BEHAVIOR CHANGE FOR NATURE:

A Behavioral Science Toolkit for Practitioners

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INSIGHTS
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Praise for
Behavior Change for Nature

"An extremely well-crafted summary of what behavioral research has taught us about better design of public policy and how we can apply that to the environmental field."

Robert Frank, Professor of Economics at Cornell University and author of Microeconomics and Behavior

"At the end of the day we're only going to make conservation work when we can change lots of places on the ground and that means helping lots of people change too. I think the approach here allows us to do that faster, better, and in a way that enables us to keep up with the threats we're facing across the planet."

Aileen Lee, Chief Program Officer, Environmental Conservation Program, Gordon and Betty Moore Foundation

"An excellent resource for teachers, practitioners, and academics alike – grounded in science yet applicable to real-world conservation challenges. I expect that many NGOs will be eager to use it in their on-the-ground work."

Pamela Matson, Professor in Environmental Studies and Senior Fellow at the Woods Institute, Stanford University

"An impressive and thorough compilation that is great for conservation. It provides strategies, examples, methodology, and tips for evaluation all in one place."

Kent Messer, Co-Director, Center for Behavioral & Experimental Agri-Environmental Research (CBEAR) and S. Hallock du Pont Professor, University of Delaware

"This report explains complex concepts in a way that is clear and easy to understand. Best of all, it is a pleasure to read. I'm sure I won't be the only one using this in my work and my teaching."

Lucia Reisch, Professor of Consumer Behavior and Behavioral Insights, Society and Communication at Copenhagen Business School

"What a terrific report, and what a tremendous public service. Behavioral science can save lives and protect the environment— and save money in the process. We've long lacked a toolkit, one that is actually usable by practitioners. This brilliant report will change the world for the better."

Cass R. Sunstein, Robert Walmsley University Professor and coauthor of Nudge

"This report is packed with great examples and outlines the potential for a new wave of behaviorally-informed interventions in conservation."

Erez Yoeli, Director of MIT's Applied Cooperation Team

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Conservation is a behavioral challenge and therefore needs behaviorally-informed solutions.

Foreword

We are fortunate to live in a world filled with both an abundance and diversity of life. Yet the growing scale and impact of human behavior pose a grave risk to the natural world in irreversible ways. Of the many challenges that we see in the world today, biodiversity loss and the degradation of natural systems are increasingly ones that threatens the livelihoods, health, and well-being of people as well as the species and places we know and love.

So imagine you are managing a team within a conservation organization, tasked with developing a strategy to curb the trade of illegal tiger products in South-East Asia and to prevent overfishing in a coastal municipality in the Philippines. From what you know, both are complex problems and require a holistic approach to creating solutions. You imagine a long road ahead of research, field visits, and endless meetings about what's working and not working. You feel the pressure from the importance and urgency of these global problems and want to develop interventions that last and make a difference. Where do you even begin?

Our past and current efforts in facing these challenges have tended to rely on a standard toolbox that enacts regulations, provides financial incentives or disincentives, and raises awareness about the dire consequences of our bad behavior. In addition to these tools, in this report we suggest a greater focus on how our cognitive biases, emotions, social networks, and decision-making environments all impact our behaviors and choices. Our goal is to offer an introductory guide to these ideas, which can help us to identify the behavioral barriers and solutions to overcoming the world's biggest conservation threats.

These approaches are still relatively new to the field of conservation and are increasingly familiar to other sectors. More than 100 governments and institutions have created 'behavioral insights teams' or 'nudge units' to improve policy by drawing on behavioral economics and psychology, and marketers and managers are becoming increasingly sophisticated in their 'human-centered' approach. Meanwhile, many development organizations and public health officials are starting to give behavior change interventions as much credence as conventional legislative, economic, or infrastructural programs to achieve positive social change. We would argue this is exactly how it should be. After all, many of society's ailments and ambitions - from corruption and conflict to obesity and road safety - are ultimately about human behavior. Protecting our planet is no different.

We hope you'll come away from this report with a clearer understanding that conservation is a behavioral challenge and therefore needs behaviorally-informed solutions. Here is your starting point with the tools and tactics to employ in your efforts to preserve our natural resources for current and future generations.

Onwards,

Brett Jenks, President & CEO, Rare
David Halpern, Chief Executive, The Behavioural Insights Team

Executive Summary

NATURE CONSERVATION IS ABOUT BEHAVIOR

In one way or another, as conservationists we are often trying to change someone's behavior. Maybe your challenge is reducing the demand for rhino horn in China, or persuading Americans to adopt a plant rich diet, or convincing artisanal fishermen that by catching less today they may end up getting more tomorrow. Maybe you are trying to encourage residents of your district to stop throwing plastic into the river, or to motivate farmers in Colombia to adopt sustainable agricultural practices like silvopasture or cover crops. Or maybe you are trying to sway your local politicians to enact new policies that makes it easier to protect the species, habitats, or resources you care about. Whatever the case may be, you are here because you want to persuade, motivate, or otherwise enable someone to change their behavior.

In Chapter 1, we explain why the daily decisions and actions of individuals and communities around the world are so central to conservation outcomes. We've identified five main categories of conservation threats as areas to apply our revised toolkit: habitat loss and degradation, overexploitation, illegal wildlife consumption, human-wildlife conflict, and pollution. For each, we identify a number of target audiences and target behaviors that could help to mitigate the losses to natural systems we are seeing around the world. We also provide further details of these five conservation threats in **Annex A**.

CONVENTIONAL TOOLS CAN BE POWERFUL, BUT REST ON FLAWED ASSUMPTIONS

For more than a century, conservation efforts have relied on three key approaches to bringing about change: legislation and regulation; market forces and material incentives; and awareness and education. In **Chapter 2**, we discuss the merits of these tools, but also their shortcomings. We highlight three fundamental insights from behavioral science which provide a new perspective on conventional wisdom: the need to focus on non-conscious as well as conscious drivers of behavior; the need to focus on the setting of our behaviors as well as internal motives and drivers; and the need to focus on behaviors rather than solely beliefs, attitudes, or intentions.

The evidence shows this new perspective is much needed in the field of conservation. Regulations, even well-designed, are difficult to enforce, especially in developing world contexts. Material incentives can be powerful, but they are difficult to design well and can produce myriad unintended consequences. And raising awareness on its own rarely leads to changed hearts and minds, let alone desired environmental outcomes – knowledge simply doesn't equate to action.

NEW STRATEGIES ARE NEEDED

A revolution in the science of human behavior over the past few decades has changed the way that we think about how people make decisions and revealed a new and growing set of insights that can aid us in designing solutions that work for everyday people from fishers, to tourists, to government officials. In particular, these insights highlight that we must change our prevailing assumptions about our target audiences. Our choices are not made solely on the basis of fully conscious, deliberate, or even rational processing of information. We are emotional; we are embedded in social networks; and are influenced by the context of decisions and the way choices are presented.

In **Chapter 3**, we collate key findings from behavioral science and propose 15 strategies. These are broadly categorized into three categories, which capture the main drivers of behavior change: motivate the change, by harnessing the right incentives, emotions, and cognitive biases; socialize the change, leveraging the deeply social nature of our behavior; and ease the change, by removing hassle, helping people plan, and building supporting environments. Conventional legislation, incentives, and education still have their place and may still be the most effective intervention in some situations. However, where that is not the case, or where implementation and enforcement is impossible, these behavioral tools offer both an alternative and a new lens through which to think about the conventional tools.

PUTTING IT INTO PRACTICE

Armed with an understanding of behavioral science, and a new set of strategies, we turn our attention to the practical challenge on putting them into action. Doing so in a way that is scientifically rigorous, often in challenging conditions around the world, is no easy feat. In **Chapter 4**, we show how both the Behavioral Insights Team (BIT) and Rare might apply these ideas in the real world, through hypothetical and real case studies of tackling the illegal wildlife trade and overfishing.

BIT and Rare each has its own methodology, with respective strengths, and also much common ground. Both recognize the need to be specific and clear in the way we set behavioral objectives; both seek to thoroughly understand the drivers and barriers of behaviors in the real-world context; both aim to embrace humility and elevate the experiences and insight of our target audience; and both aim to be rigorous in the way that solutions draw on good behavioral science and measure the impact of an intervention. In **Annex B**, we provide more detail on BIT's approach to rigorous evaluation, ensuring that we learn from our efforts and build an understanding of what works and what does not.

OUR TOOLKIT OF STRATEGIES

MOTIVATE THE CHANGE

1. Leverage positive emotions

2. Frame messaging to personal values, identities, or interests

3. Personalize and humanize messages

4. Harness cognitive biases

5. Design behaviorally-informed incentives

SOCIALIZE THE CHANGE

6. Promote the desirable norm

7. Harness reciprocity

8. Increase behavioral observability and accountability

9. Encourage public and peer-to-peer commitments

10. Choose the right messenger

EASE THE CHANGE

11. Make it easy by removing frictions and promoting substitutes

12. Provide support with planning and implementation of intentions

13. Simplify messages and decisions

14. Alter the choice setting

15. Use timely moments, prompts and reminders

1. NATURE CONSERVATION IS ABOUT BEHAVIOR

Natural systems are critical to human flourishing, and biodiversity underpins the functioning of those systems. There are a number of severe threats currently facing the world's species and ecosystems, and it is evident that many of them involve human behavior. In this chapter we provide a brief overview of biodiversity's importance and then highlight the threats of habitat loss and degradation, overexploitation, illegal wildlife consumption, human-wildlife conflict, and various forms of pollution entering our ecosystems.[a] Beneath these broad themes lie the daily actions and decisions of billions of people and millions of communities. Any effort to change these behaviors is an ambitious one, and one that needs a sophisticated and appropriate set of tools to tackle complex behavioral challenges.

1.1 WHY BIODIVERSITY MATTERS

Biodiversity is important for natural systems

Biodiversity is the name for the tremendous variety and variability of ecosystems, species, genes, and traits at different scales that characterize all life on Earth. Each species exists in a complex food web while shaping the environment around it. The accumulation of species interactions creates a balancing effect that naturally controls populations, recycles nutrients and organic matter, and produces usable energy that flows throughout an ecosystem. This creates the potential for many ripple effects when altering even a single food chain.[1] Even as biodiversity is integral to the survival of all species, including humans, many people also believe in its intrinsic value.[2, 3]

Biodiversity is important for humans

Biodiversity provides the regulating, supporting, cultural, and provisioning goods and services on which people depend (see Figure 1).[4, 5, 6] It is the source of our daily needs: fresh water, clean air, nutrient-rich food, medicine, clothing, and more. It also contributes to our mental and

Figure 1. Benefits from nature. Source: WWF, 2018
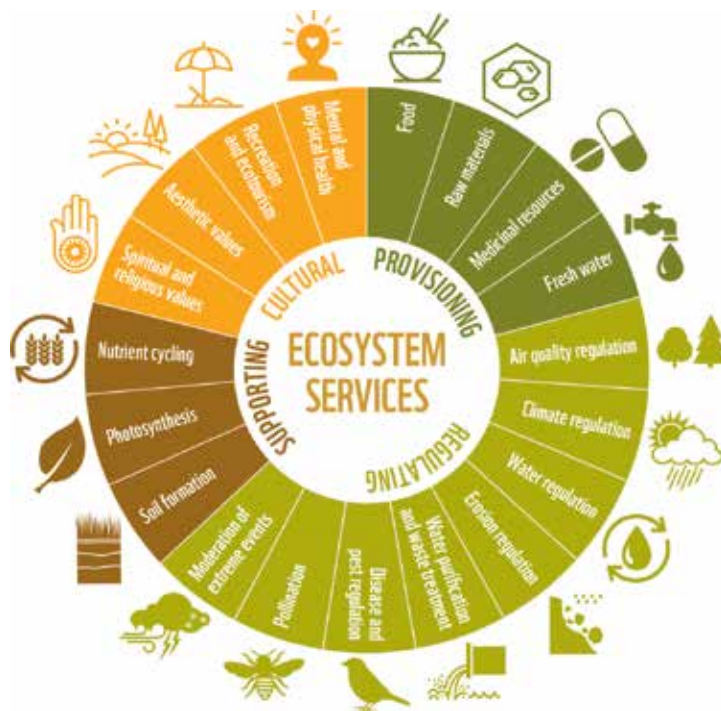
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a   We acknowledge that climate change is the greatest human-made threat to biodiversity and involves a wide range of sub-threats and target behaviors that we will not explore in this report. If you are interested in this topic, we recommend reading Rare's 2018 report, Climate Change Needs Behavior Change: Making the Case for Behavioral Solutions to Reduce Global Warming.

physical health, by giving us beautiful places for recreation, spiritual and cultural grounding, and relaxation. Protecting biodiversity ensures that ecosystems, and by extension human and non-human communities, are more resilient and better able to cope with the adverse impacts of climate change.[7] The economic value of the services provided by biodiversity assets and ecosystem services to the global economy is estimated to be US$125 trillion annually,[8, 9] although its true price tag is impossible to calculate. Natural resources, and the material and immaterial benefits from ecosystem services, are not distributed equally and equitably around the world, often at the expense of poor, marginalized, and/or indigenous communities, who are unable to keep global markets from using their local resources.[10, 11] Having a rich and ample supply of natural resources is not optional, but essential, for supporting all human communities across the world, no matter who you are.[b]

Humans' impact on biodiversity

Like all species, humans have modified their environment in order to survive. Yet unlike other species, the rate and scale at which humans have modified our natural environment is unprecedented. Continued human population and economic growth have placed immense pressure on natural systems. Current biodiversity indicators show consistent declines, while the pressures on biodiversity continue to increase.[12] For example, we have converted nearly 40 percent of forests into crop and pastureland, installed dams in 50 percent of the world's rivers, and degraded 40 percent of the world's oceans.[13, 14] As a result, scientists estimate a 60 percent decline in vertebrate species from 1970-2014, and current trends show us on a path to wipe out 90 percent of coral reefs by 2050.[15] Approximately 8,000 species of mammals, fish, amphibians, reptiles, and birds are threatened, and current species extinction rates are predicted to be 100 to 1,000 times greater than pre-human rates.[16, 17]

The past several decades have seen renewed calls to action for biodiversity conservation across the globe: 193 nations signed the United Nations Convention on Biological Diversity; the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services was created in 2012; and there has been an increase in protected areas in addition to the many local efforts that support threatened or endangered species conservation.[18] At the same time, there have been many advances in information gathering and reporting about the scale and extent of the challenge. We've learned that these advances, commitments, and

regulations are not enough; most experts now agree that the worsening conditions are largely the result of human behaviors, especially through our consumption and pollution of natural resources.[19, 20, 21] These data trends are warning signs that we must do more to change our behavior and preserve our remaining biodiversity for current and future generations, and we have the tools and technology to do so.

1.2 TARGET BEHAVIORS FOR CONSERVATION

There are numerous threats to nature in the world today, many if not most of which are caused by humans and therefore can be addressed at the scale of human behavior. We focus on five of these and provide a detailed description of each in Annex A: habitat loss and degradation, overexploitation, illegal wildlife trade, human-wildlife conflict, and pollution.

We recognize that this list is simplified and not exhaustive; there are also many interconnections where one behavior impacts natural systems in multiple ways. Our selections are based on common categories of threats identified by the International Union for Conservation of Nature (IUCN), the United Nations Convention on Biological Diversity (CBD), as well as Rare's experience with conservation.

Each threat is driven by many smaller, everyday actions and decisions that conservation practitioners might aim to address – we refer to these as 'target behaviors.' Table 1 provides a summary of the threat categories, related target audiences, as well as an illustrative list of target behaviors for each. When designing behavior change interventions, it is important to be specific in the audience and the behavior we aim to address: each will be driven by a unique set of motivations, attitudes, knowledge, values, and barriers. Any one of the target behaviors listed below could, in practice, be further expanded to identify multiple contributory 'micro behaviors,' each deserving its own focus.

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b   The inequity and inequality that result from natural resource extraction, destruction, and pollution are important and complex topics that inform our thinking and not discussed in depth here. We encourage readers to explore research and applications from fields such as environmental justice, environmental anthropology, and political ecology to learn more.

Table 1. Conservation threat categories, target audiences, and examples of target behaviors.

CONSERVATION THREAT CATEGORY	TARGET AUDIENCE	EXAMPLES OF TARGET BEHAVIORS
Habitat loss and degradation	**Farmers**	• Adopt sustainable land use methods (e.g., agroforestry, tree intercropping, and silvopasture)[c] • Adopt managed grazing practices on grasslands • Restore degraded and abandoned farmland to grow indigenous crops or native vegetation
	Consumers	• Purchase sustainably harvested wood and lumber • Decrease direct demand for natural resources • Increase demand for nature-based recreational activities
	Fishers	• Use sustainable fishing gear (e.g., hook and line, large-mesh nets) that minimize bycatch and habitat destruction • Substitute destructive fishing methods (e.g., dynamite fishing, cyanide fishing, trawling, dredging) with sustainable alternatives
	Businesses	• Limit urban development to non-sensitive habitats or existing settlements • Use sustainable/recycled building materials in new developments
Overexploitation	**Consumers**	• Increase relative consumption of fruits, vegetables, grains, and legumes over animal proteins • Purchase clothing made with sustainable fibers • Purchase locally grown natural products that are seasonal and sustainably produced
	Fishers	• Set aside reserves or 'no-take zones' that allow critical reproductive/spawning habitat • Comply with managed access policies for fishing territory • Adopt alternative harvesting methods (e.g., fishing nets) • Adopt alternative sources of income, such as different products or eco-tourism
	Loggers	• Comply with sustainable harvest management/trade management for forests

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c   We recognize that an expansion of sustainable agriculture may contribute directly or indirectly to types of habitat loss, overexploitation, human wildlife conflict, and pollution and advocate for each target behavior to be considered within the local context.

Illegal Wildlife trade	**Tourists/ Locals**	• Reduce the purchase of decorative fur and skin products, and ornamental ivory, tiger bone and rosewood carvings • Reduce the purchase of illegal pets (e.g., reptiles, amphibians, and flora including rare orchids) • Adopt alternatives to certain traditional Chinese medical products (e.g., rhino horn, tiger bone, pangolin, and turtle scales) • Increase whistle-blowing on corrupt border officials and poachers • Increase participation in wildlife management and protection groups
	Businesses	• Encourage adoption of zero-tolerance policies among governments and businesses currently complicit in wildlife consumption • Increase compliance with legislation on the trade of all wildlife products • Reduce the practice of giving gifts made from illegal wildlife products and non-financial bribes to partners
Human wildlife conflict	**Farmers/ ranchers**	• Enforce physical barriers or use natural pest deterrents to prevent animals from entering areas with crops or livestock • Comply with regulations for shooting problem animals • Minimize human encroachment on animal habitat • Participate in a wildlife management committee or co-management systems
	Businesses	• Avoid developing in areas of critical habitat or biodiversity hotspots • Increase demand for sustainable timber, meat, and crops throughout the supply chain
Pollution	**Consumers**	• Use reusable instead of single-use materials • Increase recycling of paper, plastics, and metals • Consume less and fix/reuse existing belongings • Decrease demand for fossil fuels
	Farmers	• Reduce fertilizer and pesticide inputs to lessen runoff into waterways • Intercrop to maintain soil health and decrease erosion to maintain soil health and decrease erosion • Restore degraded land to grow crops or native plants and prevent erosion
	Industry	• Comply with legislation about dumping chemical/industrial effluent into drains and waterways
	Local governments	• Provide sufficient waste-collection and disposal services in public locations

1.3 WHERE DO WE GO FROM HERE?

There are many potential tools to address the threats listed above. Non-governmental organizations (NGOs) might traditionally use awareness-raising and education to garner support for conservation, while policy-makers can legislate new economic incentives or environmental laws, standards, and protections. In the next chapter we explain the behavioral science behind these approaches and show that they can be highly effective under the right conditions. But the same science shows us that they also suffer from a number of limitations, resting on flawed assumptions about human behavior.

