experiment)

7. A summary of the research is available at http://www.acrwebsite.org/volumes/v43/acr_vol43_1019975.pdf

8. http://www.who.int/violence_injury_prevention/violence/norms.pdf

9. Five recent campaigns in India can be found at http://homegrown.co.in/indias-five-most-creative-campaigns-to-end-violence-against-women/

10. Seven plus or minus two is probably optimistic. After more experiments with a broader range of people (not just undergraduate psychology students) psychologists subsequently revised down our working memory capacity to between 3 and 5. Psychologists have also developed arguments as to why our small RAM capacity is a strength rather than a weakness (some information search seems to be most efficient in groups of size 3.5 on average and chunking enables associations without causing confusion or distraction).

11. Putpocket: https://www.youtube.com/watch?v=OpsbHht9M6E

12. Applying behavioural insights to return to work http://bi.dpc.nsw.gov.au//assets/Behavioural-Insights/Library/Applying-Behavioural-Insights-to-Return-to-Work.pdf

13. The original film of the gorilla experiment can be found at http://theinvisiblegorilla.com/gorilla_experiment.html

14. Stuart McMillen has created an engaging visual story of supernormal stimuli and how they affect animals and people at http://www.stuartmcmillen.com/comics_en/supernormal-stimuli/#page-1

15. The story about the male jewel beetle and the effect of supernormal stimuli can be found at https://www.youtube.com/watch?v=t1pOZbytOhE

16. The supernormal features of our modern world were clearly anticipated by ethologist and Nobel Prize winner Konrad Lorenz in his work on ethology and comparative psychology.

17. Animal experiments have long used much more intrusive neuro-measurement equipment and the ethical questions are not going away, especially with the rise of animal rights activism.

18. The medial forebrain bundle connects parts of the midbrain to specific parts of the limbic system.

19. PRIME for Plans, Routines, Impulses, Motives, Evaluations

20. Curious George started his life in France as Fifi then became Zozo when his creators moved to the UK and finally George in the US (they chose Zozo as a name in the UK because George would have shared his name with the King …)

21. A video of the experiment with parents and children in Brazil is available at https://www.youtube.com/watch?v=wiv8W68YMH4

22. https://www.youtube.com/watch?v=nSUJ_2uTq6I

23. Glycolysis produces very quickly a small amount of ATP, oxidative phosphorylation uses a by-product of glycolysis (pyruvate) to produce a much larger amount of ATP.

24. http://www.techrepublic.com/article/ibm-watson-the-inside-story-of-how-the-jeopardy-winning-supercomputer-was-born-and-what-it-wants-to-do-next/ http://www.redbooks.ibm.com/redpapers/pdfs/redp4985.pdf

25. US, Canada, Brazil, UK, France, Germany, Switzerland, Denmark, India, China and Australia

26. We share loss aversion across cultures and societies. This is evidenced in numerous languages (Indo-European and other groups) that display asymmetric valuation of gains and losses in their equivalent of 'bird in hand is worth two in the bush'.

27. Industrial design legend Raymond Loewy understood the tension between our desire for novelty and surprise and our preference for familiarity. Innovation can create as much excitement as it creates uncertainty and fear, two negatives that 'kill off' behaviour.

28. http://bobsutton.typepad.com/files/bad-is-stronger-than-good.pdf

29. The 24 artworks are available at http://publicdomainreview.org/collections/france-in-the-year-2000-1899-1910/

Further reading

THE REASONABLE ROAD TO BEHAVIOUR

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