



Data Science in Public Policy –
The New Revolution?

Do Hoang Van Khanh

Mindful Choice-Making

A Conversation with Eric Johnson

The Hidden Costs of Behavioural
Interventions

Walter Theseira and Ong Qiyan

Nudging: Why, How, What Next?

Kok Ping Soon



ETHOS

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The Editor-in-Chief, ETHOS
Civil Service College, Singapore
31 North Buona Vista Road
Singapore 275983
Fax: +65 6775 8207
Email: ethos@cscollege.gov.sg

EDITORIAL TEAM

Alvin Pang – *Editor-in-Chief* | Sharon Tham – *Guest Editor* | Sheila Ng – *Deputy Editor*

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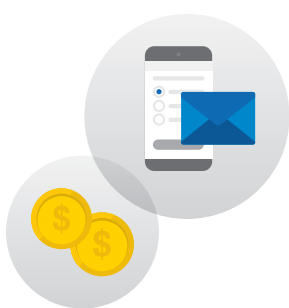
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Behavioural insights (BI) have had a positive impact on policy making and the delivery of public services. Low-cost “nudges”, a term popularised by Richard Thaler and Cass Sunstein, can lead to significant changes in behaviour — an advantage too good for many administrations, faced with tightening fiscal budgets and manpower constraints, to ignore.

While incorporating behavioural considerations into policy may not be new, BI suggest that people are much more automatic, rather than deliberative, in the way we think; that we are more easily influenced by prevailing social norms than previously thought. Our mental models may prevent us from making decisions we would have wanted. In areas such as public service delivery and enforcement, applying BI to public policies has helped citizens to make decisions that are more in line with their goals. Singapore’s public agencies have deepened their insights by conducting randomised controlled trials to test the efficacy of new ideas, including those adapted from other contexts. From

helping citizens keep track of medical appointments and financial planning (*p. 16*), to making payments on time to avoid penalties (*p. 34*), BI can help public policies and programmes work better for citizens.

BI can better inform domains where behaviour is particularly hard to change. Staying healthy is a good example because behaviour is often entrenched in daily habits and lifestyles. Getting people to eat more healthily, exercise more, or quit smoking is no easy task, even with the use of behavioural interventions. BI applications may need to be refined to ensure greater timeliness and saliency, and to tap on social norms in specific contexts (*p. 44*). Applying BI also reduces barriers and increases the relevance of more environmentally friendly practices such as recycling and using appliances that are more energy efficient (*p. 25*).

However, despite its wide range of applications in public policy, BI has sometimes been criticised for being too intrusive on an individual’s freedom to choose. Others have labelled it a fad,

since giving due consideration to how people think and behave is not new.

To address these criticisms, we need to design more mindful choice environments so that people get to think through their choices, improving their own welfare as well as that of society at large (*p. 76*). In particular, there could be hidden costs when applying BI to policy, for instance, when nudges evoke negative emotions to get individuals to change their behaviour (*p. 68*). We should thus build on past insights to sustain, customise and scale up interventions that work better for society (*p. 63*).

The consensus among policymakers, practitioners, and experts featured here is that a BI approach is not an end in itself. Neither is it the silver bullet to all our policy challenges (*p. 6*). The full potential of BI cannot be reached unless we effectively combine its use with other tools such as data science, which offers new possibilities in the way relevant information is collected, analysed and presented (*p. 52*). More importantly, BI is just one of the many tools needed for public sector innovation to address the increasingly complex problems we face. To resolve these challenges, the whole of society — not just the public sector — will have to make more thoughtful and informed choices (*p. 82*).

I hope that the expert views and local BI efforts convened for this issue of ETHOS contribute to future efforts and learning in the community of practitioners and supporters. I wish you an insightful read.

Sharon Tham

Guest Editor

Behavioural Insights Issue

Nudges: Why, How and What Next?

What does the use of behavioural insights mean for public policymaking and service delivery in Singapore? A practitioner shares his views.

BY
KOK PING SOON

Kok Ping Soon is Deputy Secretary (Development) in the Ministry of Manpower (MOM). He champions innovation and service excellence to transform MOM into a trusted and citizen-centric organisation. He is Chief Steward of the Service Delivery Leadership Council and a member of the WEF Global Futures Council on Behavioural Sciences.



Shifting Public Behaviour: Early Policy Measures in Singapore

Policymakers overseeing transport in Singapore were in a conundrum: Two decades after the Area Licensing Scheme (ALS) was first introduced in 1975, traffic congestion in the Central Business District, which had been reduced by over 70% in the initial years, had started to creep up again.

Priced as a fixed fee for the day or month, the ALS had a major drawback: the *sunk cost effect*. Individual drivers tended to continue and even increased the frequency of driving because they had already bought an ALS license. Car owners, who had come to accept the ALS fee as part of the cost of driving in Singapore, were driving *more*, rather than less. Was there a better way to make the costs of driving more salient?

In 1998, the Electronic Road Pricing (ERP) system was introduced. Drivers were charged on a pay-as-you-use basis. This reduced the sunk cost effect of the ALS. It also gave policymakers the flexibility to set congestion charges based on prevailing traffic conditions. In 2008, the cost of using a congested road was made even more salient with monitors on gantries displaying real-time ERP charges. Some joked that ERP stood for “Everyday Rob People”. Every time a driver passes under a gantry, they are reminded of the cost of road usage by an audible beep.

While increasing saliency worked in managing traffic congestion, it was

not as applicable to policymakers in the Ministry of Health (MOH), who hoped to increase organ donorship in the 1980s. Many countries then operated under an “opt-in” policy, where someone willing to be an organ donor needed to give explicit consent to doing so. Public inertia resulted in there being far fewer organ donations than transplants needed.

Understanding the power of defaults, the MOH enacted the Human Organ Transplant Act based on an “opt-out” model in 1987. Under the Act, individuals are presumed to have given their consent to donate organs upon death unless they have opted out of the default. As a result, the number of deceased donor kidney transplantations increased from five per year before the Act¹ to 442 from 2004 to 2015.²

Electronic road pricing and organ donations are just two examples of the application of behavioural knowledge to public policy in Singapore. We have always adopted a pragmatic approach to policymaking. While it may not have been codified as behavioural insights, our public agencies routinely consider how individuals think and make decisions when designing and implementing policies.

Nudge: A New Name for Applying Behavioural Sciences to Policymaking

Richard Thaler and Cass Sunstein’s 2008 book, *Nudge: Improving Decisions about*

The author wishes to thank Sharon Tham (Civil Service College) and Wong Hefen (Ministry of Manpower) for their invaluable contribution to the drafting of this article.

Health, Wealth and Happiness, triggered a wave of global interest in applying behavioural insights to public policy issue. Drawing on the emerging disciplines of behavioural economics and social psychology, “Nudge Theory” explains why people often act in ways that are against their interests, which classical economics define as the maximisation of welfare. Faced with tight fiscal situations, policymakers worldwide were excited by the potential of nudges: small, low-cost changes that could make a big difference to the effectiveness of government interventions. As a result, “nudge units” sprung up in governments across the world.

In 2010, the UK under David Cameron’s administration set up a Nudge Unit (known formally as the Behavioural Insights Team) of fewer than 10 people, in the Cabinet Office.³ Starting off as a two-year experiment, it was tasked to inject a new and more realistic understanding of human behaviour across UK Government and to deliver at least a tenfold return on its cost. Today, the use of behavioural insights has moved out of the laboratory into mainstream UK government policy. The Behavioural Insights Team underwent mutualisation in 2014; now more than 100-strong, the outfit has offices overseas in Australia, the United States (US) and Singapore.⁴

In the US, former President Obama issued an executive order in September 2015 directing Federal Government

agencies to apply behavioural science insights to their programs. This came after more than 30 pilots conducted by the Social and Behavioural Sciences Team (SBST) to improve programme outcomes in US agencies.

Today, there are 40 nudge units in more than 15 countries around the world, including Australia, Canada, Germany and the US.⁵ Even the World Economic Forum has joined the bandwagon — recognising this as a future trend, a Global Futures Council on Behavioural Sciences was recently established to increase awareness of behavioural insights approaches across governments. Nudging is here to stay.

Why Behavioural Insights are Relevant to Public Policy in Singapore

In Singapore, heightened interest in applying behavioural insights (BI) to policymaking can be attributed to three factors.

First, Rising and More Divergent Expectations for Better Public Services

Citizens increasingly expect public services to be easy to use. They benchmark government services against their experiences with commercial firms. They expect public services to be personalised and to be delivered with empathy. They expect consistency and timeliness. Unfortunately, many government services do not meet the mark. Our communications are often

laden with officious, bureaucratic jargon. Some of our government websites are ill designed and not user-friendly. There is often a poor appreciation of how people might think about and react to the way services are presented and delivered. The use of BI, which begins from understanding users' needs and motivations, has the potential to help us improve public services and regain public trust and confidence in the government.

Second, a More Complex Operating Environment

Many 'wicked problems', such as urban density, transportation and demography, cannot be adequately addressed by traditional approaches to policy formulation and programme implementation. Take demography, for example. Legislation can be passed to raise the re-employment age, but is that enough to deal with an ageing population? Beyond Baby Bonuses, what more can be done about our declining fertility rate? Our businesses are reliant on immigration but some citizens are cautious, and others outright hostile, to the prospect. How can policymakers better tackle these problems? Our citizenry is getting more diverse. The 80/20 rule of designing policy to cater to the broad majority is constantly being challenged, because the "average" Singaporean exists only in the idealised realm of policymaking.

BI, along with the use of randomised controlled trials, can help tackle complexities, by facilitating a more empirical and evidence-based approach to policymaking.

As society is *not* homogenous, we cannot assume that people will respond uniformly to an incentive, penalty or new law. In many instances, it is also not possible to foresee how a proposed policy or programme will interact with its intended users. For example, providing a monetary incentive to encourage social graciousness is not only unsustainable, it could also crowd out the intrinsic motivation of people to be thoughtful to each other. The application of BI, along with the use of randomised controlled trials (RCTs), can help tackle such complexities, by facilitating a more empirical and evidence-based approach to policymaking — without overgeneralising how we expect an "average Singaporean" to behave.

Third, Tightening Resource Constraints

Set against rising public expectations, a more complex operating environment and diverse populace, the Singapore Public Service is also faced with an increasingly tight fiscal and manpower situation. We are expected to increase our service footprint and manage an increasing number of public programmes.

Not a month goes by without new policy announcements and programmes that seek to improve societal outcomes. Using BI principles in service delivery design offers the potential to do more with less, and to make better use of limited resources for effective delivery. Simple changes, from tweaking a user-interface and providing information in a simpler format to tapping on defaults and social norms, could produce big payoffs in compliance or adoption at relatively low cost.

“Knowing is not enough, we must apply. Willing is not enough, we must do.”

Bruce Lee

How It Got Started in Singapore

Unlike the UK, the application of behavioural sciences in Singapore public policy did not begin with a big bang driven from the centre. Instead, it was a ground-up movement, with various agencies exploring and experimenting with small-scale projects. The first teams started out as “skunk works”, learning the techniques while scrounging for willing partners prepared to give these new approaches a try. Quick wins were needed to gain confidence and win support from senior management.

A team from the Ministry of Manpower (MOM) and the Central

Provident Fund Board (CPF Board), for example, collaborated to increase the take-up rate of a new pre-retirement planning service. This was aimed at guiding those turning 55 years of age through their retirement options. As a pilot, CPF Board sent invitation letters to 1,000 Singaporeans — 15% took up this free service. Believing that more Singaporeans could benefit from this service, the team simplified the letter and increased its relevance by providing personalised information. They also shifted the focus to pre-commit the recipients, getting them to think about “When should I go?” instead of “Should I go?” for the service. A four-arm RCT showed that the new letter doubled take-up rates to 32%. Given this initial success, the teams are now working to apply behavioural insights to help CPF members make better retirement decisions, and to encourage self-employed persons to make timely Medisave contributions.

Lessons Learnt

What can we learn from Singapore’s journey in applying BI in public policy? I suggest four insights:

- **BI is one of many policymaking tools.** The full potential of BI can only be realised when complemented with other policy tools such as design thinking, RCTs and data analytics. Sound data analytics can be used

to examine the existing problem more closely and specify where root causes lie. Design thinking and qualitative research can complement established behavioural theories to design policy options, while RCTs and experiments test what works and what does not. Together, they provide the evidence that policymakers need to design user-centric policies and tackle complex challenges. Without such rigour, the discussion around behavioural interventions will remain at a philosophical level.

- **BI is not a silver bullet.** While nudges are useful, not every policy outcome is “nudge-able”. If cognitive biases are not one of the key factors holding back the desired behavioural change, then BI would not be applicable or would have very limited use. For example, in cases where negative externalities are generated (e.g. industrial pollution), what’s needed to address the problem is government intervention in the form of a “shove”. Nudging also falls short when it comes to preventing serious crimes such as violence or drug abuse. In such cases, legislation and active enforcement may be more appropriate.
- **Specificity is key.** There is a tendency to start discussions on

a policy problem at a high level. However, applying BI to the problem means drilling down to a very specific issue to be tackled. While the intervention may seem to be a narrow, ‘downstream’ solution, the very nature of BI measures and the testing process requires such specificity. Each intervention then contributes to addressing part of the broader policy problem.

Applying BI to the problem means drilling down to a very specific issue to be tackled.

For example, policymakers may want to help vulnerable families to be more financially independent. However, several factors come into play, including education levels, employment and family structure. An assessment based on empirical and qualitative evidence could suggest sustaining employment as a possible area for intervention. Subsequently, BI interventions could be as specific as the design of job consultancy, the appointment process at career centres and follow up programmes to help employable members of the family stay in their jobs — these ‘last mile’ solutions ultimately make or break the multitude of programmes that seek to help vulnerable families.

- **The devil is in the details.** Knowing that a personalised SMS can be an effective nudge to prompt action is not enough. How it should be written, who should be seen sending it and when it is sent out are just as important. Working through the details of a behavioural intervention is an art, demanding acumen, broad consultation and an open mind. Having the discipline to test the hypothesis using RCTs is what distinguishes an evidence-based BI intervention from gut-based applications.

Working through the details of a behavioural intervention is an art, demanding acumen, broad consultation and an open mind.

How to SEED the Use of BI in Your Organisation

Applying BI to policymaking has been a journey of testing, learning, and adapting. Agencies intent on building up BI capabilities in their organisations will do well to keep in mind four key ingredients to successfully SEED this approach.

Strategic Leadership: Top leadership commitment to incorporate BI into the policymaking process, including at the more upstream stages, is a must.

Without high-level support, applying BI could be reduced to ad-hoc efforts instead of being an integral part of policymaking. The support of senior management also signals the importance and impact of taking a more human-centred and evidence-based approach to policy design and implementation.

Experimentation: Create a fail-safe environment, because not all interventions will be spot-on, no matter how well-designed or how much deliberation was put into the process. BI approaches need an environment that is tolerant of failure so that important lessons can be learnt. For example, the MOM ran an RCT to test messaging that reminded self-employed people to make mandatory Medisave (health insurance) contributions. Infographics were included in the letter as it had been effective in explaining difficult government policies in public communications. However, the result of the RCT showed that the letter with infographics significantly reduced contributions! The team hypothesised that using cartoons may have trivialised the subject matter, which was about encouraging compliance. Instead of being viewed as a ‘failure’, this result provided a valuable lesson, and helped the Ministry better identify what works in different contexts.⁶

Execution: Execute BI interventions and testing swiftly by working

on simpler problems. This will reap “quick wins”, which are critical to establishing credibility and getting the buy-in required to move to more complex challenges. For example, working on letters or simple prompts to improve response rates to a survey or a payment reminder can yield quick results, and create immediate impact on resource savings. In addition, unlike academic institutions that are interested in BI experiments with a view towards publication, it is important to keep in mind that as policymakers, we are not striving for novelty but workability. There is an increasing pool of international studies on similar issues and challenges. Avoid reinventing the wheel. Contextualise interventions for the operating environment, then move quickly to execution.

Diversity: Assemble a diverse team to be BI “fire-starters” in your organisation. As BI draws from theories in various established disciplines such as economics, psychology, neuroscience and sociology, a diverse team is likely to work more effectively and innovatively. But it is important to look beyond competencies in these disciplines to also identify officers with policy and operations background within the organisation. They will provide the context and connections to identify the right challenges and sponsors for this ‘seed’ to germinate.

What Next?

Today, with over 250 members in a community of practice across 50 public agencies, the use of BI in Singapore public policy has evolved from an initial fascination of how cognitive biases challenge the traditional way of designing policies, to a more sophisticated framework of testing and accumulating insights on behavioural interventions. This shift has also shown that the use of BI is more than improving the last mile experience of citizens — it has the potential to fundamentally challenge the way we think about government policies and programmes.

As policymakers, we are not striving for novelty but workability.

There are three things we can do for BI to become even more useful and relevant in Singapore and elsewhere.

One is to find new and innovative ways to integrate BI with other disciplines and tools towards a more human-centred approach in public policymaking. For example, data analytics could be used to provide insights to customer segmentation, guiding more customised BI interventions. BI could work with emerging fields in the data sciences and artificial intelligence to tackle complex and cross-cutting issues. This will become increasingly important

as citizenry becomes more diverse, policymaking more complex, and technology more pervasive.

The use of BI is more than improving the last mile experience of citizens — it has the potential to fundamentally challenge the way we think about government policies and programmes.


Two is to apply BI in a whole-of-government approach to address ‘wicked problems’. In Singapore, and perhaps in other governments where BI efforts are emerging, there is a tendency for interventions to be applied by individual agencies. This has and will continue to work well for quick wins (i.e., addressing problems that are agency-centric and simpler in nature). However, we should also think about how BI can be applied to broader challenges which are more complex and cross-agency in nature. For example, we could look at retirement adequacy from the perspective of citizens’ life stages that correspond with major financial decisions that are also key points of interaction with government services (e.g., getting their first salary, getting married and purchasing a home). This means we could re-design our services not from an “inside-out” agency perspective, but an “outside-in”

citizen’s perspective, in ways that nudge citizens towards decisions that improve their retirement adequacy. Taking a whole-of-government, citizen-centred approach means we must consistently apply BI across all government work, from how information is presented to how a regulation or incentive is structured. This means being more coordinated as a public service, with BI capabilities established across the public sector.

Three, exploring how we can also build and tap on BI capabilities outside government to develop and deploy more innovative solutions to problems. The Government has no monopoly on BI capabilities. For instance, the Singapore Management University set up a Behavioural Sciences Institute (BSI) in 2010, while the National University of Singapore has brought together a diverse pool of researchers under the Behavioural Insights Group (BIG). These are platforms we could potentially tap on to co-create policies and programmes with citizens, going beyond the current mode of engagement which is heavily reliant on feedback to government. Apart from more robust policy design, this process will also help to build deeper trust and create more resilient relationships between government and the people.

The use of BI, integrated with other tools and tapping on capabilities

within and outside government, holds great promise to help us address many pressing policy issues, including those of increasing complexity.

So go forth and nudge for good! 

NOTES

1. Donald Low, ed., *Behavioural Economics and Policy Design: Examples from Singapore* (Singapore: World Scientific, 2012).
2. https://www.moh.gov.sg/content/moh_web/home/pressRoom/Parliamentary_QA/2016/increasing-singapore-s-organ-transplant-rate.html.
3. <http://www.telegraph.co.uk/news/politics/9853384/Inside-the-Coalitions-controversial-Nudge-Unit.html>.
4. <http://www.behaviouralinsights.co.uk/people/>.
5. Presentation by UK Behavioural Insights Team at the 2016 Behavioural Exchange Conference (BX2016), Harvard.
6. Rory Gallagher, "Our Work with Other Governments" in *The Behavioural Insights Team: Update Report 2013 -2015*, 15 September 2016, accessed 23 December 2016, <http://www.behaviouralinsights.co.uk/publications/the-behavioural-insights-teams-update-report-2015-16/>.

Using Behavioural Insights to Improve Service Delivery

More targeted approaches could address rising public expectations of service, and enhance policy outcomes.

BY
LEONARD CHEN

Leonard Chen is Design Lead in the Innovation Lab at the Public Service Division. At the Innovation Lab, Leonard provides behavioural insights expertise to promote a user-centred, data-driven approach to the design of public policy and services. He works with his team to use design thinking and behavioural insights tools to support agencies in scoping, designing, and implementing innovation projects across a range of domains, from increasing the use of agencies' digital services to supporting citizens' financial planning and adequacy issues.