In subsequent chapters we draw on insights from behavioral economics and social and cognitive psychology (collectively known as behavioral science) and demonstrate how to apply these insights to improve the design of

campaigns, community interventions, financial incentives, and policy reforms. In taking a holistic approach to human behavior we highlight the importance of conscious as well as non-conscious behavior; the importance of individuals as well as social groups; and the importance of people's choices and also the physical, cultural, and economic context. Chapter 3 offers 15 strategies to encourage environmental change using behavioral science and Chapter 4 shows how we can apply them.

IS INDIVIDUAL ACTION ENOUGH? THE VALUE OF TARGETING BUSINESSES AND MARKETS

When defining our target behaviors, it is important to identity the key 'pressure points' which have the biggest impact on the systems of production and consumption that degrade our planet. Often, this leads us to consider not just the action of individuals, but also of firms, or even the functioning of markets themselves. In the UK, the recently introduced sugar tax is a perfect example of these dynamics: two tax thresholds were imposed at two levels of sugar content in drinks, but unlike a conventional 'sin tax'— i.e., one that penalizes undesirable behavior in order to discourage it — this tax was not based on incentivizing consumers to switch drinks in order to achieve particular health guidelines on sugar intake. Rather, they enabled suppliers to quite feasibly re-formulate their products to avoid the tax. As a result, even though only a small fraction of consumers would have switched products in response to the higher prices, driving reformulation caused all customers to benefit from drinking less sugar, without paying more or having to move away from their preferred brand. This results in a far more effective and less regressive tax, particularly where the behavior being targeted is rooted in habit or even sugar addiction, and thus difficult to shift at the level of consumers. When applying the strategies in this report, we must similarly consider whether we can best achieve our goals by shifting the behavior of consumers or suppliers and markets.

We must also acknowledge that markets are built upon the interactions of suppliers, regulators, and consumers – all human, and so all shaped by the biases, emotions, and other behavioral patterns described in the subsequent chapters. Recognizing and correcting for behavioral market failures is therefore just as valid a strategy (and often an extension of) nudging individual consumers.[22] For example, energy consumers tend to be 'sticky,' since status quo bias, risk aversion, and procrastination lead us to stick with our existing energy tariff, even when it is patently bad value. Suppliers can use this human failing to their advantage through price gauging. Defaulting customers into a better deal, or otherwise using behavioral science to increase their engagement, is therefore not only a welfare-enhancing nudge for the individual consumer, but also a route to overcoming fundamental market failures leading to positive structural changes. In this case, nudging just a proportion of customers can force energy suppliers to be more competitive in their pricing, thus benefitting all consumers, whether engaged or not. The same principles could help us in a variety of conservation efforts. For instance, we might seek to nudge a fraction of consumers away from unsustainably farmed produce – an achievement in itself, but with the real prize being a shift in suppliers' behavior who must now pay more attention to the sustainability of their practices to avoid losing market share. These 'double nudges' can be powerful routes to more widespread change.

So, when reading the following chapters, we urge you to hold these ideas in mind. Often what looks like an individual nudge or incentive can equally be used to shift business behavior or to fundamentally tip the incentives in a way that leads to widespread market reform.

2. SHINING THE SPOTLIGHT ON CONVENTIONAL WISDOM

For the most part, current efforts to enforce or promote conservation behaviors are built on a 'rational' account of human behavior. This perspective emphasizes the role of conscious and deliberative decision-making, suggesting we trade off costs and benefits in an effort to maximize our self-interests according to our personal values and preferences.[23] This account of human nature is formalized in micro- and macro-economic models, and thus dominates the policymaker's toolkit. Specifically, environmental laws and agreements like CITES, and incentives such as taxes or payments for eco-services, all leverage rational self-interest by making the 'good' behavior more appealing or less punishing than the 'bad' as to maximize personal benefits and minimize costs. Meanwhile tools of information provision (including education, products labels, or awareness-raising) recognize that rational decision-makers can only act on the knowledge they possess.

Conservation NGOs tend to focus on our beliefs, awareness, and attitudes as drivers of our behavior. The common assumption here is that if people only knew of the damage their actions caused (awareness), or if they cared a little more (attitudes and values), they would change their behavior. This approach is therefore synonymous with a rational account of behavior, since it implies that intentional behavior flows from a conscious appraisal of our beliefs, values, and preferences.

These conventional tools of policy and campaigning have merit, and in some cases can be profoundly effective. For instance, knowledge and awareness can be a necessary step to making a conscious decision to be more sustainable. It is plausible, for example, that many consumers of tiger wine are unaware of the severe depletion of Asian tigers in recent years, and this knowledge may be enough to shift their actions. However, this would be the exception rather than the rule. More typically, the evidence overwhelmingly shows that information alone is a weak route to behavior change; other barriers such as conflicting motives, hassle, ingrained habit, social norms, or non-conscious drivers of our behavior tend to dominate.[24]

Similarly, it is often true that our behavior reflects a strong degree of self-interest, and so incentives and bans that leverage reward or punishment can work well. But we also know they can be ineffective or even counter-productive. For instance, payments for ecosystem-services or other pro-social behaviors can crowd-out intrinsic motivations and undermine conservation efforts.[25] Fines can be construed as a price, and thus license people to continue the undesirable behavior, guilt-free.[26, 27] Outright bans can also fail to achieve their goals, particularly where the banned practice is well established, hidden or difficult to enforce, strongly motivated, and where the switch to alternatives is difficult, costly, or unappealing. It is for all of these reasons that attempts to ban alcohol have tended to fail. They urge caution in relying on bans to solve our conservation threats, such as over-fishing among coastal communities, the illegal consumption of tiger bone, or human-wildlife conflict. Each of these practices is difficult to monitor and rooted in powerful motives for safety, subsistence, or profit. Behavioral insights can help us understand these challenges.

Powerful as they are, conventional tools are evidently not a panacea. We should therefore use these tools where we can and where they'll be effective, and we also need to augment them with a deeper, more realistic understanding of the drivers of human behavior. In particular, we want to highlight three insights from behavioral science that we think add most value to the conservationist's toolkit.

Insight 1:
We must focus more on non-conscious decision-making processes

Nobel Laureate Daniel Kahneman characterizes human cognition as having two parallel processes. One is slow, reflective, and cognizant, and most resembles what we think of as 'rational choice.' Although bounded by limited information and finite cognitive bandwidth, it describes our ability to make deliberative and intentional decisions. The other system is rapid, largely automatic, and driven by intuitive processes including habit, social influence, emotion, and the use of conscious and non-conscious heuristics (mental shortcuts or rules of thumb).[28] We are bombarded with stimuli and make many thousands of decisions each day, and so we have evolved to prioritize cognitive efficiency, relying heavily on these 'fast and frugal' processes. Despite our relative unawareness of this fact, they underpin the majority of our daily decisions and actions, and thus shape our lives profoundly.[29]

Though these mental shortcuts help us make good decisions with minimal thought or effort, they also render us susceptible to systematic bias of judgment. These are deviations from strictly 'rational' logic – albeit often rooted in sound evolutionary instincts[30] – which lead to predictable patterns of decision-making.[31] For example, we predictably err towards the familiar and the status quo;[32] we feel losses more severely than equivalent gains;[33] we are highly averse to risks;[34] we blindly follow the crowd and adopt

their norms;[35] and we follow simple, routine rules of thumb like 'choose the middle option' or 'rule-out the options I've not heard of.'[36]

As behavior-change practitioners, we need to reflect these decision-making processes in our policies and campaigns: harnessing or addressing cognitive bias; understanding the mental short-cuts and social influences that dominate our thinking; finding was to shift ingrained habits; and effectively leveraging emotion. These themes emerge throughout the strategies in the next chapter.

Insight 2:
We must focus more on the setting of our behavior

Another consequence of our reliance on automatic thinking and simple heuristics is that these are often routine responses to cues in our social and physical environment. The characteristics of our environment therefore greatly influence our actions. This is highlighted by social psychology and behavioral economics, which reveal the profound power of social influence (the actions and expectations of our peers and our culture) and of the choice architecture (the manner in which choices are framed and presented).[37, 38] The importance of context and environment is emphasized even more strongly by sociological accounts which move the locus of behavior away from individuals altogether, putting society itself center-stage.[39,40] This re-gears the issue away from individuals' good or bad choices towards good or bad societal structures, both at the small scale (social and material setting) and the large (corporate, economic, cultural, and political forces).

Evidence suggests this outward focus has merit. Interventions that manipulate the social and physical setting of behavior (e.g., by changing pricing, default outcomes, availability, convenience, perceived social norms, and the physical environment) have often been found to be more effective than those that target 'internal' motives such as attitudes and awareness.[41] As behavior-change practitioners in conservation, there is enormous potential to introduce these techniques to our toolkit. We do this in the next chapter, with many strategies aiming to leverage the influence of our social environment, and of our physical or material environment. In practice, this often extends beyond the scope of a conventional awareness or social marketing campaign and demands collaboration with those who have control over our choice environments, namely governments, supermarkets, businesses, manufacturers, and so on.

Insight 3:
We must focus more on behavior, distinct from awareness, attitudes, or intentions

Conservation campaigns typically attempt to raise awareness and elevate pro-wildlife values, on the premise that awareness and values drive behavior. However, evidence of a prevalent value-action gap suggests otherwise.[42] This evidence shows clearly that pro-environmental awareness and attitudes can lead us to adopt the easiest behaviors (such as recycling), but it's another matter to significantly compromise our convenience, enjoyment, or profit in the name of sustainability.[43, 44] In other words, we tend to do just enough to buttress our sense of integrity and allay our guilt, but otherwise rationalize our actions through various psychological defenses such as moral licensing[45] (using one good act to justify the bad) and motivated reasoning or avoidance (reasoning towards a self-serving conclusion, or simply not thinking about it).[46, 47] These barriers may be particularly potent when we don't like the solution: if we are facing new restrictions on our fishing or logging practices we'd rather not see happen, we are more motivated to deny the validity of the problem.[48] Moreover, even the most sincere aspirations to act more sustainably are often thwarted by practical and psychological barriers, including lack of know-how, forgetfulness, procrastination, ingrained habit, lack of self-efficacy, limited willpower, upfront cost, poor availability, or seemingly trivial frictions and hassles that disproportionately inhibit action.

For instance, one study shows that a 7-year suite of conservation interventions around a Ugandan national park (including conflict reduction, education, community resource access, and support for community development) managed to successfully build an understanding of the conservation agenda and shift attitudes within the community. However, behavior did not materially change, with poaching and illegal grazing still widespread. The researchers conclude that "attitudes and awareness are not adequate predictors of conservation behavior."[49] Similarly, researchers have found that ecotourism can help engender pro-conservation attitudes among local villagers (in one study's case, with respect to leatherback turtles), but turtle hunting remained common.[50] In the case of the wildlife trade in Asia, researchers conclude the link between information provision and behavior change "is tenuous at best."[51] These kinds of findings are very common in sustainable behavior-change research where actual behavior is measured.[52]

We therefore need to be more realistic about what actually drives behavior and recognize the weak connection between our values, attitudes, and actions. A more pragmatic approach is partly about harnessing

the right motives – it can be naïve to use a message of wildlife conservation to compete with motives for profit, convenience, or pleasure, particularly among an audience whose livelihoods depend on the behaviors we are trying to change. It is also partly about helping people overcome barriers of inconvenience, forgetfulness, procrastination, etc., so that they can act on the good intentions they already have. It is also about finding alternative routes to behavior that don't rely on pro-wildlife attitudes, for instance through non-conscious drivers, social influence, or the physical environment (as discussed above). But perhaps an even more critical lesson is one of measurement: our behavior can be diametrically opposed to our stated attitudes or intentions, so we need to define the success of conservation efforts around behaviors, not attitudes. This requires better research and evaluation tools, which we discuss in Chapter 4 and Annex B.

None of this is to say that raising awareness and targeting public attitudes is pointless. Some individuals may shift their behavior through increased awareness alone, while some interventions (e.g., symbolic taxes, such as on plastic bags) tend to work better when consumers understand and support their goal. Moreover, public awareness is often a critical step towards public acceptance and support of major policy changes such as the creation of protected area, which brings real impact. However, we must be realistic about the limited extent to which awareness and attitude-change is a direct and effective route to behavior-change.

2.2 COMPLETING THE TOOLKIT

The key message is not that conventional thinking — using regulations, incentives, and information campaigns —is always wrong. Rather, that it is incomplete, and depends upon several assumptions that are flawed. We therefore need a more holistic set of tools that reflect these three key insights. We need tools which recognize the conscious and non-conscious processes of decision-making, including habit, emotion, social influence, and our use of heuristics and susceptibility to bias. We need tools that recognize the extent to which our social and material environments profoundly influence us. And we need tools that target behavior, not just attitudes or beliefs.

In the following chapter we present concrete strategies rooted in successful case studies from the fields of conservation, sustainability, and beyond.

3. STRATEGIES FOR APPLYING BEHAVIORAL SCIENCE TO CONSERVATION

Having explored the limitations of a conventional approach to behavior change in the conservation field, we now present a more holistic set of tools that draw on our current knowledge and findings of human behavior and motivation, and provide guidelines for their application in the field. In developing this toolkit, three clear categories of strategies emerged, which reflect the three profound drivers of human behavior. One is to motivate the change. This includes harnessing our target audiences' personal values and interests, using conventional incentives in ways that are more behaviorally informed, and effectively leveraging emotions and cognitive biases. Another category is to socialize the change. We are fundamentally a social species, with much of our behavior determined by social norms, the expectations and actions of our peers, and the social identities we ascribe to ourselves and to others. The third category is to ease the change. This includes removing frictions and hassles where possible, helping people plan and act on their intentions, finding timely moments at which change is easiest, and

building an environment that enables and supports the desired behavior. It is important to note that these are not direct replacements for, or necessarily better than, the conventional tools discussed in the previous chapter. Their value is as a suite of alternatives, best used when conventional tools are either unlikely to be the most effective strategy, or impossible to enact or to enforce (and thus where we rely more heavily on voluntary behavior-change). They might also be used in addition to legislation, incentives, or education, or indeed provide a new lens through which to look at these conventional tools, where each is improved by a better understanding of behavioral science. Often, it is a combination of approaches that yields the best results.

For each of the 15 strategies in this chapter, we draw on successful case studies across a wide range of contexts, and share ideas for how they could be translated to the conservation challenges summarized in Chapter 1.

MOTIVATE THE CHANGE

1. Leverage positive emotions
2. Frame messaging to personal values, identities, or interests
3. Personalize and humanize messages
4. Harness cognitive biases
5. Design behaviorally-informed incentives

SOCIALIZE THE CHANGE

6. Promote the desirable norm
7. Harness reciprocity
8. Increase behavioral observability and accountability
9. Encourage public and peer-to-peer commitments
10. Choose the right messenger

EASE THE CHANGE

11. Make it easy by removing frictions and promoting substitutes
12. Provide support with planning and implementation of intentions
13. Simplify messages and decisions
14. Alter the choice setting
15. Use timely moments, prompts, and reminders

The Ethics of Behavior Change

Behavior change practitioners seeking to realize a social good must pay attention to ethics, as ethics are particularly relevant to a program that uses persuasion to influence a target audience and achieve its goals. Therefore, we encourage practitioners to adhere to the following three principles:[53]

Principle of well-being

Particular intervention strategies may target different kinds of well-being, and we cannot expect all forms of well-being to be equally pursued at all times. Even so, following the principle of well-being means that our work should always entail the goal of helping humans and nature flourish.

Principle of integrity

At no time should conservation advocates misrepresent facts or people's ideas, even if they do not agree with them. Nor should advocates misrepresent the intentions and consequences of particular environmental policies or instances of management. Finally, conversation practitioners should not deceive or manipulate people in ways that cause them to do behavior they do not want to do or removes their agency or free will.

Principle of empowerment

Whenever possible, behavior change interventions should empower citizens to make democratic decisions about conservation, such as through environmental policy and management. To do this, interventions should strive to make the best scientific, political, economic, and moral arguments available to the public.

There is a rich body of literature on the ethics of behavior change, and nudging strategies in particular, which often embrace non-conscious forms of influence. We cannot do this literature justice here and direct interested readers to resources such as Cass Sunstein's The Ethics of Influence. Such literature demonstrates how behavioral science sheds new light on the nature of agency and of personal choice. In practice, influence in unavoidable, as we are constantly being nudged towards certain choices by aspects of our environment, whether done with intent or not. The ethical influencer, therefore, seeks to ensure their influence is for good rather than for profit or personal agenda; that their influence leads to improved decisions on the target audience's own terms; and freedom of choice is not restricted, unless justified to reduce harms committed to others (as with restricted freedoms through environmental laws, for example). We encourage you to explore what ethical influence means to you in your work and use our principles as helpful guidelines.

3.1 MOTIVATE THE CHANGE

Many things motivate us to take action, and these may be in tension with each other. For instance, we may have ambitions to be more sustainable, healthier, more successful, or more charitable. But these aspirations may be in conflict with our deepest desires for pleasure, wealth, security, a sense of purpose, comfort, convenience, happiness, belonging, self-expression, and so on. Often our self-interested side poses a barrier to conservation efforts, since the most enjoyable, convenient, or profitable option may not be the most sustainable. But this part of ourselves also presents an opportunity: Tesla sells sustainable cars partly on status and luxury, and researchers have found that healthy and sustainable food is better sold on the basis of indulgence and pleasure.[54] This raises the obvious but often overlooked insight that we don't need to promote conservation behaviors solely on the merits of conservation, if we can harness more powerful self-interests such as profit, convenience, security, or enjoyment.

Other motivations lie beneath the surface of our day-to-day awareness but are equally profound. For instance, related to the tension between our self-interests and our more virtuous aspirations, is the desire to make sense of our lives in a consistent, ego-enhancing, and positive light.[55, 56] This is a task requiring constant psychological trickery to overcome our own hypocrisies: the restaurant-goer opts for the steak despite her concern for the planet; the conservationist still flies on vacation; the fisherman uses the cheaper nets despite knowing they increase by-catch, and so on. As noted previously, we're good at rationalizing these inconsistencies while doing just enough to maintain our sense of integrity. Naturally, we don't like being called out on our shortcomings, revealing another important insight: guilt-based messaging, common in environmental campaigns, causes defensiveness and disengagement. Positive emotions, such as pride, can be more effective at eliciting engagement.[57]

The broader point is that our beliefs and attitudes are not shaped solely by facts or logic, but through a lens of sense-making and self-enhancement: the extent to which something concords with our prior worldview, with our identity, and with the flattering autobiography we hold in our minds. This is a process of story-telling and narrative filtered by what feels personally relevant, and so we must appeal to these ways of thinking when we tell stories of conservation.[58, 59]

All of these motivations, conscious and non-conscious, manifest through myriad decision-making processes which themselves are complex and subject to the influence of bias and emotion. This reveals yet another key insight: campaigns can more effectively motivate change when they harness or address the biases, heuristics, and emotions that dominate our decision-making. A few examples are given in the adjacent box. For instance, we might harness present bias by front-loading the benefits and delaying the costs associated with the adoption of a new conservation program. Many such biases exist and provide novel tools for boosting the impact of conservation campaigns and policies.

