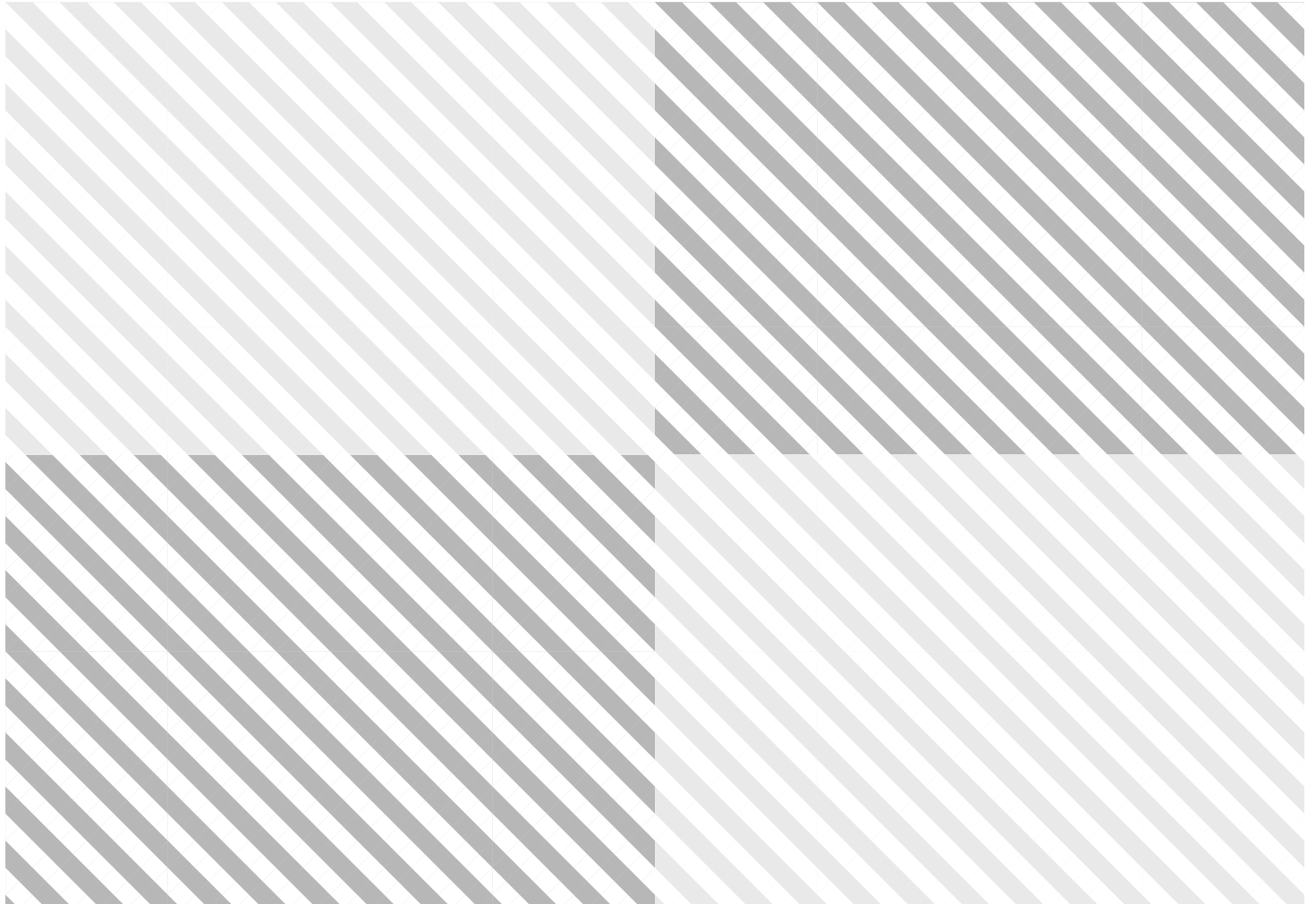


White Paper

Behavioural Strategies to Strengthen Health Programmes and Policies

Six Behavioural Insights to Increase Impact and Efficiency

March 2018



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Executive Summary

Staying healthy is hard. Despite breakthroughs in medicine, technology and evidence-based strategies, and the hard work of clinicians, administrators and health-programme designers, staying healthy is hard because the keystone of sustained well-being is behaviour. Whether one needs to keep to a medication regimen, exercise more, keep GP appointments, reduce tobacco or alcohol intake, avoid troublesome foods, track weight or blood pressure or get an annual flu shot, so much rests on our ability to match healthy intentions with healthy behaviour. Yet so often our behaviour deviates from those intentions.

We presume we all act to maximize expected utility but a significant body of evidence shows how often we don't. Despite sincere and well-articulated goals for health, finance, career and more, we regularly waste time, are easily distracted and make choices on impulse or familiarity or minutia. We act on snap judgements, give outsized consideration to unlikely outcomes, and enter complex undertakings with too much confidence and too little planning, even when past experience and failures advise against it. The expectation that decisions flow from sober rationality is regularly disappointed, especially in regard to healthy behaviour.

The field of behavioural economics explores exactly this behavioural skew and has created a rich body of theory and experiment to anticipate it and tactics to prevent it. While our health misbehaviours are plainly not optimal, the science shows they are predictable. As the 2017 Nobel Prize winner in Economics Richard Thaler said, we are not the idealized "*Homo economicus*" that classic economic theory would presume; we are *Homo sapiens* and we make predictable mistakes.

And as they are predictable, we in the healthcare field can plan for them, design for them, and using quite-often very simple cues, we can "nudge" patients around them.

In this report we discuss how behavioural economics can be leveraged to achieve the ends of healthcare practitioners, administrators and programme designers. We explore a handful of the many principles identified and their successful application to healthcare interventions. Use this document to begin an investigation into how this growing body of research can be applied to your own work, to optimize the patient experience and improve medical outcomes. Insofar as everyone is subject to sub-optimal "auto-pilot" behaviour, it is incumbent on us to understand why and to inform our work with that understanding.

“

This does not mean there is something wrong with us as humans, but it does mean that our understanding of human behaviour can be improved by appreciating how people systematically go wrong.

”

Richard Thaler (2017 Nobel Prize winner in Economics) and Cass Sunstein
Nudge: Improving Decisions About Health, Wealth, and Happiness

Introduction

Embedded in every policy, programme or medical practice designed to improve and maintain a population's health is the need – stated or otherwise – to *change behaviour*. Making and keeping a preventive care appointment is a behaviour; obtaining and taking medication properly is a behaviour; good diet and consistent exercise are behaviours; reducing or abandoning tobacco use is a behaviour; counting calories, tracking one's weight, scheduling key exams, getting more sleep, getting children vaccinated or treated – ultimately, all hinge on behaviour.

Every behaviour we would encourage, however, can get lost among the distractions and challenges of everyday life. To have our message heard above the din, programme designers typically employ two familiar approaches:

- Education and information – which underscore the importance, validity or benefits of the behaviour
- Carrot and stick – which either make the healthy path more rewarding, or the unhealthy path less rewarding

Behavioural science continues to reveal insightful new approaches that improve on these two familiar ones. These allow us to thoughtfully leverage the many shortcuts that our minds already use, to encourage the desired behaviour.