What is Public Service Delivery?

The Public Service does not choose its customers. It serves all citizens and businesses, continually carrying the responsibility of meeting diverse needs and creating a better life for Singaporeans. In a similar way, citizens and businesses sometimes depend exclusively on public services for their needs. This unique relationship sets public service delivery apart from any other service provided by other organisations.

Often, “service delivery” means providing a service efficiently, according to what citizens need at that moment — the quicker, the better. However, public service delivery has to go beyond quick fixes to satisfy immediate needs. Good “service” involves improving connections, building trust and enhancing experiences. For citizens, service experiences matter most at key milestones in their lives, such as marriage, childbirth, and retirement. In Singapore’s context, an engaged couple might be looking to purchase public housing, or families with children could be looking to the government for support towards living and education expenses. A positive and effective experience of public services during these important life-stages can help build trust in the Public Service and strengthen the government’s relationship with citizens.

“Delivery” describes the actual transaction process, which should be as convenient and easy as possible for the public to understand and use. Many

service innovations have incorporated digital channels, including mobile technology, to increase the accessibility and convenience of light-touch services. Recent advances in artificial intelligence and automation could potentially eliminate even the need for many transactions, and render public services even more seamless and fuss-free.

Good “service” involves improving connections, building trust and enhancing experiences.

A common challenge faced by the Public Service is striking a balance between delivering easily accessible services that meet our citizens’ needs, and improving manpower and fiscal efficiency to make the most of limited public resources. The draw of Behavioural Insights (BI) is that they have been able to help governments around the world do both — achieve substantial improvements in service outcomes, at relatively low cost. BI approaches have come to be increasingly important tools in designing public services. Governments around the world have successfully “nudged” citizens to contribute to desired service outcomes, such as paying their outstanding taxes or signing up for organ donation programmes.

Insights from these efforts challenge us to rethink how we can design and deliver better services from two broad angles: how to make services more

salient, easy and convenient, and how to improve experiences and connections so that public services continue to be aligned with what really matters to our citizens.

Making Services Salient, Easy and Convenient

Making services salient and easy to access is key, because even the best-designed

services cannot achieve their outcomes if they are underutilised. Most people are already preoccupied with things that demand their attention – family, work, and leisure time. How do we make sure that public services stand out from the daily “noise” and are easy to use, so that citizens can and will make the most of public programmes and services meant for their benefit?

BOOSTING PARTICIPATION IN THE GROWTH VOUCHERS PROGRAMME (UK)

In the UK, the Department for Business, Innovation, and Skills (BIS) launched a programme in 2014 to support small businesses to seek and obtain strategic business advice by offering “Growth Vouchers” that would help pay for the cost of this advice.

Although BIS had devoted significant resources in promoting the programme through business exhibitions, telemarketing, social media, and setting up advice clinics, not all small businesses could see its relevance. They also lacked the time to engage with the programme. The key challenge for BIS was finding a way to contact these small businesses directly and convince them of the programme’s value.

Working with the UK government’s Behavioural Insights Team, BIS tested a variety of ways to convey this information through direct emails that were already being sent from Her Majesty’s Revenue and Customs (HMRC) to small businesses on a regular basis.

Various approaches such as simplifying the message or emphasising incentives or social norms were tested. They found the most effective measure was informing businesses that their type of organisation had been chosen to receive information on the programme. This was possibly because the email was sent by the HMRC, which was already contacting these businesses about other specific matters, such as their tax returns.

Similar effective results have been achieved in other instances, by coordinating across government agencies to tap on ongoing engagement channels and framing the message in a way that matters to the customer.

Source: Department for Business, Innovation & Skills (2014). *Growth Vouchers Programme: Trial Protocol*; Department for Business, Innovation & Skills (2015). *Growth Vouchers Programme: Phase One Qualitative Assessment Report*; The Behavioural Insights Team (2015). *Update Report 2013 – 2015*.

In the healthcare sector, hospitals face the problem of patients who persistently miss their outpatient appointments, but who do not cancel or rearrange the appointments in advance. This creates wastage: time and resources that could have been used to serve other patients in need. The UK Behavioural Insights Team worked with the Department of Health and Imperial College London to increase the saliency and ease of arranging for appointments. They included a specific phone number in text messages for patients to use for cancellation and rearrangements. On top of that, the cost imposed on the system was highlighted in the message by stating, “*Not attending costs NHS 160 pounds approx*”. This redesigned message reduced the incidence of missed appointments from 11.1% to 8.4%.

In Singapore, which has one of the highest mobile phone penetration rates in the world, our ability to reach a large majority of our citizens through text messages means that we have the potential to scale up such low-cost interventions for many services. In fact, Khoo Teck Puat Hospital has replicated the UK’s hospital appointments trial. Their SMS message, stating “*Missed appointments keep others waiting*”, reduced the incidence of missed appointments by 6.9%.

Another important way of improving the ease of services is through digital channels. Traditional service channels, such as over-the-counter interactions,

are labour intensive and require citizens to make the time and effort to visit physical service locations. Merely offering a digital alternative, however, is usually not enough. There needs to be a shift in people’s behaviour, which often “sticks” to the status quo. Experience shows that BI methods can effectively shift more users online, as seen in the Singapore Housing Development Board’s efforts to prompt online payment of upgrading fees.

The best-designed services cannot achieve their outcomes if they are underutilised. How do we make sure that public services stand out from the daily ‘noise’ and are easy to use?

Transforming Experiences, Making Better Connections

In the process of providing more channels and e-services to increase the ease and convenience of public services, the actual experience of the citizen can sometimes be compromised. What public agencies see as efficient and effective may not always be aligned with what citizens expect. To establish trust in the Government, the Public Service needs to be citizen-centric; BI can contribute to this effort by helping us to understand how people interact with our public agencies, make decisions and respond to different service modes.

GETTING MORE CITIZENS TO PAY PUBLIC HOUSING UPGRADING FEES ONLINE

Whenever the Housing Development Board (HDB) carries out estate upgrading programmes to enhance the living environment, residents are required to pay a proportion of the cost. The letter and bill sent to residents after works were completed include information on available payment modes. In order to encourage more residents to pay online, the letter was simplified to make the required action clear, and to draw attention to the online payment service with a brief description of how to use it. This simplified letter almost tripled the proportion of residents paying online, from 11.1% to 31.2%.¹

Importantly, this increase was seen even among older households, and with the largest magnitude of improvement. This indicates that, despite concerns about whether older Singaporeans would be comfortable using digital services, making such channels easier to use can significantly increase adoption.

NOTE

1. The data was based on a trial HDB conducted with help from the Innovation Lab and the Behavioural Insights Team.

For instance, providing job opportunities is not a simple matter of presenting information in a clear manner to the right target group. An unemployed jobseeker faces many challenges that need to be better understood before appropriate support can be provided. The Singapore Ministry of Manpower and the former Workforce Development Authority understood the need to connect with the jobseekers' experience in order to design more effective employment services.

In another example, the Central Provident Fund Board (CPF Board) found that engaging customers to understand their concerns helped in the redesign of communications for a retirement

planning service, improving take-up rates.

Other kinds of pre-commitment and reframing devices have been used effectively by other public agencies to encourage citizens to sign up for programmes that are beneficial but not immediately salient to them. For example, the Ministry of Home Affairs worked with the Singapore Civil Defence Force, in collaboration with Harvard University's Behavioural Insights Group, to encourage residents whose apartment block had just encountered a significant fire to participate in the Community Emergency Preparedness Programme (CEPP). Even though the CEPP was already well-subscribed to, those who

REDESIGNING THE JOBSEEKER EXPERIENCE AT NORTH EAST COMMUNITY DEVELOPMENT CENTRE

Singapore's Ministry of Manpower and Work Development Authority (WDA) found that jobseekers relied heavily on WDA Career Coaches to source for and arrange job referrals. They also faced difficulties in committing to job search tasks, such as following up on appointments or job interviews, and staying motivated over time. Based on these insights, the team worked closely with the Career Coaches at the North East Community Development Centre (CDC) to co-design interventions that could support their jobseekers:

- **Commitment device.** This came in the form of a job booklet available in different languages. Jobseekers were to sign on the cover page of the booklet after having a structured conversation with the Career Coaches on their job search goals, indicating their commitment to the job search process.
- **Breaking down the job search process into a series of small activities.** This allowed jobseekers to feel a continued sense of accomplishment during the job search process. Career Coaches could also reinforce this positive behaviour through feedback during their consultation sessions.
- **Use of social norms and priming to motivate jobseekers.** Stars were displayed on the wall of the consultation rooms to represent the number of people who had found work through the CDC. Information about top job vacancies and their average salary ranges were also displayed to influence jobseekers to adopt more realistic job expectations.

In a randomised controlled trial with 777 jobseekers, 49% of jobseekers who received the redesigned service found work within three months, compared to 32% of jobseekers who received the normal employment service. As intuitive as the concept may be, the trial demonstrated that connecting with customers and designing services to meet their needs do lead to better outcomes.

Source: Ministry of Manpower, *Applying Behavioural Insights in MOM: 2013-2014 Year in Review*, 2014.

ENGAGING SOON-TO-BE RETIREES FOR RETIREMENT PLANNING SERVICES

The Central Provident Fund Board (CPFB) in Singapore found that sending an invitation letter to all soon-to-be retirees to attend a newly introduced retirement planning service resulted in 15% of recipients making an appointment. After making additional reminder calls to the target group, this increased to 27%. In other words, almost half of the attendees were interested in the service, yet did not follow through until further prompted.

Interviews with these recipients found that procrastination and inertia were factors that prevented them from participating. Some thought that the letter was too long and complicated, and did not offer a compelling reason to sign up for the service. Others felt they would be too busy to make the trip to the service centres for the planning session.

The team redesigned the invitation letter to make it more compelling and attractive to readers, through:

- **Personalisation.** The letters were personalised to include information about citizens' individual funds in their Ordinary and Special Accounts, monthly housing payments, and projected balances before and after they turn 55 years old. The inclusion of such information signalled the importance of the letter, making recipients pay more attention to it.
- **Pre-commitment.** The letter also stated, *"We have reserved a place for you at the CPF Retirement Planning Service in [month]. Call [number] to confirm your appointment with us."* This statement reframed the question for recipients, from "Should I go" to "*When* should I go", reducing the perceived barriers (e.g. lack of time) to sign up for the service.

Taken together, these interventions increased attendance for the retirement planning programme from 13.9% to 31.1%.¹ By understanding how best to engage a target group and making simple changes to the invitation letter to accommodate their needs, many more signed up for a service that benefitted them.

NOTE

1. The data was based on a trial conducted by CPFB and MOM.

attended were mainly from organised groups such as schools and companies, compared to members of the public who needed to pre-register to attend. Two BI-based modifications — message frames and follow-through prompts — helped nudge residents to participate in the CEPP. The use of a message frame, paired with pre-registration (allowing residents to sign up for a slot on the spot) was found to significantly narrow the intention-action gap and increase CEPP attendance among residents.

This surge in capacity is matched by a rise in expectations of services that are faster, cheaper, and more intuitive. Citizens expect public services to perform as well as those of the private sector.

The Future of Behavioural Insights in Service Delivery

Technological change is rapidly transforming the business of the Public Service, creating new frontiers for service delivery. Citizens can now interact with organisations through digital channels such as chat bots, augmented reality, or virtual reality interfaces. The explosion of data generated and collected through service interactions allows organisations

to customise and anticipate the needs of its customers through thoughtful use of analytics. This surge in capacity is matched by a rise in expectations of services that are faster, cheaper, and more intuitive. Citizens expect public services to perform as well as those of the private sector, be delivered in real-time and resolved quickly with minimal effort or disruption to their lives.

These changes present opportunities for the Public Service to be more sophisticated in how it applies BI to service delivery challenges. There is potential in combining a rich understanding of data with the implementation of BI. Existing descriptive data can be used to customise interventions based on customer profiles. We have already seen how we can encourage citizens to sign up for retirement planning services by providing personalised information. We could take this a step further by targeting and customising our invitations according to data about their age, employment status, income, and current level of retirement savings.

Looking forward, machine learning may yield algorithms that can predict specific outcomes based on a citizen's characteristics. For example, we could one day predict the risk of re-admission of a patient upon discharge from the hospital, based on their demographic profile, symptoms, and treatment and discharge plan. However, the prediction of such 'high-risk' customers only points us to where the problem may be. It does

The US Social and Behavioural Sciences Team highlights three **key elements that define the most promising opportunities** to apply behavioural insights:

1. there needs to be a **clearly defined policy goal**;
2. there must be a **specific individual behaviour** we want to influence;
3. there needs to be a **point of direct interaction** between individuals and the Public Service.

Source: Office of Science and Technology Policy, Social and Behavioural Sciences Team 2015 Annual Report, September 2015, https://www.dol.gov/asp/evaluation/reports/sbst_2015_annual_report_final_9_14_15.pdf.

not inform us on specific treatments that would reduce the likelihood of re-admission. How do we encourage better health behaviours amongst these high-risk patients? How do we provide information to healthcare professionals about these high-risk patients in a way that will support their medical decision-making? Answering these questions require a deeper understanding of user behaviour — including both patients and medical practitioners — to design effective interventions.

BI will not be able to resolve all issues with service delivery. The context of the problem will determine whether BI interventions are the most appropriate solution. Most importantly, we must constantly ask ourselves if

we are solving the “right” problem. A BI-based approach allows us to achieve substantial improvement in service outcomes only when there are clearly defined policy outcomes. We should not use it as a blunt tool whenever we find gaps in service efficiency or effectiveness. We should always return to the policy intent, and question if it continues to be relevant. If our citizens are not engaging with the service, is it because the service is not effective at meeting their needs, or is it because the need has changed? It is only with such rigour and discipline, that we can design and deliver our services effectively, and continue to build trust in the Public Service. ✨

‘Nudging’ Singapore to be Cleaner and Greener

Carefully chosen and tested behavioural interventions can complement traditional policy tools in cultivating more environmentally friendly habits and actions.

BY
JASON BOH

Jason Boh is part of the Environmental Behavioural Sciences & Economics Research Unit (EBERU) in the Ministry of the Environment and Water Resources (MEWR). EBERU, formed in 2011, was one of the first units in the Singapore Public Service dedicated to deriving and harnessing behavioural insights for policy formulation. In addition to driving the use of behavioural science and economic concepts in the statutory boards under MEWR (e.g. the National Environment Agency and PUB, Singapore’s National Water Agency) to test environmental interventions and refine policy design, the unit also collaborates with other government agencies in the design of sustainability policies and programmes.



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The Need for Environmentally Friendly Behaviours

When people think of environmental issues, what often comes to mind are images of smoke-spewing chimneys, rubbish-strewn rivers and melting ice caps. For those living in countries with well-run municipal services, where pollutive activities are situated out of sight, environmental concerns can seem far removed from daily life.

This seems true of Singapore, where it can be less apparent that the accumulation of small daily actions and activities — such as not switching off the lights before leaving a room — can have significant negative environmental effects in the long run.

Individual action is not simply a good-to-have but an essential piece of the puzzle.

This indifference towards environmental issues is no trivial matter. Singapore is a small island state vulnerable to the challenges posed by climate change, including heightened competition for limited resources and potential supply disruptions due to extreme weather events. As the country increases in urban density, the need to manage the demands placed on our limited resources and infrastructure, and to mitigate the risk of environmental pollution will only increase.¹ Individual Singaporeans

cannot afford to remain passive actors in light of these environmental challenges.

Technological advancements may offer some solutions, but studies show that efficiency gains from technology (e.g. in energy-efficient appliances or water-saving devices) are often outpaced by consumption growth. More importantly, such advancements will only have an impact if there is broad behavioural change.² For instance, a state-of-the-art recycling system will not be useful if people do not recycle their waste. In addressing environmental challenges, individual action is not simply a good-to-have, but an essential piece of the puzzle.

Why Traditional Policy Tools Do Not Always Work

The tools governments have traditionally used to improve environmental outcomes include economic instruments (price mechanisms, incentives and taxes); legislation; education and engagement programmes. Such tools work on the basis that individuals make optimal choices for themselves; however, if this were so, everyone would reduce their electricity consumption when prices are raised, stop littering to avoid fines, and start recycling after environmental campaigns!

The problem is that people do not make choices according to these assumptions. Most of the time, people simply rely on their choices being good

enough or satisfactory — a decision-making strategy which Herbert Simon terms “satisficing”.³ Social influences also tempt us away from making environmentally friendly choices. Changing behaviours is therefore not a matter of simply invoking a system of external rewards or penalties.

Take for example the ubiquitous use of air-conditioning in Singapore: is it necessary for the temperature in offices and shopping malls to be set at such low levels? While raising the temperature by 1 to 2 degrees can help save on electricity bills and conserve energy without compromising on comfort, this is not often practised as decision-makers are often unaware of, or unable to assess, the potential benefits of doing so. Some business owners may even see risks in deviating from current air-conditioning norms and putting off tenants and patrons accustomed to cooler interiors.

Very often, even the simplest of behaviours — from separating recyclables from general waste or turning TV set-top boxes off — are hard to change. People tend to fall back on what is familiar or which requires the least time and effort, even when they might benefit from doing otherwise (e.g. in terms of cost savings or environmental benefits).⁴ In other cases, prevailing social norms hinder individuals from doing the ‘right’ thing. One of the reasons why issues of public cleanliness continue to persist even in Singapore is due to the fact that

some people do not view small pieces of paper or cigarette butts as litter.⁵

Unless policy measures impose high costs or large benefits, they have limited impact on changing behaviour. Moreover, there are limits to the level of punishment that can be meted out for offences such as littering. Introducing new legislation to mandate environmentally friendly behaviours (e.g. recycling at home) might also be construed as overly intrusive, and there are practical limits to how much a government can police people’s behaviours.

Nudges fill the gaps where traditional policy interventions have been found wanting.

‘Nudging’ People to be more Environmentally Friendly

In recent years, behavioural science interventions have demonstrated that people can be influenced to be more civic conscious without the need for expensive programmes or compulsion.⁶ Could such techniques, commonly known as ‘nudges’,⁷ complement existing policy initiatives to better achieve Singapore’s environmental goals?

Within the environmental context, nudges fill the gaps where traditional policy interventions have been found wanting on two accounts. Firstly, they offer an effective yet affordable and less intrusive way of getting people

to adopt environmentally friendly behaviours. This is critical considering many of these behaviours are within the private sphere of people's lives, in which excessive interference from the government is not desirable. Secondly, nudges directly address the social, cognitive and physical barriers — usually unaccounted for by traditional policy tools — that hinder such choices from being made in the first place. Nudges achieve this by making the right choices more apparent and accessible to those who are otherwise ill informed, do not care, or simply stuck in their ways.

Efforts to nudge people towards more environmentally friendly

behaviours have generally involved (a) making the practical benefits of environmentally friendly options more salient, (b) leveraging social norms, and (c) making changes to the physical environment to reduce barriers.

Salience of Costs and Benefits

To overcome the general tendency for people to make decisions based on routines and 'rule-of-thumb' heuristics, environmentally friendly options need to be provided in a salient and timely manner to capture their attention. A common example, used in many countries, is eco-labelling.

In Singapore, it is mandatory for suppliers to affix energy labels on air-



Figure 1. Energy Label for Air-Conditioners, Refrigerators, Clothes Dryers and Televisions (Credit: National Environment Agency)



Figure 2. Energy Label for Lamps (Credit: National Environment Agency)

conditioners, refrigerators, clothes dryers, televisions and lamps sold locally.

Information on the annual energy consumption and running cost is displayed together with a rating of the appliance's energy efficiency (with the best rating being three ticks for lamps and five ticks for other appliances). This makes it easier for consumers to choose the "better" alternative when purchasing an appliance.

Another effort that uses similar principles is the recent Car-Lite parking trial conducted by Singapore's Ministry of the Environment and Water Resources (MEWR), and Land Transport Authority (LTA). The trial tested the use of different pricing mechanisms to increase the saliency of parking charges in influencing people to drive less to work (see box story on "Reducing Car Usage").

REDUCING CAR USAGE: TWO AGENCIES, TWO DIFFERENT OUTCOMES

As part of the efforts to move towards a Car-Lite Singapore, MEWR and LTA embarked on a project to examine the effectiveness of usage-based pricing in reducing the rate at which their employees drive to work.