Cognitive biases: A few examples

Present bias: A tendency to skew our attention to the present over the future,[66] leading us to make short-term decisions, procrastinate on our long-term intentions, and adopt risky or unsustainable behaviors that are enjoyable, cheap or convenient now but may be detrimental in the future.

Loss aversion: A greater sensitivity to losses than to equivalent gains, such that we will do more to retain something we perceive as ours, than to acquire it in the first place.[67]

Risk aversion, uncertainty aversion, and status-quo bias: An over-weighted aversion to risk,[68] to uncertainty, and a tendency to stick with the familiar, known, default option (the status quo).[69]

Confirmation bias: A tendency to focus on, emphasize and recall information that confirms our prior convictions, and to downplay or ignore that which goes against them.[70]

Availability heuristic: Our judgment of probability or likelihood is based on the availability of examples (or the ease of recall of similar cases) rather than on statistical knowledge.[71] More observable, high profile, or memorable occurrences (such as shark attacks) are therefore considered more likely than comparable events (such as death by falling out of bed). This may contribute to, for example, an overblown response to human-wildlife conflict, or a distortion in the perceived risk of certain threats.

Finally, we must recognize the distinction between intrinsic motivations – doing something for its own inherent appeal – versus extrinsic motivation – doing something to achieve some other reward or benefit. The most common way to harness extrinsic motivations is to use financial incentives including taxes, fines, payments for ecosystem-services or new pricing schemes. Behavioral insights have a lot to contribute to the design of financial incentives and disincentives, because they invariably embody psychological mechanisms as well as economic ones.

First, extrinsic motivations (e.g., in response to payments or fines) can undermine or 'crowd out' the intrinsic motivation to do the right thing. For example, paying someone to adopt a certain agricultural practice may imply that it is an otherwise undesirable thing to do since it 'deserves' compensation.[60] Precisely this effect was found among a Swiss community who were less likely to support the construction of nuclear facility when offered compensation, since payment implied risk.[61] For similar reasons, payments to volunteers have been found to undermine their efforts,[62] since 'doing it for money' cheapens the act and undercut other motives for doing it: to feel good about themselves, to contribute to a worthy cause, or to gain social kudos by signaling their virtues. This is why symbolic, non-financial rewards can sometimes be more effective at promoting pro-social behaviors. For instance, public recognition amplifies rather than crowds-out these intrinsic motivations for pro-social behavior. This was found to be so among Zambian hairdressers encouraged to hand out condoms to their community: gold stars in the window for each pack they gave out were more effective rewards than a generous financial incentive.[63]

These challenges are not limited to payments, but also arise with fines, which can be seen as a fair 'price' that justifies the bad behavior.[64] Before introducing a system of fines, it is therefore important to consider that there may already be a 'cost' associated with transgressive behavior (such as social disapproval from the community) and that introducing a financial element can undermine this existing mechanism of enforcement.

But incentives don't always go wrong. Often, they work as we would intuitively expect, and well-designed extrinsic rewards can 'crowd-in' (strengthen) intrinsic motivations and achieve a stronger effect than would be expected from the financial element alone. For example, in the UK the 5p (~7¢ USD) plastic bag charge has reduced bag use by 83 percent,[65] in part because the charge reinforced, rather than undermined, certain psychological mechanisms. Specifically, the charge acts as a salient reminder of what we should do, and it imposes a new default and social norm of not using one, which can be broken only by proactively asking for a bag.

Finally, the biases and heuristics which shape our perceptions and decision-making can also be used to boost the power of conventional financial incentives. For instance, we tend to overweight very small probabilities, and focus on the size of a potential windfall rather than the odds of it happening. For this reason, lotteries or prize draws can often be more effective, per dollar spent, than fixed incentives. Similarly, we might harness loss aversion by offering an incentive upfront, to be retracted if a certain behavior is not adhered to. A number of ideas in this chapter build on this theme.

Our motivations to act are clearly complex and varied. To summarize, the strategies in this chapter are to:

- **Leverage positive emotions**
- **Frame messaging to personal values, identities, or interests**
- **Personalize and humanize messages**
- **Harness cognitive biases**
- **Design behaviorally-informed incentives**

Strategy 1:
Leverage positive emotions

Does it make you feel proud to do something good for your community?

One of Rare's trademark initiatives has been its Pride campaigns, named for the focus on increasing community pride in local species and habitats and sustainable behaviors that affect them. After 30 years, across over 450 campaigns and over 60 countries, Rare has found that leveraging the power of pride can lead to greater conservation outcomes where people and nature thrive.

What is the strategy?

Use positive messaging with emotions like pride, self-efficacy, joy, and gratitude, instead of negative messaging with emotions like guilt, disgust, and fear.[72]

Why does it work?

We often respond to emotion more than reason. When considering environmental concerns, abstract or highly technical statistics do little to stir our sense of care and compassion. The focus on positive emotions is important because messages harnessing more negative emotions like guilt and fear can backfire. Guilt and fear are powerful emotions and can be motivating if the action needed to resolve these negative emotions is clear and easy to adopt, but principally we deal with these emotions by ignoring the issue, denying its validity, or rationalizing and licensing our actions. In contrast, positive emotions such as pride, curiosity, compassion, and a sense of agency encourage change without inviting defensiveness.

Learn about other success stories:

- An experiment with Australian university students found a positive relationship between habitual environmental behavior and feelings of pride and a negative relationship with feelings of guilt.[73]

- A study on emotions and self-control had individuals imagine feeling shame from eating chocolate cake or pride if they resisted eating it. 40 percent of members in pride group resisted eating the cake versus only 10.5 percent of the shame group.[74]

- A study asked individuals to imagine feeling proud or guilty about pro-environmental decisions prior to choosing between green and less green options and found that those who felt proud were more likely to choose the green options.[75]

Now it's your turn:

- Build a sense of pride in the fishing 'profession,' e.g., with mascots, or by creating uniforms, membership of an association. Give out free t-shirts or hats that imply membership and also signal pride. This visible signaling also operates as a social norm.

- Deliver key messages (e.g., on required actions) during a 'peak moment' of emotion (e.g., moment of joy, celebration, excitement) so it is memorable, for example during a community parade where individuals are celebrated.

- Harness local or national pride to encourage engagement and compliance. This could be done through town awards for participation, 'local hero' badges (e.g., farmers who reduce their share of intensive livestock farming), or through national pride campaigns (e.g., 'Don't mess with Texas campaign' aimed at reducing littering) to reduce marine pollution, or protect emblematic local species.

Strategy 2:
Frame messaging to personal values, identities, or interests

Would you prefer a 'field grown breakfast' or a 'meat-free breakfast'?

Outside of a niche health-conscious market, healthy food is better promoted as delicious rather than as ostensibly healthy (which can be a turn-off).[83] Working with the World Resources Institute, BIT found a similar effect when promoting sustainable food: replacing labels like 'vegetarian' or 'meat-free' with language like 'field-grown' or more indulgent descriptions made non-vegetarians more likely to order vegetarian dishes.[84] This tends to be true across many domains of sustainable behavior, where it may be beneficial to focus on sustainability for a small minority of consumers, but more effective to focus on other attributes for the majority of consumers.

What is the strategy?

Tailor messages, campaigns, products, and marketing to make them personally relevant, palatable, and appealing to the target audience. Often, this can mean speaking to the audiences' concern for security, convenience, profit, status, or enjoyment, rather than sustainability in its own right.

Why does it work?

We all have our own perspectives on the world and set of values and attitudes. Messages of sustainability tend to be effective only among those already on-board, because we tend to discard, ignore, or play-down information which goes against our existing world-views and beliefs, and bias us towards information that validates us (confirmation bias).[76, 77] We must therefore acknowledge the limits to which conservation messages can prevail over other concerns. Specifically, marketing research suggests that criteria for purchase decisions are predominantly about performance, price, healthiness/safety, and availability of the product. If these criteria are met, it may be a bonus that the product is green, but green products that fail to meet these criteria tend to be ignored.[78, 79]

Learn about other success stories:

- Tesla's success in selling electric cars is largely rooted in their focus on status, luxury, exclusivity, speed, and performance, rather than on sustainability.[80]

- The Alberta Narratives Project seeks to bridge polarizing perspectives on the future value of fossil fuels through identifying a common narrative of community interests and identities.[81]

- The 'Strength of Chi' campaign in Vietnam sought to reduce demand for rhino horn amongst 35-50 year old businessmen. The campaigns promoted a positive identity of professional success and 'making your own good fortune' rather than utilising horn. The campaign may have contributed to a self-reported reduction in rhino horn use from 27.5 percent in 2014 to 7 percent in 2017.[82]

Now it's your turn:

- Use religious (or national identity) prompts or framings to reinforce the ethical aspects of protecting species in human-wildlife conflict. For example, by getting local religious leaders to frame habitat protection in terms of stewardship, or by harnessing timely moments/a spiritual state of mind during temple visits.

- Promote substitutes to wildlife products as more high-status/luxury/desirable rather than as more ethical per se. Chinese chefs could be effective messengers, for example, if they compete in a cooking show for a $1 million prize to create a luxury soup. This would then be promoted as an alternative to shark-fin soup, which is predominantly eaten as a high-status and traditionally 'fancy' dish at Chinese weddings. Also, by letting the public vote for the winner, they would identify more with this new trend/behavior.

- Frame ecotourism initiatives to local communities as good money-makers and providing job security, rather than as conservation efforts.

Strategy 3:
Personalize and humanize messages

Have you considered how climate change may impact your life, your family, and your home?

A study in British Columbia explored how different types of messaging and a person's weak or strong place attachment impacted climate change engagement. The results showed that messages about the local effects of climate change plus strong place attachment were most predictive of taking action on climate change. Making behavior feel personally relevant or tailored to individuals can help to focus attention and energy for a topic as complex and abstract as climate change.[93]

What is the strategy?

Personalize campaigns and correspondence to the individual and their circumstance, and put a human face on campaigns. This includes telling stories of individuals rather than statistics, highlighting consequences that are relevant in the person's neighborhood or context, and focusing on the human story with identifiable characters.

Why does it work?

We are more likely to respond to messages and pay attention to information that is personalized to us and our context. Similarly, we are more likely to pay attention to something that comes from an individual human, rather than from a faceless organization. We have evolved to empathize with known individuals, and abstract statistics do little to stir our emotions or compassion. Research on the 'identifiable victim effect' show we are more willing to take action in response to the plight of a single known victim.[85, 86] For instance, European politicians and citizens responded more strongly to when a single, named, migrant child washed up on a beach than to the tens of thousands of nameless refugees who had died over preceding months.[87] There is mixed evidence on how this effect translates to animals, and more research is needed here.[88] Early findings suggest there could opportunities to link the impact of biodiversity loss to humans (e.g., loss of livelihood, or rangers killed by poachers and illegal loggers), or focus on charismatic species.[89]

Learn about other success stories:

- Recent news stories such as the trophy hunting of Cecil the lion suggest anthropomorphized and iconic animal victims can elicit greater empathy than statistics.[90] Research suggests statistics of species decline evoke empathy from conservationists but less so from the general public. [91]

- Handwritten post-it note requests on envelopes increased response rates to a survey by the Irish Revenue from 19.2 percent to 36.0 percent, simply because the post-it notes made people more likely to open the envelope.[92]

- Rare campaigns integrate in-depth research with local communities so that the resulting messaging and brand reflect key community characteristics such as important colors, customs, clothing, and sayings.

Now it's your turn:

- Have community associations send personal notes to new members of a community welcoming them to the area and asking them to follow waste reduction guidelines for recycling and composting.

- Frame messages around the unique and personal impacts to a given community, household, or individual.

- For a threat like resource overexploitation, focus on telling a story of a local individual or family negatively affected by this behavior; alternatively tell a story about behavior change around resource conservation that positively impacted a celebrated individual by helping them support their family.

Strategy 4:
Harness cognitive biases

Uncertainty causes us to stop and think.

A study with cooperatives of small-scale fishers along the Baja peninsula in Mexico compared how future uncertainty would affect fishing behavior of abalone. Across multiple rounds of a common pool resource game, researchers found that fishers reduced their harvest of abalone when faced with scenarios of higher social and environmental uncertainty. These trends were even stronger when communication occurred among fishers. This experiment presents an effective way to harness fishers' risk and uncertainty aversion biases in order to change their behavior to preserve the communal resource over time.[94]

Photo: Spanish Fly TV

What is the strategy?

Harness or address specific cognitive biases and heuristics in messaging and campaign materials, such as loss aversion and present bias.

Why does it work?

There is a wealth of evidence that our decisions are predictably skewed by our reliance on heuristics (mental shortcuts) and our susceptibility to biases. As such, it is often possible to frame information and choices in a way that harnesses or addresses these biases. For instance, highlighting the avoidance of losses rather than gains can tap into our loss aversion (tendency to be more motivated to avoid losses than to achieve equivalent gains), and we can help people make more long-term decisions by making the long-term consequences of their decision more salient.

Learn about other success stories:

- **Present bias:** When individuals wrote an essay about their desired legacy in the long-term, they were then significantly more likely to state they believed in climate change, make intentions to do environmental behaviors, and donate more to an environmental organization in the present.[95]

- **Present bias:** BIT redesigned product labels in a large UK retailer to highlight lifetime running cost alongside the product cost, to motivate consumers to buy more efficient washer-dryers by thinking about future costs.

- **Endowed Progress:** Loyalty cards on which consumers need 12 stamps and 2 are pre-stamped, are more effective than those that require 10 stamps, since it gives a sense of having progressed towards the goal.

Now it's your turn:

- Harness risk aversion to steer companies away from gifting wildlife products. We tend to be risk-averse when gifting to avoid getting it severely wrong and offending the recipient. A campaign harnessing risk aversion could be effective if it highlighted shifting social norms and working with some high-profile firms to convey the risk of causing offense. The bias would ensure the behavioral response (stopping the gifting of ivory) should be disproportionate to the actual risk.

- Harness loss aversion by highlighting that if you are caught breaching fishing schemes or logging regulations, your rights of access may be reduced or taken away entirely.

- Harness the scarcity effect when advertising a fishing program (or of another scarce resource) by emphasizing the limited chances, capacity, or tight application deadline to boost interest and overcome procrastination.

Strategy 5:
Design behaviorally-informed incentives

Would you rather have a guaranteed $0.05, or a small chance of winning $100,000?

Lotteries can be effective incentives because we focus on the size of the prize and overweight small probabilities. A local authority in China harnessed this insight to reduce tax avoidance. Rolling out a public lottery scheme with tickets printed on the back of retail receipts, customers started asking for their receipts despite the very small face value of the ticket (the odds were very long but the prize was attractively large). By generating receipts, businesses were forced to declare and tax that revenue.[96]

What is the strategy?

Improve the impact of financial incentives, and reduce the risk of them backfiring:

- **Use non-financial incentives over small cash incentives**, such as symbolic rewards or public recognition, particularly where the behavior is already intrinsically motivated or rooted in social norms, peer pressure or gaining social kudos or altruistic motives (such as volunteering). The aim is that these existing pro-social and social motivations should be amplified, but should not be replaced with financial incentives. If financial rewards are used, they must be large enough to outweigh the damage they may have done in undermining intrinsic motivations - in other words "pay enough, or don't pay at all." The same advice applies to sanctions - make sure the fine is big enough, or instead leverage non-financial penalties such as peer pressure or public recognition.

- **Use group incentives** where payment is made to all members of a group (or to pairs in buddy schemes) so long as all of them comply, or they collectively meet some target.

- **Use lotteries and prize draws** rather than fixed incentives. A variation is the regret lottery, based not on ticket purchase but some existing (external) identifier (such as zip code, postcode, or fishing license number). Only those adopting the desired behaviors are eligible to win, but others are informed they would have won.

- **Harness loss aversion by rescinding a payment for non-compliance** rather than giving a payment for compliance. For instance, give payments at the beginning of a season, which are then retracted at the end depending upon performance.

Why does it work?

Incentives, including taxes, subsidies, fines and grants, are powerful tools. In the introduction to this chapter we discussed the risk that payments or fines crowd-out intrinsic motivations, and the opportunities for using them to crowd-in (strengthen) intrinsic motivations. The difference often depends on subtle psychological factors and is not always easy to predict, so robust testing is always advisable.

Where financial incentives risk crowding out intrinsic and altruistic motivations (such as among volunteers), non-financial incentives may be more effective, as they signal the recipient's pro-social and social motivations (for instance, public recognition amplifies the social kudos of volunteering). A similar issue arises for negative behaviors, where fines can remove the guilt and thus license the behavior ('if I'm paying for it, I'm at liberty to do it').

Lotteries and their variants work because we overweight small probabilities and focus on the size of the prize more than our odds of winning.[97] Regret lotteries add an element of regret-avoidance to motivate future adherence to the desired behavior.[98] They can only be used for regular, ongoing behaviors, common in bureaucratic processes or adherence to quotas. For instance, if one month you find out you would have won the lottery if you'd correctly submitted your paperwork, you'll be more motivated to do so next time.

Learn about other success stories:

- **Non-financial incentives:** A trial in Zambia offered three groups of hairdressers different incentives to encourage them to give our condoms to promote safe sex.[99] One group received a small cash incentive, the second group received a larger cash incentive and the third group received gold star stickers that were put onto their shop window. The gold star incentive, albeit non-monetary, made hairdressers most likely to give out condoms. Hairdressers cared more about displaying to their community that they are engaging in this campaign and contributing to the social good than receiving monetary compensation.

- **Lotteries:** BIT found people were more likely to register to vote at the prospect of being entered into a lottery.

- **Regret lotteries:** A study in the Netherlands compared two lotteries, one regular lottery where participants buy a ticket with a number on it, to a regret-lottery where people pay a participation fee but their postcode is the ticket number. In the postcode lottery it becomes public knowledge what postcode won and this might cause feelings of regret for not having played if one's postcode won. The study found that this anticipation of regret influenced participation rates in the postcode lottery but not in the regular lottery.

Now it's your turn:

- Integrate a lottery into a plastic bottle deposit return scheme (e.g., 'don't just get your £0.10 back, but get entered into a lottery to win £50k when you return the bottle').

- Harness loss aversion incentives by giving members of professional fishing organization (or some other organization/association) an upfront point record, or an entry into a prize draw each month. If they meet best practice standards over that month, they keep their point record or monthly entry ticket for the lottery. If not, they lose a fraction of their points or lose their ticket. At the end of the year their remaining points are paid out in cash, or the lottery prizes are distributed. A study on teacher performance pay showed this to be effective.[100]

- Give out non-financial incentives, such as something to put on a boat (a flag/plaque) in return for being a champion or meeting certain 'good practice' standards. The positive signaling effect of the plaque is likely to encourage compliance/positive behaviors.