By understanding these and fitting them thoughtfully into our programmes and policies, we can begin to make the healthy path the easy and automatic path.

The stakes are high

Consider the list, on the right, which reads like a commonsense prescription for healthy living. These seven evidence-based healthy behaviour changes are the American Heart Association's "Life's Simple 7", and the list is supported by more than 20 of the world's largest corporations for their employees.

However, these simple behaviours are far from being widely adopted. The results have important implications for the health of many populations:

- As of 2014, more than 1.9 billion adults worldwide were overweight – and of these over 600 million were obese¹
- Tobacco kills around half of those using it and there are over 1 billion smokers globally²
- The number of adults with diabetes worldwide has almost quadrupled since 1980 to 422 million; in 2012 alone, 1.5 million people died from diabetes³

Eat better.
Exercise more.
Quit smoking.
Control your cholesterol.
Manage your blood pressure.
Reduce your blood sugar.
Lose weight.

Source: American Heart Association, www.heart.org, 2014

Indeed, the *Global Burden of Disease Study 2015*⁴ estimated that lapses in these types of behaviour collectively cause two-thirds of the global disease burden: 38.3 million deaths. The World Economic Forum estimated in 2011 that by 2031 cardiovascular disease, chronic respiratory disease, cancer, diabetes and mental health disorders will cost the world \$47 trillion⁵. For example, in the US alone, 75% of the \$3 trillion healthcare expenditures are related to chronic diseases⁶ that could be greatly reduced through wider adherence to these simple behaviours.

The gap between a population's stated knowledge of, and day-to-day adherence to, these behaviours is wide. Addressing this gap is perhaps the key priority for public health in the early 21st century.

Behavioural solutions

Historically, many public health interventions have focused on disseminating information about risks, costs and benefits. However, extensive research shows that *knowledge alone rarely triggers significant behaviour change*. Therefore, our health programmes and policies need to be informed by a deeper understanding of the drivers of human behaviour if we are to deliver and sustain behaviour change among populations.

Fortunately, the science of behavioural economics is providing many critical insights. Researchers are identifying social, environmental and psychological principles that trigger and reinforce habits, both good and bad. Armed with these insights, designers of health programmes and policies can leverage them – sometimes in surprisingly inexpensive and elegant ways – to help make these healthy behaviours easier, automatic and habitual.

We set out below six key behavioural principles; not an exhaustive list but a productive start. We encourage health-programme designers, and policy-makers in health and the driver domains of health (e.g., nutrition, urban design, labour), to explore how these principles have been leveraged successfully in the past and offer suggestions for implementation.

Behavioural economics

Behavioural economics bridges psychology and economics. It began with the recognition that the traditional economic model of rational entities making optimal choices based on logic, data and estimates of expected utility has significant limitations. Our choices, financial and otherwise, are highly sensitive to our cognitive limitations of attention, time and expertise and to the decision-making environment. In general, our decisions are affected by how choices are framed, the messenger presenting the choice, an awareness of other people's choices (social norms), and even the sequencing of choice options on a page. Behavioural economics is the systematic study of how people make decisions given these challenges to cognitive deliberation and the impact of contextual influences.

Nobel laureate Daniel Kahneman has suggested a helpful distinction that is now central to behavioural economics. Imagine that our minds use two parallel cognitive systems: a rational, methodical, linear system and a speedy, automatic, intuitive, live-for-the-moment system. We often call the speedy automatic system "System 1" and the deliberative, rational system "System 2."⁷ System 1 is always on, processing sensory and emotional input rapidly and effortlessly, arriving at immediate (though perhaps un-nuanced) assessments and conclusions. System 2 is under our conscious control and requires active effort to bring to bear.

System 1 knows in a flash that there is tension in a room; it takes System 2 to review the situation and sort out why. System 1 has a worker rising from her desk when colleagues invite her to lunch; System 2 calculates the time this would lose to a deliverable due the next day (and sits her back down). System 2 understands the long-term value of regular exercise and so buys a treadmill; System 1 finds the treadmill distinctly less rewarding than *Game of Thrones* so it sits unused.

Being so effortless and fast, System 1 "votes first" on choices and behaviours, acting like an autopilot. As an autopilot, it often serves us well, making mundane behaviours automatic and freeing our attention for other things – unless we activate our System 2 to work out a better choice option.

When it comes to health behaviours, this insight invites us to expand our focus beyond data, logic and consequences (System 2) and to explore how we might optimize our work to leverage those contextual signals that trigger System 1. If we each have an autopilot, how can we prompt it to follow a healthier trajectory? What small changes can we make that will cue our populations towards the best long-

term health? Even our most effective programmes may benefit from applying behavioural economics. And because the changes needed are often subtle, the corrections can be surprisingly inexpensive.

We present here six behavioural economic principles and real-world examples for each. The authors, experts in behavioural science engaged in the work of health improvement around the globe, identified these as highly valuable and applicable to this work, though these six in no way comprise an exhaustive list.

These examples are not cookie-cutter solutions; they are meant to illustrate the six principles and to stimulate thought. They show that the principles can be used to advantage, but their implementation must always fit the audience, aims and context.

The six principles:

Present bias	Benefits and costs in the present appear disproportionately larger relative to those in the future.
Framing	We often respond very differently to identical information depending on how it is delivered.
Time-inconsistent preferences	Our preferences are not fixed but change significantly over time, so we need help (commitment devices) to stick to our plans.
Reminders, cues and prompts	Sometimes even light touches can have a big impact on our behaviour.
Social norms and support	Knowing what our peers are doing can strongly influence our own behaviours.
Choice architecture	Decisions are heavily influenced by the presentation of choice options – how many choices are presented, their order, whether there is a default, and more.

No Time Like the Present

Principle: Present bias

Consider this offer:

- “Would you prefer €50 now or €55 in two weeks?”

Now consider this offer:

- “Would you prefer €50 in a year or €55 in a year and two weeks?”

Posed with the first offer, most people prefer the €50 now. But posed with the second, most would wait the additional two weeks. Why is this? Classical economics argues that the two scenarios are essentially identical and the utilitarian response to both is to wait the two additional weeks. Yet many of us are compelled to take the €50 now.

The reason is called “present bias”. Near-term benefits and costs seem to loom disproportionately larger in our System 1 perception than identical (or larger) ones in the future. That is, we weigh them more heavily and so they have an outsized influence on our decision processes. But the effect tapers off the further into the future we place the outcome – so we are more willing to wait for the additional €5 after a year has passed. The implications of this are important to consider in programme and policy design.

In general:

- A smaller-but-sooner reward can be more compelling than a larger reward that comes later
- If offering a reward for behaviour, the sooner it is to be awarded the more compelling it will be
- A later reward may have to be disproportionately larger than one received sooner to achieve a similar impact

Behaviourally informed incentive programmes⁸ that successfully helped users quit heroin and other highly addictive substances illustrate the power of leveraging present bias. While the daily destructive impact of these drugs on users’ lives might seem incentive enough to quit, many addicts need help quitting and research indicates that the most consistently successful design feature of such incentive programmes is the immediacy of the reward.