The current monthly season parking scheme (MSP) charges employees a monthly fixed price for unlimited access to the car park. Such an upfront irrecoverable cost could have reduced the saliency of the charges, causing a sunk cost effect, prompting people to drive to work more than they otherwise would since they had already paid for season parking.

To test out the alternative idea of a daily season parking scheme (DSP), the LTA introduced a flat daily fee for using the car park (employees are not charged on days that they do not drive to work) from August 2013. This was positioned as an alternative to the current MSP which gives a month of unlimited car park access with upfront payment directly deducted from the employee's pay. A difference-in-differences analysis showed that the average monthly car park usage for those who converted to the DSP dropped significantly by about 4 days (from 16.5 days to 12.5 days per month) compared to those who remained on the monthly scheme. This conclusion remained unchanged even after accounting for seasonality and individual differences.

At MEWR Environment Building, a randomised controlled trial on the DSP scheme was conducted over two months from August to September 2015. Drivers were randomly assigned to three schemes: (i) a daily charge of \$4 per day for car park use, i.e. the DSP; (ii) a daily rebate scheme, where a monthly fee of \$80 is paid upfront, but a rebate of \$4 is received for every working day that the car park is not used; and (iii) a control group retaining the

status quo, i.e. monthly season parking scheme. The car park fees for all officers involved in the trial were effected via the payroll and staff were regularly prompted to check their pay-slips to track their car park charges or rebates.

Results from the MEWR trial showed that the DSP had no significant effect. On the other hand, the daily rebate scheme was effective in the first month, resulting in a 13% reduction in car park use. However, changes for the second month were not significant.

It was interesting to note that the DSP seemed to work better at LTA than at MEWR, despite no known differences between the profile of employees. This was possibly due to the ERP-like deduction of parking fees at the LTA car park gantry system upon exit. In contrast, parking costs and rebates at MEWR were only available through monthly payslips. This delayed feedback could have resulted in employees valuing the time flexibility and convenience of driving more than future money savings (i.e. present bias).

The permanence of the DSP scheme at LTA could also have led its officers to consider their long-term savings when making driving decisions. On the other hand, the temporary nature of the trial at MEWR may have resulted in employees assessing that changing their behaviour for two months would not be worthwhile.

Social Norms

Social norms come in two forms — societal expectations and rules that guide behaviour (injunctive norms), or simply behaviours that are prevalent in society (descriptive norms). Individuals tend to behave in accordance to what is commonly deemed as “right” or commonly done.

A well-known example of how social norms have been used to nudge people to be more environmentally friendly is the incorporation of social comparisons in utility bills. Indicating how one’s energy consumption compares to “efficient” neighbours, coupled with the use of injunctive norms (e.g. ☺ and ☹ faces to indicate the household’s energy

performance), have been shown to be effective in encouraging households to reduce their overall energy consumption.⁸ Less energy efficient households have been found to improve on their energy performance to match and conform to their “good” performing neighbours.

In Singapore, the use of social norms can also be found in posters reminding people to keep their surroundings clean, reinforcing what is socially expected of people when using public spaces. For example, a message like “Your Considerate Act Lights Up Someone’s Day” evokes positive emotions and leverages people’s proclivity to conform to what is socially expected. People are thus influenced to keep their surroundings clean.

Changes in the Physical Environment

Making changes to the physical environment by disrupting people's routines and by making "green" options more appealing can also work as a powerful nudge. Such changes encourage people to reconsider their choices and to adopt environmentally friendly behaviours.

A study in Copenhagen, for example, found that placing footsteps on the ground leading to rubbish bins helped reduce littering substantially.⁹ These footprints, given their prominence, work as visible reminders to disrupt a person's habit of littering and point them to an accessible alternative.

In Singapore, an ongoing study is attempting to assess whether second-hand cigarette smoke along public thoroughfares could be reduced by specially designating areas for smoking. By providing viable alternative places specifically for smoking, it is hoped that such public spaces can be better enjoyed by all.

More than Common Sense: Designing "Nudges" for the Environment

While behavioural nudges may seem little more than common sense, it is important to frame the issues correctly and objectively understand why certain behaviours persist. Four key factors influence the practice of environmentally friendly behaviours:¹⁰

- a) **Attitudes**, such as a person's beliefs and values;
- b) **Context**, such as social influences, infrastructure, policy initiatives, monetary costs and benefits;
- c) **Personal capabilities**, such as knowledge, skills, the availability of money and time required to perform such actions; and
- d) **Habits or routines**.

These factors interact with one another, and may vary in influence. For example, buying an energy efficient appliance, with its higher upfront cost, might be more strongly influenced by a person's disposable income (personal capabilities). Whereas the practice of recycling is probably a result of one's personal habits and the availability of recycling infrastructure (context).

It is important to identify each target behaviour and understand the relevant barriers to action. Nudge effects may vary even among contexts or situations which appear similar.

In designing and implementing environmental nudges, it is important to identify each target behaviour and

Relying on common sense alone is not enough. A robust system of testing, adapting and evaluating is needed to ensure that nudges remain effective.

understand the relevant barriers to action (e.g. by using surveys, interviews, ethnographic methods or secondary research). Furthermore, it is also vital to track the results of behavioural interventions. Nudge effects may vary even among contexts or situations which appear similar. Nudging may also give rise to unintended side effects. For example, the heightened awareness that one's appliances are efficient may inadvertently result in them being used more frequently than necessary, causing a rebound effect which reduces the effectiveness of the intervention.

Relying on common sense alone is not enough. A robust system of testing, adapting and evaluating is needed to ensure that nudges remain effective in addressing environmental challenges and needs over time.

Conclusion

There is certainly room for the use of nudges to sustain a cleaner and greener environment. Given the fundamental disconnect between our daily lives and

environmental issues, it is all the more important to try new approaches to create and sustain an environmental consciousness amongst people.

However, nudges should not diminish people's ability to choose how to act. Neither should they be seen as replacements for traditional policy tools.¹¹ Many behavioural interventions have been effective in part because of existing social and economic conditions established by traditional policy tools. For example, the use of energy labels to encourage people to buy more efficient appliances works partly because energy costs are priced correctly such that they promote sustainable consumption. Similarly, social norming interventions such as anti-littering posters are effective due to the possibility of sanction for violating such norms, e.g. fines. In essence, nudges serve not to replace, but to complement traditional policy interventions in addressing cognitive biases and social barriers that hinder people's willingness and ability to become more environmentally friendly. ♀

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Using Behavioural Insights to Strengthen Enforcement

Understanding why people are not acting and responding in a timely manner allows government agencies to implement nudges that can significantly improve compliance rates.

BY
LEONG WAI YAN

Leong Wai Yan is Senior Economist in the Economics Unit, Policy & Planning Group of the Land Transport Authority.



Introduction

Governments are vested with the authority to enforce rules and regulations for the orderly functioning of society. They have an interest to ensure that as many people comply with regulations as possible, because this helps to reduce administrative costs significantly, while contributing to desired public outcomes.

In cases of non-compliance, there already are punitive consequences in place, based on the severity of the offence. No citizen would like to receive a warning letter, or be given a penalty. At the same time, there are those who fail to comply with the rules, despite well-designed schemes and appropriate penalties. Understanding why people are not acting and responding in a timely manner is a start to enforcing rules more effectively.

In Singapore, research from several government agencies shows that incorporating behavioural insights (BI) to make simple changes in the way they communicate with the public can nudge behaviours and result in sizeable improvements in compliance rates. As aptly put by Jason Furman, Chief Economic Advisor to former US president Obama, “(e)specially well-chosen behavioural policy interventions can have nano-sized costs and produce extremely high benefit-to-cost ratios”.¹

The experience from a number of public agencies in Singapore in using BI to encourage on-time settlements, and to nudge overdue customers to take action immediately, bears testimony to the veracity of Furman’s observation.

The author thanks Xu Ding Jiao from IRAS and Kenny Tan from URA for providing information on their respective agencies’ examples in this article.

Understanding why people are not acting and responding in a timely manner is a start to enforcing rules more effectively.

Encouraging On-Time Settlements

Applying BI, the Inland Revenue Authority of Singapore (IRAS) sought to help two different customer groups — newly incorporated companies and property owners — file their returns (see “Increasing Tax Filing Compliance of Newly Incorporated Companies”) and pay their taxes on time (see “Encouraging Property Owners to Pay On Time”) respectively. Common features of these interventions included customised reminders and letters, and the use of loss aversion by emphasising the need to take prompt action in order to avoid late penalties. The Land Transport Authority (LTA) has also applied BI to nudge vehicle owners to pay their road taxes on time (see “Understanding How Nudges Interact”).

INCREASING TAX FILING COMPLIANCE OF NEWLY INCORPORATED COMPANIES

The Problem

Each year, companies receive letters from the Inland Revenue Authority of Singapore (IRAS) reminding them to file their corporate tax returns on time. These letters provide information tailored to the needs of various company segments. While the vast majority of companies file on time, IRAS has found that one particular profile of newly incorporated companies (NICs) was more likely to be late in filing their returns, compared to other firms.

The Trial

In its re-design of the reminder letters, IRAS incorporated a number of BI-based approaches, including (a) a “to-do” checklist of important actions to help NICs quickly take the necessary steps for tax filing, and (b) highlighting assistance channels, such as free seminars or tax guides, for NICs needing additional help with tax rules and requirements.

Besides these features, IRAS was interested to know whether a loss aversion frame, by highlighting the punitive consequences for failing to file on time, would lead to improved compliance. This idea was motivated by data suggesting that NICs tend to be less aware of tax matters, with some not even aware of the penalties for non-compliance. Accordingly, an alternative version of the redesigned letter was trialled, highlighting the consequences of failing to file on-time:

“If you do not file on time: Failure to file returns is an offence under the Income Tax Act. You may be subject to fines, penalties and court summons. To avoid these enforcement actions, please file your company’s income tax return on time.”

The Results

A two-arm randomised controlled trial (RCT) showed that the letter highlighting punitive consequences led to 55.5% of NICs filing their returns on time, 6.5 percentage points more than the group of NICs receiving the letter that did not employ the loss aversion frame. From this study, IRAS has concluded that customising communications and highlighting negative consequences for non-compliance could help NICs avoid downstream problems such as late filing penalties.

ENCOURAGING PROPERTY OWNERS TO PAY ON TIME

The Problem

IRAS wanted to encourage people with overdue property taxes to pay their taxes immediately. Their proposed solution involved sending trial text messages to encourage immediate action on property tax.

The Trial

IRAS ran a two-arm RCT comparing a control group (which did not receive any text message) with a treatment group (which received a BI text message). The BI-informed text messages were designed to prompt recipients to take immediate action, by recommending the most convenient payment mode and highlighting that taxpayers still had a “last chance” to avoid losses before penalties are imposed.

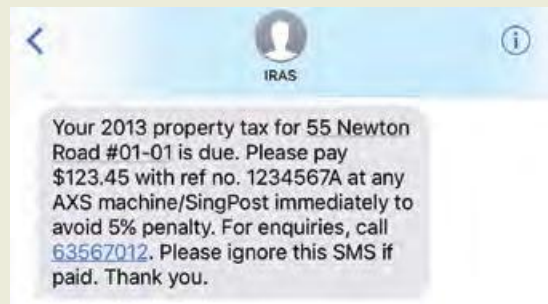


Figure 1: Trial Text Message to Encourage Immediate Action on Property Tax

The Result

The text message trial was overwhelmingly successful, with 47% of text message recipients promptly paying their overdue tax compared to 16% in the control group. The text reminders have also brought about other benefits to taxpayers and IRAS. Calls and walk-ins dropped from 10% to 4% as fewer taxpayers called in for assistance and clarification; 81% of taxpayers surveyed also said that they liked having the text reminder. With this encouraging outcome, IRAS has scaled up the use of text reminders. Today, property owners receive text reminders from IRAS before the gazetted payment due date of 31 January.

UNDERSTANDING HOW NUDGES INTERACT

The Problem

The Land Transport Authority (LTA) regulates close to one million vehicles in Singapore, including matters related to road tax. LTA's standard practice is to send a renewal notice to vehicle owners one month prior to road tax expiry. However, historical data showed that about 10% of all vehicle owners still end up making late renewals.

The Trial

LTA sought to evaluate the effectiveness of behavioural interventions in improving on-time renewals. By redesigning both the renewal notice and its accompanying envelope, LTA could test the individual and combined effects of nudges in both collaterals, gaining greater insight into how the nudges interact.

Redesign of Envelopes

The front of the envelopes accompanying renewal notices was redesigned to enhance the saliency of settling road tax on time, by adding a prominent and explicit call to action that reads “Renew Your Road Tax online in 3 minutes”. A social norm statement was added to the back of the envelopes, citing the high proportion of vehicle owners who renew their road tax on time (Figure 2).



Figure 2. Back of Accompanying Envelopes – Previous and Redesigned Versions

Redesign of Renewal Notice

The renewal notice itself was also redesigned to include a simplified message, stating renewal and expiry deadlines. LTA also tested the effects of two messages:

- Loss aversion statement: *“Be On Time! Avoid Late Renewal Fees”*
- Social norms statement: *“Be On Time! 9 out of 10 in Singapore Renew Their Road Tax on Time”*

To test the effects of both the redesigned envelope and letters, the randomised controlled trial consisted of three treatment groups (Table 1).

Groups	Design of Envelope	Renewal Notice Statement	On-Time Renewal Rates*
Control	Old	Old	88.4%
Treatment 1	Revised	Old	89.3%
Treatment 2	Revised	Revised with loss aversion statement	90.1%
Treatment 3	Revised	Revised with social norms statement	88.9%

Table 1. RCT Design – Treatment groups and control group

* All treatment effects were statistically significant at the 5% level (as compared to the control group). Newly registered vehicles were excluded from this analysis.

the social norms message at the back of the envelope is more effective than highlighting the social norms message alone (Treatments Groups 1 and 3).

The behavioural effects of the interventions were also found to vary across the different segments of the vehicle owners who were involved in this trial. For example, businesses/corporate vehicle owners did not respond in any significant way to Treatment 1 (envelope redesign only) compared to individual vehicle owners. The most effective nudge for them also came through the loss aversion message (Treatment 2). This may be because businesses tend to be more sensitive to profits and losses.

Following the conclusion of this study, LTA is now using the redesigned envelope and the loss aversion statement in its communications with motorists on road tax related matters.

The Results

Treatment Group 2 (revised envelope and redesigned renewal notice with loss aversion statement) was the most effective at encouraging on-time road tax renewals. It achieved the highest on-time renewal rate of 90.1%, or 1.7 percentage points more than the control group. An interesting aspect of this trial was the ability to examine the individual effects of the nudges and how they interacted when combined. It appears that layering the loss aversion message framing in the renewal notice with

Nudging Overdue Customers

Most enforcement agencies rely on a reminder system to prompt people to pay their fines early. However, there will always be cases that end up being escalated to the courts. As this is a time consuming process, agencies are testing ways to achieve early settlement. One proven way of nudging people in this

direction is to convey the consequences more saliently — by highlighting the penalties of late or non-payment and the action they can take to avoid higher fines and court action (see “Increasing Compliance to Payment of Parking Fines” and “Nudging Vehicle Owners in Arrears to Settle Immediately”).

INCREASING COMPLIANCE TO PAYMENT OF PARKING FINES

The Problem

Motorists who are late in making payment receive reminder letters to settle their parking offences, failing which, court action would be taken. The Urban Redevelopment Authority (URA) wanted to test if more clearly worded and better designed letters could encourage motorists to take action promptly and reduce the number of late payers downstream.

The Trial

URA ran an RCT comparing a new set of reminder letters to existing ones. The new letters were designed to nudge motorists to take action promptly. For example, important information was printed prominently in colour and bold print, in the title and in a call-out box.

In particular, the first reminder letter was redesigned to highlight a social norm — that the majority of motorists pay their fines promptly. It also pointed out the consequence of non-payment — that the motorist may face higher penalties and court action.

The Results

The redesigned first reminder letter increased the percentage of motorists who paid up within the deadline. Of those who received the redesigned letter, 69% paid within the deadline, compared with 65% of motorists who received the previous version of the letter. The new letters helped more motorists avoid higher fines and court action.

Given the positive trial results, URA has switched to using the revised reminder letters starting from April 2017.

The Problem

Each year, around 7,200 vehicle owners end up in road tax arrears of more than three months. In such cases, a Notice to Attend Court is issued stating that a court charge is imminent. Accompanying the court notice is an Advisory Note providing information on how the case might be settled out of court.

To reduce the number of offenders ending up in court, LTA conducted an experiment to test if a refreshed Advisory Note could increase the propensity for road tax arrears to be settled immediately.

The Trial

Based on existing evidence, LTA was confident that a nudge to trigger loss aversion could be implemented in the redesigned Advisory Note without further testing. To these vehicle owners in arrears, LTA inserted a prominent call-to-action stating that a court charge (and by implication, further losses through higher fines) could be easily avoided by immediate payment of outstanding road tax.

However, there was scope to apply more behavioural insights in the redesigned Advisory Note, and so, an RCT was designed to test the efficacy of three other nudges:

- Specific cut-off dates: E.g. “If you do not pay by DDMMYY” as opposed to a generic cut-off date presented as “If you do not pay by 14 days to Court Date”;
- Social norms: E.g. “9 in 10 pay their road tax on time”; and
- Using a red background as an additional visual warning of the seriousness of the situation.

The RCT was conducted with 1,774 vehicle owners. A control version (old Advisory Note) and five treatment versions of a revised Advisory Note were tested (see Table 2).

The Results

The results showed some success in achieving desired outcomes. Those who received the Advisory Note with specific dates and a social norms statement were 6 percentage points more likely to settle their arrears promptly compared to the control group.

LTA has now implemented the redesigned Advisory Note, and results have been encouraging. The proportion of owners who settled 14 or more days before their court date has increased from 30% to 48%. Moreover, arrears of 2.5 to 6 months duration have also been reduced by about 30%.

Version of Advisory Note	Nudges Tested
0	Control
1	Generic dates only
2	Generic dates + Social Norms statement
3	Specific dates + Social Norms Statement
4	Specific date only
5	Specific dates + social norms statement + red warning

Table 2. Control and Treatment Versions of the Advisory Note

Learning Points

These examples of successful behavioural nudges in strengthening enforcement suggest common factors relevant to Singapore's public sector context:

1. The call-to-action must be clear.

Agencies are now placing more focus on action items such as "Pay your Fines now" and "Renew your Road Tax Online" in their communications with the public.

2. Communications should be customised for specific users.

Customising letters has an effect of nudging users to comply earlier and helping them to avoid potential penalties.

3. Loss aversion messaging works.


In the context of enforcement, there is some evidence that people react more strongly to the mention of punitive measures for failing to

take prompt action. Nevertheless, social norms might still have some role to play in encouraging prompt compliance.

4. **The later the arrears, the more salient the consequences should be.** For people who are already late in complying, cautionary statements such as “Do not ignore this notice unless you have already made payment”, or “Avoid Court Charges” need to be emphasised, on top of helpful features such as customisation and social norms. This evokes a greater sense of urgency by focusing on the severity of the penalties and making them even more salient than before.

Conclusion

Our agencies are making good progress in using BI to achieve their regulatory objectives, but more work lies ahead. For instance, LTA is looking into the efficacy of measures such as minority norms (e.g. “You are among the last 5% of vehicle owners who have yet to pay their tax”) in encouraging immediate compliance to road tax matters. URA is studying ways to simplify letters when inviting business owners to renew their expiring planning permission. IRAS is considering how BI can be applied to improve service delivery and to enhance tax reporting accuracy.

There continues to be a common imperative for all our enforcement agencies to adopt more learning, innovating and trials, in designing more effective communications, and finding out what works better for both the agency and its customers. 

NOTE

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Healthy Living, Everyday

Nudges have been shown to help Singaporeans form healthier habits and make more informed lifestyle choices.

BY

VANESSA TAN,
VASUKI UTRAVATHY,

AND

CHEW LING

The authors are from the Insights, Innovation and Planning Division, Health Promotion Board.