Tackling dishonesty, corruption, and selfish behavior

Dishonest and selfish behavior poses many problems to conservation efforts, including outright corruption and law-breaking (e.g., poaching and trafficking); selfish overconsumption of common resources; non-compliance with regulations (e.g., fishing quotas); and dishonest reporting. Conventional wisdom suggests this is rational behavior if the benefits outweigh the risks. Re-aligning the incentives, by increasing the penalty of the risk of being caught, is therefore an important response to these behaviors but not the whole picture according to behavioral science.

None of us readily admit to being immoral,[101] yet the evidence shows most of us cheat, at least a little! We tend to strike a balance, acting dishonest enough to profit, but only to the extent that we can rationalize our actions and thus preserve our positive self-image.[102, 103] This rationalization takes many forms, and there are many potential strategies to undermine them.

Form of rationalization

Minimization. Re-framing a modest amount of dishonesty as a display of integrity, because we forewent the greater dishonesty. For instance, excusing ourselves a small bribe because we could have taken a bigger one, or eating shark-fin soup because we only do it on special occasions.

Social comparisons. Claims that 'I do my bit' or 'I do better than most,' often stretching the truth.

Omission bias. Describes our greater tendency to act dishonestly by omission/inaction, than by proactive action, for example turning a blind eye to an error in your favor, or keeping the gift given to you but never asking for a bribe.

The sharing of spoils. Claiming behavior is for the benefit of others alleviates our guilt, while collusion (I will if you will) normalizes the behavior.

Moral licensing. Using one good act to justify another bad act, such as citing our efforts to buy food with less plastic packaging to justify our unwillingness to change our diet, which would have far bigger impacts; or the fact we receive a low wage, or do a bit of overtime, which justifies a bribe.

Potential strategies

Honesty prompts and commitments help draw attention to our moral standards and thus reduce the degree of dishonesty that we are able to reconcile.[104] These can take many forms, including pledges (see strategy 9); religious prompts that bring to the surface our sense of integrity[105] (recital of the 10 commandments has been shown to reduce cheating[106]); and efforts to promote professional integrity through the use of uniforms or mottos. With declarations, the ordering is important: signing an honesty declaration after the fact has no impact, since the dishonesty has already occurred, whereas signing at the beginning of an audit or self-assessment increases honesty.[107]

Highlighting the prevalence of good behavior helps overcome self-serving beliefs that 'everybody does it' (see strategy 6). Alternatively, inadvertently highlighting the prevalence of undesirable behavior can make it worse.[108,109]

Making the behavior more observable, e.g., through surveillance, public league tables or auditing, amplifies the power of peer pressure to comply with socially acceptable behavior (see strategy 8).

Framing the act as an active choice can overcome omission bias. For instance, including the following message on a tax reminder letter in Guatemala doubled tax revenue from recipients: "Previously we have considered your failure to declare as an oversight. However, if you don't declare now, we will consider it an active choice."[110] Relatedly, changing defaults so that dishonesty cannot happen 'automatically' is likely to be effective.

Avoiding ambiguity of rules can help limit our ability to rationalize bad behavior. For instance, unclear laws on certain wildlife products promote a 'don't ask, don't tell' relationship with our own conscience.

Some final thoughts

Research also shows that small frictions and hassle factors can help discourage dishonesty and crime. For instance, in 1980s Germany, new regulations required motorcycle riders to wear a helmet. An unexpected consequence was a 60 percent reduction in motorcycle thefts: opportunistic thieves without a helmet would no longer steal the bike, as the risk of being pulled over for not wearing a helmet.[111] Similarly, the inclusion of state lotteries on the back of retail receipts in China significantly reduced tax avoidance: consumers were motivated to ask for a receipt, making it more difficult for retailers to omit the transaction from their accounts.[112]

3.2 SOCIALIZE THE CHANGE

Humans are deeply social creatures. We have evolved with a variety of social traits and instincts principally through two mechanisms: social proof, and peer pressure (conformity to norms and expectations). First, social proof describes our tendency to treat our social environment as a source of information: if other people are running away looking panicked, it's probably wise to join them without stopping to think. Beliefs and behaviors therefore tend to be socially contagious. Second, our tendency to conform to norms is a driver for group cohesion and cooperation. We feel awkward about deviating from acceptable behavior, and we want to fit in and be accepted. Our sensitivity to fairness reflects the importance of cooperation and reciprocity to our social nature: we have an innate urge to reciprocate favors given to us; to feel guilt when we don't reciprocate with others; to socially exclude or punish those who don't do their part (freeloaders); and a tendency towards unconditional altruism, when the cost to ourselves is minimal.[a]

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Two types of norms[113, 114]

Descriptive norm: What most people do, i.e., what we see others doing.

Injunctive norm: Social etiquette or expected behaviors, i.e., what other people think we ought to do.

Three types of conformity to norms

Informational social influence (social proof): Adoption and internalization of behaviors and beliefs because we infer from our social environment they are right or appropriate.[115] For example, if our neighbors install solar panels it will influence our belief that they are a good idea.

Normative social influence (compliance): Conformity to norms without private belief, due to 'mere' peer pressure. For example, we might be more likely to donate when others around us do. This also depends upon the behavior being observable by others.

Identification: Adoption of behaviors and beliefs of those we identify with as an act of self-expression and group membership (e.g., fashion and political views).[116]

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As conservationists, these human traits are our allies, because many conservation outcomes depend on community cooperation and the elevation of group benefits over individual self-interest. As such, understanding how cooperation works - through the tacit norms of reciprocity and subtle forms of peer pressure against those who break rank - is vital. This is particularly relevant in the management of common pool resources, including fisheries, forests, and waterways. In these scenarios, it is in the best interests of the group as a whole to share the resource fairly and conserve it. Local communities have historically developed various social norms and informal institutions for safeguarding them. However, the opposing risk is that it may be in the best interest of an individual to maximize their own use of that resource. The risk here is a tragedy of the commons[117] and ultimately resource depletion, since nobody is willing to curtail their own extraction unless everyone else does. This implies systems of cooperation can be fragile and collapse very quickly - one selfish fisher might cause a 'fish race,' as others are motivated to keep up or miss out.[118] Once selfishness is normalized, re-establishing cooperation can be very difficult, since it would be heroic for any individual to curb their extraction while everyone else is maximizing theirs. Rather, a majority needs to change their behavior together.[119]

Classical economics, which stresses the self-interested nature of individuals, suggests a collapse towards resource depletion is inevitable. This view implies we must privatize the resource, impose taxes, or introduce a cap and trade arrangement, to realign self-interest with the preservation of the resource. In some cases this is true, and selfishness is a real problem. However, the classical economic account can be wrong on two counts.

First, as noted above, a natural tendency for cooperation based on reciprocity and peer-to-peer enforcement can naturally emerge. Nobel laureate Elinor Ostrom revealed how these social tendencies rebut the classical economic paradigm,[120] and much real-world research undertaken since has identified many past and present communities where such 'social enforcement' happens.[121] Good conservation interventions should amplify these, not trample over them. Second, external enforcement cannot only be unnecessary, but can be ineffective or even damaging. For instance, privatization, as well as often raising serious ethical concerns, doesn't always work, as the resource owner may still prioritize short-terms gains and choose to extract the resource to ruination. Quotas or taxes can also be difficult to enforce in many real-world situations, and they may crowd-out intrinsic

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a   Evolutionary psychologists differentiate between proximate motives and ultimate motives. For example, lust (a proximate, or psychological drive) serves the evolutionary function of reproduction (the ultimate genetic motive), even though the two are not always aligned - we don't pursue sex purely with the desire to procreate. Similarly, the urge to act altruistically (the proximate driver), ultimately serves the evolutionary benefit of cooperation and the receipt of reciprocal favors, even though the desire to act kindly may be genuine and non-conditional. In other words, genes are always 'selfish' in that their sole measure of success is replication, but the ultimately selfish benefit at the genetic level does not imply selfishness at the human level.

social incentives. Indeed, evidence shows that where heavy-handed regulatory or fiscal policy has been naively introduced into traditional agrarian communities, it has sometimes worsened the situation.[122]

These social dynamics are complex, and it is not always obvious when we might rely on natural cooperative tendencies, and when external enforcement is necessary. It's fair to assume that with very large and diffuse communities (such as globalized society sharing the atmosphere) regulations are necessary. But in smaller communities that may have their own norms of resource management, there are things that conservationists can do to promote cooperative and sustainable behaviors. This includes promoting the desirable norm by advertising what most people are doing; making the target audience's behavior more observable (to increase peer pressure to comply, but also increase the social reward of good behaviors); introducing other forms of community empowerment so that freeloaders are more effectively monitored or punished; encouraging public pledges to adhere to approved local practices; and having community leaders and other influencers lead by example. We discuss each of these in the strategies below.

Another major cluster of research in social psychology explores the importance of identity. We develop our preferences and express ourselves through an attachment to social groups and categories (such as our gender, nationality, political view, tribe), and therefore tend to adopt the norms and values of our 'in-group' through a process of self-expression and belonging. Conversely, we may intentionally distance ourselves from, and shun the practices of, our perceived 'out-group.' These factors are important because efforts to promote more sustainable

norms may be ineffective if we fail to understand the social identity of the target group - for instance, meat eating is linked to masculinity, and therefore vegetarianism is often perceived as emasculating.[123] We must address this threat to masculine identity if we want to promote reduced meat consumption among certain demographics.

A final aspect of this is choosing the right messenger, as we are far more likely to heed the message of a person or organization we identify as 'like us,' on our side, and as credible. This is particularly important when considering spokespeople, celebrity endorsement, and branding for wildlife campaigns. Given that so much conservation work is undertaken internationally, we must also recognize the importance of cultural differences. Our ways of looking at the world are rooted in tradition, collective narratives, and social identity. Gaining this local insight, and approaching an issue with humility, is therefore always critical when trying to promote conservation outcomes in local communities we are not a part of - both because it is polite, but also because it will be more effective.

Again, these insights into our social nature give rise to a wealth of new tools. In this chapter we highlight the following strategies:

- **Promote the desirable norm**

- **Harness reciprocity**

- **Increase behavioral observability and accountability**

- **Encourage public commitments**

- **Choose the right messenger**

Strategy 6: Promote the desirable norm

How would you feel if you found out most people in your industry agreed with a certain practice?

A study of French farm owners found that farmers were much more likely to continue their sustainable farming practices when they heard that others were doing it, regardless of when their sustainable farming contracts were ending. Of the farmers who received information that 80 percent of farmers intended to continue sustainable practices, 61 percent responded "absolutely" or "probably yes" to sustaining their own current practices as compared to only 43 percent in the control condition where no information was provided.[124]

What is the strategy?

Highlight the desirable norm (e.g., "9 out of 10 people do….") and cases of success or good behavior. Alternatively, emerging research suggests that where the behavior we wish to promote is not yet normative, highlighting the increasing prevalence or frequency of the desired behavior (called a dynamic norm) can also be effective (e.g., 'more and more people are reducing their meat consumption'). A similar technique is to make social comparisons (e.g., to target and inform people that they are using more energy than their neighbors).

Why does it work?

We are influenced by the behavior of our peers for multiple reasons: we infer from their actions that it's a sensible or appropriate thing to do (e.g., if lots of other farmers are using a new technology, it's probably a good technology); we feel peer-pressure to comply; and we like to mimic those we aspire to or identify with. However, we often have skewed perceptions of what's normal, so correcting these misconceptions can shift behavior. We are often most affected by what the majority is doing, but particular by people 'like us,' and aligning campaigns with desirable social identities can therefore be effective. Where behavior is not widespread, sharing clear examples and personal stories that are relatable, memorable, and affecting highlight individual successes and to lead by example. Social norms are further one way of overcoming the feeling that our individual contributions won't make a difference, by highlighting that others are also doing their part. This is related to reciprocity (see strategy 7).

Learn about other success stories:

- Utilities have been successful in leveraging social norms and social comparison in monthly home reports to reduce energy and water consumption, by telling people they use more than their neighbors.[125]

- Dynamic norms: highlighting that more and more people are starting to eat less meat, and to conserve water, led individuals to order more meatless entrees and reduced water consumption.[126]

- Including the sentence '9 out of 10 people pay their tax on time' in UK government tax reminder letters brought forward £200 million in late tax payments.

- A number of studies have shown that one of most influential factors for a household purchasing solar panels is whether other households in the neighborhood have them, more so than their age, race, income, or political affiliation.[127, 128]

- A study in China's Wolong Nature Reserve sought to boost farmers' re-enrollment in their Grain-to-Green program that converts agricultural land into forests or pastures. When given information about their neighbors' behavior towards converting land in addition to a payment upon enrollment, farmers were more likely to re-enroll.[129]

Now it's your turn:

- Where desirable behaviors are not yet normative (e.g., reduced meat consumption, or adoption of new lobster and fishing equipment that reduces plastic pollution and bycatch), we can either highlight the dynamic norm ("more and more people…. "/ "The number of fishers using this equipment tripled this year"), or target the highest users and draw a social comparison ("The great majority (80 percent) of farmers in your area are using less fertilizer per hectare than you).

- Where the desirable behavior is normative, we can target non-compliers and highlight the social norm ("9 out of 10 are using barriers to reduce the need to kill local wildlife").

- Use the power of social norms to influence spiritual leaders to comply with the norm of not endorsing wildlife products as spiritually valuable items.

Strategy 7:
Harness reciprocity

Would you reciprocate a kind gesture?

Rare's watershed program in the Andes region facilitated communication and cooperation between upstream and downstream users to ensure clean water for everyone. Downstream users financed payments and materials to upstream users with hopes that they would reciprocate these efforts and be stewards of the upstream ecosystems that regulate water resources. A three-year campaign led to 263 contracts between users and protected over 16,000 hectares of land in the watershed.[130]

What is the strategy?

By giving an unconditional gift or favor, we can elicit the urge to reciprocate. This can be a literal gift (such as a discount, entry into a prize draw, or free sample), or we can more subtly highlight the fact that we or other members of their group are doing something to help (and thus elicit helpfulness in return).[131]

Why does it work?

We have the innate tendency to return favors and feel guilt when we do not. This is the psychological drive that pushes groups towards harmony and cooperation. To reciprocate is itself a type of social norm, and some social norms messages (such as 'thousands of people choose to donate their organs') are, in part, messages of reciprocity (implying that other people are doing something that might help you, so you should reciprocate). Here we build on the social norm examples in strategy 6, and describe ways to more directly evoke reciprocity.

Learn about other success stories:

- A study of voluntary contributions to a national park in Costa Rica showed that when individuals were given a free gift prior to donation or were told about the average donation amount by others, they tended to donate more themselves.[132]

- A study comparing trust and cooperation among marine and lake fishermen found that marine fishermen worked more in groups and therefore had greater trust and influence over each other's fishing practices, where lake fishermen tended to work alone and had less coordination over resource extraction.[133]

- BIT subtly evoked reciprocity to increase rates of organ donation, adding 100,000 donors in one year by using the message, "If you needed an organ transplant would you have one? If so, please help others."[134]

Now it's your turn:

- Give out freebies to encourage change to agricultural practice. For example, if the goal is to encourage adoption of silvopasture, give out free saplings to spark interest and to reduce anxiety associated with new, unknown techniques and materials. To encourage uptake, free assistance (e.g., volunteers will plant the saplings for you) can elicit helpfulness and concession in return.

- Highlight good acts that individuals or organizations have done for the local community and the common resource, to encourage others to also contribute. For example this might take the form of a 'pride of the community' award in which local individuals and businesses are contributing to the community, encouraging others to do so. Support offered to specific individuals could be linked to a 'pay it forward' scheme.

Strategy 8:
Increase behavioral observability and accountability

Would you try harder if your performance was made public?

In 2010, the UK government published monthly performance tables showing individual departments' energy consumption. Each department's Permanent Secretary was held accountable for their performance in meeting with the Cabinet Secretary to introduce a competitive element. Over 12 months, the government saved 10 percent in carbon emissions.[135]

What is the strategy?

There are several ways we can increase the observability of behavior, both to socially 'police' undesirable behavior, and to socially reward good behavior. For example, using public league tables publicizes who is transgressing and who is excelling (e.g., who is taking most from a common resource and who is contributing most to conserving that resource). Other mechanisms such as non-financial rewards or public recognition can act as a social incentive. Actual or implied surveillance, for example through cameras, published audits, or increased bureaucratic transparency can also help by leveraging the social cost of transgressing.

Why does it work?

Where our self-interest may lead us astray from the socially acceptable behavior, it is peer pressure and the need to maintain our reputation that forces us to comply. These forces depend on observability, since we are more willing to transgress in private. This is so hardwired that even the allusion of observability, for instance through a fake pair of eyes above an honesty payment box, or fake roadside police officers, can work on our conscience to do the right thing.[136] Observability is not just about curbing undesired behaviors, but also about promoting good behaviors. Conspicuous green behavior allows us to signal our virtues and gain social kudos, which we can amplify by making the behavior more noticeable by others or by increasing the level of social reward (e.g., through greater public recognition). Highlighting these good behaviors also helps to reinforce the perception that they are normal (see strategy 6).

Learn about other success stories:

- Voluntary contributions to a Costa Rican national park made in public in the presence of a solicitor were 25 percent higher than those made in private.[137]

- BIT modified letters sent to drivers who failed to pay road tax. By adding a photo of the recipient driving their car (captured by on-road cameras), payment rates were increased by over 20 percent.[138] Compliance with 'no-idling' traffic signs to improve air quality was also increased in the same way.[139]

- When apartment residents publicly signed up to install an automatic power regulator on their heating and cooling system to reduce energy demand, overall participation rates in the building increased.[140]

Now it's your turn:

- Make community leaders more publicly accountable. If a mayor pledges to do something, there need to be social costs to not following through. For example, setting up mechanisms of tracking their efforts and keeping the community aware of them could be highly effective.

- Set up public league tables of 'performance' in adhering to conservation behaviors (e.g., compliance among businesses). The comparison could be either between individuals in a community, or between communities in a region.

- Paint signage on boats for those who are registered 'professional fishers.' Make the signage contingent on compliance with best practice.

- Harness virtue signaling and pride by creating 'visible perks' that fishers or other people belonging to a professional membership organizations have to 'earn' certain gear through good (i.e., sustainable) behavior. For instance, Rare have had success with using t-shirts, often worn to signal performance or leadership.

Strategy 9:
Encourage public & peer-to-peer commitments

Would you commit to reuse your hotel towel during your stay?

A study found that towel re-use increased when hotel guests were given the option to make an open commitment at check-in. They were then handed a label pin to remind them their commitment. Specifically, the proportion of guests reusing at least one towel increased by 25 percent and the total number of towels reused increased by 40 percent.[141]

What is the strategy?

Encourage people (whether consumers and companies, farmers and fishers, or mayors and community leaders) to make public pledges and commitments. Added gravitas through ceremony and fanfare or written signatures can further strengthen the commitment. Similarly, buddy systems or group incentives (where rewards are only gained if someone else, or a whole group, comply) can encourage peer-to-peer enforcement where regulatory enforcement may otherwise be difficult.

Why does it work?

We are much less likely to fall back on a promise we have made publicly, or to a friend or peer, than we are to give up on our own private intentions. We often go to great effort to 'save face' and avoid appearing hypocritical or dishonest in front of our social group. We also seek to act consistently with our past selves. By making a commitment into a notable 'event,' it becomes a bigger deal to break this promise in the future. Buddy-schemes and incentives conditional on group behavior can also be effective as we a) police each other's actions to ensure we don't miss out and b) feel obliged not to let others down, since their approval is now contingent on our behavior.