Right-sizing rewards

If we control the delivery of the benefits, we can work this present bias calculus to our advantage. That is: we can use smaller (less expensive) rewards rather than larger more remote rewards, to the same or better effect.

Present bias explains many gaps in healthy behaviour. Whether trying to diet, exercise, quit tobacco, take

medications, keep an appointment or pursue any of the Simple Seven mentioned earlier, we work against the same cognitive headwind: we must sacrifice near-term pleasures for long-term benefits. Fortunately, there are numerous strategies to overcome this. In fact, all the principles described here can be thought of as pointers to such strategies.

In one successful programme in Udaipur⁹, India, the gift of ~\$1 of lentils and ~\$2 of serving plates (thalis) was enough to improve child immunization rates from 6% per village to over 38%. The choice of *gifts* over cash in this cultural context leveraged present bias because plates and lentils are useful immediately, while cash requires a purchase before its value is realized.

In another study¹⁰, patients taking warfarin (a blood thinner) were entered in a recurring daily lottery, provided they followed their medication plan each day as instructed. On any given day, each participant had a 1 in 5 chance of winning \$10 and a 1 in 100 chance of winning \$100. The study’s design specifically provided daily rewards (rather than monthly, or one big lottery at the end) so that the time threshold for the next “win” was never more than 24 hours away. In the three-month study, the non-compliance of the subjects dropped from 35% to only 12%. Other studies showed similar successes for weight loss using daily incentives¹¹ and improved corporate health reimbursement arrangement (HRA) completion using a time-limited incentive to combat procrastination.¹²

Putting this to work:

- What is the timeframe for the benefits for the programme or policy? Could the timeframe be made shorter (and perhaps less expensive), with smaller but more frequent rewards?
- Does the current programme or policy emphasize the near-term benefits (e.g., feeling better, whiter teeth) over the longer-term ones (e.g., longer life, stronger heart)? Might changing this emphasis improve effectiveness?
- Is the programme working against a present bias “headwind”? What is the patient or participant being asked to sacrifice in the near term? What small, salient (hopefully inexpensive) alternative could be offered to offset that sacrifice?
- Could costs be made less onerous by positioning them in the future?
- Can the near-term costs of a health policy be reframed as an offset against future gains, thereby positioning the disadvantage in the future, making it less dissuasive today?

Framing Matters

Principle: Framing

How we *present* choices can deeply influence people's responses. Consider the classic example, posed by Kahneman and Tversky in 1981, in which an outbreak scenario was described and then two sets of possible responses were randomly assigned to subjects.

Scenario¹³:

Imagine the United States is preparing for the outbreak of an unusual new disease, which is expected to kill 600 people. Two alternative programmes to combat the disease have been proposed and you oversee the programme's resource allocation.

Half of the subjects were offered these two possible responses:

- If Programme A is adopted, 200 people will be saved.
- If Programme B is adopted, there is a 1/3 probability that 600 people will be saved and a 2/3 probability that no people will be saved.

Which of the two programmes would you favour?

The other subjects were offered these different possible responses:

- If Programme C is adopted, 400 people will die.
- If Programme D is adopted, there is a 1/3 probability that nobody will die and a 2/3 probability that 600 people will die.

Which of the two programmes would you favour?

Note some symmetries in the options. First, Programme A is mathematically identical to Programme C, in that "200 saved" and "400 died" describe the same outcome among the 600 patients; and Programme B is identical to Programme D. Second, Programmes A and B pose the outcome in a positive frame ("lives saved"), while C and D pose it in a negative frame ("lives lost"). And third, note that Programmes A and C offer predictable outcomes, while B and D are more of a gamble.

Here is what the study looks like in a diagram:

	50% of subjects: Positively framed options	=	50% of subjects: Negatively framed options
Clear, predictable outcome	A	=	C
Risky, unpredictable outcome	B	=	D

So, arguably, all subjects were offered identical choices and outcomes; only the framing of the options differed. If framing does not matter, we would expect the ratio of choices for A versus B to be identical to the ratio for C versus D. What were the results?

- Offered the positively framed options, 72% of subjects chose A, the predictable outcome
- Offered the negatively framed options, 78% of subjects chose D, the risky outcome

Participants were risk-averse about saving lives, and so sought to "lock in" a definite number of lives saved. And they were risk-seeking about reducing deaths, preferring in that context the gamble that might save more lives.

The underlying principle – that the framing of our options influences the choices we make – has been demonstrated many times.

One such demonstration in 1992 showed that the phrasing of advanced directives options had a significant impact on the choices of elderly patients. Three phrasings, all of which were accurate but described the function of ventilators differently – positive (a "device to help you breathe"), neutral ("breathing by machine") and negative ("a machine that controls your breathing") – resulted in very different levels of patient opt-in (30%, 19% and 12% respectively).¹⁴

Accentuate the positive?

Framing is powerful and it is essential to recognize this in developing our messages and offering choices. We must be thoughtful in our designs to leverage framing intentionally, to avoid self-defeating frames. It is critical to test our designs as well, to ensure we have framed our message to achieve the desired effects.

The “rules” for such optimal framing are still emerging. One recent examination of message framing resulted in this helpful breakdown¹⁵:

Individual (person-specific) characteristics that determine message effectiveness

Characteristic	Situations in which gain-framed messaging may be more effective	Situations in which loss-framed messaging may be more effective
Level of involvement in the issue	Low involvement: e.g., nutrition information for the general public	High involvement: e.g., breast cancer screening for high-risk individuals
Certainty of outcome	Outcome certain: e.g., belief that getting the HIV vaccine through a trial would prevent contraction of HIV	Outcome uncertain: e.g., breast self-exams
Preference for risk	Risk-averse behaviour: e.g., using sunscreen	Risk-seeking behaviour: e.g., prostate exams
Need for cognition (processing style)	Heuristic processing: e.g., promoting exercise to the general public	Piecemeal processing: e.g., promoting healthy eating to registered dietitians

Source: “When do gain-framed health messages work better than fear appeals?” Nutrition Reviews 73.1, 2015

Pondering the impact of framing on choices can lead to an “Alice Through the Looking Glass” disorientation. It defies intuition. Surely our preferences are knowable and *fixed*; they do not shift based on the mere presentation of options? However, we see again and again how powerful framing can be, even in matters of critical medical importance. In the advanced-directive study mentioned above, 77% of the subjects subsequently changed their minds at least once when presented with the differently phrased options. It is as if preferences are...

“...remarkably labile, sensitive to the way a choice problem is described or ‘framed’ and to the mode of response used to express the preference... These failures of invariance have contributed to a new conception of judgement and choice in which beliefs and preferences are often constructed – not merely revealed – in the elicitation process.¹⁶”

While remembering that framing is powerful, even pivotal, we must accept that framing is essentially unavoidable. Any message we create to express facts, risks, benefits or outcomes cannot avoid the use of some framing, whether positive or negative. We must, therefore, carefully consider how we present choice options and try to match the framing to the desired outcomes.

Putting this to work:

- Review the programme/policy messages and consider how they are framed. If positively framed, try articulating the equivalent negative and vice versa; reversing the frame might be more effective.