Health in Singapore has improved substantially over the past five decades. Medical advances and a high standard of public health have raised life expectancy from 67 years in 1967 to 82 years today — one of the highest in the world.¹ Singapore ranks second in the Sustainable Development Index, a testament of advances made in providing sustainable environment for its people.²

However, challenges lie ahead. By 2030, one in ten Singapore residents will be aged 65 and above. A busy and affluent lifestyle has given rise to issues such as over-eating, sedentary lifestyles and tobacco use. These unhealthy habits increase the likelihood of non-communicable diseases (NCDs) such as cancers and cardiovascular diseases, which lead to a poorer quality of life and add to the burden of the healthcare system, and social support structures. These NCDs can be prevented if individuals maintain healthy lifestyles.

Getting people to live healthily is not a simple task. Government incentives and nation-wide educational campaigns have met with limited success. The challenge is complex, and policymakers need a deeper understanding of why and how people behave as they do. Tasked with keeping the nation healthy, the Singapore Health Promotion Board (HPB), a statutory board formed under the Ministry of Health, actively applies behavioural insights (BI) to help individuals shift their behaviours

and take greater ownership of their own health.

From Informing to Influencing: Making a difference to health outcomes

Since the early years of independence, health promotion — largely in the form of health education and mass public campaigns — has played a significant role in raising health awareness and literacy in Singapore. However, trends have shown that knowledge does not necessarily lead to practice.³

A growing body of research indicates the strong influence of physical and social surroundings on individuals' actions. For example, simply asking people to go for regular health check-ups (even at low or no cost) may not be adequate. But making cancer screenings readily available in the polyclinics and in the community may boost participation.

As part of a new initiative to increase screening for colorectal cancer, HPB has worked with partners such as the Singapore Cancer Society to make FIT kits (which picks up suspicious blood traces in stools) available in the community — such as through major pharmacies, polyclinics or at community events — at no cost to eligible clients.

Similarly, asking children to eat more healthily will probably meet with limited success, but making healthier food choices available and more attractive

in school canteens might work better. This approach was adopted in the Healthy Meals in Schools Programme (HMSP) in Singapore, which helps children and youths to eat more healthily. A survey done among students from 33 primary schools and 19 secondary schools in 2015 showed that 24% more students consumed at least two servings of fruits and vegetables every day, six months after the Healthy Meals in Schools Programme was introduced. The early success of this programme has seen the Healthy Meals in Schools Programme being introduced to all mainstream schools.

What these examples tell us is that behavioural theories can point the policy

community to better interventions. However, finding out what works is often highly contextual and requires continuous experimentation and adapting. In our shift from “informing” to “influencing”, many of our efforts have taken into account behavioural traits such as how Singaporeans think, decide and form new habits. This demonstrates how BI can complement existing evidence-based approaches to create solutions that work.

Other examples from HPB’s experience illustrate the importance of designing and testing interventions that are Easy, Attractive, Social and Timely,⁴ in order to make a greater impact on health outcomes in Singapore.

CASE STUDY #1:

Creating and sustaining a healthier dining ecosystem

To create systemic nudges, stakeholder engagement is key. Map out a customer journey to identify gaps and opportunities. Make it easy and attractive for industry partners to come on board, and for customers to buy in repeatedly.

Excess calorie intake is a key cause of obesity in Singapore. If the trend continues unchecked, by 2050, one in two Singaporeans will be overweight,

obese, or suffer from diabetes in their lifetime.

HPB found that six in ten Singapore residents usually eat out for lunch or

Make it easy and attractive for industry partners to come on board, and for customers to buy in repeatedly.

dinner, compared to 1 in 2 in 2004. Singaporeans who eat out tend to consume more and have unhealthier diets.⁵ To slow the rise of obesity among Singaporeans, HPB introduced the Healthier Dining Programme to weave healthier choices into the dining-out menu. When the average Singaporean eats out, a typical meal portion consumed is about 700 calories. HPB partnered with food and beverage (F&B) operators to offer lower-calorie options (500 calories or less) that were still tasty and satisfying. In addition, healthier ingredients such as wholegrain, fruits and vegetables were included in their core menu offerings.

HPB first mapped the local food and beverage landscape, identifying food court chains, coffee shops and restaurant chains where a significant number of Singaporeans dine out. HPB then engaged identified F&B partners

to understand the impact on costs and operational challenges in providing healthier food options. By highlighting healthy menu options as an emerging area of business growth, HPB motivated F&B owners to come on board. In return, HPB supported their efforts to introduce new menu offerings by marketing the availability of healthier choices over an extended period.

To drive consumer demand for healthier options, HPB leveraged insights from design thinking to create attractive on-ground promotions including point-of-sales prompts, nudging consumers to choose healthier options at F&B outlets.

As of December 2016, 62 F&B partners (with over 1,600 touch points) have come on board the Healthier Dining Programme. Participating F&B operators range from food courts such as Kopitiam and Foodfare, to

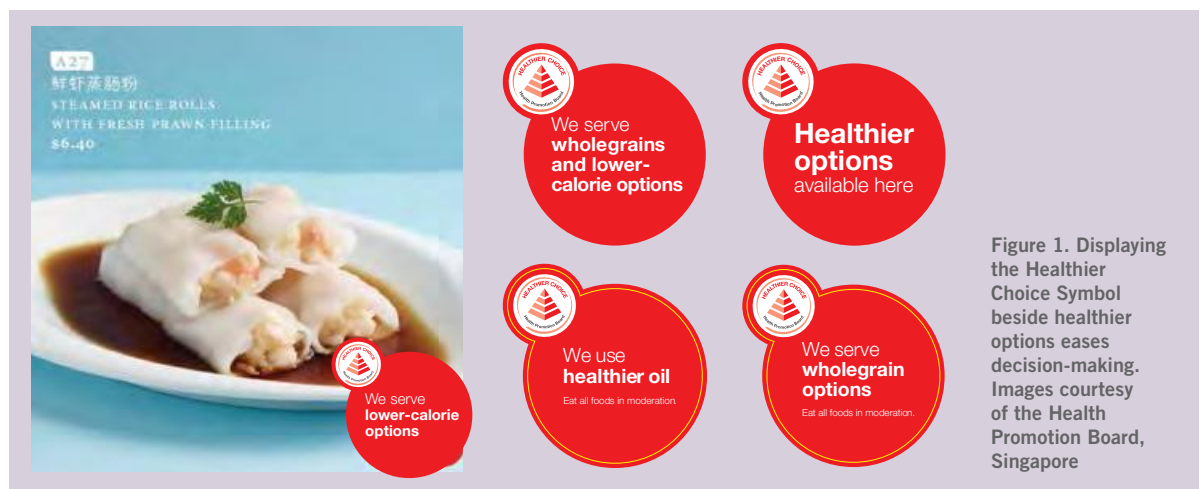


Figure 1. Displaying the Healthier Choice Symbol beside healthier options eases decision-making. Images courtesy of the Health Promotion Board, Singapore

restaurant chains such as Paradise Group, Pu Tien and Swensen's. Since June 2014, more than 5,000 F&B partner outlets island-wide have served healthier meals to Singaporeans: one in

ten meals eaten out has been healthier. Efforts are also underway to extend the programme to hawker centres, through a partnership with the National Environment Agency.

CASE STUDY #2:

Getting people to walk more

To influence longer-term behaviour change, a combination of nudges is required — first, to initiate the new behaviour, and then to encourage repeated behaviour. These nudges must be attractive enough to keep users engaged at each stage.

The 2010 National Health Survey showed that two in five adult Singaporeans between 18 to 69 years old do not engage in at least 150 minutes of physical activity per week. A further quarter of these inactive adults engage in less than 30 minutes of physical activity a week. The concern here is their increased risk of cardiovascular disease, cancer and obesity, due to the lack of physical activity.

To influence longer-term behaviour change, a combination of nudges is required — first, to initiate the new behaviour, and then to encourage repeated behaviour.

To address this, the National Steps Challenge was launched in 2015. It has since enjoyed both nationwide reach and

impact, becoming one of HPB's most successful initiatives. Besides attracting over 100,000 adults and students in its first season, it enjoys high participation levels and has influenced the majority of sedentary participants to become active during the period of the challenge, i.e. achieving at least 150 minutes of physical activity per week. How did this happen?

At the onset, the Challenge sought to be attractive to participants: they each received a wearable steps tracker and a 'sure-win' chance to earn small cash incentives by clocking 5,000 to 10,000 steps a day (4km to 8km). The rewards programme was gamified to keep participants engaged.

By design, it was relatively easy to reach the first rewards tier: those who clocked 10,000 steps daily would earn the first incentive within two weeks.

Subsequent tiers were made slightly more challenging. By the time all three tiers were reached, the average participant would have taken 12 weeks or more to complete them, which based on past experience with similar programmes, is a sufficient timeframe in which to form new habits. In fact, 36% of those who had reached the third tier continued clocking their steps, despite having won all 'sure-win' prizes.

Participant behaviour was sustained throughout the Challenge. When Season One concluded in May 2016, more than 50% of the current participants had achieved 7,500 steps or more a day, and over 75% had used the step tracker five days or more in a week. Most encouraging of all, 78% of participants who were previously inactive reported themselves to be sufficiently active,

with 150 minutes of activity per week since joining the Challenge.

In addition, based on a population survey conducted by HPB, the proportion of Singapore residents aged 18 to 74 years of age who had at least 150 minutes of physical activity (exercise/walking) a week increased from 50.7% to 57.4% between 2013 and 2016.

The Challenge continues to be popular. As of March 2017, nearly 400,000 Singaporeans of all ages have participated in Season Two. With a more extensive gamified rewards programme, more participants have hit key milestones faster than in Season One — 16% of Season Two participants achieved all six tiers of rewards and would have walked a total of about 1,200,000 steps, about 960km, the distance from Singapore to Hat Yai, Thailand.

CASE STUDY #3:

Break fast, break a bad habit

To introduce a change, identify a timely point in people's lives when they will be most receptive. Understand what they are experiencing in those moments and tap on social support or norms in the community to influence the experiences.

Smoking is a highly addictive behaviour, and those trying to quit may find themselves relapsing several times before they succeed.

While rolling out population-based programmes to all Singaporeans, HPB has, over the years, tailored culture-specific programmes. To better reach

out to Malay-Muslim smokers, HPB introduced the Ramadan I Quit 28-Day Countdown programme in 2013. During Ramadan, Muslims fast from first light of dawn to sunset and smoking is an activity that is strongly discouraged. In fact, based on focus group discussions that were conducted with the Malay-Muslim community, 48% of smokers indicated that they had previously tried to quit smoking during Ramadan.

There was evidence that smokers who managed to stay smoke-free for 28 days were five times more likely to quit smoking for good.⁶ Hence, Malay-Muslim smokers were recruited in the month of Ramadan and challenged to remain smoke-free for 28 days. In short, this was the most timely period to nudge Malay-Muslim smokers to start kicking their habit.

People should be able to exercise informed choice over what health decisions to make.

To increase the accessibility of the I Quit programme to the Malay community during Ramadan, roadshows were held in festive bazaars. HPB also worked closely with mosques and MUIS (also known as the Islamic Religious Council of Singapore) to share the importance of quitting smoking, particularly given the broader support for doing so during Ramadan.

In 2015 and 2016, HPB attracted an average of 1,700 participants during each month of Ramadan, a ten-fold increase compared to an average of 170 participants in non-Ramadan months. This demonstrates how a targeted and timely approach can yield significantly greater reach and impact.


Conclusion

Singapore's growing affluence, with its associated lifestyles, present more complex challenges for health. Many health problems can be addressed significantly by getting more people to adopt healthier ways of life. The longer-term challenge is to help people form and sustain healthier habits, and even influence others to follow their example. This is important as we seek to move from 'inform' to 'influence' in our public health strategies, and have citizens help themselves and others to achieve healthier outcomes.

We should continue our stakeholder engagement efforts, to nurture an ecosystem where innovative ideas and nudges can be applied effectively. By making a strong business case for healthy living, we can grow our network of public, private and people partnerships. As demonstrated in the Healthier Dining Programme's growing market share, this approach can tilt the market to provide healthier options and make it easier for citizens to take up and sustain healthier behaviours. Bringing

a variety of exercise programmes to the doorsteps of Singaporeans' homes⁷ and workplaces⁸ has also elicited a positive response.

People should be able to exercise informed choice over what health

decisions to make. HPB's mission is to empower individuals to take ownership of their health. This will only be possible when an increasingly educated populace realises the importance of health, and takes concrete steps to improve it. 

NOTES

1. "Life Expectancy in Singapore," https://www.moh.gov.sg/content/dam/moh_web/PressRoom/Highlights/2016/cos/Life%20Expectancy%20in%20Singapore%20Information%20Note_120416.pdf.
2. Stephen S. Lim, et al., "Measuring the health-related Sustainable Development Goals in 188 countries: a baseline analysis from the Global Burden of Disease Study 2015," *The Lancet* 388(10053): 1813–50.
3. AIA Healthy Living Survey 2011, https://www.aia.com.sg/content/dam/sg/en/docs/press-releases/2011/AIA_healthy_living_index_survey_findings_sg.pdf.
4. "EAST - Four simple ways to apply behavioural insights," where behaviour change can be encouraged by making it Easy, Attractive, Social and Timely, <http://www.behaviouralinsights.co.uk/reports/behavioural-insights-team-publishes-easta-new-framework-for-applying-behaviouralinsights/>
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6. "Clinical and public health significance of treatments to aid smoking cessation," *European Respiratory Review* 17: 110, 199–204.
7. Sundays at the Parks, which was launched in 2013, has grown from 2 parks to 89 to date, in partnership with Sport Singapore: <https://www.healthhub.sg/programmes/33/sundays-at-the-park>.
8. Full list of exercise programmes, <https://www.healthhub.sg/programmes/34/get-active>.

Data Science in Public Policy — The New Revolution?

Data science tools are likely to revolutionise policymaking, but human intervention is still key to success.

BY
**DO HOANG VAN
KHANH**

Khanh is Senior Researcher in the Social & Economics Team, Institute for Governance and Policy, Civil Service College. Her research interests include healthcare economics, behavioural economics and evidence-based policymaking.



The Data Science Revolution

Using data to make decisions is not new, but we have seen data produced at an unprecedented rate by the Internet and mobile technologies. Yet, the revolution in data science is not so much about “data” itself, but the rapid advances in statistical methods and software that allow huge amounts of data to be analysed and understood. Indeed, this data science revolution has caused many industries to relook their strategies and introduce new ways of generating business. Modern analytics has made its way into just about every field: from public health, policing, economics and sports to political campaigns.

Modern analytics has also improved the way in which public policies are designed and implemented. For example, public officers can acquire and analyse data in real time, and develop more evidence-based solutions. In addition, datafication¹ — the ability to transform non-traditional information sources such as text, images, and transactional records into data — has given policymakers fresh insights into perennial issues.

However, when the ultimate goal is behavioural change, data science and behavioural insights (BI) need to go hand in hand. Predictive analytics and nudges can serve as two parts of a greater, more effective whole.² For instance, data science can help identify or predict groups that face high, moderate, or low risks in

particular contexts. Policymakers can then channel resources towards more hands-on and high-impact interventions (e.g. personal visits) to address the highest-risk cases. For moderate- and low-risk individuals, low-cost, low-touch nudges (such as SMSes or letter reminders) could be sufficient to keep them on the right track.

Data science tools such as **real-time data**, **data visualisation**, and **machine learning** are already bringing new ideas and approaches to policymaking. Used together with behavioural approaches, they could revolutionise the way policies are made.

When the ultimate goal is behavioural change, predictive analytics and nudges can serve as two parts of a greater, more effective whole.

Real-Time Data and Data Visualisation

Real-time data refers to data that is passed along to the end-user as quickly as it is gathered — it is not kept or stored. Global Positioning Systems (GPS) that show drivers traffic situations around them are an example of real-time data in popular use. With data visualisation, real-time data can help policymakers to see patterns, get a better grasp of what is happening on the ground, and make more timely and better-informed choices.

SOLVING THE CIRCLE LINE DISRUPTION MYSTERY

Between August and November 2016, Singapore's MRT Circle Line was hit by a spate of mysterious disruptions, causing confusion and distress to thousands of commuters. Prior investigations by train operator SMRT and the Land Transport Authority (LTA) indicated the cause as some form of signal interference. This resulted in signal loss and triggered the emergency brake safety feature in some trains, causing them to stop along the tracks. However, the incidents seemed to occur at random, making it difficult for the investigation team to pinpoint the exact cause.

Using data including the date, time, location as well as train IDs from each incident, the Data Science team in the Government Technology Agency (GovTech) generated some exploratory visualisations. These showed that incidents were spread throughout each day, mirroring peak and off-peak travel times. Incidents happened at different locations on the Circle Line, with slightly more occurrences in the west. However, there were still no signs of where the signalling interruptions were coming from.

After train direction data was added to the chart, the team managed to pick up a pattern. They noticed the breakdowns seemed to happen *in sequence*. Once a train was hit by interference, another train behind it, moving in the same direction, was hit soon after, leaving a consecutive “trail of disaster” leading away from the initial incident. This raised the question of whether **something that was not in the dataset had caused the incidents. Could the cause of the interference be a train going in the opposite direction?**

Testing this hypothesis suggested that train disruptions could be linked to one “rogue” train, which itself might not be encountering any signalling issues. A review of video records of trains arriving at and leaving each station at the times of the incidents identified the suspect: PV46, a train that had been in service since 2015. When the team matched PV46's location data to train disruptions, they concluded that more than 95% of all incidents from August to November 2016 could be attributed to this “rogue train”.¹

Data visualisation helped GovTech officers pin down both the problem and the root cause of the train disruptions in a relatively short time.

Note

1. The remaining incidents were likely to be due to signal loss, which happens occasionally under normal conditions.

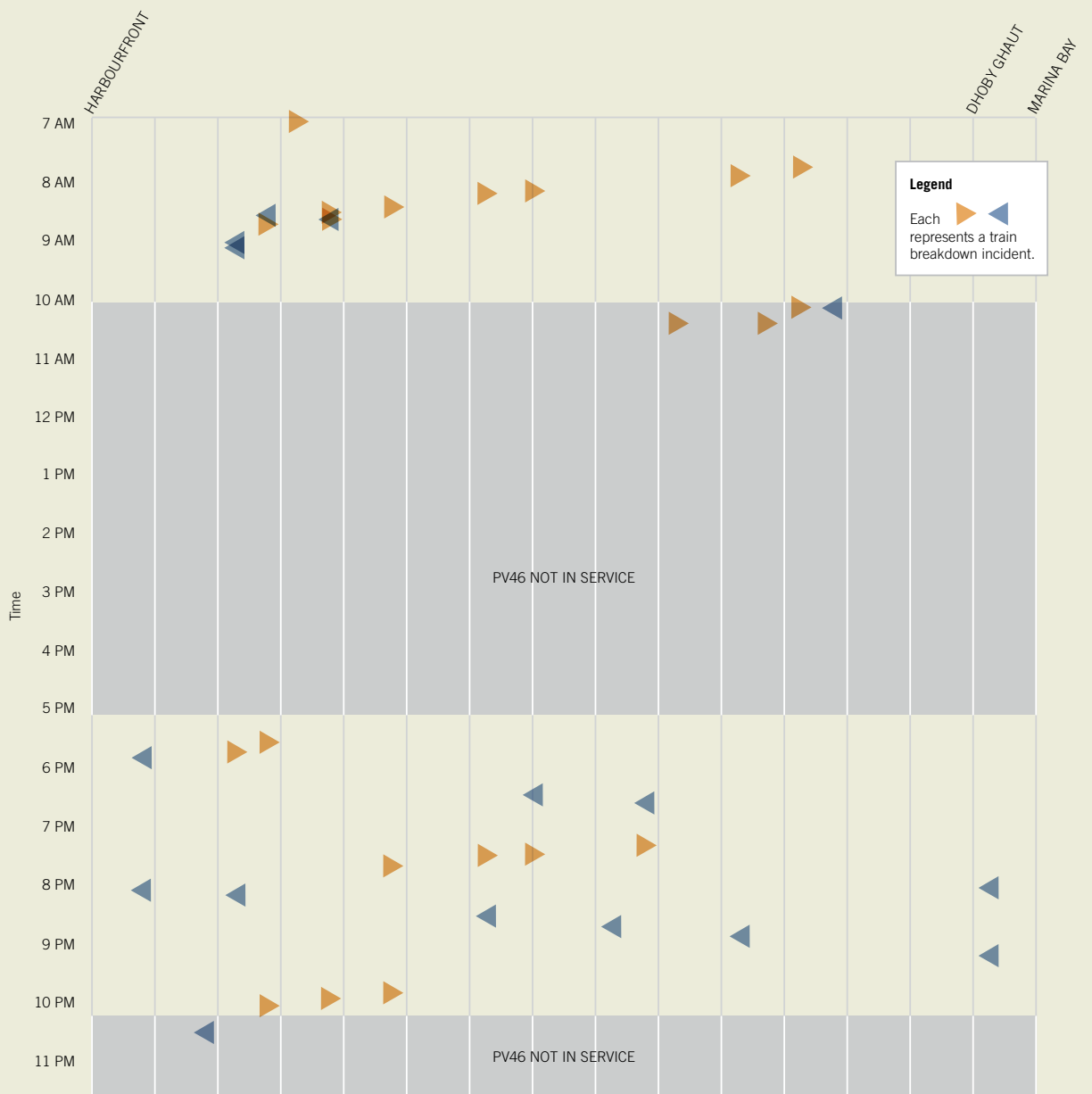


Figure 1. Interference incidents during or around the time belt when PV46 was in service on 1 September 2016. Reproduced with permission from Government Technology Agency.