Learn about other success stories:

- BIT ran a 'buddy incentive' to increase attendance at math and English classes. A pair of students received an incentive (gift voucher) only if both students attended. This led to a 73 percent increase in attendance.[142]

- A study in the Northern Republic of Congo found that the use of participatory, inter-group monitoring systems decreased wildlife hunting more than inter-group communication alone.[143]

- A small study in the Netherlands found that, compared to farmers who only received feedback, farmers who also made a public commitment reported being more likely to adopt sustainable farming.[144]

Now it's your turn:

- Introduce the obligation of making a public pledge to adhere to the sustainable standards of the organization for new joiners of farmer associations, fishing memberships, etc.

- Reward all members of a community or a professional organization (or pairs of colleagues or friends) in return for certain objectives being met by all (or both). For example, this could apply to attendance at local training events, or achieving a community-wide transition to new agricultural practices or targets.

- Provide recognition or non-financial rewards to companies who have pledged and committed to conservation standards, such as removing palm oil from their products. By publicly ratifying and recognizing their efforts, they are more likely to adhere to them.

Strategy 10:
Choose the right messenger

Whose advice would you rather follow?

The University of Delaware (UD) and Rare partnered on an experiment where students role-played as factory owners who had to make decisions about production activities that could result in local stream pollution. Some students interacted with a UD mascot and others with a Rare mascot, and each mascot would react to students' decisions. Students who were paired with the UD mascot were 75 percent more likely to achieve the clean water goals compared to the Rare mascot, showing the importance of in-group identity.[145]

What is the strategy?

Identify who (or which organization or branding) will be most influential in promoting a certain message, product, or practice. We generally respond to people of authority, and those with whom we identify. First, by 'authority,' we refer to those with credibility (e.g., experts or those who have adopted the behavior themselves), or those with some degree of power over us (including government, local leaders and parents, children). Second, we care about those with whom we identify, which typically includes our peers (who are relatable and trustworthy), or indeed celebrities (who we admire).

Why does it work?

Social identity theory highlights just how important social identity is: we adopt the norms and practices of our perceived 'in group' but often refute those of our 'out group.'[146] This means that our peers, or converted individuals who used to be 'just like us,' are both relatable and credible. Social influence more broadly shows we are more likely to internalize the claims or opinions of those perceived as credible, and to comply with those of perceived legitimate authority.[147] Trust is also key, and we are more likely to trust our neighbor or general practitioner than we are to trust our government or a foreign organization meddling in our community. We are also more likely to present a good persona of ourselves to certain people, such as our own children, a religious leader, or our boss. Used effectively, these people can therefore have a stronger effect on our actions than generic or psychologically 'distant' messengers (such as a national government or a foreign NGO). The use of celebrities – common among environmental NGOs – can be effective partly because they simply increase the exposure of the message itself, but it is important that in order for the message to resonate with the audience, the celebrity must also be credible, trustworthy, likeable, and relatable.

Learn about other success stories:

- In a study where parents served as environmental role models, their children adopted more pro-environmental behavior.[148]

- A study of Costa Rican children who were in an environmental education course showed that parents' knowledge of conservation increased after one month as compared to a control group of adults whose children were not part of the education course.[149]

- BIT found that energy companies are more effective messengers to get their own customers to switch suppliers than the energy market regulator Ofgem, because of trusted relationships and the clear lack of ulterior motive in one supplier promoting its competitors.[150]

- Community organizers who themselves owned solar panels recruited 63 percent more households to install solar panels, since their own adoption of the technology signaled credibility.[151] This speaks to the power of 'convert communicators.'

- Yao Ming, a household-name basketball player in China who played for the Shanghai Sharks, has appeared in numerous WildAid campaigns to good effect, including "I'm FINished with FINs" to decrease demand for shark fin.[152]

- A campaign led by the World Wildlife Fund and Rare helped develop official clubs for fishers in Mongolia to learn and teach one another about sustainable methods for catching taimen, a declining species in the area. These fishers then became seen as leaders and set new norms for the community about catch-and-release practices. After only two years, the program led to a 50 percent increase in the taimen population as well as huge gains in awareness about local regulations.[153]

Now it's your turn:

- Devise templates of sermons for different religious leaders to use regarding stewardship of natural world (e.g., get priests, monks, or spiritual leaders to speak about behaviors that have religious motivations).

- Use 'convert communicators' to lead enforcement action, i.e., those that have previously engaged in an undesirable behavior such as dynamite/illegal fishing and have now switched sides.[154]

- Harness 'network effects' by getting those that have already adopted a certain practice/behavior to advocate it among peers. In one of BIT's studies on charitable donation, investment bankers who were prompted to donate by colleagues who had previously donated were the most likely to donate (compared to those prompted by other messengers).[155]

3.3 EASE THE CHANGE

There is a direct relationship between our motivation to do something and the ease of doing it: the less motivated we are, the easier it must be for us to take action; the harder it is to do, the more motivation we must have to do it. This is particularly important when it comes to conservation and other pro-environmental behaviors, since we know that motivation is often low, or at least in conflict with other motives such as for pleasure or profit. It is therefore critical that we make the desirable behaviors as easy as possible. There are various ways of achieving this, some by supporting and encouraging the individual, and some by shaping the environment around them to ease the change.

In Chapter 2 we introduced the idea of limited cognitive bandwidth. We often grapple with too much information, too little time, uncertainty over options, and complexity in reaching a distant goal. Willpower, forgetfulness, know-how, and procrastination further impede our ability to act on our good intentions. Helping people with these decisions, with making plans, and with implementing their intentions, is therefore a valuable approach. This is particularly true where the target behavior is complex or multi-faceted, such as adopting new agricultural practices, or when we risk defaulting to a 'hot' or impulsive response, such as in human-wildlife conflict. In these situations, using behavioral science to help our target audience develop plans and strategies can help, as can the simple use of prompts, reminders, feedback, and deadlines to overcome procrastination or forgetfulness.

It is also useful to think about the timeliness of a target behavior. We are much more likely to change our behavior at certain moments, such as moments of disruption or natural decision points where the status quo is disrupted. This is partly because old habits have been paused (for example, we might start cycling to work when we move jobs), and partly because hassle is temporarily removed (for example, we are more likely to install attic insulation when we have just moved homes, while the attic is empty and we're doing renovations anyway). There is therefore great value in identifying the timeliest moments to intervene to encourage behavior-change.

Substitutes also provide a powerful tool: when an action is rooted in ingrained habit, or driven by powerful motives that are difficult to overcome, it is often easier to transplant those desires onto a substitute behavior than to curtail them altogether. This is a strategy that has recently attracted attention in the conservation community working to tackle the illegal wildlife trade.[156] However, promoting viable substitutes is not straightforward. For instance, there are concerns that efforts to promote synthetic alternatives to wildlife products such as rhino horn may have backfired, since demand for the real product may have increased in response to sellers promoting its authenticity.[157] More research is needed, but it is probable that the important feature of substitutes is not that they have superficial similarity to the original product or behavior, but that they satisfy the same fundamental motivations and desires and renders the original behavior unnecessary. For instance, substituting beef for chicken has significant environmental benefit, and is likely to be easier for meat-eaters than going meat-free. Meanwhile, several food tech companies, such as Impossible Burger, are working to create plant-based products that offer hyper-realistic alternative to beef that even 'bleed.' In the context of illegal gifting of wildlife products, the motivations are variously rooted in status and exclusivity, currying favor, generosity, artistic value, memorability, and so on. As such, sustainable but synthetic versions of the same product may be seen as an inferior alternative on all these metrics. Instead, substitute gifting practices that evoke the same notions of luxury and status would be more likely to be effective.

One of the most powerful ways we can support an individual to change their behavior is to change the structure of their environment or the framing of the choices presented to them. As discussed in Chapter 2, our choices and our actions are as much a function of the physical 'choice environment' as they are of our 'inner' motives and cognitive processes. Recent research in behavioral economics has shown the power of altering the setting to smooth to journey towards the desired behavior. Sometimes this is as simple as removing 'frictions costs' and hassle factors in bureaucratic processes (or indeed add

them in to discourage undesirable behaviors). These small inconveniences have been found to be disproportionately inhibiting to action. Other times we can re-engineer choices to directly harness or address certain cognitive biases. For instance, we can simply make certain options more salient, since our limited cognitive bandwidth tends to direct our attention to that which is most novel or relevant. Alternatively, we may re-order options or make the good option more available, which have both shown to influence our choices. More powerful still, we may be able to default our target audience into certain outcomes (with the freedom to opt out), since we overwhelmingly 'go with the flow' and stick with default options.

To summarize, there are many ways we can ease the change, both by editing the setting of our choices, and by supporting the individual though planning and implementing their intentions:

- **Make it easy by removing frictions and promoting substitutes**
- **Provide support with planning and implementation of intentions**
- **Simplify messages and decisions**
- **Alter the choice setting**
- **Use timely moments, prompts, and reminders**

Strategy 11:
Make it easy by removing frictions and promoting substitutes

What if there was a tool to make your work easier and more sustainable?

A campaign in the Bahamas called "Size Matters" provided size gauges to fishers to help them measure the tails of spiny lobsters as a way to catch only mature ones. This simple and easy-to-use tool has had a major impact, and one of the biggest processors in the Bahamas recorded close to zero undersized lobster for the first time in 40 years. As of 2018, the Bahamas spiny lobster fishery was also the first Caribbean fishery to receive Marine Council Stewardship certification.

What is the strategy?

Make the desired behavior more convenient and accessible to encourage an action. You can also add more hassle to the undesirable behavior to discourage an action. There are many ways we can make the good behavior easier: streamline bureaucratic processes; partially complete forms; shorten wait-times; simplify instructions; provide new technologies; and promote appealing substitutes to undesirable behaviors.

Why does it work?

Small hassle factors and friction costs can disproportionately keep us from completing an action.[158] For example, a study found that recycling contamination decreased when waste bins were designed with the shape of each hole to match the shape of disposable items.[159] The minor hassle of installing attic insulation or cancelling a subscription mean we often procrastinate and never quite get around to acting on our intentions. Research has shown that even the smallest of bureaucratic frictions can thwart action,[160] and our inaction is often compounded by our tendency to discount the future over the present — in other words, we prioritize the immediate convenience of doing nothing, over the long-term benefits of acting.

Providing compelling substitutes can be effective where there is a strong motivation to continue an existing, undesirable behavior. Satisfying these motivations through more sustainable means is often easier than curtailing the behavior altogether, particularly if that requires breaking an ingrained habit. Here it is more important to ensure the substitute satisfies the same underlying desires (such as for status, exclusivity, providence, or pleasure), rather than for the substitute to be superficially similar. For example, recent efforts in producing artificial rhino horn may have backfired as sellers raise prices for 'authentic' products.[161]

Learn about other success stories:

- Multiple studies have found that removing trays from a university cafeteria significantly reduced 'plate waste,' as there was a hassle of having to get up multiple times that reduced mindless food grabbing.[162, 163]

- For students who received personal assistance to fill out financial aid forms, there was a 29 percent increase in university enrollment compared to students who didn't receive assistance.

- BIT ran a trial with the UK tax authority to improve tax collection rates by making it easier for individuals to pay and found that removing one mouse click from the online process increased the response rate by 21 percent.[164]

- A study found that specialized recycling container lids, as opposed to no lids, increased the beverage recycling rate by 34 percent by making it very easy and intuitive to know what type of waste and container belongs where.[165]

Now it's your turn:

- Lots of bureaucratic processes exist (e.g., license renewal, ordering of products, signing up to schemes) where frictions can be removed. These often provide opportunities for quick and easy trials to apply behavioral insights.

- Develop and provide access to 'good' substitutes, as easy alternatives to harmful behaviors. Examples include wildlife photography for recreational game hunters (rifle-shaped cameras even exist); 'blended burgers' (mixed beef and mushroom) or chicken burgers for meat eaters; and artisanal jade carvings for collectors of ivory and tiger-bone carvings.

- Put recycling and compost bins in easier-to-access places than trash bins to reduce plastic pollution and increase composting of food waste.

- Encourage whistleblowing and reporting on illicit behavior (e.g., illegal wildlife trade) by creating a safe and convenient whistleblowing platform, with no hold time (BIT's research shows even a few seconds of hold time can discourage callers to stay on the line).

Strategy 12: Provide support with planning and implementation intentions

Would planning motivate you to recycle more at work?

A tele-company in the Netherlands wanted to reduce its environmental impact through employees recycling more paper and plastic. They conducted an experiment to compare the effectiveness of offering recycling bins and the opportunity to form implementation intentions to recycle. For employees who spent time planning out their recycling intentions, waste going to landfill decreased by 75-80 percent as compared to employees who did not make a plan, and this behavior persisted in the months following the intervention.[166]

What is the strategy?

Implementation intentions are a specific type of planning tool that specify when, where, and how a person intends to complete a goal, giving them a premeditated strategy for overcoming likely barriers. Providing timely feedback can also help people track and validate their progress to maintain motivation and help re-direct efforts.

Why does it work?

Studies find that only about half of people successfully act on their intentions and potentially achieve subsequent goals.[167] There are many reasons for this 'intention-action gap,'[168] including daily distractions, conflicting intentions, or small hassle factors (e.g., having to rinse a yogurt cup before being able to recycle it). These can be disproportionately discouraging and keep people from acting on their intentions (e.g., to recycle more). We also systematically overestimate our future performance, or the likelihood that good things will happen to us, and in turn underestimate adverse events.[169] Implementation intention prompts ask people to note down, or at least consider, when, where, and how they will follow-up on their intention and thereby create a concrete association between a feeling or intention in the present and the consequential behavior in the future.[170] In addition to making a plan, having a way to obtain feedback can be useful for tracking and feeling rewarded for progress, and comparing how you're doing compared to others.[171]

Learn about more success stories:

- BIT ran a pilot with the Department for Work and Pensions and JobCentre Plus in Essex and found the usage of implementation intentions in searching for work opportunities significantly increased employment outcomes.[172]

- When motivating free flu vaccinations, researchers found that when individuals were prompted to write down the date and time of their appointment, they were more likely to get vaccinated.[173]

- When individuals used smart-meters to provide real-time feedback about their water consumption in the shower, their water use decreased 22 percent.[174]

Now it's your turn:

- Develop pre-specified plans for how to deal with situations of human-wildlife conflict and distribute these exercises in the community through workshops, leaflets, or community assemblies.

- Reduce meat consumption by prompting people to plan their meat-free days and meals. This is to overcome moments of temptation or a reversion to familiar habits when buying and preparing food.

- Help community members adopt new sources of income by making a plan to develop eco-tourism services, breaking this ambitious transition down into manageable, concrete steps.

- Tackle corruption in the illegal wildlife trade by providing strategies for 'positive' reactions to common situations, e.g., whistleblowing, or knowing how to refuse a bribe or pressure from a boss, (i.e., people are asked to develop implementation intentions in the form of "if I see someone do X, I will….").

Strategy 13:
Simplify messages and decisions

What environmental messages have stuck with you the most?

Recently there has been a movement to ban and restrict the use of plastic straws. Despite the debate over its real impact on ocean plastics, there is no denying that the specificity and simplicity of this one action has led it to become highly popular with businesses and municipalities around the world. Catchy slogans such as "the last straw" and "stop sucking" have become rallying cries. Global companies such as Starbucks and McDonalds are just some of the major players who are phasing out straws in their stores, and the movement is only spreading.[175]

What is the strategy?

Simple, straightforward messages are more actionable than complex ones. These can include rules of thumb, checklists, mnemonics, decision trees, and calls to action that serve as 'decision aids' that simplify information and choices.

Why does it work?

We are presented with an overload of information and complex decisions every day. We filter out the noise, focus on that which seems most relevant and salient, and adopt fast and frugal decision-making rules to navigate this complex world.[176] Decision aids like rules of thumb, checklists, and mnemonics are various strategies to help us deal with this complexity, making it easier to make good decisions.

Learn about more examples:

- There are many memorable slogans that contain instructions within about simple pro-environmental behaviors: "Reduce, reuse, recycle" for waste reduction and diversion and "Slow the flow, save H2O" for water conservation.

- Following the best-selling novel, The Checklist Manifesto, a series of hospitals found that when surgeons use checklists in the operating room, the rate of in-patient deaths following surgery drops 40 percent and other major complications by over 30 percent.[177, 178]

- Price comparison websites and apps serve to simplify decision-making for customers, while simplified metrics like a Tariff Comparison Rate (TCR) on energy tariffs combine multiple dimensions of price into a single figure to help consumers find the best options.

Now it's your turn:

- Provide a decision-aid or rule of thumb on how to interact with wild animals as to prevent violent encounters and help people feel prepared when they come into contact with one.

- Put pictures of recyclable and non-recyclable items on bins to reduce contamination of waste and pollution from littering.

- Promote simple heuristics for sustainable food consumption to reduce the complexity of diet shift. Even if imperfect, simple rules are more likely to be followed, such as 'swap tofu for chicken.'

Strategy 14:
Alter the choice setting

What is the strategy?

Editing the choice setting and manner in which options are presented or structured can nudge people towards certain decisions.[179] There are many ways of doing this. For example, we can make the sustainable option the default; we can improve the ease of access; we can put the sustainable option first within a choice-set or list; we can add or remove other options from the choice set to alter the relative qualities of the sustainable option; and we can make the sustainable option more salient through eye-catching imagery or packaging design.

Why does it work?

Our reliance on heuristics and rapid decision-making leaves us susceptible to influence from small cues and details of our environment and the manner in which a choice is framed. The features of the choice environment can therefore be modified to harness or address certain biases.[180] For example, one commonly used strategy is to make the desired behavior the default: this appeals to our tendency to stick with the current situation or state of affairs (status quo bias).[181]

Learn about more examples:

- When choosing between two options, the introduction of a third option strongly influences consumer preferences, as in the case of tour packages, product brands, and more.[182]

- A study in Germany showed that defaulting consumers into a renewable electricity tariff (retaining the freedom to choose their own tariff) lead to a 10-times increase in the number of consumers using green electricity.[183]

- A study to increase vegetarian meal selections found that if you integrate plant-based diets into the menu design rather than placing them in a separate chapter, people are more likely to order vegetarian because they appear as just another item, and the option is normalized rather than segregated as for vegetarians only.[184]

- When healthy food items are placed at the top or the bottom of a menu they are twice as likely to be selected than if they are in the middle.[185, 186, 187]

- By putting a full serving of food on smaller plates or in smaller packages, researchers have found they can greatly influence caloric intake without sacrificing people's satisfaction or feelings of being full.[188]

- Combining eye-tracking lab studies and in-store field trials, one study found that making the forest certification label on coffee more salient and visually appealing (using images of trees) led to greater attention (looking at the product for longer) and a 22 percent increase in sales. In contrast, consumers' concern for the environment, and the provision of information about the forest certification scheme, had no impact.[189]

Now it's your turn:

- Default people into vegetarian options (e.g., on flights, at catered events, conferences, weddings, etc.), or default landowners/farmers into managed access and rights-based systems.

- Harness the decoy effect when presenting 'options' to people. For example, when researchers/ campaigners ask a third party (e.g., tourist bureaus in China) to collaborate with them to combat illegal wildlife trade, pollution, or something else, 'conditional cooperation' (e.g., for a non-financial incentive, reputation, etc.) could be presented as a third option to collaboration and no collaboration.