- Consider the target audience and review the characteristics in the table above. Does the messaging fit or would a change be in order?
- Test different framing options if possible, before committing your time, effort and money to a particular approach. Try to determine empirically which framing options are most effective for your specific audience and context.
- How might a new policy be introduced to the public, knowing that audiences are generally risk-averse for positive frames but risk-seeking for negative frames?

Aligning Our ‘Future’ and ‘Present’ Selves

Principle: Time-inconsistent preferences

Most of us intend to improve our healthy behaviours... in the future. Our “future selves” sincerely desire to exercise and be thinner; our present selves sincerely desire a second helping of dessert. Day by day, those future selves transform into our present selves – a creature with different desires and priorities – and those healthy plans we made earlier get pushed aside.

At issue is that our preferences are not fixed but rather highly “time inconsistent” and so we need to build an alignment between the “far-sighted planner” and the “myopic doer”. We want to arrange support for those future selves perhaps by constraining later choices, or by making deviations from the desired path harder or less inviting.

Commitment devices are means by which a person self-imposes rewards or punishments in the future to support their follow-through on a desired behaviour. When friends agree to meet at the gym at 7am Tuesday they are putting their credibility and self-image at risk to compel themselves to show up; they are using a commitment device.

By offering our populations well-designed commitment devices, we can help willing participants stick to their plans. Such devices need not be complex or costly.

In a six-month study of smokers in the Philippines¹⁷, participants put money into a “deposit contract” bank account every two weeks while abstaining from smoking. They would receive their money back at the end only if their urine tested negative for cotinine (a metabolite of nicotine); if positive, they would forfeit the money to a charity. The programme costs were small. The participants’ total investment was about 550 pesos, or \$11, approximately the cost of the tobacco they did not use. Not only did the participants show higher quit rates at the six-month mark but also they saw 31 to 53 percentage points improvement in the likelihood of passing a second test at the 12-month mark. The latter is noteworthy because by the 12th month all monies were settled and no consequences were pending; yet, to a high degree, these quitters remained successfully quit.

Similar success has been seen for weight loss. In a 16-week study¹⁸, military veterans in the United States assigned to the deposit contract group lost about 14lbs, 9lbs more than the control group lost.

Lotteries can also be designed to create pre-commitment. In the same weight-loss study, a third group participated in a daily lottery draw, with a 1-in-5 chance of winning \$10 and a 1-in-100 chance of winning \$100. The winners, however, were not paid daily; they were paid after an end-of-month weigh-in. To collect, the participants needed to be at or below their weight goal for that month. On average, this group lost 13lbs, a statistically identical amount to the weight loss observed within the deposit contract group.¹⁹

It is worth mentioning that programmes requiring voluntary enrolment can present special challenges. In a recent study²⁰ based at a large US employer, over 50% of participants in a commitment contract quit smoking, but less than 14% who participated were offered the opportunity to do so. This resulted in lower overall quit rates than a group that was simply offered a comparably sized reward. This reluctance to enrol has been observed even when the programme promised additional matching funds of 100%, 200%²¹ and even 400% of the participants’ personal contribution.

Bundling “wants” with “shoulds”

One intriguing model is “temptation bundling” in which an immediately gratifying activity (a “want”) is paired with a healthy activity (a “should”). In a 2013 US study²², audiobook devices pre-loaded with popular and “tempting” novels (e.g., *The Hunger Games*, *The Da Vinci Code*) were made available for free to college students – but only while exercising at the gym. This simple pairing of a “want behaviour” with a “should behaviour” resulted in a 51% increase in gym attendance.

Two additional observations from the audiobook study:

- Asked later if they would consider buying a gym product based on the study’s design, 61% of the students said “yes”
- The students could easily have enjoyed the audiobooks without exercising, but the evidence suggests they found the constraining of their choices effective in increasing gym use

These both seem to indicate some receptivity, even eagerness, for such commitment devices. This model of bundling a “want” with a “should” could be applied to achieve a variety of health improvement objectives.

Public commitments

Commitments made in public can be powerful drivers of desired future behaviour. This was demonstrated in a 2014 study to reduce inappropriate prescription of antibiotics for upper respiratory infections (URIs). Research shows that up to half of the 41 million prescriptions given annually are for URIs for which they would produce no benefit²³ as URIs are typically caused by viruses. The reasons cited for such pointless prescriptions include “defensive prescribing”, unawareness of diagnostic guidelines (e.g., those allowing clinicians to accurately distinguish between pneumonia and acute bronchitis), patient demand and workplace culture.

To reduce this inappropriate prescribing, posters were placed in the examination rooms with the clinicians’ photos and signatures, stating in clear language their individual commitment to not prescribe antibiotics for viral infections. With this public commitment on display for 12 weeks, inappropriate prescriptions dropped by almost 20%²⁴.

What makes a compelling commitment?

As we design commitment devices, it is worth considering the qualities of a behaviour-changing commitment. Robert Cialdini, Regents’ Professor Emeritus of Psychology and Marketing at Arizona State University, suggests these three characteristics²⁵:

1. It is *public* or *shared*. As discussed above, we are more compelled to deliver on promises that are known by others. (This is increased if we know that our promise has been recorded in some fashion.)
2. It is *active*. Entering into the commitment involves taking some action. This need not be effortful. Pressing a button, filling out a card, checking a box, signing your name, voicing agreement; these small actions anchor the commitment in external reality.
3. It is *voluntary*. Self-evident perhaps, but our designs must ensure such commitments are unencumbered and freely chosen. As the poet Samuel Butler wrote in the 1600s, “*He that complies against his will / Is of his own opinion still.*”

Consider this elegant and well-crafted example of commitment. Gordon Sinclair, the proprietor of Gordon’s restaurant in Chicago, has hit on a highly effective tactic [for reducing expensive no-shows] that doesn’t bruise the egos of his customers when they call for reservations. He has instructed his receptionists to stop saying, “Please call us if you change your plans” and to substitute, “Will you call us if you change your plans?” – and then to wait for a response. As a result, his “no-show” rate has dropped from 30% to 10% (*New York Times*, 1997). What is it about this subtle shift that leads to such a dramatic difference? The receptionist specifically asks for – and waits for – the customer’s voluntary affirmative response, at which point the customer “owns” her commitment in a way she did not before. By inducing customers to make personal commitments to a behaviour, chances increase that they will perform the behaviour²⁶.

We can spot Cialdini’s recommendations at work. The commitment is public or shared insofar as the customer knows their reservation has been recorded for the other staff. It is active, insofar as the customer was prompted to voice their “Yes” aloud. And it is, of course, voluntary.

Putting this to work:

- How might a pre-commitment contract be used to build healthier habits?
- What health-promoting behaviours could be bundled with tempting, immediately gratifying behaviours in a way that leads to positive habit formation?
- What simple interactions with patients could be subtly adapted (following the Gordon’s restaurant example) so that an intention to follow-through is voiced as a commitment?
- How can commitments be made public, thereby increasing the likelihood of individual follow-through?
- What commitments are asked of patients today that could be augmented by adding some small, simple action on their part?