Contributed by Data Science Division, Government Technology Agency.

Each year, forest and peatland fires spread across Kalimantan and Sumatra, mostly due to peatland drainage and the conversion of land to palm oil cultivation. Besides the damage caused to biodiversity and the ecosystems, according to UN Global Pulse, over 10 million people in Southeast Asia are affected by haze. Indonesian forest and peat fires in 1997 to 1998 were estimated to have caused over US\$4.5 billion in damage, mostly health-related, across the region.¹

To better support the Indonesian government in forest and peat fire management, the UN Pulse Lab Jakarta set up a baseline study of social media conversations on Twitter during and immediately after three fire-related haze events between 2011 and 2014. The study found that there were a larger number of relevant tweets during significant fire-related haze events. Topical analysis of over 4,000 tweets between the February to March 2014 haze event in Riau further revealed common patterns between tweets and hotspots during a fire event. The most frequently discussed topics were “Status of forest fires” (close to 1,200 tweets), followed by “Support from Government”, “Hotspot status” and “Support from Community” (in the range of 400 to 600 tweets).

As more Indonesians use social media during fire-related events, there is great potential for social media data to offer real-time insights related to public concerns and conversations. Twitter analysis, combined with other real-time data sources — such as remote sensing, mobile phone calls to emergency phone numbers or mobility traces — can also provide additional insights on disaster impact and recovery on the ground. Twitter can also be used to verify information channels or serve as an early warning mechanism for improved emergency response and management.

Note

1. UN Global Pulse, “Feasibility Study: Supporting Forest and Peat Fire Management Using Social Media”, Global Pulse Project Series, No. 10, 2014, http://www.unglobalpulse.org/sites/default/files/UNGP_ProjectSeries_Peat_Haze_2014_0.pdf, accessed 3 January 2017.

Recent examples — from resolving the MRT Circle Line disruption to peat fire management in Indonesia — demonstrate how real-time data and visualisation have revolutionised and accelerated the effective resolution of complex policy issues and the management of crises.

Real-time data can also complement traditional ways of analysing, presenting and evaluating data. It can prompt policymakers to rethink established ways of addressing problems.

For example, the Pulse of the Economy, an initiative by the Government Technology Agency of Singapore (GovTech) in collaboration with various government economic agencies, uses high-frequency big data to develop new indicators to “nowcast” the economy. It draws from varied non-traditional sources of data, from Ez-link taps on the rail system to electricity consumption information, and even JobsBank applications and social media sentiments, to “nowcast” the economy. For example, the amount of electricity consumed in a particular district in Singapore, and the number of people alighting at bus stops in the district, can provide a timely indicator of how much economic activity is happening in that area. Government agencies can identify areas of growth and formulate strategies based on emerging data and patterns — which may have otherwise gone unnoticed.³

Machine Learning

Machine learning, a branch of artificial intelligence (AI),⁴ is a statistical process that starts with a body of data and tries to derive a rule that explains the data or can predict future data. Unlike older AI systems where human experts determine the rules and criteria for the system to make analytical decisions, machine learning can be used even where it is difficult or not feasible to write down explicit rules to solve a problem.

Machine learning is already an essential feature of many commercial services such as trip planning, shopping recommendation system, and online ad targeting. It has also been applied in strategic games, language translation, self-driving vehicle, and even public services. In the public sector, machine learning software has helped the US Military to predict medical complications and improve treatment of severe combat wounds,⁵ and cities to schedule, track and provide just-in-time access to public transport.⁶ In Singapore, the Housing Development Board (HDB) in collaboration with GovTech used machine learning to identify customer concerns more accurately and adapt its policies to cater to citizens’ needs.

Building on the success of the HDB project, GovTech developed a text analysis platform, “GovText”,⁷ to enable public officers to apply unsupervised machine learning to discover topic

MAKING SENSE OF PUBLIC FEEDBACK TO THE HOUSING DEVELOPMENT BOARD (HDB)

The HDB's Estate Administration & Property Group (EAPG) receives approximately 100,000 emails each year about flat sales. Together with GovTech, EAPG applied unsupervised machine learning to emails received in 2015 to discover key topics of public concerns. The analyses found about a cluster of emails on key collection: many new flat owners were emailing HDB to rush or delay their key collection date.

With this insight, HDB implemented an online system to schedule key collection, addressing the issue for both the public and HDB officers. This data-driven approach also helped improve the public sector's "ground-sensing" ability, by surfacing emerging trends and issues that may not have been obvious before.

Contributed by Data Science Division, Government Technology Agency

clusters from textual data without any coding knowledge. GovText not only scales data science capabilities across all levels within the whole of government but also allows officers to improve their "ground-sensing" methods.

The Predictive Power of Machine Learning

The bigger draw of machine learning lies in its predictive power. Supervised machine learning provides a systematic way of selecting which factors matter and in what way, which is useful for predictions. This predictive power could greatly improve policy design and evaluation.⁸

Currently, the use of machine learning for prediction is more prevalent in the

commercial world. Software for a video streaming service can predict what people might enjoy, based on the past choices of similar user profiles. But such software cannot yet determine which children are most at risk of dropping out of school. However, as Sendhil Mullainathan of Harvard University points out, these types of problems are in fact similar.⁹ They require predictions based on, implicitly or explicitly, lots of data.

Many areas of policy could benefit from machine learning, especially where prediction is important. For example, hospital doctors try to anticipate heart attacks so they can intervene before it is too late. Manual systems currently correctly predict this with

about 30% accuracy. Sriram Somanchi and colleagues from Carnegie Mellon University, however, have created a machine learning algorithm that predicts heart attacks four hours in advance of the event, with 80% accuracy (as tested on historical data).¹⁰

In Singapore, SingHealth together with GovTech also used machine learning to identify potential frequent admitters based on data such as medical history and demographics. The algorithm predicted with 80% accuracy, the probability of each patient's likelihood of returning to the hospital. This information could aid hospital staff to focus on patients with high predicted risk of returning, in order to reduce the number of readmission.¹¹

Limitations of Machine Learning

While the thoughtful application of machine learning to policy has many advantages, it cannot be applied to every policy problem. There are a number of caveats that policymakers need to be aware of when applying machine learning:

1. Prediction, not evaluation

Where a policy decision depends on a prediction of risk, machine learning can help inform this decision with more accurate predictions. For example, it can help social workers determine the quantum and duration of financial assistance that recipients should receive based on their

profile, or help hospitals identify which patient may be at higher risk of becoming a frequent admitter.

Predictions cannot unveil the cause-and-effect relationship between policy interventions and outcomes. Just because something is predictable does not mean that decisions should be made solely on predictions.

However, predictions cannot unveil the cause-and-effect relationship between policy interventions and outcomes. To uncover causation, policymakers need to use other evaluation tools such as randomised controlled trials. In addition, just because something is predictable does not mean that decisions should be made solely on predictions. For example, even if an algorithm predicts that an applicant seeking financial assistance has a greater likelihood to fall short of the programme's requirements, this does not mean that the application should be rejected outright without reviewing other aspects of the case.¹²

2. Define the outcome in a clear and measurable way

Being able to measure the outcome concretely is a necessary prerequisite to predicting.¹³ Machine algorithms are most helpful when applied

to a problem where there is not only a large history of past cases to learn from, but also a clear outcome that can be measured.

On its own, a prediction algorithm will focus on predicting its specified outcome as accurately as possible, at the expense of everything else.¹⁴ Any other outcomes, no matter how significant, will be ignored. In a ground-breaking project by Kleinberg et al,¹⁵ machine learning is used to predict which suspect should be detained in jail pending trial and which can be released on bail.¹⁶ The estimates show that if the release decisions were made using this low-cost algorithm instead of relying on judges' judgment, the crimes committed by suspects on bail could reduce by 25%. In this example, the algorithm treats every crime (past and present) as equal, whereas judges may, quite reasonably, place disproportionate weight on whether a suspect had previously committed a very serious violent crime. In such cases, an algorithm may not always predict the desirable outcomes.

When using machine learning, it is important for policymakers to clarify what they care about most, and what they might be leaving out. If the outcome is hard to measure, or involves a hard-to-define combination of outcomes, then the problem is probably not a good fit for machine learning.

3. Quality of training dataset

The success of any algorithm depends entirely on the quality of the training dataset it has to learn from. If the training data does not capture all the factors that affected previous outcomes, it can mislead the algorithm. For example, if judges previously based their decisions on whether family members showed up at court to support the accused (thereby displaying strong family support), this aspect needs to be captured in the dataset. Otherwise, the algorithm would not be able to factor this into its analysis, and it may recommend the release of more suspects without family support than desirable.¹⁷

For machine learning to be useful for policy, it must accurately predict “out-of-sample”. That means it should be trained on one set of data, then tested on a data set it has not seen before. When training an algorithm, policymakers should withhold a subset of the original dataset, then test the finished algorithm on that subset to verify its accuracy.¹⁸

4. Retaining human judgement

Ultimately, an algorithm cannot capture all the factors that impact the outcome of a policy intervention. Other than leveraging on trials and experiments to verify the actual impact on the ground, the element of human judgement remains

important. Machine learning can look at millions of cases in the past and extract what happened on average. But it is only the human who can see the extenuating circumstances in any given case, which might have not been captured in the training dataset. The human-machine team can be more effective than either one alone, using the strengths of one to compensate for the weaknesses of the other.¹⁹

Conclusion

To reap the full benefits of data science, governments need to systematically collect, share, as well as manage the sensitivities of using data. Beyond new approaches to collecting, analysing and presenting data, developments in data science have immense potential to work with other policy tools, such as behavioural insights, to bring about changes that benefit individuals and society.

By helping people to visualise the effects of their immediate actions, governments can address biases such as hyperbolic discounting²⁰ and “not in my backyard syndrome”, by making the future costs of their actions more salient and more personalised. This presents many opportunities to nudge people to “do the right thing” in areas such as public health, public transport, and the environment. At the same time, policymakers need to be aware of potential issues arising from the use of data, such as privacy protection and the risk of data-based discrimination.²¹

It is important to recognise that human intervention is key to the success of using data. Data science is excellent at identifying patterns and making predictions, but it does not tell policymakers what to do with the patterns and the predictions, nor does it offer solutions. To solve real-world problems, human judgement in designing and evaluating possible solutions remains irreplaceable. ✧

Ultimately, an algorithm cannot capture all factors in the real world that impact the outcome of a policy intervention. The human-machine team can be more effective than either one alone, using the strengths of one to compensate for the weaknesses of the other.

NOTES

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19. Refer to Note 1.
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OPINION

Making Policies More Effective, Scalable, Customised and Sustainable

Behavioural science has shown that a small nudge in the right direction can produce positive results with enormous benefits.

BY
HO TECK HUA

Ho Teck Hua is Deputy President (Research & Technology) and Tan Chin Tuan Centennial Professor at the National University of Singapore. He is a behavioural scientist with a PhD in Decision Sciences from the Wharton School, at the University of Pennsylvania. His research interests include behavioural economics, marketing and data science. Professor Ho is a Fellow of the Civil Service College.

Why Behavioural Insights Are Essential to Public Policy

Public policy affects the lives of many individuals. Traditionally, a policymaker might have expected individuals to behave rationally, and would formulate policies based on that assumption. Behavioural science tells us, however, that people may not always behave rationally: they may instead exhibit systemic biases that end up hurting their interests.

Behavioural insights (BI) have opened doors to new ways of thinking about public policy. A BI approach shifts from a purely rational perspective of policymaking to one that incorporates peoples' actual views and behaviours. It shuns the traditional assumption

that people always make the best decisions, and instead researches how people actually make decisions, before implementing large-scale interventions. It means trying and testing new ideas by placing citizens at the centre of issues and formulating solutions for them. These solutions use deliberately designed behavioural nudges that have a high chance of success in changing the behaviour of an individual for his or her long-term well-being. This is what makes BI unique and powerful.

Innovative Uses of BI in Public Policy

Examples in education, healthcare, sustainability and social norms, in

Singapore and other countries, illustrate how BI can provide innovative ways to shape policies that benefit individuals and society.

Lifelong Learning — Short-Term Incentives, Long-Term Impact

Although people know lifelong learning helps them adapt, grow and stay economically competitive, individuals often do not take developmental courses, for various reasons. This behaviour is especially prevalent in small and medium-sized enterprises (SMEs), as these companies lack the resources to conduct in-house training. Instead, they tend to rely on employees' self-motivation to pursue training courses that enhance their skills and improve employability.

In a 2015 randomised controlled trial that my colleague and I conducted in Singapore,¹ we used proven psychological techniques and a one-time, outcome-based financial incentive to motivate workers from an SME to attend short- and long-term vocational training. The trial presented participants with the opportunity to take two valuable courses for free, by offering a one-time cash incentive of \$60. This was offered to workers who finished two courses within four months, to reimburse their out-of-pocket expenses for enrolling. This incentive design not only doubled training participation during the intervention period, but also had a sustained effect

of increasing the long-term uptake of courses post-intervention, despite the absence of further incentives.

In this example, a simple nudge in the right direction shifted employee mind-sets and helped individuals to get past the initial hurdle of 'starting'. More importantly, the nudge helped this mind-set and behaviour to 'stick', even after the incentive was removed.

Losing Weight — Different Folks, Different Strokes

To tackle obesity, my colleagues and I devised a public initiative called the Self-Management in Lifestyle Enhancement (SMiLE) programme.² SMiLE provides incentive-based behavioural interventions to help people in Singapore lose 5% of their starting weight while emphasising a lifestyle change and focusing on the health consequences of obesity.

We found that financial incentives offered for weight loss worked very well for men. However, this was not the case for women, who had a higher baseline motivation to lose weight and who responded better when they understood the risks of obesity.

Such gender differences in behaviour affect the efficacy of blanket policies. They challenge traditional thinking and the boundaries of conventional policymaking, which often assumes that target groups will respond to policies in homogeneous ways.

Environmental Sustainability — Keeping Energy Usage Down by Keeping Up with Peers

Opower, a leading provider of energy efficiency cloud services in the United States, uses ‘guilt’ and ‘competition’ as a strategy to help millions of consumers lower their energy bills. Opower’s software platform stores and analyses over 600 billion meter reads from 60 million customers globally. The company then works with energy producers to send detailed energy consumption reports to individual households.

These reports include a bar graph that compares a household’s energy consumption to the community average, and to the community’s most energy efficient households. What makes this report truly effective is a box that grades energy consumption using smiley faces: two smiley faces if a household consumes less energy than 80% of its neighbours; one smiley face if it consumes less energy than most of its neighbours; and no smiley face if a household uses more energy than its neighbours.

Using peer comparison as a messaging strategy has worked. As of March 2017, Opower clients have saved US\$1,150,746,800 on their energy bills, abated 13,299,477,900 pounds of CO₂ emissions, and saved 11,694,214,500 kilowatt hours of energy.³ These figures keep increasing by the second.

Who knew that peer comparison and a desire to stay ahead would inspire energy conservation?

Social Norms — Encouraging People to ‘Join the Rest’

Humans are social beings. Describing what most people would do in a certain situation often encourages others to follow.

The UK’s Behavioural Insights Team (BIT) leveraged social norms to increase tax payments. BIT teamed with Her Majesty’s Revenue and Customs department to send letters to people informing them that most people made tax payments on time. This led to a substantial increase in tax payment rates, with the most successful message yielding a 5% increase in tax payments.⁴

In Singapore, local agencies such as the Land Transport Authority have also adopted social norms to improve the timeliness of tax payments (Editor’s note: see Leong Wai Yan’s article on p. 34).

These examples show how simple nudges can work wonders in changing behaviours. More importantly, such nudges are not costly to implement and can be easily scaled up. That said, there remains many more avenues and opportunities to use, for instance social norms, to change individual behaviour.

Key Areas of Impact for Policymakers

Although a BI approach has the potential to be applied widely, in the context of many developed countries where issues of ageing, integration and sustainability are pertinent, policymakers could yield significant payoffs by focusing on the following areas:

Retirement planning: Many people are not well prepared for retirement. Using BI, we could educate people to adopt a long-term perspective for savings, perhaps as soon as an individual starts his or her working life.

Active ageing: Ageing is a global phenomenon. To delay premature ageing, we could use BI to promote healthy eating and more exercise to stay fit.

Social integration: Many large cities have diverse populations. BI could be used to educate people to be more tolerant of one another, so that there will be less conflict and greater inclusiveness in the society we live in.

Environmental sustainability: Climate change will be a central challenge in the century ahead. We could frame key messages using BI-based principles,


educating people to be more environmentally responsible by consuming less energy and by adopting behaviours that protect the environment.

The Future of BI — Scalable, Customised and Sustainable

Despite being a developing field, the potential of BI to strengthen public policies has already been demonstrated in a broad range of domains. Going forward, researchers should delve deeper into studying three types of nudges:

1. Scalable nudges that can easily be scaled up and rolled out to a large population at reasonable cost.
2. Customised nudges to account for heterogeneity in individuals, who may respond to behavioural interventions in different ways.
3. Long-term nudges which achieve intervention effects not only when the nudges are first introduced, but are also sustainable over the long-term.

BI-based approaches hold great promise to bring about large-scale changes in behaviour, while allowing for customised solutions and sustainable longer term effects — all at a low cost.

By unlocking human potential, these behavioural changes could make people wealthier and happier, society more integrated and the environment cleaner and more sustainable. 

NOTES

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OPINION

The Hidden Costs of Behavioural Interventions

Too many small nudges could lead to big problems, argue two social scientists in Singapore.

BY
WALTER THESEIRA

AND

ONG QIYAN

Walter Theseira is Senior Lecturer of Economics at the Singapore University of Social Sciences. He earned his PhD from the Wharton School, University of Pennsylvania. He has consulted on research with agencies including the Economist Service, the Civil Service College, the Land Transport Authority, and the Central Provident Fund Board.

Ong Qiyen is Deputy Director of Research, Social Service Research Centre, National University of Singapore. She received her PhD from the Nanyang Technological University. A behavioural economist by training, her current focus is on bringing behavioural science to social services to generate new insights and stimulate innovative solutions.

Introduction

Few social science ideas have been adopted by policymakers as quickly as the behavioural science revolution. The main attraction of behavioural interventions is the low cost of implementation: simple changes in messaging or policy workflows can meaningfully affect behaviour, often more cost effectively than taxes or regulation would. Motivated by the promise of low-cost, high impact policymaking, governments including the United States, the United Kingdom, and Singapore have set up behavioural intervention offices reporting directly

to their highest officials. But the success or failure of behavioural interventions is usually defined simplistically: “Did it work? Did it change behaviour?”

Rarely do we ask: “Is society better off?”

Behavioural science is no magic bullet. While many behavioural interventions are fiscally cost-effective, even successful interventions may impose implicit costs on individuals and society. Consider a simple example. To improve public health, many workplaces now nudge people to take the stairs by highlighting the benefits of exercise

and the risks of a sedentary lifestyle. But not all are made better off. Some may exercise when they should not, degrading their performance at work; others may fail to exercise, but will feel guilty for not making the effort. Is society truly better off when guilt is subtly imposed on people who were simply making their way to work?