- Harness saliency by putting more sustainable products at eye level, in the center of displays, or in the front row of items at a local store (e.g., food items or items that can be used for sustainable farming/fishing).

Strategy 15:
Use timely moments, prompts, and reminders

Have you ever attempted to start a habit right after a life moment or transition?

BIT ran a study in Portland, USA, where the goal was to increase the number of people signed up to the city's bike sharing scheme. We distributed leaflets with promotion offers to people in neighborhoods where new bike racks had just been installed and to a group of people who had just recently moved to the area. We found that recent movers were four times more likely to sign up to the bike sharing scheme than those with a new bike rack in their vicinity.[190] Moving houses and neighborhoods therefore represents a temporal landmark for people to form aspirations and goals with regards to sustainable travel.

What is the strategy?

Target periods of transition or provide prompts and reminders at timely moments to capture people's attention and spur people to action when it's most needed. These can be especially helpful during 'visceral states' (e.g., when angry, in pain, or hungry) that can cloud judgment and bias behavior.[191]

Why does it work?

Periods of transition make us more susceptible to change in other areas of our lives too. This can be for practical reasons like being open to learn how to use less energy when they just received a new heating control. Periods of transition are also powerful for psychological reasons (e.g., the 'fresh start effect.')[192] Temporal landmarks (e.g., a new job, birthdays, beginning of the week) that represent new beginnings make us more likely to form aspirations and take steps towards a goal. They help us to leave prior, failed attempts at change in the past and create a new image of our present and future selves. New Year's resolutions are the most famous example of aspiration formation at a temporal landmark. Additionally, the extent to which we are receptive to certain information varies significantly from moment to moment, and so timing is key. For example, a reminder to eat less meat might be easily forgotten if read at a random moment during the day, but might be quite effective and salient when read in a supermarket.

Learn about other success stories:

- A study on transportation behavior found that context change can activate environmental values, leading university employees who had just moved to drive to work less than employees who had not moved.[193]

- A study sent a reminder letter to landowners about participating in a conservation reserve program, which lead to estimates of hundreds of thousands of conserved acres each year at scale.[194]

Now it's your turn:

- Target people when booking their holidays (e.g., at tourism agency, on flight comparison websites, airline websites, etc.) against buying illegal wildlife products when abroad.

- Harness natural disasters or other adverse moments, when much of people's equipment will be damaged/lost and livelihoods disrupted, as an opportunity to help people rebuild their livelihoods through more sustainable practices. This removes the problem of sunk cost and being locked in with existing equipment/investments, etc.

- Mark edges of sensitive habitat with clear signs, tape, and/or fencing as a visible reminder to stay on trails.

4. FROM THEORY TO PRACTICE: APPLYING BEHAVIORAL INSIGHTS TO REAL-WORLD CONSERVATION CASES

With all of the previous behavioral strategies in mind, it's time to put them into action. In this chapter we illustrate BIT's and Rare's methodologies to delivering behavior change projects. BIT and Rare work in similar ways, but each has a slightly different focus, which is rooted in the strengths and histories of each organization. In this chapter, BIT and Rare share their insights as well as how they would approach real-world cases of illegal wildlife trade and overfishing, including how the strategies from Chapter 3 might be applied.

OVERVIEW OF THE TWO METHODOLOGIES

BIT: A typical project at BIT has five components, and together we refer to this as the TESTS methodology. Each stage builds on the previous, though it is also iterative. The five stages are as follows:

Phase	What	Why
Target	Step 1: Translate project objectives into behavioral objectives Step 2: Prioritize the target behavior(s) and make it SMART	Program objectives are often broad or stated in terms of conservation outcomes. We first need to identify the specific behaviors we need to influence.
Explore	Step 3: Map out the user journey and identify relevant touchpoints Step 4: Identify barriers and drivers	We aim to understand the drivers and barriers of the target behavior, the surrounding context in which it occurs (and within which we must operate), and the possible touch-points at which to intervene.
Solution	Step 5: Ideate interventions Step 6: Prioritize and refine	Our interventions should a) be rooted in an understanding of behavioral science, b) reflect the dominant barriers and drivers, and c) make the most of available touch-points with the target audience.
Trial	Step 7: Develop research and evaluation strategy Step 8: Implement strategy and analyze data	Human behavior is complex and unpredictable, so we focus strongly on the rigor of evaluation, to find out if (as well as why, how, and for whom) the interventions work.
Scale	Step 9: Scale successful interventions	Where interventions are successful, and where the evidence meets high standards, we seek to scale them and spread best practice.

Rare: We typically follow eight steps in our projects. Our methodology is called 'Behavior-Centered Design' (BCD), as it blends insights and approaches from behavioral science and design thinking. While the steps appear linear, like BIT, we also encourage circling back to a prior step, such as to gather more data or generate more solutions. Self-evaluation is critical throughout.

Step		What	Why
Frame		Frame the conservation challenge to understand the target behavior, target audience, and describe their context.	To focus your efforts on behaviors and audiences that will have a meaningful impact on your conservation goals.
Empathize		Gain deep insights about the target audience's relationship with the target behavior, including their motivations and challenges.	Successful interventions depend on your ability to reach people in ways that are meaningful to them.
Map		Organize insights about your target audience into behavioral motivations and challenges.	Developing a holistic hypothesis about your target audience's behaviors will lead to more effective interventions.
Ideate		Generate, group, and prioritize intervention ideas.	You have many creative ideas and limited time and resources! This step will help you decide among your interventions to choose the best one to pilot.
Prototype		Select your best intervention idea and develop a prototype (small-scale version) that captures its essential features.	By creating a small-scale version of your intervention, you can experiment and estimate its success without investing a lot of resources.
Test		Test your prototype with your target audience and make revisions based on their feedback and your own experience.	Before launching your intervention at scale, it's valuable to gain feedback from a few members of your target audience.
Launch		Plan and launch your full-scale intervention and think about evaluation and impact metrics.	This is your big moment! Use this step to launch your intervention and prepare for how you will measure it in the next step.
Assess		Assess the impact of your intervention and reflect on potential improvements.	This step helps us know if behavior change is happening and to what degree, so we can share our success and findings with the world!

The two approaches share similarities. What are their respective strengths?

BIT: Being founded within the UK prime minister's office, BIT has historically been immersed in the world of policy. We take a rigorous approach to applying behavioral insights to the design of policy instruments, communications, public service design, and bureaucratic process. We've also been at the forefront of evidence-based policy-making, having undertaken more Randomized Controlled Trials than the rest of the UK government combined. Our portfolio of work has since expanded well beyond government (working internationally with NGOs, private firms, and government ministries), but we've maintained a focus on evidence and rigorous evaluation (see Annex B for details on our approach to impact evaluations).

Rare: As a conservation organization working with local communities around the world, we have a particular focus on co-creation with our partners. That means we spend significant time in the field to immerse ourselves in the local experience and learn about community members' day-to-day lives. Qualitative research and co-designing solutions with community members thereby become integral to developing the right behavior change strategy. It's this collaborative and hands-on approach that we're known for.

APPLICATIONS TO REAL WORLD CONSERVATION CASES

How might BIT think about addressing the illegal consumption of tiger products?

BIT: Most of our projects are collaborative with one or more delivery partners – such as a government department, NGO or other organizations 'on the ground' who act as point of access to the target audience. Different organizations have different levers they can pull – for instance an NGO might be restricted to media campaign interventions, whilst a local government department, or a large firm, or a national park authority, will all have different points of influence over the target audience. In this case let's imagine we're working with an NGO in the China/ Mekong region, with some scope to collaborate with local businesses or other organizations.

Target
Step 1: Translate project objectives to behavioral objectives

The first task is to unpack the overarching project goals into discrete target behaviors: specifically what actions, and among whom, do we want to influence? The consumption of tiger products captures myriad motivations, contexts, target audiences, and types of behavior. When designing interventions, each of these might deserve its own tailored approach. It's therefore helpful to be as specific as possible, and one approach to this is to start by defining all the discrete 'micro behaviors' that contribute to the larger problem. Sometimes this might need a formal Theory of Change, modeling the steps and mechanisms through which the behavior arises. A simpler approach is to categorize the contributory behaviors, such as in the diagram shown in Figure 2.

Reduce the demand for illegal tiger products
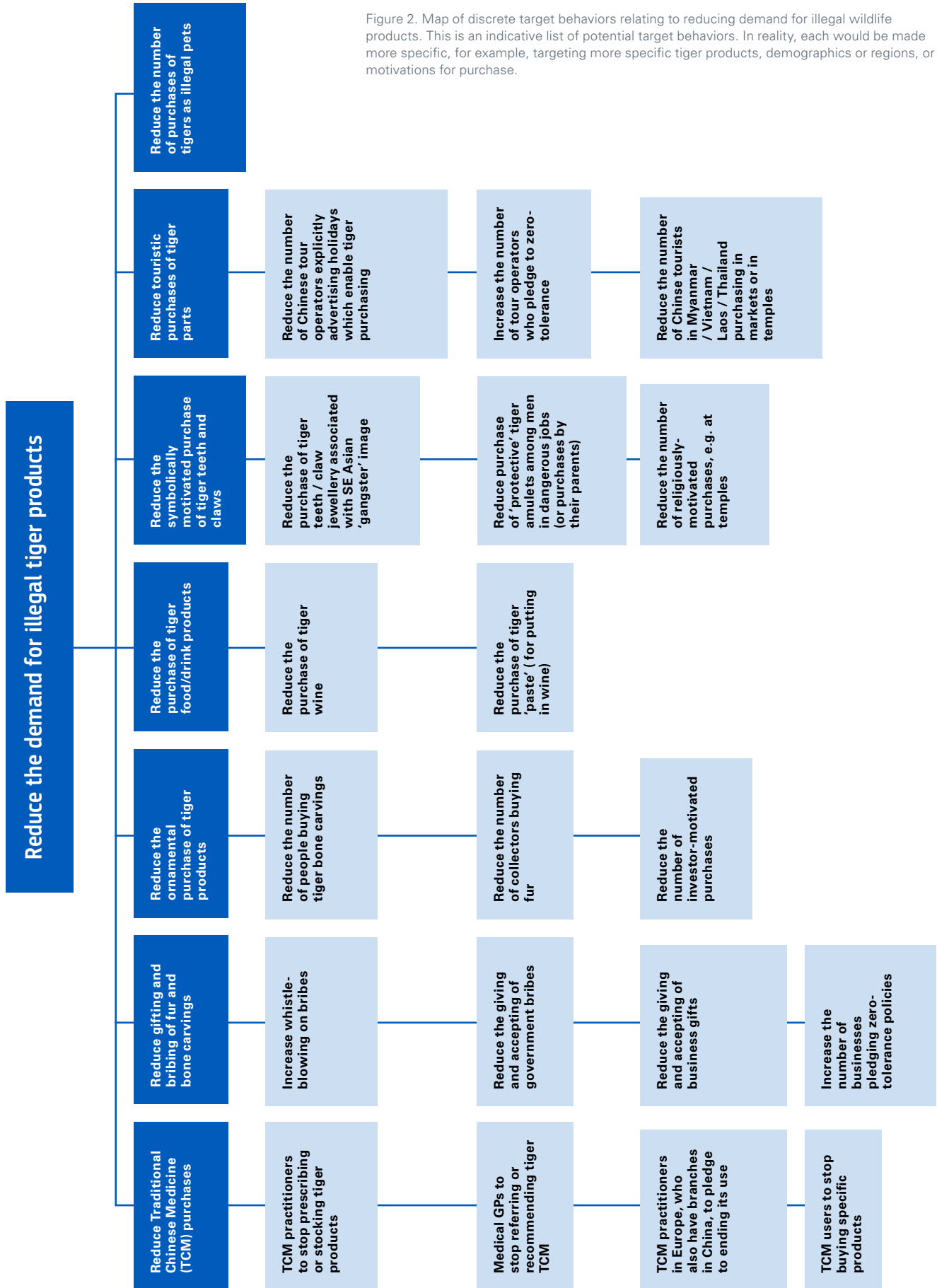
Figure 2. Map of discrete target behaviors relating to reducing demand for illegal wildlife products. This is an indicative list of potential target behaviors. In reality, each would be made more specific, for example, targeting more specific tiger products, demographics or regions, or motivations for purchase.

Reduce the number of purchases of tigers as illegal pets

Reduce touristic purchases of tiger parts
- Reduce the number of Chinese tour operators explicitly advertising holidays which enable tiger purchasing
- Increase the number of tour operators who pledge to zero-tolerance
- Reduce the number of Chinese tourists in Myanmar / Vietnam / Laos / Thailand purchasing in markets or in temples

Reduce the symbolically motivated purchase of tiger teeth and claws
- Reduce the purchase of tiger teeth / claw jewellery associated with SE Asian 'gangster' image
- Reduce purchase of 'protective' tiger amulets among men in dangerous jobs (or purchases by their parents)
- Reduce the number of religiously-motivated purchases, e.g. at temples

Reduce the purchase of tiger food/drink products
- Reduce the purchase of tiger wine
- Reduce the purchase of tiger 'paste' (for putting in wine)

Reduce the ornamental purchase of tiger products
- Reduce the number of people buying tiger bone carvings
- Reduce the number of collectors buying fur
- Reduce the number of investor-motivated purchases

Reduce gifting and bribing of fur and bone carvings
- Increase whistle-blowing on bribes
- Reduce the giving and accepting of government bribes
- Reduce the giving and accepting of business gifts
- Increase the number of businesses pledging zero-tolerance policies

Reduce Traditional Chinese Medicine (TCM) purchases
- TCM practitioners to stop prescribing or stocking tiger products
- Medical GPs to stop referring or recommending tiger TCM
- TCM practitioners in Europe, who also have branches in China, to pledge to ending its use
- TCM users to stop buying specific products

Step 2: Prioritize the target behavior(s), and make it SMART

We can't expect to succeed in tackling all of these issues with a single intervention or campaign. Rather, we embrace an approach of 'radical incrementalism,' focusing on discrete elements of the problem. This reflects the fact that multiple tailored interventions each generating small improvements add up to a substantive impact and can often be more effective than generic campaigns seeking to increase awareness or concern for tigers generally. Our next step is therefore to prioritize these target behaviors, typically on the criteria outlined below:

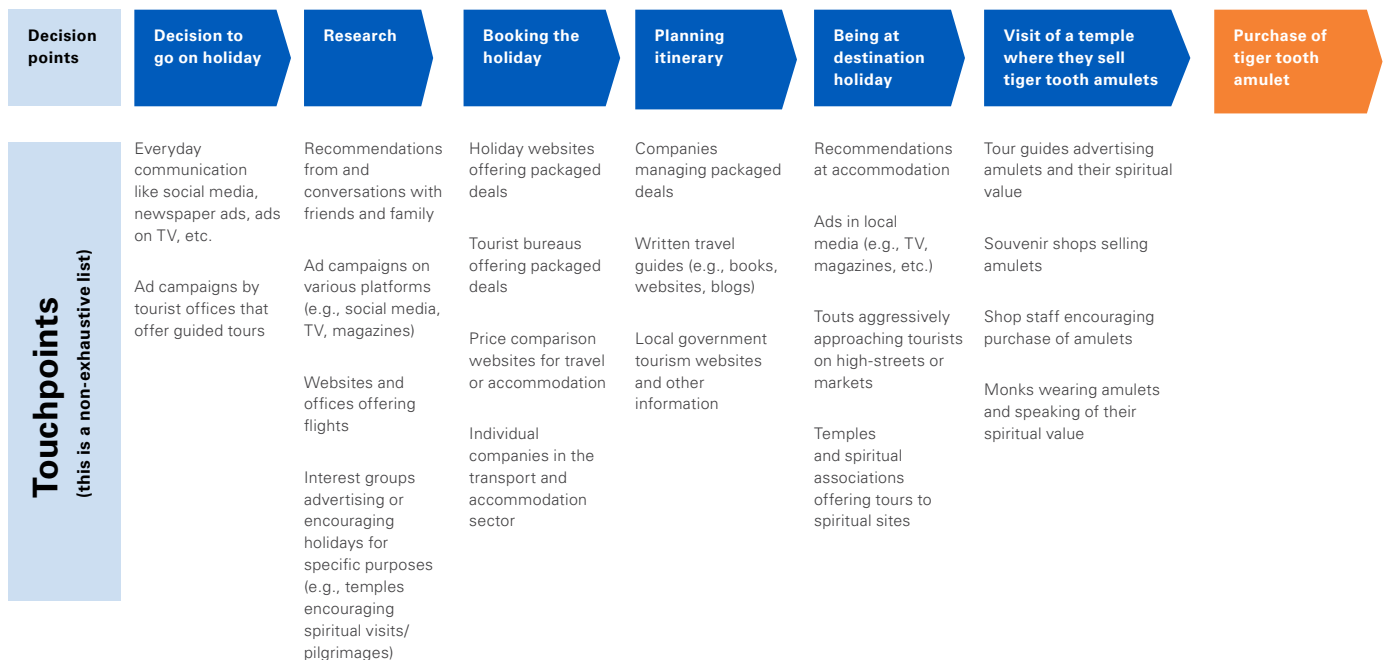| Criteria	General considerations	In the case of illegal consumption of tiger products….
Target audience	Across a large population, there will typically be a minority who are almost impossible to change. Ideally, we want to identify a large cohort who is less committed to their habits and who might be responsive to nudges and other, non-legislative interventions.	Tourist purchases may be less pre-meditated, and thus easier to influence. There is also a large demographic of Chinese tourists who are easily targeted (through the right collaborations) since they tend to use tour operators offering packaged trips with set itineraries and schedules. In contrast, medicinal purchases may be more rooted in tradition, emotion or desperation, whilst investors, gifters, and bribers will be more reasoned and calculated.
Feasibility	Several dimensions of feasibility must be considered: Are there political barriers? What kinds of behavioral interventions might we need in order to have an impact, and are they practically achievable? Do we hold the levers required to implement the kinds of interventions necessary and collect data, or would we need to collaborate with another organizations? Are there cost limitations?	In this case our partner NGO has good local contacts and expertise, but no direct 'implementation power,' since they don't control the systems or touch-points through which people are buying tiger products. We can therefore run mass-media campaigns, but it's likely to be more impactful if we can collaborate with others. We'd presume that working with Traditional Chinese Medicine (TCM) providers might be more difficult than working with tour operators, airlines, or businesses, for example, perhaps leading us to focus more on business gifting and bribing, and touristic purchases.
Potential impact	We aim to prioritize our efforts towards specific elements of the problem where most impact can be had. This depends on two factors 1 - to what extent is the target behavior impacting wildlife? And 2 - to what extent might we be able to shift this target behavior?	We'd look to our partner's expertise to understand which behaviors are most impactful and share our own expertise on which behaviors might more easily be influenced. This is partly down to extensive experience and expertise in behavioral science, but also built on the available evidence and data, which is why the next step (Explore) is often iterative with this step. In this instance, the consumption of TCM products and tiger wine might be higher impact, but less easily influenced, as with non-financial bribes too. Again, business-gifting, and touristic purchases emerge as both significant in the impact on wildlife, but also more feasible to address through the local connections we have.
Data and measurement	It is important to establish upfront that you can (or already do) collect data on the behavioral outcome of interest. Whilst data should not be the primary determinant of our conservation efforts, it is reasonable to 'follow the data' to some extent and focus more towards behaviors we can actually measure.	Many of the behaviors we are interested in are illegal, and so are difficult to measure. Survey methods exist to yield more honest responses (such as unmatched count techniques), but we'd still need a way of implementing the survey in a controlled manner. Other sources of data, such as seizure rates on borders, also exist. Again, this decision depends largely on the potential to collaborate with the right partners and potential they have to observe or measure the target audience's behavior. Once again, working with firms, tour operators, or airlines leads us towards touristic purchases or business-gifting.