That's Your Cue

Principle: Reminders, cues and prompts

Four community mental health clinics in London wanted to reduce patient appointment “no-shows”. With an inexpensive message, they reduced no-shows by 25%-28%²⁷. What was the intervention? A single SMS reminder.

In 2013, Evive Health added a simple prompt to the reminder letter sent to customers who were eligible for colonoscopy (an evidence-based approach to screening for colon cancer). The prompt increased uptake of colonoscopy by one percentage point, which could save 271 lives for every 100,000 letter recipients.²⁸ What was the prompt? A yellow sticky note.

A Florida teaching hospital wanted to improve the staff hand-washing hygiene compliance in its surgical intensive care unit. With one simple sensory cue the hospital increased compliance by nearly 50%²⁹. What was the cue? The scent of citrus.

We are each reminded, cued and prompted continually – whether by design or inadvertently. We may be lifted by a song, drawn into memory by a perfume, saddened by a movie poster, or angered by a turn of phrase. Our sensory apparatus is constantly gathering in the world around us and responding to conscious or subconscious cues, and the effect on our actions, attitudes and choices is striking. Through careful design, we can put these cues to work.

Reminders

Sometimes the problem is simple: people forget. Well-placed reminders can boost the salience and urgency of a desired behaviour, leading to better choices and outcomes. The London mental health clinics mentioned above sent an SMS that reminded patients of the cost of missed appointments³⁰. The success led the authors to assert that “Moving from the existing reminder to the more effective costs message would result in 5,800 fewer missed appointments per year in [that clinic alone]...at no additional cost.”³¹

This study is one of dozens³² demonstrating the efficacy of SMS reminders, especially for medication and appointment adherence, disease management and smoking cessation.

SMS is not the only tool. Another study³³ increased drug compliance from 63% to 86% using the simple reminder chart shown here.



Information about your medicine

Name: Any Patient

Date: 03 OCT 1989

How to use this chart

- This chart shows you when to take each of your medicines
- At each meal time, look down the column to see which medicines you need to take with or just after the meal. Do the same about half an hour before bedtime.
- A spoon means a 5ml plastic medicine spoon
- Medicines which you take only when you need them are not included in the chart.

Medicine		Breakfast	Lunch-time	Evening-meal	Bedtime
ATENOLOL Tablets	100mg	1 Tablet			
NAPROXEN Suspension	125mg/5ml	2 Spoons		2 Spoons	
AMOXYCILLIN Capsules	250mg	1 Capsule		1 Capsule	1 Capsule
BECLOMETHASONE Inhaler	50mcg	2 Puffs	2 Puffs	2 Puffs	2 Puffs

Source: “Effects of computer generated reminder charts on patients’ compliance with drug regimens, BMJ, 1993



Source: “Planning prompts as a means of increasing preventive screening rates”, Preventive Medicine, 2014. (Image courtesy of Evive. © 2010 Evive Health, LLC. All rights reserved.)

Cues

There is rich body of research indicating the impact of subtle sensory cues. Dimmer lighting has been shown to promote creative thinking³⁴. The chocolate flavour of a brown M&M candy is judged to be more intense than an identical green one³⁵. Slower-paced music in restaurants can lead to longer customer stays (and in one study, >14% higher customer spending³⁶. The aromas outside a bakery can increase altruistic behaviour among strangers³⁷. Wine stores that play classical music (versus popular music)³⁸ sell more expensive wines, and sell more German than French wine while playing German music (and vice versa)³⁹.

These examples illustrate that whereas System 2 may process input linearly and logically, System 1 responds *associatively*, favouring behaviours that are thematically consistent with that input⁴⁰. It is this tendency that the Florida surgical unit used to such positive effect. Most Americans associate a citrus scent with freshness, cleanliness, purity, etc.; thus, the scent cued staff to behave in a thematically consistent way; i.e., by washing their hands.

Prompts

Evive Health's yellow sticky note was a prompt – specifically, a *planning prompt*. While all 12,000 subjects in the study received a letter encouraging them to schedule colonoscopies, one group also received a yellow sticky note, like the one shown here, with specific blank spaces. The letter made no mention of the sticky note or how to use it. The assumption was that recipients would grasp its utility, fill the blanks with details from the letter, place it in plain sight, and it would provide an ongoing environmental reminder not to forget the appointment. As mentioned earlier, the 1% improvement in uptake could mean 271 lives saved per 100,000 letters – an immense reduction in human suffering, for the cost of a sticky note.

By means of an explanation, it is believed that the act of filling out the sticky note has two effects. First, the act mentally binds the date to the behaviour, so the approaching date itself becomes a reminder: “Tomorrow is the 15th? I have a doctor’s appointment.” Second, the act of writing makes it more salient (akin to a personal commitment). Third, the act of completing the note encourages the customer to consider potential impediments to attending for colonoscopy at that time (e.g., the need to arrange childcare, existing schedule conflicts, etc.).

In a famous 1960s study, a Yale University professor explained to students the value of tetanus shots and encouraged them to schedule vaccinations at the campus health clinic. The researchers hoped to demonstrate that fear-based messaging was more effective than neutral messaging, but only about 3% from either group kept their appointments. On a hunch, the researchers tried a new approach. They gave students a map of the campus with the clinic circled. “Students were given routes that could be taken to pass the health service as one changed classes. The student was asked to think over his daily schedule and to plan at least one class change so that he would walk by the health service.” By doing this, the researchers created a planning prompt. Attendance rates at scheduled appointments rose from 3% to 28%⁴¹.

Putting this to work:

- How might an inexpensive reminder, whether SMS, email, automated phone call or a letter, be used to encourage a beneficial behaviour?
- Could the timing, placement or content of current reminders be improved?

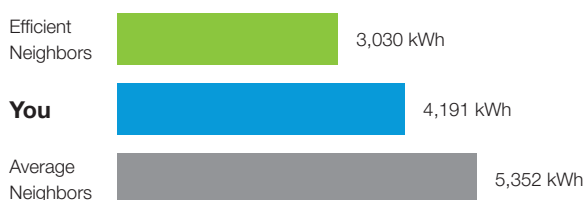
- What low-cost prompts might boost the effectiveness of existing programmes and materials?
- How might planning prompts optimize the impact of current messaging?
- What changes to the sensory environment might cue populations towards the optimal choices and behaviours?

Perception and Power

Principle: Social norms and support

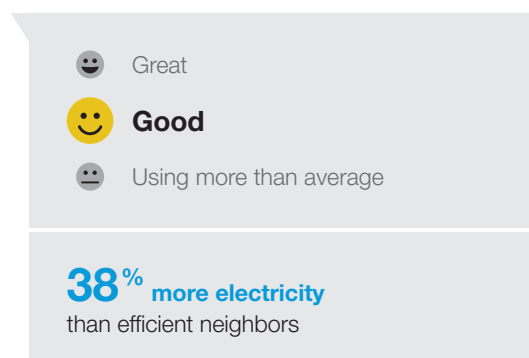
A US electrical company called Opower sent customers a simple report of their electricity usage compared with similar homes in their neighbourhood. Below is an example, showing the data in plain numbers and graphs along with a “smiley face” icon (indicating that the customer is doing well on energy efficiency).