When we consider the well-being of the entire community or societal welfare, we should weigh both the benefits from people changing their behaviour in positive ways, but also the real costs imposed on people who are made to feel guilt, social impropriety, or discomfort with their day-to-day actions.¹

In general, behavioural interventions which help direct people towards their own desired outcomes more efficiently are likely to promote welfare. For example, interventions which help people understand and interpret their CPF account statements, highlight the real costs of borrowing on credit cards, and nudge people into attending their medical appointments, are almost certainly welfare promoting.

In contrast, behavioural interventions which steer people towards the outcomes desired by policymakers may not always promote welfare, even if the prescribed behaviours are well intended. Behavioural interventions that evoke negative emotions, encourage social comparisons and discrimination, or leverage cognitive biases may impose societal costs that could

outweigh the benefits from improvements in the targeted behaviours.

Behavioural interventions should not be abandoned as policy tools. As legal scholar Cass Sunstein points out,² our everyday choice environment already shapes behaviour regardless of whether interventions are consciously applied, and policymakers have a responsibility to shape this environment in the best interests of the public. However, policymakers may overuse behavioural interventions, because they are easier to implement than conventional policy. Conventional interventions that rely on regulation, taxation or subsidies are highly visible and require strong support from stakeholders because they impose costs or use coercion. However, behavioural interventions are usually incorporated to improve the effectiveness of an existing policy, making them less visible to the public. Policymakers therefore receive less direct feedback on behavioural interventions and should exercise discretion, and even restraint, when leveraging on behavioural insights for their work.

Behavioural Interventions that Enhance Welfare

Most people often lack the expertise or time to make careful deliberations based on complete information. Interventions that ease rational decision making — by providing information, de-biasing decision making, or reducing the costs of decision processes — are likely to

be welfare enhancing, because they do not compromise autonomy. Instead, they help decision makers achieve their own objectives more efficiently. In Sunstein's terms, such interventions 'increase navigability': they guide decision makers much as a good map does, but the decision maker ultimately chooses the destination.

In general, interventions that ease rational decision making — by providing information, de-biasing decision making, or reducing the costs of decision processes — are likely to be welfare enhancing, because they do not compromise autonomy.

The best interventions target specific problems of decision making such as our inability to compute complex financial sums, and our tendency to procrastinate and fail to plan for the future. For instance, the Central Provident Fund Board (CPF Board) in Singapore has employed behavioural interventions to help members become more informed about their retirement savings, and to encourage members to plan for retirement. In 2016, the CPF Board simplified CPF members' account statements, using visual cues and graphical summaries to highlight the most salient information. They also added a salient, gain-framed financial tip to nudge members to prepare for retirement: Members were told exactly

how much additional interest they would earn by the age of 65 for each \$1,000 they transfer from their Ordinary Accounts to their Special Accounts.³ Since most people have difficulty understanding compound interest,⁴ such nudges could motivate CPF members to take early action to prepare for retirement.

Behavioural interventions can also help people who fail to take advantage of public benefits they are entitled to, or fail to make choices that would benefit themselves. In Singapore public hospitals, up to three in 10 patients fail to attend appointments in the specialist outpatient clinics. This contributes to operational inefficiency, and increases patient risks from untreated health conditions.⁵ Each public healthcare cluster now implements behavioural interventions, through SMSes and physical mail, to increase the salience of upcoming appointments and reduce no-show rates.

Such behavioural interventions efficiently enhance societal welfare because they do not force people down any particular path, and do not leverage biases to get people to act; they simply guide people to make rational and informed decisions that enhance their welfare.

Behavioural Interventions that Need to be Used with Care

Interventions that leverage emotions

Behavioural interventions that exploit emotions to change behaviour are often considered less coercive than traditional

policy tools such as taxes and regulations. Evoking negative emotions — fear, disgust, guilt and so on — is effective, because risks and dangers tend to be more salient and easily recalled when making decisions. However, such nudges impose social costs on the public who experience negative emotions, and may also lead people to make choices that are inconsistent with their own preferences or interests.

For instance, while graphic anti-smoking advertising is widely credited with raising awareness of the hazards of smoking, there is also substantial evidence showing people are mentally and emotionally affected by graphic images printed on cigarette packs.⁶ Whether public shock and disgust is a worthwhile trade-off depends on whether graphic anti-smoking campaigns actually discourage smoking, which is more challenging than simply raising awareness of its hazards.

While the public health hazards of smoking may justify emotionally stressful interventions, negative messaging is increasingly being considered to address other health-related issues, such as sedentary lifestyles, obesity, and the consumption of sugar, meat, and fat. Those who have no serious health problems will likely resent being made to feel guilty or shameful at the occasional indulgence. Others, who are trying hard to improve their habits, may likewise feel shame and stigma⁷ if the interventions are not carefully

calibrated. Negative messaging imposes costs, just as taxes do, and should be used with the same caution.

Interventions that leverage cognitive biases

A wide variety of cognitive biases, associated with “System 1” (quick, subconscious, emotive) decision making, affects how we make choices every day. Policymakers recognise that emotions and biases may cloud rational judgment — which is why a ‘cooling-off’ period applies for purchasing insurance and political voting. But the same concerns apply to policy interventions which leverage cognitive biases, when people may be nudged into decisions inconsistent with their own welfare.

Default policies, which rely on our tendency to passively accept the status quo, are highly effective. Nearly all adults are organ donors in countries where consent is presumed by default, whereas less than two in 10 consent to be donors in countries where people must actively choose to become a donor.⁸ However, leveraging the default bias can fail to enhance welfare because the choice made by the policymaker may differ from the choice preferred by an informed decision maker. For example, employees tend to invest their retirement savings according to the default asset allocation set by their pension fund,⁹ regardless of whether the default allocation meets their needs.

Changing policy outcomes is also not the same thing as changing the minds

Nobel Laureate Daniel Kahneman divides human decision making into two modes:

System 1 which is quick but driven by subconscious heuristics, emotions, and instincts, and **System 2** which is slow, but deliberative and rational.

Behavioural interventions that support System 2 decision making, and avoid exploiting the cognitive biases inherent to System 1, are likely to enhance welfare because they help people accomplish their own deliberative, long-term goals.

Source: Daniel Kahneman, *Thinking, Fast and Slow*, (New York, USA: Farrar, Straus and Giroux, 2011).

of decision makers. A 2014 survey on organ donation in Singapore suggests that only 60% of those surveyed were willing to donate their organs, even though very few actually actively opted out.¹⁰ For the policy default to be a real nudge, policymakers need to make a concerted effort to ensure that individuals are aware of the real consequences of their decision (or lack of a decision). Otherwise, a policy default is a shove rather than a nudge, and may have repercussions if the public believes that a decision has been made against their own preferences.

Policymakers recognise that emotions and biases may cloud rational judgment, but the same concerns apply to policy interventions which leverage cognitive biases.

Interventions that leverage social norms and alter perceptions of what is socially acceptable
Advertisers and governments have long recognised the impact of social norms.¹¹ However, the recent wave of policy enthusiasm for social norms is motivated by systematic evidence showing that social norms can change behaviours in a cost-effective manner. Social norm-based nudges have since been used to encourage citizens to pay taxes on time,¹² to pay their foreign domestic worker levies,¹³ and to act more graciously on public transit. By and large, these measures have nudged behaviour in the direction intended by

policymakers. However, as governments apply social norms to more domains, they should also consider the risks from overuse.

Social norms work because people judge behaviour against a social yardstick, and feel implicit and explicit pressure to conform. In the short run, social norms interventions impose mental costs on people who — for whatever reason — resent having their behaviour measured and compared to others. Research on Opower, a social norms intervention to lower energy consumption by comparing energy usage levels between neighbours, suggests that mental costs incurred by individuals who dislike the intervention eliminate half of the gains to society.¹⁴ While lowering energy consumption has great social benefits, policymakers should be mindful of the mental costs.

In the long run, the persistent use of norm-shaping interventions may increase social polarisation, and prime society to discriminate more harshly against minority behaviours. In Taiwan, priority seats on public transit have caused conflict when seemingly able-bodied commuters who take the priority seats are bullied by bystanders aggressively enforcing the social norm. In late 2016, the Taiwanese government received a public petition to remove priority seats, on the grounds that designating priority seating is counterproductive to improving overall civility and graciousness on public transport. Using social norms

to promote civic-mindedness may eventually replace altruism with social obligation; people may feel forced to act kind, rather than feel any intrinsic motivation to be kind. While one social norms intervention is unlikely to change society fundamentally, the overuse of social norms messaging across different domains may have a multiplier effect in accelerating social polarisation. People may be gradually primed to discriminate against minority behaviours not only in the domains where social norm messaging is applied, but also in other societal issues.

Interventions that are too narrowly focused on agency goals

Agencies naturally seek to use behavioural interventions to solve policy challenges in their domain. But there is a risk that behavioural interventions could be overused in pursuit of, say, agency performance indicators, rather than outcomes that truly enhance societal welfare. Take one of the fastest growing uses of nudges: bill collection by public agencies. Bill collection nudges have cost-effectively increased on-time payment rates in the UK and Singapore.

These nudges are welfare enhancing when delayed payment is due to simple procrastination or absent mindedness. The agency gets payments on time, and the payer avoids late penalties.

However, there are people who cannot afford to pay on time because they are in financial distress, or have low incomes. They face a 'cognitive tax' from having to manage competing needs on a very limited budget,¹⁵ and may make poor financial decisions when nudged for immediate payment. They may, for instance, resort to borrowing money at high cost to pay for a bill when nudged, instead of seeking financial assistance, or they may prioritise paying creditors who nudge them the most effectively, rather than settle their most critical debts. While introducing nudges may improve specific policy outcomes, they could also unintentionally reduce the welfare of certain groups in society.

Every behavioural intervention that is narrowly focused on a specific policy goal may impose a small, but cumulative, cognitive tax on members of the public. A barrage of such nudges may gradually deplete our capacity to plan and make good decisions.¹⁶

The persistent use of norm-shaping interventions may increase social polarisation, and prime society to discriminate more harshly against minority behaviours. It may also eventually replace altruism with social obligation; people may feel forced to act kind, rather than feel any intrinsic motivation to be kind.

Society accepts that constant exposure to commercial interventions may be harmful, which is why many cities, including Singapore, regulate billboards and outdoor advertising. But policy interventions are not as easily ignored as commercial advertising: they make use of official government channels to reach members of the public wherever they are. Policymakers must therefore regulate themselves; they must ask whether an intervention is truly necessary, given the potential cognitive costs on society.


Conclusion: Weighing behavioural interventions

Behavioural interventions are a powerful — even disruptive — tool for policymakers. But they do not relieve the policymaker from the need to carefully consider the costs and benefits of implementation. We suggest three principles for policy thinking in the age of behavioural interventions.

First, policymakers should act more cautiously when their interventions are designed to nudge people towards making the choice desired by the policymaker, rather than to just make better choices overall. Designs that leverage cognitive biases or impose mental costs to achieve behavioural change are particularly likely to generate welfare losses, because they infringe on people's autonomy to make the choices that best suit themselves. The best interventions are those that preserve the autonomy to choose as far as possible, while using behavioural

insights to help people make choices that are better for society as a whole.

Second, policymakers should evaluate behavioural interventions to consider the broader impacts on societal welfare, rather than just the narrow question of whether the policy 'works as intended'. Societal welfare can be improved if policymakers use willingness-to-pay estimates to help to quantify the implicit costs of behavioural interventions, and use advances in analytics to target interventions on those who are the most likely to change their behaviour. For example, a more efficient method of implementing social norms interventions may be to focus on households or individuals who value conforming more, and reduce efforts to reach out to those who dislike conforming, and who would not conform in any case.

Finally, policymakers must exercise discretion and even restraint when considering behavioural interventions, particularly because they are relatively easy to implement. Greater openness and scrutiny of behavioural interventions from public agencies will be helpful; the commitment that many public agencies have made to share their findings publicly is an excellent start. In the longer term, we believe that creating an institutional process to coordinate and evaluate behavioural interventions across the whole of government will help to ensure that interventions continue to make everyone in society better off. 

NOTES

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INTERVIEW WITH ERIC JOHNSON

Mindful Choice-Making

A behavioural insights veteran wants to make it easier for people to make the right informed choices for themselves.

ERIC JOHNSON

Professor Eric Johnson is a faculty member at the Columbia Business School at Columbia University where he is the inaugural holder of the Norman Eig Chair of Business. He is also Director of the Center for Decision Sciences. He was awarded the Distinguished Scientific Contribution Award from the Society for Consumer Psychology, and is a Fellow of the Association for Consumer Research, and the Association for Psychological Science. His recent research interests focus on choice architecture and its influences on public policy.

Professor Johnson spoke with Civil Service College Principal Researcher Sharon Tham and ETHOS Editor-in-Chief Alvin Pang when he was in Singapore to deliver a NUS-MTI-CSC lecture on “Beyond Nudges: What and How to Present Options” in October 2016.

From a public policy perspective, how might behavioural insights help shape the context in which people make decisions in a way that would be of broader benefit?

A major concern people have is when to intervene and how to know whether it's good or not. I love the book *Nudge*.¹ But some of the points the book makes get lost in public discussion: that nudging is not the only goal. There's no such thing as neutral choice architecture, but there's certainly always a choice environment. It's about a mindful design of the choice environment.

In a book I'm writing now, I'm thinking about the differences in emphasis between choice architecture and nudging — very often, people think of these as the same thing. One point that as choice architects we need

to think about is what our goals are. The aim may not be to change everyone so that they exhibit one kind of behaviour, say to lose weight or save more. It may actually be to have each person meet their own goals, or a goal that hopefully is wisely chosen.

Choice architecture differs from how the nudge concept is often used, in that choice architecture tries to make people's choices the right choice for them. The other big difference is that we are also trying to make choices easier, faster and subjectively something people find more pleasant. People often don't want to make choices, so if you can make that choice easier for people, you're doing something good.

The beauty of defaults is that you can save people from having to make

some painful choices. Defaults work really well when you have an option most people would choose. For example, we know that almost nobody saves enough, so making them save more money is probably a good thing. For retirement decisions however, since some people live longer than others, there are no one-size-fits-all decisions; we have to customise the options. The challenge is to help people make the choices that are right for them, individually.

One option is smart defaults. There are times that we may know more about a person than they know themselves, so we might then set an appropriate default that would be the one they're likely to choose if they thought about it carefully. They may not, for example, enjoy thinking about how long they'd live, but could instead answer a few questions and have a calculator make estimates that will help them make a better decision.

In what ways might time, age, culture and other dynamic factors influence the way choices are made?

In the United States, when you default into retirement savings, you may be defaulted into a life cycle or life stage fund. This is a fund that manages certain aspects of your retirement money. When you are young, you should be taking more risk and be invested mostly in stocks. But as you get older, you should be putting more of your money into lower risk cash and bonds. Many retirement

plans default you into a target date and automatically readjust the proportion of your money invested in stocks and bonds as time goes on.

The beauty of defaults is that you can save people from having to make some painful choices.

This is a smart default: we know roughly when you were born, we roughly know what most people want in terms of their investments. So if I'm older than you and we both save through a retirement plan, I should have a different investment profile than you.

People tend to make such decisions and never revisit them. They are 'one and done', and tend to stick throughout their lifetime. Some other decisions, such as what you are going to eat, are made several times a day; perhaps even with every spoonful. Those are harder to change, because it's not a set-it-and-forget decision, and these decisions can be quite influenced by the environment. For example, the layout of a menu might change what we order, and different restaurants have quite different layouts. These frequently repeated decisions are different. So far, we have been lucky and most of our interventions have been set-and-forget-it decisions, and we have been successful so far.

Another source of differences occurs over the life span. There are two findings from research we have

done that shows how decision making changes as you get older. The first trend is that you start measurably losing what is called fluid intelligence from about 25 years of age onwards.² This is actually a remarkably strong pattern. Fluid intelligence is measured by things like how quickly you can respond using button presses, or complete sets of visual patterns. Luckily, there's a second kind of intelligence, called crystallised intelligence, that is related not only to biology but to experience. A person in their 60s knows a lot that a 25-year-old does not. This has an important implication. It is not the case that older people are necessarily worse decision makers than younger people; they are just different kinds of decision makers — crystallised intelligence can compensate for the decline of fluid intelligence. For instance, our research shows that older people are less likely to fall for certain standard cognitive biases, such as hyperbolic discounting or present bias. They also tend to have less loss aversion.

Choice architecture differs from how the nudge concept is often used, in that choice architecture tries to make people's choices the right choice for them.

All this suggests that we should support the decision making of younger and older people differently. When younger people make a pension decision,

they may not know as much about investing. An older person may know more, and perhaps may not benefit from being shown as many different options which are also more complex to process.

Also, because crystallised intelligence increases until about age 65, you might want to consider making an initial pass at important financial decisions at around retirement age, and not wait until you're in your 80s. You may make changes later, but you should have a plan earlier in your senior years, rather than when it is needed.

One thing to note is that crystallised intelligence is domain specific. The classic example is older people being better than younger people in doing crossword puzzles. So if I have more financial knowledge, it might help me with stocks and bonds, but if you start asking me about blockchain and bitcoin, then crystallised intelligence is not as relevant.

If people are aware of being nudged, in what ways might it affect the efficacy of interventions?

There are some recent research efforts that warn people they're being nudged, then ask them whether they thought the nudges affected them. The fact is that warning people doesn't mean the nudges become ineffective. You may change your behaviour because someone wants you to do something else, but for that, you have to disagree with what they want you to do.

Organ donation laws, such as you have in Singapore, are an example of defaults that I often use. It is important to be aware of the effect of defaults, because you are trying to change people's behaviour in a way that some segments of the community may not approve. In these cases, you may want, instead of changing the default itself, to ask people to pay more attention to this decision and its implications for them.

I think the reality is often that if we make the decision easier to make, people will make the decision actively. If I can help you avoid expending effort on a choice I know you'd choose anyway, it seems like a good idea. You're choosing the same thing with less effort. However, if you are only making each decision easier, you are not necessarily giving people more time to think. It may be slightly more pleasant to choose, and in that sense, the choice architecture might be good, but you might not be improving the decision.

How might social media and the evolving online, digital landscape change our understanding of choices?

There has been quite a bit of discussion on how people tend to choose a more homogenous set of information that confirms rather than disconfirms their opinions. Then you end up with polarisation. Scholars have talked about this for years, but I think we're seeing it now more and more. This is also a question of largely unmediated, unverified

sources of information becoming more available. So people are relying on very different sets of facts, which can work against trying to help people make informed choices. Vaccines are a good example. One of the things that needs to be done is of course to provide relevant information, at a relevant time to people. I think part of the disconnect is that easily processed, factual information is not being made more readily available.

It is not the case that older people are necessarily worse decision makers than younger people; they are just different kinds of decision makers. This suggests that we should support the decision making of younger and older people differently.

Another concept we talk about in psychology is constructive preferences, which I prefer to call *assembled preferences*. By that I mean a belief that I put together as a result of how I am asked a question, or due to the environment. For instance, we have done research that shows that whether the temperature today is warmer or cooler than usual can influence your belief in climate change. It's like a form of saliency bias. We think it works through what you think about. So even for an information rich topic like climate change, your opinion can be changed by the environment.

One way to address this is to give people more pros and cons, making sure they are aware of both sides of an argument. We've been playing with a technique we call a *preference checklist*. This is usually applied to retirement claiming decisions: we give people a list of reasons why they might claim earlier, or why they might claim later.

Too often choice architecture gets framed in a very paternalistic framework.

So when people make a choice, we want to help make sure they've thought about all the relevant considerations. We cannot address the breadth of the issue but at least this helps to increase awareness, since people may not have thought about a particular element before. It is like a checklist for an airplane before it takes off. Some airlines today use positive affect and emotional or humorous appeal to get people to pay attention to the safety message before takeoff. They are wise enough to know it's probably not a good idea to warn people about how bad things can get if they hit turbulence without seat belts on. It would put people off.

How might the public sector and the policymaking process become a more mindful choice-making environment?

Too often choice architecture gets framed in a very paternalistic framework: *I know what's best for you, so here are your choices*. It is quite clear that public policy, even

when it's well intentioned, may have unintended consequences.

Obviously, it is important to carry out as much empirical evaluation as possible beforehand. For instance, the US Consumer Financial Protection Bureau tests regulations with companies using randomised controlled trials (RCTs). RCTs are useful but can be expensive, slow, and almost impossible in certain contexts, but there are other kinds of research that you can do as well.