Explore

We then move on to the second phase, Explore. The purpose here is to understand the target audience; their motivations, drivers, and barriers; relevant features of the context in which they are acting; and the various touch-points and opportunities we have for intervention. This lays the groundwork for developing a realistic, impactful solution.

Step 3: Map out the user journey and identify relevant touchpoints

In order to understand the context and the processes within which our target behavior arises, we typically undertake a customer journey mapping exercise. This both illuminates the constraints of the systems we must operate in, and also identifies touchpoints (i.e., moments and connections through which we can intervene and elements of the process we might consider changing). In the case of Chinese tourists buying tiger tooth amulets in South-East Asia whilst on a package holiday, a typical customer journey might be as follows in Figure 3.

Figure 3. Touchpoints to discourage illegal wildlife purchases along a tourist's decision journey

Decision points	Decision to go on holiday	Research	Booking the holiday	Planning itinerary	Being at destination holiday	Visit of a temple where they sell tiger tooth amulets	Purchase of tiger tooth amulet
Touchpoints (this is a non-exhaustive list)	Everyday communication like social media, newspaper ads, ads on TV, etc. Ad campaigns by tourist offices that offer guided tours	Recommendations from and conversations with friends and family Ad campaigns on various platforms (e.g., social media, TV, magazines) Websites and offices offering flights Interest groups advertising or encouraging holidays for specific purposes (e.g., temples encouraging spiritual visits/pilgrimages)	Holiday websites offering packaged deals Tourist bureaus offering packaged deals Price comparison websites for travel or accommodation Individual companies in the transport and accommodation sector	Companies managing packaged deals Written travel guides (e.g., books, websites, blogs) Local government tourism websites and other information	Recommendations at accommodation Ads in local media (e.g., TV, magazines, etc.) Touts aggressively approaching tourists on high-streets or markets Temples and spiritual associations offering tours to spiritual sites	Tour guides advertising amulets and their spiritual value Souvenir shops selling amulets Shop staff encouraging purchase of amulets Monks wearing amulets and speaking of their spiritual value	

Step 4: Identify barriers and drivers

Next, we aim to identify the barriers, drivers, and motivations: why do people do what they do, and not do what we would like them to? What are the potential motivations and triggers we could harness? When identifying barriers there is often a valid distinction between psychological (e.g., emotions, motives, cognitive biases, norms) and practical (hassle, availability, cost). In answering these questions, we draw on a number of research tools:

- **Existing literature:** what is already known from academic, government, and NGO research?

- **Ethnography, surveys, interviews, and focus groups:** engaging with the target audience through the appropriate qualitative and quantitative research tools.

- **Analysis of existing datasets:** this can define the main contours of the problem, identify patterns of relevant behavior over time, identify segments of our target audience who differ in prevalence of the behavior or other characteristics, or to identify correlational links between the behavior and other factors.

- **Audience segmentation:** This is sometimes helpful to tailor interventions to different circumstances and target segments accordingly.

- **Mapping out a theory of change:** This helps ground our intervention designs within an understanding of why the behavior occurs and the psychological and practical steps which consumers go through when purchasing tiger products.

For example, in the case of touristic purchases of tiger amulets, the following kinds of drivers and barriers might emerge through research:

Barriers to address	Potential drivers that could be harnessed
Structural: • Economic incentives associated with investing or reselling • Traders have networks that receive commission or profit, including guides, touts, temples, etc. • Ease of access both in markets and online • Increasing middle class wealth and purchasing power **Behavioral:** • Powerful messenger effect if monks or other respected individuals suggest it is OK • High social pressure from touts and guides, and social norm of other tourists acting as a 'social license' • Spiritual motivation, particularly in the moment of temple visits • Scarcity effects – 'now or never' effect whilst on holiday • Cultural beliefs associating amulets with masculinity and protection (e.g. gifted to male relatives with dangerous jobs)	**Structural:** • The law is mostly aligned with the prevention of this behavior • International pressure for governments to take action **Behavioral:** • Increasing secularization of society • Hassle and worry associated with risk of taking the products over borders • National pride • Religious duty not to harm is at odds with this practice

Solution

Next, we aim to develop intervention ideas. These should be grounded in the insights from the Explore phase (addressing the major barriers, harnessing relevant motivations where possible, utilizing key touch-points), but also bring in what we know about the science of behavior change (e.g., from Chapter 3 of this report). There are various ways of approaching this, including running workshops, creative design sessions, or rapid prototyping. One typical BIT approach would be as follows:

Step 5: Ideate interventions

We brainstorm intervention ideas drawing upon a range of resources, including the behavioral strategies covered in Chapter 3 of this report, as well as our frameworks EAST[195] and MINDSPACE[196].

Continuing with our hypothetical case, intervention ideas might include the following:

1. Promoting substitutes. Behaviors can often be substituted for less harmful behaviors provided they satisfy the same motivations – in this case with credible spiritual associations, exclusivity, and rareness. This would likely require collaboration with temples and spiritual leaders to demote the idea that tiger products have spiritual value, promoting the idea that it is the monk's blessing, rather than the product itself, which matters. (Strategy 11)

2. Messaging using dynamic norms. Communicating the changing public attitudes against the consumption of tiger products can leverage our sensitivity to social influence. (Strategy 6)

3. Identifiable victim effects. By creating a recognizable persona for a tiger hunted for its teeth and claws, we might build greater empathy towards the species. (Strategy 3)

4. Incentivize engagement with campaign materials through a lottery or mandate. Working with Chinese tour operators, tourists may be required (or incentivized like through a lottery) to view behaviorally-informed campaign materials at the point of flight check-in. This also harnesses a timely moment. (Strategies 5 and 15)

5. Encourage pledges or commitments among tourists. When booking a holiday online, there could be a place to sign on to not purchase tiger products. Timely reminders (e.g., through SMS when the tourist departs) can remind them of this commitment. (Strategies 9 and 15)

Step 6: Prioritize and refine

Typically, we might come up with several dozen intervention ideas, and in the first instance, no idea is a bad idea. We then prioritize these ideas on likely impact and feasibility, ranking each idea from low-to-high, looking for intervention ideas, which are high in both (see Figure 4). This may be expanded to include other key considerations, such as cost, ease of evaluation, or public acceptability. Often, multiple ideas (i.e., strategies from Chapter 3) can be bundled into a broader 'suite' of interventions. For example, idea 5 might include the use of dynamic norm messaging (idea 2). It may also be possible to test multiple interventions to compare their impacts. This also means that individual strategies from Chapter 3 often can be combined into one, more comprehensive intervention. If this is appropriate, deciding which ones may fit together needs to be assessed on a case-by-case basis.

At this point it is also necessary to refine the idea and flesh it out in full detail, including designing the materials of the intervention (e.g., communications or new processes), and ascertaining how it will be delivered. Where possible this should be prototypes and 'stress-tested.'
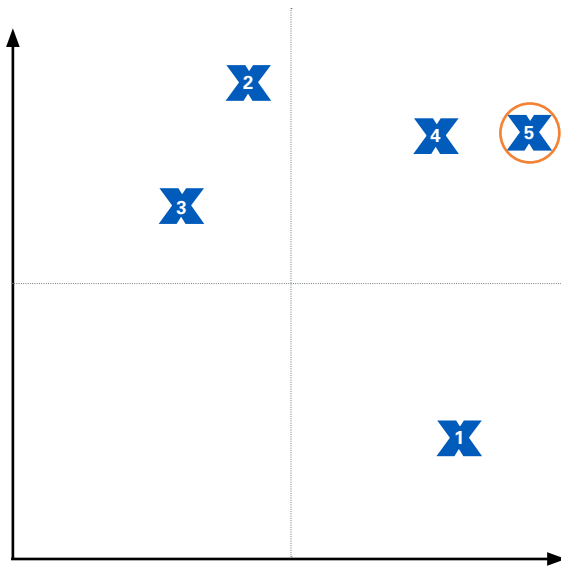

Figure 4. Our intervention impact-feasibility matrix.

Trial

The next stage is to evaluate the impact of the chosen intervention. Impact evaluations are often supplemented with process evaluations (understanding why and how an intervention worked).

Step 7 & 8: Develop a research and evaluation strategy and implement.

This is perhaps the most important stage, because no matter how well-theorized our intervention, human behavior is complex, context-specific, difficult to change,

and unpredictable. It is therefore vital we know what works. It is also an area where we need to improve in conservation by measuring behavior (not attitudes of self-reported intentions), and testing intervention through robust, controlled trials. We use various research tools. Often this includes a Randomized Controlled Trial (RCT), in addition to quasi-experimental techniques, data science, laboratory experiments, and qualitative theory-based evaluations. In Annex B we provide further detail on robust approaches to impact evaluation.

Scale
Step 9: Scale successful interventions

The final stage of TESTS is about scaling up our intervention if it has been successful. In order to do this a number of factors need to be considered:

Evidence: Is the finding robust enough? Scientific rigor normally demands replication of findings, particularly in high-stakes contexts where getting it wrong at scale would be damaging. However limited resources, and the need to act fast, often demand a more pragmatic view on where the balance of evidence lies and whether the evidence of efficacy outweighs the risk. It may also be possible to continue to measure and evaluate as we scale up, for example undertaking a 'step wedge' trial.

Cost/benefit: Was the intervention successful enough to justify the cost? Can the intervention be delivered in a more cost-efficient way at scale?

Logistics: Do we have effective delivery channels? Can we create them? Must we scale the intervention by repeating it one location at a time, or are there existing channels to do this en-masse, for example through professional bodies or authorities? Can we codify interventions for others to adopt, or develop best practice guides?

Fidelity: Is it possible to maintain the fidelity of the intervention when delivering at scale? Or is there a risk that important detail will be lost as others adopt it?

Replicability: Are we confident that we would observe the same results in other locations? Or do we think contextual differences require us to evaluate and validate the findings in each individual case?

Sponsorship: How can we ensure buy-in from both leaders and frontline practitioners who were not involved in the initial trial, and who may need persuading of the value?

Accountability: Do we have clear levers and reporting structures?

And how would Rare think about encouraging sustainable coastal fishing?

Rare: A lot of Rare's work is focused on marine conservation. Overfishing is one of the greatest threats to the livelihoods of tens of millions of coastal, small-scale fishers around the world. It's a classic common-pool resource (CPR) dilemma: in an environment where a potentially unlimited number of fishers share access to the resource, each individual is incentivized to "race for fish" – to catch the next fish before somebody else does, inevitably faster than the fish population can be renewed. The following example walks through a previous behavior change campaign to restore a small-scale fishery in a community in the Philippines.

Frame

Designing a behavior-centered solution begins with the appropriate framing of the conservation challenge to understand the target behavior, target audience, and describe their context. This narrows the scope of the conservation objectives to focus specifically on the behaviors, and the audiences engaged in those

behaviors, that will meaningfully impact the desired outcomes.

Contrary to common assumptions, "small-scale" fisheries – or fishing areas within only a few miles of shore where fishers are operating with very small boats (<15m) – are responsible for roughly 50 percent of the total global fish catch.[197] Nine out of ten fishers globally operate in a coastal small-scale fishery, and some 90 percent of the fish caught in these fisheries is destined for domestic human consumption.[198] Common pool resources like fisheries, which tend to be unregulated, unreported and undermanaged, reflect "complex adaptive systems" in which individual behaviors effect changes to an entire dynamic system that then influence subsequent behaviors.[199]

Overfishing can largely be mitigated if fishers and their communities cooperate systematically to change their behavior and practice more sustainable fisheries management. One such approach is known as 'managed access with reserves': a community-led, rights-based management approach that provides coastal communities

The Behavior-Centered Design Journey

1. FRAME

2. EMPATHIZE

3. MAP

4. IDEATE

5. PROTOTYPE

6. TEST

7. LAUNCH

8. ASSESS
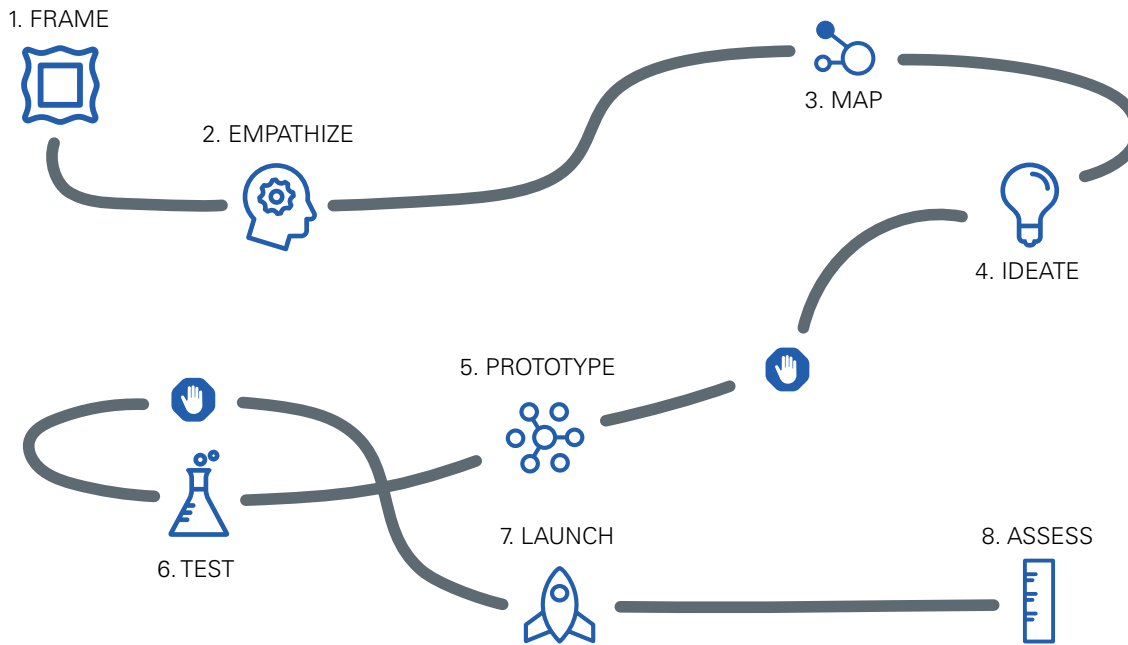
with exclusive access privileges for fishing in defined areas. They are positioned next to 'no-take' reserves where no fishing is allowed, promoting fish reproduction and 'spillover' into fishing grounds.[200]

Tinambac, a municipality in the northern Luzon region of the Philippines, has a population of about 65,000 people, where the primary industries are fishing, farming, and seaweed farming. Around 1,000 registered fishers use the 209 square kilometers of municipal waters, mostly in the region's two bays, San Miguel and Lamit. In the 1990s and 2000s, fishing pressure from local and industrial fishers in Tinambac became so great that the future sustainability of the municipality's critical resource base was in dire straits. 80-90 percent of local fishers used cyanide and dynamite to stun and kill fish, and it was common for locals to hear 15-20 blasts a day. In 2010, a local NGO called Network of Sustainable Livelihoods Catalysts, Inc. (NSLC, Inc.) and founded by a young, enterprising local leader named Cathy Demesa, began partnering with Rare to promote a better path forward for Tinambac's fishing industry.

They focused on the following four key target behaviors:

1. Fishers become registered
2. Fishers participate in community-based management
3. Fishers record and use catch data for management decision-making
4. Fishers fish with the right gear in the right place at the right time

Empathize

Before beginning to design any behavior-centered intervention to such a complex challenge, it is critical to gain deep insights about the target audience. In this case, we'll focus on Tinambac fishers and the broader community of local citizens surrounding them, and their relationships, motivations and challenges. Successful efforts depend critically on the ability to 'meet people where they are,' reaching them in ways that are meaningful to them, not necessarily the intervention designer. This begins by deploying a mixed methods approach, including observation, interviews, focus groups, and questionnaire surveys in order to develop an empathetic lens through which to view the target audience.

Map

After gathering your data, it's time to analyze and organize it in a way that helps to reveal key behavioral insights on which to base your intervention. Specifically, this step draws out and shows the relationships between the behavioral motivations and challenges related to your target behavior (i.e., where there is potential to motivate, socialize, or ease the change). Developing a holistic hypothesis about your target audience's behavior will lead to more effective interventions. On the next page, we have provided an example of how we might translate our data observations into behavioral insights, and one could imagine mapping the connections between similar categories of motivations.

As a result, we hypothesized that fishers will be motivated to do the four key behaviors if we appeal to key values in the community, help to establish visible social norms, expectations, and peer enforcement in accordance with local regulations, leverage key influencers such as family members and the local mayor, and it easier to register and recognize the boundaries of the MPA.

Ideate

During the Ideate step, it is time to brainstorm, bundle, and balance intervention ideas based on your findings. This is where the strategies for applying behavioral science outlined in Chapter 3 of this report intersect with the specific challenge and audience for which you are designing. Ideate starts with brainstorming a list of ideas that correspond to intersection points or key insights from the behavior map(s) and then combining ideas and prioritizing them based on your team's capacity. Often times, it helps to start with "How might we..." questions to generate ideas. Below is a simplified example of what our own ideation for Tinambac might have generated and the related strategies presented in Chapter 3.