Here's how you compare to neighbors



Jun 20, 2013 - Jul 21, 2013

This is based on 10 similar homes. Efficient neighbors are the 20% who use the least amount of electricity. See back for details.



Source: Social Norms and Energy Conservation, Journal of Public Economics, 2011

This simple intervention caused the least efficient electricity users to reduce their consumption by an average of more than 2%⁴². While this may seem a small effect, providing this information is essentially free and this small change over a large population represents an enormous amount of energy saved.

Human beings are, of course, highly social creatures, sensitive to the behavioural norms we observe around us. When we spot such a social norm our automatic inclination is to adopt it ourselves. Opower simply made these neighbourhood norms visible and the result was behaviour change. Building on this approach, we can begin to explore how to use norms in our work to optimize healthy behaviour.

Two types of norms

We can begin by unpacking three elements from the Opower example. It contains:

- The *descriptive* norm: This is the relative performance data that underlies the norm. In this case, the homeowner sees his or her electrical usage in simple numbers, graphs and percentages.

- The *injunctive* norm: This is the “value statement” that indicates which actions are considered desirable. The smiley-face icons are a concise form of this⁴³.
- The *relevance* of the comparison group: In the Opower report, each household is compared with homes of similar size and energy usage and with local houses.

At first, Opower used the descriptive norm alone, but this led to the most energy-efficient customers using more power once they realized they were doing better than average! It is as if, as Cialdini suggests, descriptive norms alone tend to draw behaviour towards a “magnetic middle”⁴⁴. Opower found that adding the injunctive norm – that is, highlighting what consumers are supposed to do – neatly counteracted this effect.

For our work in health programme and policy design, the thoughtful presentation of norms can have far-reaching effects.

For example, in a trial to reduce the over-prescription of antibiotics in the United Kingdom, letters were sent to more than 3,000 GPs (primary care physicians) who were ranked in the quintile that most frequently prescribed antibiotics

for conditions that do not typically warrant them. The letter compared each practice with other practices in their local NHS area – in effect, comparing them with those who were performing better. “Six months later,” reported Duncan Selbie, Chief Executive of Public Health England, “the practices that received letters saw a decline in their rate of antibiotic prescribing compared with those that did not, resulting in around 73,000 fewer antibiotic prescriptions.”⁴⁵

When exploring the power of norms, remember that “perception is everything”. If a perceived norm is, in fact, inaccurate, the simplest intervention is to correct the error. For instance, a high predictor of heavy drinking on college campuses is the students’ *assumption* that heavy drinking is the campus norm. In a 2003 study at a Midwestern US university⁴⁶, drinking quantity and frequency were both successfully reduced by correcting that misperception through simple messages like these:

- “70% of . . . students have never let drinking get in the way of academics”
- “85% of . . . students drink less than once a week”
- “66% of . . . students have refused an offer of alcohol in the past 30 days”

Express norms carefully

Keep in mind that communicating a norm can attract others to follow suit, even if the behaviour is not desired. In a famous example⁴⁷, when a national park posted a sign indicating that visitors were damaging the park by stealing bits of petrified wood, theft increased. The sign “normalized” the behaviour, perhaps even suggested it. When the signs were changed to read that “the vast majority of past visitors have left the petrified wood in the park”, the effect was reversed. A study in a UK healthcare clinic in Bedfordshire

showed a similar outcome. The clinic changed a waiting room poster to underscore how many patients do keep their appointments, rather than how many miss them. Implemented along with some insightful improvements in appointment booking processes, this reduced no-shows by more than 30%.

The Health Authority of Abu Dhabi performed research into the social and cognitive barriers to breast cancer screenings⁴⁸ and included social norming in their subsequent messaging. Screening rates rose from below 20% to over 60% inside 12 months.

In a 2014 study⁴⁹, descriptive and injunctive norms regarding hand-sanitizer use in a Denmark hospital were combined with admirable brevity: “Here we use HAND DISINFECTANT . . . in order to protect your relatives.”

This message, combined with some intelligent changes in the positioning and colouring of the dispenser (increasing its salience), raised hand-sanitizer use among hospital visitors from 3% to 67%, a better than 20 times increase⁵⁰.

Putting this to work:

- What positive “hidden norms” could be increased further by making them more visible and known to the target population?
- Do existing social-norming messages include both the descriptive and injunctive elements?
- Does any current messaging inadvertently normalize an undesirable behaviour?
- Opower intentionally compared each household with others similar in size and location, making the norm more salient and meaningful. How might messages be similarly fine-tuned to maximize impact?



Source: “Nudge for bedre håndhygiejne,” Copenhagen Business School, May 2014

Crafting the Moment of Choice

Principle: Choice architecture



Decision-makers do not make choices in a vacuum. They make them in an environment where many features, noticed and unnoticed, can influence their decisions. The person who creates that environment is, in our terminology, a choice architect.



Richard Thaler, Cass Sunstein, John Balz, Choice Architecture⁵¹

In their influential paper, Thaler, Sunstein and Balz remind us that choices always elicit *some* System 1 response. No matter how we order the content, adjust the phrasing or include or omit options, the final assembly cannot avoid nudging the decision process in one direction or another (via System 1 processes).

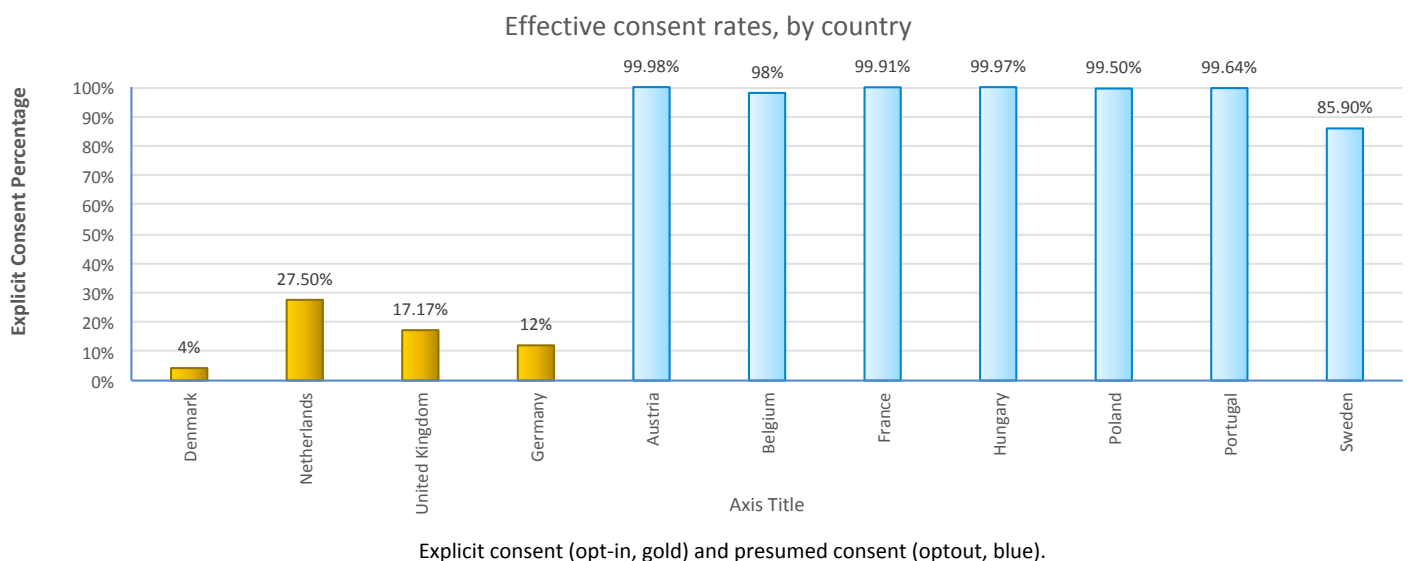
Our opportunity, and our obligation, is to make that nudging intentional and mission-consistent. If we seek to encourage or discourage certain behaviours, we must design our choice environments carefully. Thaler and team divided choice architecture into the following six elements:

- Setting defaults
- Expecting error
- Mapping choice to outcome
- Giving feedback
- Structuring complex choices
- Creating incentives

Some of these will overlap previous topics, but we elaborate a little on each of these principles here to clarify their relevance to choice environments.