There are framed field experiments — these are experiments that match real world decisions in terms of the population, stimuli, and forms, and are framed just like the actual decisions, except without the consequences. You can do those studies very easily and relatively quickly, particularly since so many of forms now are web-based. So you can assign the appropriate people who need to make the decisions to various conditions and see if you make a difference in what they will choose. It's a form of empirical testing that can inform policy, without having to do full blown RCTs every time.


One example we've worked on is with health insurance choices and health exchanges in the US — the people implementing these systems were under incredible time pressure to produce exchanges.³ Nobody had time to do a careful RCT, but we did six different framed field trials in six months. We used people who would be making these choices and examined the impact of

various aspects of the exchanges on the quality of their decisions. For example, we looked if providing more policies resulted in better or worse decisions. This worked well in answering these questions. People were motivated, since they were incentive compatible: people got more when they made better choices. We would never have done this if we had relied on RCTs and had to set up an actual exchange with each of these features.

One of the challenges of government is making sure you're not making the same kind of mistakes that the people you are governing make.

Such trials can be done carefully and pragmatically, resulting in changes that offer not just qualitative but

relevant quantitative feedback. We can explore many more things than we could if we were doing RCTs. For example, in our last study, we looked at six different possible designs and we identified a winner in a month. The difference between the worst and best design would mean billions of dollars of savings if implemented.

I think Singapore is an interesting laboratory for choice architecture, in part because you've been bolder than most in pursuing this. You have all the functions of a federal government. Philadelphia, New York may be doing small tweaks on retirement systems — you do it all. The advantage of a small but very diverse city is that you have a population that you can reach much more easily, but this is an effort that would be strengthened by carrying out empirical evaluations. One of the challenges of government is making sure you're not making the same kind of mistakes that the people you are governing make. 

NOTES

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OPINION

Re-thinking Public Innovation

The public sector should seek to transform not just itself but society's broader capacity to generate new solutions for the common good.

BY
JOCELYNE BOURGON

An international expert in governance and public sector reforms, the Honourable Jocelyne Bourgon is a Senior Visiting Fellow at the Civil Service College Singapore, President of Public Governance International (PGI), President Emeritus of the Canada School of Public Service, project leader of the New Synthesis Initiative and author of *A New Synthesis of Public Administration: Serving in the 21st Century*.

This article was adapted from a fuller chapter of the second book of the New Synthesis Initiative, to be published in August 2017: Jocelyne Bourgon, *The New Synthesis of Public Administration Fieldbook* (Dansk Psykologisk Forlag, 2017).

The situation faced by public servants and public sector leaders today may not be more challenging in absolute terms than in previous generations, but it is certainly different. The problems societies face today stem from a world characterised by increasing complexity, hyperconnectivity and a high level of uncertainty. In this context, the public sector's role in developing innovative solutions is critical.

Despite the need for public innovation, public servants (when asked to discuss the challenges they face in New Synthesis' labs and workshops) tend to present a narrow perspective, rarely going beyond the boundary of their respective units. While recent public sector reforms have encouraged a drive for efficiency and

productivity, they have also generated a narrow and sometimes distorted view of the scale of the role of government in society.

Ideas and principles matter. The way one thinks has a direct impact on the solutions that will be found and the results that will be achieved. Innovation in government has received much attention over the years. For the most part, the focus has been introspective, giving special attention to the modernisation of public sector systems and practices as well as the service delivery functions of government. The focus of attention in these conversations is on *innovation in government* and as a result may have missed the most important contributions of government to *public innovation*.

Innovation in Government

A typical narrative is that innovation in a public sector setting is inherently more difficult than in a private sector one because it is operating under a heavier burden of constraints and controls.² The political environment is described as generally hostile to public innovation due to short political cycles and the need to respond to political pressures.³ As a result, the culture of the public service is inherently risk averse and risk-avoiding.⁴ The literature tends to focus on finding ways to remove barriers to the introduction of innovative practices.⁵

In every narrative, there are elements of truth. Here, the story misses the point: it is public innovation that matters. A focus on *innovation in government* is unlikely to help government keep pace with the increasing complexity of society or yield solutions to issues ranging from climate change, increasing income and employment inequalities or the impact of an aging population.⁶ A conversation framed around *innovation in government* suffers from too narrow a focus to reveal the significance of *public innovation*. It underestimates the importance of the role of government in building an innovative society and in inventing solutions to emerging issues with unknown consequences.

Public Innovation

Governments innovate: this is the starting point for a broader conversation

on public innovation. To reframe the conversation about innovation from a public sector perspective is to position it in the broader context of the role of the State and the contribution of government to society. *Public innovation is a core mission of government*—that is, to invent solutions to the challenges faced by society that cannot be solved without some form of government intervention. The capacity of governments to guide society through an ongoing process of change depends on this critical role.

A focus on innovation in government is unlikely to help government keep pace with the increasing complexity of society. It underestimates the importance of the role of government in building an innovative society and in inventing solutions to emerging issues with unknown consequences.

The public sector is responsible for many of the innovations that have given shape to our modern societies. Public organisations have funded and built infrastructure necessary for a modern society to function.⁷ Government investments underlie the radical technological innovations that have fuelled the “New Economy” and are currently being used in unprecedented ways to stimulate the world economy. Government interventions constantly

mediate and redraw the boundaries between the private and public spheres of life in society.⁸

In an earlier work, I defined public innovation as “innovative solutions serving a public purpose that require the use of public means”.⁹ What distinguishes public innovation from social innovation is the intimate link to government actions and the use of instruments of the State.¹⁰ From this perspective, far from being risk averse, *the State is the ultimate risk taker in society*. Government takes risks on a scale that no other sector or agent in society could take on and intervenes in areas where the forces of the market or the capacity of civil society would be unable to go.

This broader perspective reveals some of the distinctive characteristics of public innovation.

The State is the ultimate risk taker in society, taking risks on a scale that no other sector or agent in society could take on and intervening in areas where the forces of the market or the capacity of civil society would be unable to go.

Distinctive Characteristics of Public Innovation

Public innovation has distinctive characteristics that make it irreplaceable. These characteristics are linked to the authority of the State and the legitimacy

of government to intervene in the public sphere to change the course of events in a manner judged preferable for society. They distinguish public innovation from innovations in any other sector.

A Macro-scale of Interventions: Unlike in the private, academic or civic spheres, public innovations often take place at the largest scale. They apply to the whole territory under the jurisdiction of the governing entity and to everyone under the authority of the State. New laws apply to all. New programmes and services define the entitlements of eligible citizens and create new rights enjoyed by all citizens in similar circumstances. The law is a necessary enabler to act in this manner and on this scale. No other actor in society can intervene in such a way and on such a scale.

Macro-scale interventions create particular difficulties for government. Companies will generally test innovative ideas on a small scale before scaling them up. This reduces risks and improves the likelihood of a successful launch of a new product or service. Governments face the opposite challenge; they must find ways to scale down an initiative in order to learn more before launching it on a national scale. This is more difficult than it seems at first glance. For instance, scaling down an initiative to a geographical area or a smaller group of people may give rise to ethical dilemmas or to legal challenges if an initiative benefits some citizens and

not others. The equal treatment of all citizens is an important consideration for government. In some countries, legal constraints may even limit the use of pilot projects. In other cases, testing ideas on a smaller scale could lead to speculative behaviours and unfair competition. As a result, governments have a tendency to deploy new initiatives on a national scale and thus with the highest level of risk. *Governments are inherently risk takers* when it comes to initiating new policies, programmes and services.

Every intervention entails the promise of generating better outcomes as well as the risk of producing unknown, unintended or unwanted consequences. The challenge is to discover how to improve the likelihood of successful government intervention while reducing the risks of generating unintended effects.

Imperfect knowledge and unknown impact: Government intervenes with imperfect knowledge. There may be efforts to encourage evidence-based decision making, using data analytics to extract meaning and detect patterns and other techniques to improve decisions — but ultimately governments must make decisions with the knowledge available to them at the time.

Policy decisions, new programmes and services are not definitive answers, but the beginning of long chains of interrelated actions intended to influence behaviours in a given direction. From

that perspective, success may not depend so much on what was known at the time the decision was made, but on the ability of public organisations to capture new insights of what is happening in practice in order to adjust the initial design to achieve the desired impact over time.

Governments intervene to create a better future from a place of incomplete and imperfect knowledge. In most cases, the full impact of a government intervention is unknown at its inception and will only become known over many years. Public organisations with a strong inventive capacity must be able to monitor results over long periods of time to recalibrate the initial intervention as circumstances change and new knowledge becomes available. Government interventions are experiments in progress.

Success may not depend so much on what was known at the time the decision was made, but on the ability of public organisations to capture new insights of what is happening in practice.

Enabled by law and politics: Public innovation does not happen in spite of politics and the law but is enabled by them. Government interventions derive their legitimacy from a mix of democratic principles, political leadership and the rule of law. Government possesses the legitimacy to intervene on behalf of society.

Public innovation takes place at the intersection: of a reliance on the law, which encourages predictability, and of experimentation, which can reveal new and better ways of achieving results of value to society. A particular difficulty for government is balancing the need for continuity and stability with the need for change to meet the challenges ahead. Important interventions can also be potentially disruptive. Public innovation is a process of constructive deconstruction that must be calibrated with care to engender the necessary public support.

Public innovation is both the goal and the process of generating public solutions that frequently exceed what government can do on its own, but could not be achieved without the use of the levers of the State.

In summary, reframing the conversation about public innovation opens up a broader perspective: it highlights the importance of government interventions in addressing problems that cannot be solved and in producing results that would not exist without making use of the levers of the State.

Public Innovation through Public Intervention

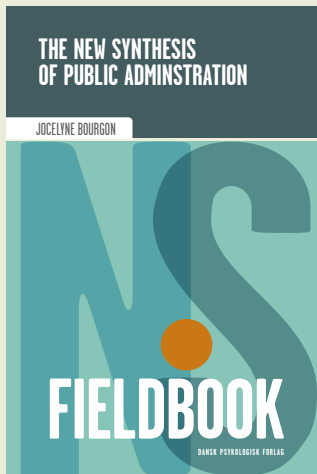
Every action and decision taken by government is deliberately designed to transform some aspects of society.

Government interventions are intended to modify behaviours or transform the interactions between the public, private and civic spheres. At times, these actions are a response to pressing challenges, in other cases, they are proactive measures aimed at securing a better future. In either case, the impact of government interventions can be felt across vast systems and at times well beyond the country of origin.

At their core, public innovation and government intervention are related concepts. Government intervenes in the current state of affairs to invent a new reality distinct in some ways from the one that existed previously. This is a process of change and innovation. Jesper Christiansen, in *The Irrealities of Public Administration*, reminds us that it is through government intervention that innovations “come in” the public sphere and “come between” various actors in society.¹¹

Public organisations are mandated to shape the environment and to steer society through a change process to achieve desirable public outcomes. Such interventions may require regulatory support or make use of the spending power of the State. Public means can be used to guide collective actions, encourage collaboration or prevent behaviours detrimental to society through coercive measures. Public innovation is both the goal and the process of generating public solutions that frequently exceed what government can do on its own, but could not be

THE NEW SYNTHESIS OF PUBLIC ADMINISTRATION FIELDBOOK



The book (and e-book) will be available for purchase through Amazon worldwide on 1 August 2017.

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The book aims to reconnect public servants with their fundamental public purpose to promote and serve the collective interests of society. It also provides a structured, exploratory approach to collective problem solving.

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Cover image: Hellen Jensen

achieved without the use of the levers of the State.


Some initiatives will achieve their desired outcomes; some will work reasonably well for a time but require periodic adjustments; others will fail. In some cases, the reasons for failure may rest with government. This is the case when the lack of progress is due to a poor understanding of the issue, an inadequate selection of instruments or a poorly designed intervention. In other cases, the lack of progress is due to a lack of synergy between public, private and civic actions. Innovation benefits from an ecosystem where the State plays a key role in building dynamic linkages among multiple organisations and across sectors.

Reframing the conversation on innovation means focusing on societal results and exploring how the authority

of the State can be put to optimal use to lever a collective effort that encourages the sharing of responsibilities and rewards for contributing to a common desirable outcome. It raises questions about the potential for the State to create a symbiotic system in which both society and the private sector benefit. It also raises further questions about the potential for government to intervene and bear risks beyond the market's tolerance in order to promote the public good or for government to explore how to leverage social agents to build an innovative economy and society.¹²

The perspective on innovation found in the New Synthesis Initiative repositions public innovation in the broader context of the role of the State. The task of re-thinking the role of

government in public innovation is in no way limited to the questions mentioned above. Thinking through the role of government in public innovation is an opportunity to re-articulate its public

purpose in a changing context and to examine the system of relationships between public, private and civic spheres that produce societal results. 

NOTES

1. The New Synthesis Initiative is an international collaboration aimed at giving public service practitioners a conceptual framework of public administration that can guide their actions and decisions, and invent solutions fit for the times. It results from years of research and practical application, and has been used by more than 1000 practitioners from countries including Australia, Canada, Denmark, Finland, Malaysia, Singapore and some EU member states. More information can be found at <http://www.pgionline.com>.
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The Making of Behavioural Economics

A pioneer's account of the paradigm shift in economics offers compelling insights for the contemporary scholar and practitioner alike.

BOOK DETAILS

Misbehaving: The Making of Behavioural Economics

By Richard H. Thaler

Penguin Books Ltd (May 2015); 415 pp; S\$43.

REVIEWED BY
CHARMAINE TAN
HUAN YUEN

Charmaine Tan is a researcher at the Institute of Governance and Policy in the Civil Service College. She is concurrently pursuing her PhD in Economics at the National University of Singapore (NUS). She holds a first class honours degree in Economics from NUS, and a Masters in Economics of Markets and Organisations from Toulouse School of Economics, France.

Misbehaving: The Making of Behavioural Economics is Richard Thaler's fascinating account of how the field of behavioural economics came about, and how it has revolutionised modern economics in the last four decades. Thaler, one of the first economists to apply behavioural ideas to his field, lays out the once-mainstream intellectual arguments against the emerging approach of behavioural economics — and then proceeds to rebut them.

Challenging the Rational Choice Model

In his early career, Thaler made a list of ways in which people's behaviour appeared inconsistent with the rational choice model. One of these illustrated a behaviour which violated the assumption that sunk costs would be ignored in decision making:

"Jeffrey and I somehow get two free tickets to a professional basketball game in Buffalo, normally an hour and a half drive from where we live in Rochester. The day of the game there is a big snowstorm. We decide not to go, but

Jeffrey remarks that, had we bought the (expensive) tickets, we would have braved the blizzard and attempted to drive to the game.” (p. 20)

While working alongside psychologists Amos Tversky and Daniel Kahneman at Stanford, Thaler came upon what he describes as his “slow hunch” — something that did not come from any one “aha” moment — that something important was to be discovered. Subsequently he helped develop many important ideas in behavioural economics, such as endowment effect (i.e., how we value things that we own more than things that we do not yet own) and how we need help to control our behaviour (such as hiding away cashews before dinner to avoid overeating).

Behavioural solutions are often context-dependent and this makes the policy applications of behavioural findings less straightforward than might have been hoped.

“Misbehaving” in the title suggests a point Thaler repeats throughout the book, which is the importance of sticking with one’s convictions even in the face of unrelenting opposition. He refers to running the “gauntlet” — a set of familiar objections that would be raised repeatedly about his theories and case studies whenever he presented them in

the work’s early days. These included the following arguments:

- **“As if”**: Even though people are not able to grasp the complexity of an issue, their eventual decisions would be “as if” they had been able to do so, and they would thus still end up behaving like “Econs” (Thaler’s term for the fictional hyper-rational agents assumed in traditional economics).
- **“Incentives”**: Results from experiments could only be expected to mirror reality if the stakes were sufficiently large. This called into question the validity of the findings from behavioural studies that leveraged small incentives to bring about behavioural change.
- **“Learning”**: Experiments in decision making were one-shot games, and not reflective of the repetitive nature of real-life decisions.

Thaler’s reaction was to offer example after example rebutting the “as if”, “incentives”, and “learning” arguments, assuaging any junior academic wary of going against the orthodoxies championed by their seniors.

Perhaps the most memorable term in the whole book comes from Thaler’s account of the “invisible handwave”. This is the assertion that markets trump in all situations: that markets can discipline

people's misbehaviour, and that non-optimal individual choices somehow disappear in a competitive marketplace. A tongue-in-cheek reference to Adam Smith's "invisible hand", Thaler makes short shrift of that counter-argument with a number of examples, one of which reads:

"Suppose you pay attention to sunk costs, and finish a rich dessert after a big dinner just because you paid for the dessert. What will happen to you? If you make this mistake often you might be a bit chubbier, but otherwise you are fine." (p. 52)

Clearly, markets do not inevitably correct irrational behaviours. In this instance, they do nothing to change the customs of the misbehaving individuals who fail to ignore the sunk costs of their dessert.

The Behavioural Revolution in Economics

As with many institutions, paradigm changes in academic fields do not come about by simply piling up evidence, although that is a necessary condition. More importantly, there needs to be constant conversation. In the second half of the book, Thaler highlights how the debate began in 1985, when the University of Chicago Graduate School of Business, a vaunted bastion of the hyper-rational Econs, organised a two-day workshop bringing behaviourists and rationalists

together for serious sparring. Among the many eye-catching and fascinating anecdotes is the account of a presentation by Kenneth Arrow (who passed away in February 2017 at the age of 95). Arrow, the youngest ever recipient of the Nobel Memorial Prize in Economics, made the case that **rationality is neither necessary nor sufficient for good economic theory**. It was a revolutionary concept then, which clearly had an impact on the debate at that conference, as well as debates and policymaking for the next three decades.

As with many institutions, paradigm changes in academic fields do not come about by simply piling up evidence; there needs to be constant conversation.

Misbehaving and Challenges to Public Policy Design

Thaler also spends time tracing the influence of behavioural economics on other fields, from law to finance. Behavioural concepts have by now made their way into the realm of policy innovations: notably the UK government's Behavioural Insights Team, which has among its stated goals to "encourage, support and enable people to make better choices for themselves". In Singapore, public agencies are also applying behavioural insights more systematically to improve policy design and implementation.


Not surprisingly, once theory is put into practice, complexities arise. To Thaler's credit, he does not shy away from them. Behavioural solutions are often context-dependent: interventions that work in one cultural setting might not translate well, or may not be fully scalable, in another context. This makes the policy applications of behavioural findings less straightforward than might have been hoped.

Since behavioural nudges are not meant to tell people what to do, they are not useful in situations where we do not know what people want.

Another challenge of applying behavioural approaches to policy is the complexity of problems faced. A behavioural intervention may need to be multi-faceted to adequately address public issues. Thaler describes how the use of defaults alone in encouraging savings for retirements could be counter-productive and could lead to lower savings. In his example, when a company adopted an automatic enrolment plan with 3% savings rate as the default, employees who would otherwise have chosen to save at 6% were now only saving a 3%. The inertia against taking action to change the default rate in this case helped some but hurt others. Thaler suggests that an automatic enrolment plan coupled with *automatic escalation* of savings rate would lead to higher

savings, because people tend to have less problem with self-control when it comes to decisions about the future rather than the present (i.e., the present bias). In Thaler's "Save More Tomorrow" plan, savings rate increases are tied to future salary raises. This also mitigates loss aversion, as increases in savings are only taken away from future gains. Through examples like "Save More Tomorrow", Thaler highlights the importance of thinking more deeply about how best to apply behavioural theories, and adapting them to the context of the issue being addressed.

At a more philosophical level, there are sometimes ethical considerations with a paternalistic approach to policymaking. Since behavioural nudges are not meant to tell people what to do (they are meant to help people to choose better for themselves), they are not useful in situations where we do not know what people want. After all, a better choice for one person may not be the case for another. In such situations, it could be better for the government to make it mandatory for people to make a choice, rather than to set a default.

Despite such limitations in the use of nudges, behavioural economics has greatly impacted our understanding of how people make decisions. Given the clarity and levity in which *Misbehaving* provides the reader with insights into these developments, there is clearly one optimal choice for both academics and practitioners: read this book. 



BOOK REVIEW

Plan for Behavioural Change, One Step at a Time

BOOK DETAILS

Think Small: The surprisingly simple ways to reach big goals

By Owain Service & Rory Gallagher
Michael O'Mara Books Limited (2017); 230 pp.