Setting defaults

We tend to opt for the path of least resistance and thus highly favour default options. This is the pre-defined option that takes effect if we do not override it. The thoughtful architecting of default options (for example, opt-in or opt-out) can have great impact, as demonstrated in areas as diverse as magazine subscriptions, car insurance, organ donation and retirement savings⁵².



Source: Johnson and Goldstein, "Do Defaults Save Lives?", Science 2003

Consider this chart⁵³, which shows the percentage of citizens on organ donation registry lists among various Western European countries. The countries on the left in yellow require a citizen to “opt-in” (that is, default = no); in the countries on the right in green, the choice is opt-out, meaning that citizens are presumed to be on the list unless they explicitly opt out. The differences in registration rates are enormous. Similarly, the choice of advanced directives prioritizing comfort care among patients with terminal diagnoses varies greatly on whether the default option is “comfort,” “life-extension”, or no default provided⁵⁴. Much higher percentages (77% versus 41%) choose comfort care when that is the default.

Defaulting was also key to the highly successful Deworm the World Initiative (launched by the World Economic Forum in 2007; now run by the NGO Evidence Action) which made school-child participation an opt-out for parents. In 2015-2016, the programme helped deworm more than 185 million children across India and Kenya⁵⁵. The Health Authority of Abu Dhabi’s screening campaign for cardiovascular risk factors⁵⁶ also made consent opt-out; in combination with other behaviourally informed programme design choices, this programme screened more than 90% of Abu Dhabi’s adult population.

Keep in mind that defaulting succeeds best when the default behaviour is acceptable and desired by the target audience, or when they already had a general intention of doing it. We can also think of defaulting as providing implicit guidance towards the preferred option and making it more likely to happen by reducing friction.

Expecting errors

Everyone has put a credit card or bank card into a slot-reader backwards or upside down. There are four possible orientations of these cards but typically only one will work

– so 75% of the orientations are “errors” that waste time, frustrate cardholders and slow the queue.

For comparison, consider the Paris Metro: their card-readers are designed to accept cards in any orientation, reducing that opportunity for error from 75% to zero.

Similarly, a London teaching hospital reduced common errors on medication and antibiotic prescription orders by designing the form shown here⁵⁷. They found users “significantly more likely to include correct dose entries, [the] prescriber’s printed name and contact number” and the “anti-infective indication and duration”. The form discouraged freehand notes, encouraged the use of block capitals and circling the desired unit of measurement. Their conclusions: the new form “significantly reduced a number of frequent prescribing errors including dosing errors and illegibility”.

Mapping choice to outcome

We typically base our choices on a mental “mapping” of choices to their outcome. When outcomes for each are clear, choices are easier; when unclear, choices are harder and more susceptible to secondary influences. For instance, in one study⁵⁸ of men with prostate cancer, those discussing the matter with surgeons most often chose surgery; those speaking to radiologists tended towards radiotherapy. In other words, they gravitated towards the option where the outcome was made clearest.

To improve this mental mapping, the use of plain, non-technical language can help immensely. One study found that rewriting guidelines in this way⁵⁹ successfully produced in patients “stronger intentions to implement the guidelines, more positive attitudes towards them and greater perceived behavioural control over using them.”

ANTI-INFECTIVE AGENTS

Prescriber to review every third day and initial in red outlined box

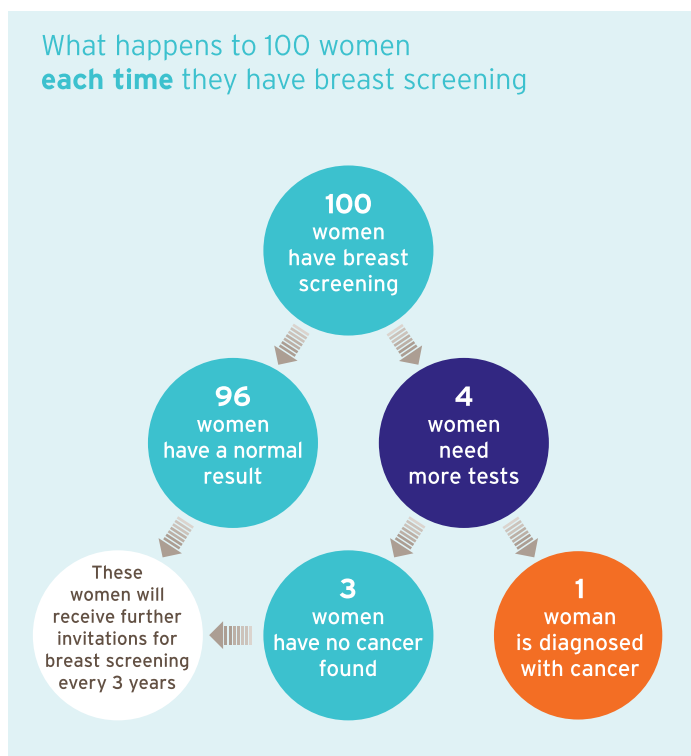
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Source: “Redesigning the ‘choice architecture’ of hospital prescription charts”, BMJ, 2014

Original	"Plain English"
"Also, if you want psychological help, you will need antipsychotic medicines at the same time. Remember, the decision about which medicine to take is best made by you and your doctors together."	"You will need to take these medicines if you also want psychological help. You should decide which medicine is best for you with the help of your doctors."

Source: "Words matter: increasing the implementation of clinical guidelines", Quality and Safety in Health Care, 2005

The NHS diagram shown here presents an almost literal map of the confusing "if thens" that women must comprehend with regard to their breast cancer screenings. This was included in a newly redesigned NHS leaflet⁶⁰ on the topic, which was hailed as "a revolution in presenting patients with balanced information so they can make an informed choice"⁶¹. Public policies that encourage the creation of such choice-support tools could increase confidence and decision-quality for both patients and their influencers (family, health specialists, etc.) for any number of complex medical situations.