REVIEWED BY

LEON LIM

Leon Lim is Lead Researcher with the Social & Economics team in the Institute of Governance and Policy, Civil Service College. He began his Public Service career in 2005, and has served stints in strategic planning, industry development and research in the Public Service Division, the Media Development Authority and the Ministry of the Environment and Water Resources.

Singapore's public sector is no stranger to integrating behavioural insights (BI) into policy design. Our Civil Service College (CSC), an early advocate, has organised training and other programmes on applying BI to policymaking. In 2011, CSC published *Behavioural Economics and Policy Design: Examples from Singapore*—a book surveying Singapore's experiences with, and approaches to, incorporating BI into public policies.

Policymakers seeking further guidance on applying BI in policy design will find *Think Small: The surprisingly simple ways to reach big goals* useful. Succinct and focused on application,

the book features a detailed roadmap for designing policies that work with individual needs and objectives.

Service and Gallagher are with the UK's Behavioural Insights Team (BIT), which has taken the lead in applying BI to policy issues and works with governments internationally. Rather than plan grand regulatory or legislative changes, the BIT focuses on maximising policy impact by designing small incremental changes based on behavioural science research, and quickly testing and adapting them. The authors note: "in order to reach big, you need to start by thinking small."

Behavioural Scaffolding to Make Changes Stick

The book condenses the BIT's collective experiences and the relevant research into a "behavioural scaffolding" — seven structured steps to specify a personal goal, plan how to achieve it and, more importantly, how to make the necessary behavioural changes stick:

1. **Set:** Think about what you want to achieve. Focus on one objective, set yourself a clear deadline and target, then break your goal down into manageable actions.
2. **Plan:** Create simple, clear rules that let you know when you deviate from your goal. State how, when and where you will take the actions you had identified, then identify cues for them. Repeating actions in response to the same cues over time will turn them into habits.
3. **Commit:** Make a pledge linked to your goal or intermediate actions, then make it public and write it down. Ask a trusted colleague or friend to be your "commitment referee", whose job is to make sure you stick to your pledge.
4. **Reward:** Use smaller rewards or penalties linked to intermediate actions to motivate yourself. Make these non-monetary to avoid

undermining intrinsic motivations and good intentions.

5. **Share:** Ask family, friends and colleagues for help in achieving your intermediate goals. Consider tapping on your social networks. Team up with people trying to achieve the same goal and you will likely achieve more, faster.
6. **Feedback:** Get feedback that shows you where you are relative to your goal, and that is timely, specific, actionable and focused on effort. Try also to find out how well you are doing relative to others.
7. **Stick:** The quality of your actions is as important as the time spent. Test small changes to see what works. Learn from what did not work, and celebrate what you have achieved.

Service and Gallagher devote a chapter to each structured step, in which they explain the underpinning behavioural science research, and illustrate the principles involved using examples from BIT's external projects and internal practices. For instance, the BIT structures its internal annual "FitFeb" month-long contest so that individuals gain points for physical activity, but they can only win as a team. Staff get extra points for organising

BEHAVIOURAL SCAFFOLDING AT WORK: REDESIGNING JOB CENTRE PROCESSES

In Essex, BIT redesigned how job centre staff interacted with job seekers. Previously paperwork dominated interactions between centre staff and job seekers. After the changes, centre staff took job seekers through a process that:

- identified the most important concerns for the job seeker, e.g. “provide for my family”;
- set a specific, realistic goal for getting back into work, e.g. “find a job in the next three months in the construction industry”;
- broke the goal down into steps, e.g. “improve my CV”, “answer job advertisements”, “ask my friends to speak to their bosses”. Doing this gave job seekers a sense of progress and improved their motivation;
- linked each action to cues in a daily routine so as to build habits, e.g. “send out three applications for jobs on Monday morning after breakfast”;
- emphasised commitment, e.g. signing one’s name against each step; and
- gave regular, relevant feedback.

group exercises. These encourage even the least active staff to increase their exercise level substantially, by tapping on office relationships.

The authors further elaborate on the framework with meaningful personal actions, using “Thinking Small in Action” sample checklists. These show how individuals can apply the behavioural scaffolding to everyday concerns such as improving fitness, being a better manager, and spending more time with one’s children.

Developing good behaviours is easier with policies designed to nurture these habits.

Applications for Policymaking

Policymakers and public servants may find the behavioural scaffolding in the book relevant, because so much of our work involves directly or indirectly helping citizens achieve their goals. Traditional policy measures to effect behavioural change use incentives and penalties, but behavioural science research shows that it is very difficult for

ABOUT THE BIT

The UK's Behavioural Insights Team (BIT) was founded in 2010 by the Conservative-led coalition government to apply behavioural science insights in making public services more cost-effective and citizen-friendly, and to enable people to make better choices. BIT faced initial scepticism from civil servants and observers, but gradually gained credibility over the course of various projects with different agencies for its ability to design and implement “nudges” that improved agency outcomes at minimal cost. The BIT is now a company (jointly owned by its employees, the UK government, and innovation charity Nesta), with projects in over 15 countries and offices in London, New York, Sydney and Singapore. Here is what Rory Gallagher has to say about his new book:

What motivated you and Owain to write this book in the self-help genre?

There were three main reasons to why we wrote the book. Firstly, part of BIT's mission is to spread the use and awareness of behavioural science. Writing this book allowed us to go beyond the world of government, and to open up the Behavioural Insights tool box for people to apply in their everyday lives.

Secondly, the self-help genre is full of inspirational stories and catchy mantras, but it is often lacking in evidence of what really works in practice. This book attempts to add some scientific rigour to the field. Last but not least, it encouraged us to practice what we preach. The framework we developed for the book enabled us to draw on the tools we had been using at BIT and apply them more systematically to achieving goals in our daily lives.

How would you like your book to improve policymaking?

Over the past few years, we've found that policymakers and public servants have become increasingly interested not only in how we can use nudges in government, but whether these same tools can be used to help them achieve their goals in both their professional and personal lives. So we wrote this book with teachers, job advisors, doctors, policy officials and managers in mind. For example, we highlight how to set clear objectives and timeframes, how to break goals down into manageable chunks, how to draw on social networks and rewards, and how to give good feedback. We hope that policymakers and public servants are able to use the seven simple steps that we set out in the book to make meaningful differences to their life and those around them.

What is the one thing you want your readers to take away from *Think Small*?

The key message of the book is that to reach big, we need to Think Small. This is not about reining in your ambitions. It is about adopting a mindset that focuses on getting the small — and often simple — details right that will set you on the path to achieving big goals.

individuals to change their routines and habits even with the best of intentions and with clear benefits or punishments. Developing good behaviours is easier with policies designed to nurture these habits.

Perhaps the most salient example of the behavioural scaffolding in practice is the BIT's work with job centres in Essex (see box story). While behavioural scaffolding might seem more challenging to plan, the changes are not expensive and the payoffs are greater. For instance, Essex job seekers reported feeling more in control of their lives, and job centre officers were more engaged in their work. These practices have since been introduced across the UK. Service and Gallagher also highlight that integrating BI into policy becomes easier with each iteration as teams build on earlier efforts.

The insights in the book may sound like common sense. However, as the authors note, people often fail to apply common sense at all, much less in a consistent or disciplined manner. Research also shows that some “common

sense” notions actually backfire. For example, telling people our goals will not help us, but telling them specific plans will; making a loved one your “commitment referee” does not work because he or she is probably too close to you to ensure you follow through on your plans; and people are actually more willing to help one another than we think.

Conclusion

Think Small: The surprisingly simple ways to reach big goals offers an actionable roadmap for effective behavioural change. It also contains many insights on feasible and cost-effective ways to integrate BI into policy design and implementation. It explains and structures key learning points from BIT's extensive experience and from behavioural science literature, suggesting new ways of engaging with citizens in order to help them move progressively toward their better selves. At heart the authors approach policy with a pragmatism not unlike that of Singaporean policymakers: focus on what works, not how the world ought to be. ✨

Project Tap-Out: Nudging Commuter Habits with Behavioural Insights

A randomised field trial has helped identify key habits and motivations of concession bus riders.

BY
YAP JUN LIANG

Yap Jun Liang was Researcher in the Social and Economics Team, Institute of Governance and Policy, Civil Service College.

AND
SHARON THAM

Sharon Tham is Principal Researcher in the Social and Economics Team, Institute of Governance and Policy, Civil Service College. Her research interests include evidence-based policymaking, behavioural economics and economic geography.



To the vast majority of public transport commuters in Singapore, “tapping out” their travel cards when exiting a public bus has become an ingrained habit: they do so to avoid the penalty of having the maximum route fare charged to their travel cards. However, more than half of commuters who hold Monthly Concession Passes (MCP) do not do so. Since MCP holders pay a flat fee for unlimited travel on public transport for a fixed period of time, they do not see the need to tap out, nor are they subject to the maximum fare penalty that regular commuters face if they skip this step when exiting the bus.

From an administrative perspective, tapping out contributes to data on commuter travel patterns, which is needed to plan bus routes and compute bus loads in real-time. In the absence of tap-out data to indicate the distance travelled, the public transport operators (PTOs) that run our buses have to charge the maximum possible fare, for which (in the case of MCPS, which are a form of subsidised public transport) they are reimbursed by the government. In other words, a failure to tap out may use more public funds than warranted by the travel actually consumed by MCP holders. If travel concession schemes were to be extended to more segments of the population, this problem could well be exacerbated.

Why Apply Behavioural Insights?

One obvious solution might be to impose a full trip fare on MCP holders who do

not tap out: a penalty which has been effective for regular bus commuters. However, as MCP holders already pay for their monthly pass upfront, they may feel that this penalty is unfair. Furthermore, they would need to have an additional “purse value” in their travel cards to be charged the penalty, which could leave those with an insufficient purse value (including younger students) stranded. To modify the entire MCP system to include a penalty would also have required significant investments in time and money. Given these considerations, the Land Transport Authority (LTA) and the Civil Service College (CSC) worked together to run a randomised controlled trial, to explore behavioural nudges that might encourage MCP holders to tap out.

Defining the Problem

Available travel data showed that polytechnic students had one of the lowest tap-out rates among all MCP holders; it also revealed specific bus routes which ran along or terminated in and around polytechnics had particularly high non tap-out rates, where 41% of polytechnic MCP holders hardly tapped out at all (less than 10% of the time) (see Figure 1). Based on this information, the trial focused exclusively on changing the tap-out behaviour of polytechnic students who were defined as “non-compliers” in this experiment, i.e., those who tapped out less than 10% of the time; this allowed it to be run

This project was done in collaboration with Dr Leong Wai Yan and Linda Liu (Land Transport Authority), and Dr Giovanni Ko (Nanyang Technological University).

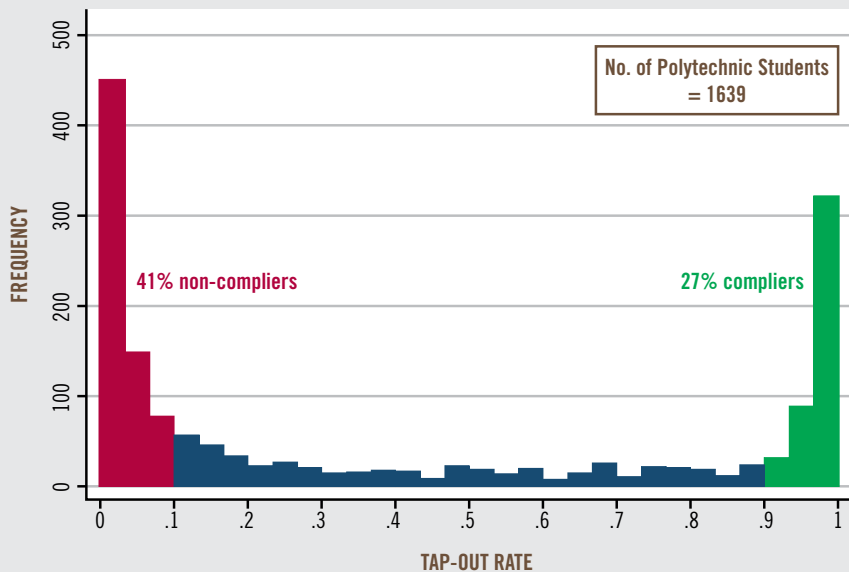
on a manageable scale, and to provide more insights to potential nudges that would change habits.

Both qualitative and quantitative methods were used to understand commuter attitudes and tap-out behaviour. Focus group discussions highlighted that one of the key reasons underlying current behaviour was peer influence (“My friends told me there was no need to do so”). Others felt that tapping out was inconvenient. However, the focus groups also revealed that students seemed to respond positively to tapping out when they were given a simple reason to do so, e.g. to help the

government plan bus services better. This was in contrast to more technical reasons typically cited within policy circles, such as potentially passing on costs to regular commuters — such complex reasoning was lost on students and did not seem useful as a nudge (see box story).

Running the Randomised Controlled Trial

Polytechnic students were recruited for the experiment through email invitations, with a promise of at least \$30 for full participation. To be shortlisted, they had to be regular bus



Source: Land Transport Authority, data from 20 October 2014 to 12 December 2014 and from 5 January 2015 to 6 February 2015.

Figure 1: Tap-Out Rate Distribution for Polytechnic Students Using Monthly Concession Pass

EXAMPLES OF INFORMATION MESSAGES SHARED WITH THE FOCUS GROUPS

Simple Message: “It is important that you tap out when alighting from buses even if, as a monthly concession pass holder, you might feel it makes no difference to you. This is because by tapping out, you give the government more accurate information about your bus journeys and how crowded buses truly are. With this information, the government can do a better job of improving bus services across Singapore.”

Complex Message: “I already enjoy a subsidy when I travel on a monthly concession pass. If I do not tap out whenever I take the bus, other public transport users / the government may have to further cross-subsidise my bus fares. This is unfair to other public transport users.”

users (at least 10 trips per week) with a low pre-experiment tap-out rate of at most 10%. A total of 453 students were chosen out of an initial 1,986 who registered, and randomly assigned into one of the five groups.

The final trial, which lasted eight weeks from April to June 2015, consisted of one control group of 50 students and four treatment arms of about 100 each.

Students in the Control group were included to account for the effect of being in an experiment, where behaviour might change simply because one is being watched (known as the *Hawthorne effect*). This group provided baseline data with which to compare the behaviour of students from the intervention groups.

Participants in the Information-only group were told why tapping out is important but not given any monetary incentive.

Three Information + monetary incentive groups were also formed, consisting of participants who were given the same information as the information-only group, in addition to being:

Gain group: paid a bonus for tapping out (bonus of 20 cents every time they tapped out, up to \$4 for every two-week period);

Loss group: charged a penalty for not tapping out (the penalty of 20 cents every time they did not tap out was deducted from \$4 that was given to each student for every two-week period);

Lottery group: entered into a lottery if they tapped out at least 20 times during every two-week period.¹

All groups were sent fortnightly emails. Those in the Gain, Lottery and Loss groups had updates on their tap-out behaviour and the incentives/

lottery outcomes, while emails to the Information group merely reiterated the reason for tapping out.

Results from the Trial

Within the first two weeks of the trial, tap-out rates rose quickly before remaining stable throughout the experiment. The Loss group, who incurred penalties for not tapping out, yielded the greatest improvement in tap-out rates. This increase in tap-out rates was statistically significant when compared to the Information group, but not for the Gain and Lottery groups. This is not surprising, since behavioural theory tells us that people tend to value losses more than gains of the same value (also known as “loss aversion”).

One unexpected but strong effect that was uncovered by the trial was that simply providing information alone resulted in a significant increase of 36% points in tap-outs and 29% points in compliance (defined as tapping out at least 90% of the time), when compared to the control group. Subsequent focus groups highlighted that this could be because tapping out was not too onerous, once they were given a reason to do so.

Did the Nudges Change Habits?

After the RCT ended, all incentives, penalties and information message prompts were ceased. All participants consequently tapped out less, although they were still tapping out more often than before the experiments.

Across participants, the tap-out rates of those exposed to monetary incentives fell at a faster rate than the information-only group. Six weeks after the trial ended, the tap-out rate and proportion of compliers from the information group were higher than the monetary intervention groups, and significantly so for the proportion of compliers (see Figure 2).

This suggests that any additional effect of monetary interventions during the experiment was lost once the interventions ended. While it is not possible to pinpoint the key reason, it is possible that the information-only nudge led to intrinsically motivated behaviour, which had a more sustained impact on tap-out behaviour compared to extrinsic (e.g. monetary) incentives. The post-trial results further suggest that extrinsic motivations ended up *crowding out* intrinsic motivations to tap out.

Conclusion

As a result of this study, between January and March 2017, LTA and the PTOs rolled out new “Tap Out for Better Services” information posters across the entire Singapore bus network and at bus stops outside polytechnics, universities and Institutes of Technical Education. Early indications are encouraging, with the overall non tap-out rate among polytechnic MCP holders falling from about 62% at the end of January to about 50% as of end April 2017.

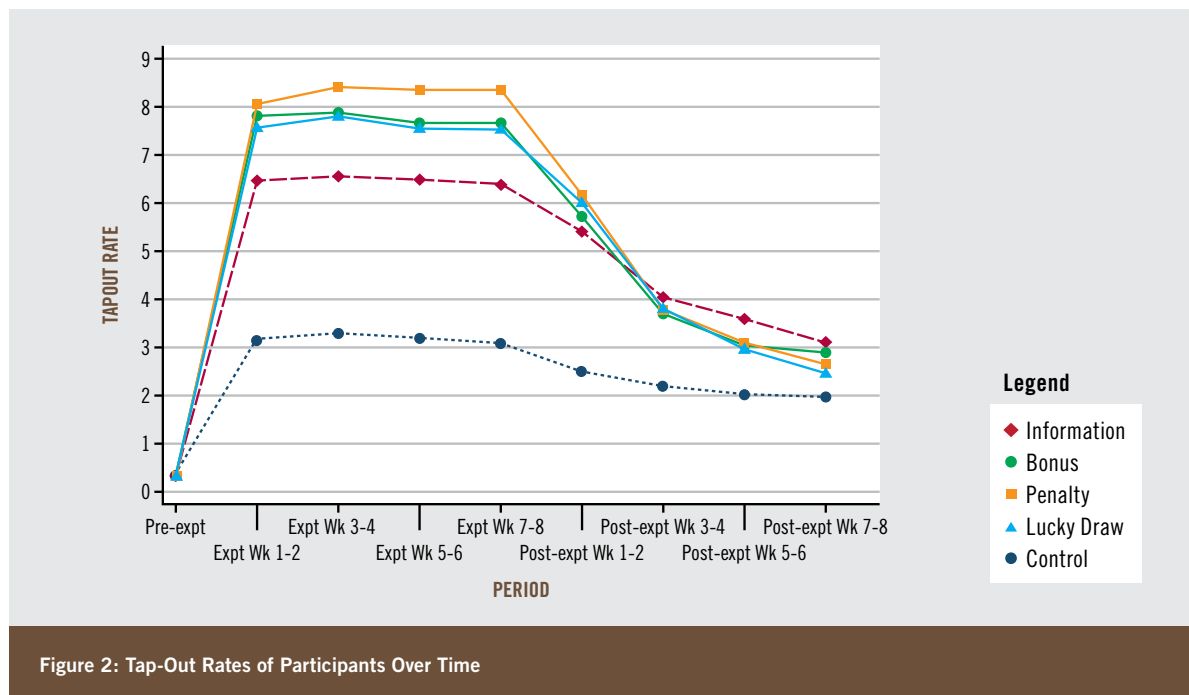



Figure 2: Tap-Out Rates of Participants Over Time

The Project Tap-Out trial highlights the importance of testing to understand how different interventions play out on the ground, and how sustainable they are. In this context, providing information alone was effective and more sustained than monetary incentives. More importantly, the trial offered evidence on the unintended consequences of crowding out intrinsic motivations,

when extrinsic rewards or penalties are introduced to encourage socially desirable behaviours. This is an important consideration for future policies, especially if monetary measures are not intended to be permanent. Insights from this and other such trials could help identify similar policy challenges, and explore ways to use information and data more effectively. 

NOTE

1. The prize was the value of a Hybrid Monthly Concession Pass (\$51). There were eight winners per draw.
 Expected value of prize
 $= 8 \text{ winners} / 100 \text{ participants} \times \51
 $= \$4.08 \approx \$4 \text{ maximum incentive for gain/loss.}$

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