Source: Brochure from NHS and Public Health England, July 2016

Feedback is essential

Feedback is often key to sustained effort when working towards health goals. Depending on the intervention (e.g., improving the water quality for a city, enacting a vaccination campaign, an individual trying to reduce stress or tobacco use, etc.), the most profound benefits may take months or years to materialize. Being present-biased, we easily lose sight of the goal and so fail to sustain the effort or expense. Regular, accurate, salient short-term feedback

is, therefore, key to keeping participants on track. Exercise tracking apps, for instance, often mark progress against arbitrary systems of levels or badges. Tobacco cessation programmes sometimes show each day the total money saved by not smoking.

We have many feedback channels to choose from: postal mail, email, face-to-face conversation, media outlets, SMS, phone and IVR, web and mobile app reminders and prompts. But there is no best formula for using feedback and no best channel to use. A review of feedback to improve medical practice advised that the results "do not support mandatory or unevaluated use of audit and feedback" – meaning it is critical to consider context in our designs, and to iteratively test and improve the content and timing of the feedback for maximum real-world impact. Still, some researchers are identifying guidelines⁶² and tentative best practices⁶³ (as in the table below).

Tentative best practices in audit and feedback design

Audit components

- Data is valid
- Data is based on recent performance
- Data is about the individual's/ team's own behaviour(s)
- Audit cycles are repeated, with new data presented over time

Feedback components

- Presentation is multi-modal, including either text and talking or text and graphical materials
- Delivery comes from a trusted source
- Feedback includes comparison data with relevant others
- Targeted behaviour is likely to be amenable to feedback
- Recipients are capable and responsible for improvement

Nature of the behaviour change required

Targets, goals and action plan

- The target performance is provided
- Goals set for the target behaviour are aligned with personal and organizational priorities
- Goals for target behaviour are specific, measurable, achievable, relevant, time-bound
- A clear action plan is provided when discrepancies are evident

Source: "No more 'business as usual' with audit and feedback interventions: towards an agenda for a reinvigorated intervention", Implementation Science, 20

Structuring complex choices

“Choice paralysis” is the familiar experience of being unable to choose from among too many options, or options that are difficult to compare. This can have a serious and negative impact on the quality of choices regarding health insurance, retirement investments, and in many other contexts. Through careful structuring of the presentation of these choices and their options, we can help people find a better fit between what they want and what they actually choose.

One of the simplest ways to reduce complexity is to reduce the number of options. This can be done by narrowing the total list of options for everyone, or by dynamically reducing the list for each individual through a filtering algorithm based on their profile or preferences. This latter method is often used by online tools for selecting a clinic or health insurance plan.

Another approach is to use incentives that are more easily understood. For instance, the US health insurance plan Humana Simplicity only has co-payments in terms of patient cost-sharing, which is far simpler to understand and calculate than coinsurance or deductibles⁶⁴. This simplified plan collapses hundreds of medical services into about six categories, which helps consumers grasp what is in their plan and what they are incentivized to do.

It is also possible to simplify choices by bundling the options by attribute. Choosing a new automobile is easier if one attribute has top priority for us, such as “reliability” or “sportiness”. Similarly, asking end-of-life patients their overarching preference for “comfort” versus “life-extension” can reduce the number and complexity of subsequent choices. In fact, many of the topics described earlier (such as defaults, norms and framing) can be thought of as a way of bringing structure to choice complexity⁶⁵.

Policy-makers can call for increased consistency and standardization in the health insurance market, where “choices are numerous, complex and hard to compare and in which mistakes can cause considerable loss or harm to consumers”⁶⁶.

Creating incentives

The term incentives is often assumed to mean financial incentives – and money can certainly be used to great effect. But not all incentives need be financial; for example:

- Public commitments create an incentive to follow through, in order to be viewed well by one’s peers or other audiences
- Data about social norms can incentivize one to behave in kind, as the Opower reports (ibid.) demonstrated
- Goals can be structured in a way that draws people to achieve their own objectives
- People typically choose default options and keep to the status quo; in effect, we can often anticipate an inherent disincentive to make changes

In pro-social contexts, such as raising money for charity or donating blood, “intrinsic” incentives can sometimes prove more compelling than “extrinsic” incentives. A good recent example of this is the case of Zambian hairdressers encouraged to sell condoms to their customers (salons were chosen for the camaraderie and trust customers typically enjoy with their stylists). Some stylists received money for each condom pack sold, while others received “social rewards”. They were given a thermometer display, like those used in charitable fundraisers, and instructed to place it in a publicly visible place.

“Each sale is rewarded with a star stamped on the thermometer, which is labelled as measuring the stylist’s contribution to the health of their community... In addition, stylists were told that all those who sell more than 216 packs over a year would be awarded a certificate at a ceremony.”

This intrinsically motivated group sold twice as many condom packs on average as those who received financial incentives⁶⁷.

Putting this to work:

- How can the most beneficial choice be made the default choice?
- Might “opt-in” decisions benefit from being re-cast as “opt out” decisions?
- Is it clear to the audience what will result from each choice option? Can the choice-mapping be made clearer in their minds?
- Who are the target audience’s key influencers and messengers? These might be family, employers, friends, health professionals, even (as we saw above) hairdressers. How can the policy or message be presented so that it also incorporates indirect influencers?
- What errors can be anticipated, and thereby minimized (or their repercussions lessened), by designing around them, like the Paris Metro?
- Are the choice options too complex? Can these be simplified and made more readily comprehensible?
- Explore all the types of incentives available. How might pro-social, altruistic motivators be leveraged, in addition to (or in lieu of) financial motivators?

Taking on the Mantle

Every choice has its own architecture

Increasingly, evidence shows strong linkages between behaviour, life expectancy⁶⁸ and chronic disease, morbidity and mortality⁶⁹, highlighting the value of designing public health and corporate programmes and policies with the encouragement of healthy behaviour as a fundamental aim. Behavioural economics provides insights, tools and models to follow to achieve that aim.

While the principles of behavioural economics do not provide fixed templates, there is a wide variety of ways in which we can make our work more effective.

Not everyone will respond to these efforts; there are no universal solutions. Behavioural strategies best help those who want to improve, but we must not dictate the choices of those who strongly prefer otherwise. Being intentional in our designs can help make our programmes significantly more effective. Knowing that these “System 1” factors can be so compelling obliges us to account for them because, intended or not, they are always at work in our populations and in our own lives.

We have summarized here a few principles that can boost the effectiveness of health programmes and policies, and many of these can be implemented with minimal cost. We encourage readers to explore the resources listed below, and to continue to investigate the potentials of behavioural science to benefit the populations we serve.

Acknowledgements

This report was written by:

Oliver Harrison, Chief Executive, Telefonica’s Alpha Health, Spain

Tom Kelleher, Founder and Lead Consultant, Tom Kelleher Consulting, Inc., USA

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Kevin Volpp, Director, Center for Health Incentives and Behavioral Economics, University of Pennsylvania, USA; Janet and John Haas President’s Distinguished Professor, Perelman School of Medicine and the Wharton School, University of Pennsylvania; Principal, VAL Health LLC.

Josh Wright, Executive Director, ideas42, USA

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World Economic Forum
91–93 route de la Capite
CH-1223 Cologny/Geneva
Switzerland

Tel.: +41 (0) 22 869 1212
Fax: +41 (0) 22 786 2744

contact@weforum.org
www.weforum.org