A snapshot of Tinambac, 2010-2014

- 12,000 households

- Average household size of 5 people

- Average monthly income of fishers is USD$40-65 or less

- Fishers see themselves as the main providers for their families

- Primary fishing gear and methods: nets, hook and line, spear fishing, cyanide fishing, dynamite fishing, seaweed farming, compressor, bottom-set longline and traps

- Marine Protected Area (MPA, sanctuary) ordinance written by local leaders and established in 2006

- Regulations, penalties, incentives, and local enforcement are a part of the MPA ordinance

- Fisher registration is a hassle and requires a lot of time and travel to complete

- Local government has begun to get involved in the community and provides financial support for MPA

- 95 percent of residents claim knowledge about the importance of sanctuaries but still believe that they, not the sanctuary, are the law

- Fishing regulations are not working and violations are commonplace

- Strong place-based identity and feelings of ownership of natural resources

- Strong spiritual and religious beliefs that fish resources are limitless and that God's will and nature will replenish stocks through the rain and sunshine

- Fishers find it hard to identify the boundaries of the MPA in the municipal waters

- Distrust of outside interventions due to numerous failed livelihood projects in the area over the years

Fisheries Management Timeline of Tinambac, Camarines Sur
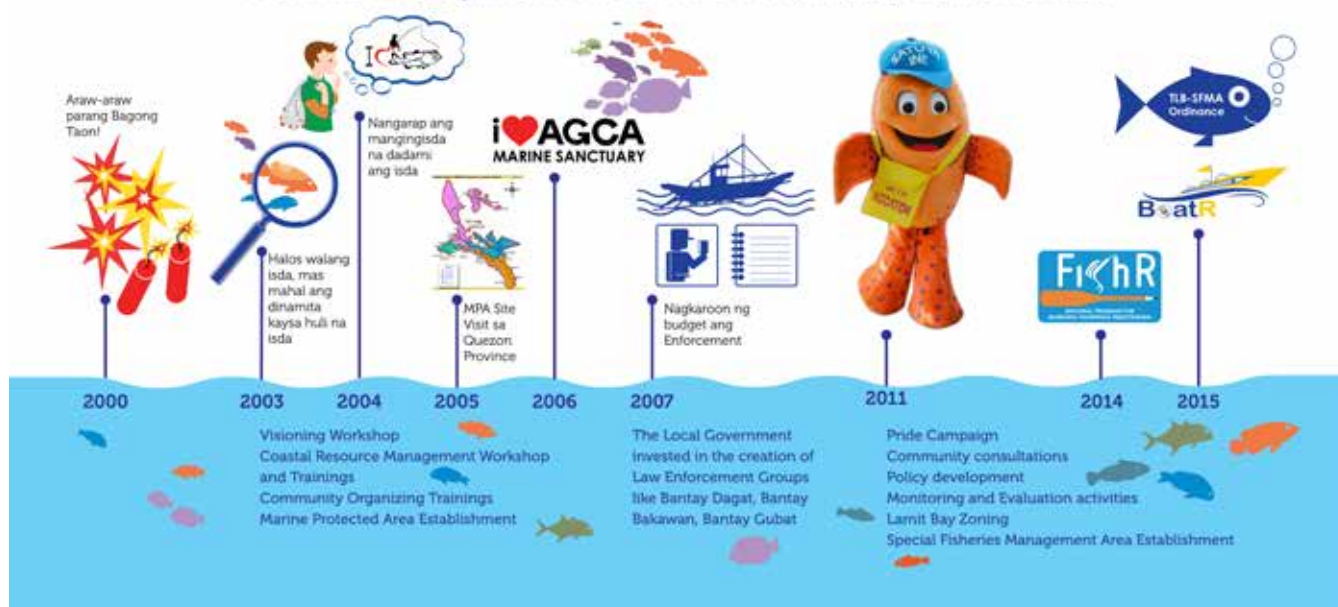
Data observation	Behavioral insight
There is a strong connection to spirituality and religion	Spirituality/religion is a core local value and trusted source of information for guiding behavior (Motivate, Socialize)
Fishers see themselves as providers for their families	Family is an important value, and family members are potential influencers of fishing behavior (Motivate, Socialize)
The local government has begun to get involved in supporting MPA	Local government regulations and incentives could be helping to enforce fishing behavior (Socialize, Ease)
There is a strong sense of place and local identity	There is a collective identity in place related to ownership of natural resources (Motivate, Socialize)
Illegal fishing behavior is commonplace and enforcement is difficult	Lack of peer enforcement about illegal behaviors; behavior not easily visible by others (Socialize)
It is hard to identify where the MPA is in the coastal fishery	Behavior is not easy to do without specified knowledge or awareness of what to look for (Motivate, Ease)
95 percent of residents claim knowledge about the importance of sanctuaries but still believe that they, not the sanctuary, are the law	Knowledge does not align with behavior and other parts of local identity are more salient (Motivate, Socialize)
Fisher registration takes a lot of time and energy	Fisher registration is not easy to do and there are strong barriers to behavior (Ease)

HOW MIGHT WE...?	POTENTIAL SOLUTIONS (STRATEGY #)
Leverage local values to guide desired behavior?	• Use framings related to religion, spirituality (2) • Use framings related to pride and ownership of place (1)
Use key influencers in the fishers' social network to encourage desired behavior?	• Make local government support more visible and vocal (6, 8) • Provide ways for fishers' family members (wives, children) to get involved in promoting sustainable fishing behaviors (10) • Promote more conversations among community members (6, 9)
Strengthen enforcement of local regulations and incentives using social and emotional appeals?	• Incentivize local government action through offering a national grant that is dependent on fisher registration outcomes (5) • Support peer enforcement mechanisms and build trust and accountability as related to the community sense of justice (2, 9) • Create visible and transparent co-management system between local communities and local government (8)
Make illegal behavior more visible to others?	• Set up anonymous reporting system for locals to submit violations (11) • Publicly show the consequences for someone who did not follow the rules (8)
Make behavior easier to do or remove hassle factors?	• Bring registration process to local villages and create a simple, convenient system (11) • Mark MPA boundaries with clear buoys (13, 14) • Use a mascot who can demonstrate the desired behaviors in a clear and memorable way (13)
Provide knowledge and information in a way that helps to connect current behavior to local values and identities?	• Frame information about the importance of the local fishery to connect with current knowledge and local values and identity (2)
Celebrate local accomplishments to date to build momentum for further action?	• Frame efforts to date as time and resources invested and sacrifices made that will go to waste without ongoing maintenance (4) • Help local government apply for awards about the progress of the local fishery (1, 12)
Support poverty-reducing initiatives to increase time and resources for sustainable behavior?	• Create alternative livelihood programs (11) • Establish savings clubs programs where community members can loan out money to those in need (2, 5)

The resulting intervention used a combination of many of the strategies above as to provide multiple motivations for each of the desired behaviors. After brainstorming and bundling, we balance out our intervention by considering the capacity of the team, resources available, and other constraints that might narrow our list of intervention ideas.

Prototype

Now, select the best intervention idea or bundle of ideas and develop a prototype (small-scale version) that captures its essential features. By creating a small-scale version of your intervention, you can experiment and estimate its success without investing a lot of resources.

One of the ideas Cathy prototyped in Tinambac was to create a mascot who could popularize the ideal fisher who adopted the four behaviors, called 'ProFi.' Short for 'professional fisher,' ProFi sought to borrow a respected title often used for academic professors to make fishing, traditionally seen as a livelihood of last resort, something

for fishers to be proud of and community members to respect. ProFi would represent a sustainable fisher identity and demonstrate the appropriate managed access behaviors publicly. Additionally, when fishers became registered, they would become known themselves as 'professional fishers', or ProFis. This idea incorporated insights from our previous steps through a) making fishing something to be proud of; b) strengthening fishers' sense they are part of a group to give them a reason to cooperate; c) making their behavior observable so there's a social benefit to doing it; and d) creating a memorable and simplified way to engage with the four key behaviors.

ProFi prototype demonstrating the four key behaviors:

Test

Before launching your intervention at any scale, it is valuable to gain feedback from a few members of your target audience and then make revisions. Testing can occur at multiple scales, from something as simple as rapid user feedback from individuals and focus groups, to more sophisticated experimental trials (see Annex B).

Cathy and her team created a ProFi mascot who appeared at community events and began to affix the ProFi brand to various components of her intervention in Tinambac. With its early success, she knew that this would be a good strategy to use in a full-scale intervention.

Launch

When the intervention has been sufficiently tested and revised, it is time to launch at full-scale. This might mean at the full audience or community-wide scale as well as incorporating additional strategies from the Ideate step. In Cathy's case, early successes with the ProFi idea in Tinambac were so promising that the ProFi brand was quickly scaled across more sustainable

fisheries management project sites in the Philippines, where they are still being piloted today to encourage a wider set of behaviors. During this step, we also need to define metrics for evaluating our intervention that will guide our assessment in the next step. For this example, we'll focus on the relative health of the fishery and community pre- and post- intervention.

Assess

Intertwined with full-scale launch and implementation is the critical importance of assessing the impact of your intervention and reflecting on potential improvements. This step helps us know if behavior change is happening and to what degree, so we can share our success, but more importantly, so we can adapt and revise the intervention as needed. Particularly in a case like overfishing and sustainable fisheries management, solving for a complex adaptive system means that the system itself and the behaviors that it influences are themselves continuously in flux, and therefore no single intervention is a permanent and constant solution. One of the major success indicators for Tinambac was fish biomass. As a result of the ProFi campaign, fish biomass in the MPA increased from 33 tons per km^2 prior to intervention to 55 tons per km^2 four years later.[201]
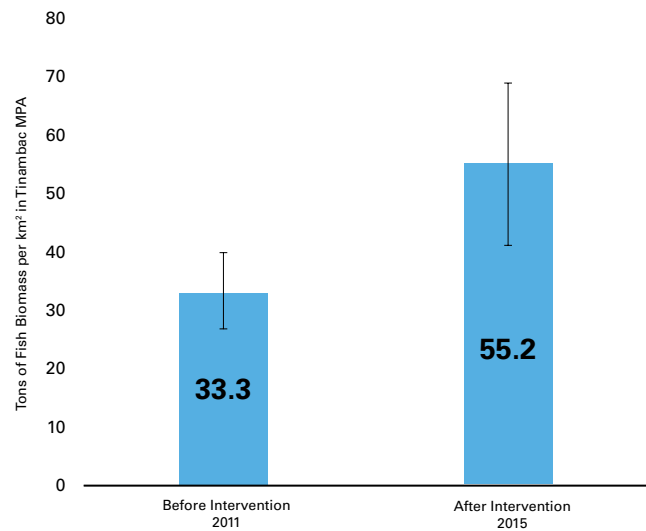
Conclusion

People are and will always be inextricably linked to nature. For the sake of those with whom we share this planet – human and otherwise – we all need to make different choices about how we interact with other species and natural resources. Conservationists have therefore always been in the business of behavior change, though this is only recently becoming recognized as fundamental to all our work.

There is a long list of valiant efforts by governments, NGOs, local communities, and individuals to protect our natural environment. Many of these have brought fantastic success. Many others have not. And many, regrettably, have lacked the rigorous evaluation necessary to know one way or the other. But as we've seen, for the most part they have drawn upon a set of tools that are incomplete. As powerful as regulations, incentives, and education are, and important as their continued use will be, recent behavioral science offers us new ways of thinking about the challenges we face.

We started this report by identifying some of the behavioral problems we need to address. We hope that in reading the enclosed chapters you now have some ideas as to how you might tackle these problems and feel more equipped to do your own work differently. Due to the wealth of information we now possess about human behavior, we have a huge opportunity to apply these insights and transform conservation threats into real-world solutions. While behavioral insights may not hold all the answers, we do know that they are a crucial part to making behavior change happen in the short and long term. We encourage you to take what you've learned here and test the strategies for yourself. This is about using good behavioral science, but also about good measurement and evaluation. Human behavior is complex, and change is difficult. It is therefore imperative that whatever tools we are using, we robustly measure their impact so that we can learn. Without integrating this evaluative approach, we cannot build on our successes nor learn from our failures.

Moreover, there are certain topics we did not cover in this report, and there are many additional target behaviors to those we listed in Chapter 1. Whether it's climate change, invasive species, animal welfare, or water consumption, the strategies we've shared are applicable across all domains of human behavior. We hope that this report empowers you with a set of tools to be a change agent in your field of work, whatever it may be.

If you're interested in working with us directly on your conservation challenge, we'd be interested to learn more and connect about how we can support you. You can find contact information and resources on our websites at www.bi.team and www.rare.org/center. We look forward to hearing from you and hope you'll join us in designing behaviorally-informed conservation solutions.

Annex A

AN OVERVIEW OF CONSERVATION THREATS

The following is a resource for learning more about each of the five threats to conservation we outlined in Chapter 1 as a way to develop a more informed behavior change strategy.

Habitat loss and degradation

Habitat loss through the destruction, degradation and fragmentation of natural environments are a primary threat to global biodiversity.[202] By the beginning of this century, humans had converted two-thirds of the world's terrestrial, ice-free surfaces for agricultural use, industrial production, or urban development. [203, 204, 205] For instance, deforestation has removed or degraded more than 50 percent of the world's forests through conversion to agriculture, building cities, and development projects.[206] Marine systems suffer when the fishing industry trawls and dredges the ocean floor, and estimates suggest that humans have damaged 75 percent of reefs.[207] There are also patterns of small-scale fishers using destructive practices, such as blast fishing, to increase yields quickly.[208] Coastal habitats, such as seagrasses, wetlands, and mangroves, are at increasing risk of damage or loss due to boating activity, agriculture and aquaculture, and development projects.[209, 210]

Habitat fragmentation, where a large habitat is divided into a number of smaller and isolated habitats often separated by human development, is an especially important dimension of habitat loss.[211, 212] Species thrive in large, connected areas that enable free movement over large tracts of land. For example, bees, one of the world's most important pollinators, require diverse and connected ecosystems to thrive.[213] Fragmented landscapes and habitats are more vulnerable to events like storms and fires, particularly as there are a greater number of edge habitats and microclimates created by the new patchwork of landscapes.[214, 215] Isolated or small populations of wildlife are more prone to inbreeding or genetic mutations that can harm survival and resilience to threats in the long term.[216] Habitat loss and degradation have major impacts on biodiversity and dramatically affects overall ecosystem structure and function; when there are fewer resources, there is increased competition, and therefore lower population sizes.[217, 218, 219]

Overexploitation

The process of overexploitation or overharvesting occurs when humans harvest any natural resource, like a species of wildlife, faster than it can replenish. This results in the population diminishing over time, sometimes even to the point of extinction. Overexploitation is the second greatest threat to biodiversity after habitat loss.[220, 221] Approximately 6,241 threatened or near-threatened species are overexploited for trade, recreation, or food provisioning.[222] Overharvesting of marine resources is especially concerning, as an estimated 64 percent of global fisheries have been depleted due to large scale industrial fishing, demand for seafood, sport fishing, and capture for aquarium.[223] Overfishing has huge negative impacts on coastal marine ecosystems as well as local livelihoods for the three billion people who rely on fish as their main source of protein.[224] In addition, mammals face risks from the demand for recreational hunting, traditional medicine, animal products (e.g., fur, horns), zoos, exotic pets, and biomedical research. Some markets are legal, and others are illegal (see next section on illegal wildlife trade). Reptiles are primarily harvested for their skin, shells, meat, and pet trade. Invertebrates are harvested for food, fishing bait, jewelry, and ornaments. And plants are collected for food, building materials, medicine, and plant-based products and goods.[225]

Illegal wildlife trade

Illegal wildlife trade (IWT) is the illegal and unsustainable harvesting of wild species of terrestrial and marine animals and plants and their products, which often embedded in global trade networks and markets.[226] Although trade in many types of wildlife is still legal and regulated, such as by international agreements like the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), the recent growth in illegal trade has caused much concern. IWT is estimated to be worth US$21 billion (£17 billion) per year and expanded in recent decades to become the fourth most profitable international crime after drugs trade, weapons trade, and human trafficking.[227] The items in highest demand include rosewood, elephant ivory, pangolin and rhino horns, reptile skins, parrots, agar wood, and Sturgeon caviar.[228] Poachers and traders tend to target the fittest individuals in a population, which can have negative implications for future generations. Beyond its substantial impact on biodiversity, IWT can have profound impacts on the economic development, governance, and security of societies in both source and consumer countries.[229]

Geographically, IWT spans almost every continent, although assessing the scale of wildlife crime is very challenging because it lies outside 'mainstream' crime and mainly concerns non-human victims.[230] The demand for wildlife products is believed to result from increasing economic growth and development around the world, facilitated by high-speed communications and transport networks.[231] This allows for trades to be made easily, quickly, and secretly through online platforms. Such channels make tracking and addressing IWT extremely difficult and complex. There are also different motivations between subsistence and commercial poachers; the former is interested in smaller animals and acquiring food and medicinal products, while the latter is directly contributing to the global IWT market.[232, 233]

Human-wildlife conflict

Human-wildlife conflict refers to the interactions between humans and non-domesticated species of plants and animals that people perceive to threaten their property, safety, health, economic security, or food.[234] As urbanization, population growth, and the spread of agriculture and transport networks have encroached into natural areas, humans increasingly come into contact with wildlife.[235, 236] Our response against threats of disease, injury, or damage to crops and property is often disproportionate, leading to the excessive destruction of wildlife.[237] Humans use a large set of lethal and nonlethal techniques to kill and trap animals that are believed to pose a threat. This causes severe injuries, or even death, to the target species as well as others who are accidentally shot or ensnared. Moreover, there is a rich social and cultural history of human-wildlife interactions that have created diverse interests, perspectives, stories, and values, as well as powerful institutions surrounding the protection of wildlife.[238] In some places, a deep divide has developed between groups that are "pro-wildlife" and others who are "pro-humans," which results in poor management systems and heated debates over human-wildlife conflict.[239, 240]

Certain species are more at risk than others. Over 75 percent of large cats are affected by human-wildlife conflict, such as tigers, lions, and jaguars. Deer, elephants, bears, wild boars, reptiles, and marine creatures such as sharks and whales are other common animals to suffer from human-wildlife conflict due to their perceived threat to humans, property, or livelihoods.[241] These animals all play an important role in their ecosystems, and there are ripple effects throughout the food chain when they are removed from the environment.[242] For example, humans' overexploitation of a prey species leads to food scarcity for predators who then enter human areas in search of food sources.[243, 244]

Pollution

Material and chemical pollution and waste result from human economic activities; agriculture, industries, as well as urban environments threaten the health of terrestrial, freshwater, and marine ecosystems. Plastic pollution has received a lot of recent attention due to its increasing presence in natural habitats, especially in oceans. It is estimated that plastic production has doubled every 11 years since 1950 and that there are 580,000 pieces per square kilometer in oceans.[245, 246] Marine transport and fishing, poorly managed waste streams, and plastic pellets and granules are some of the major sources of ocean plastic.[247] Both ingesting plastic and becoming entangled in bags and packaging threaten marine life. The UN Convention on Biological Diversity has found that marine plastic affects at least 600 species, with seabirds being particularly susceptible.[248] Chemical forms of pollution also affect the world's water bodies. The growing industrial agriculture sector has led to large increases in nitrogen and phosphorus inputs and runoff into waterways, creating dead zones that are inhabitable for wildlife and also damage coral reefs. The growing use of pesticides adds further toxic chemicals to natural systems and has contributed to the decline of a range of species.[249, 250] Apart from agriculture, pollution from our energy and technology industries are widespread, as in the cases of oil spills, coal mining, and mineral mining.[251, 252, 253]

Annex B

A GUIDE TO THE ROBUST EVALUATION OF BEHAVIORAL INTERVENTIONS

This annex outlines BIT's typical approach to running robust impact evaluations of behavioral interventions and campaigns.

Introduction

Human behavior is complex, unpredictable, and context-dependent. As such we can never be sure, even with the best understanding of the behavioral literature that our intervention is going to be effective. History is littered with examples of 'common sense' initiatives, which, years later under scrutiny, were found to be ineffective or even harmful. For example, the administration of steroids for head injuries to reduce inflammation was standard practice until as late as 2005, when a large-scale evaluation found them to significantly increase mortalities.[254] Moreover, even if we're confident our intervention will have a positive impact, we don't know to what magnitude — a critical piece of information when trading off different options or allocating finite budgets.

And so behavioral insights projects are not just about the novel behavioral science but are also fundamentally about taking an empirical and humble approach to find out 'what works' in the real world. This requires constant evaluation, supported by a sophisticated set of research and evaluation tools. These tools are often absent from the field of conservation, partly because genuine challenges exist, such as measuring illicit behaviors like the consumption of ivory products. But much more can be done using tools that have become standard practice in other fields such as medicine, international development, and public health. The following steps are key to designing robust evaluations.

STEP 1: IDENTIFY YOUR RESEARCH QUESTIONS (AND KNOW WHAT KIND OF EVALUATION YOU'RE RUNNING)

Good research usually starts with a firm understanding of what questions or hypotheses you intend to answer. To avoid confusion from the beginning, it is useful to recognize the type of questions you are posing, which we break into four categories:

Impact evaluation.

This is research intended to quantify the impact of an intervention or policy change on the outcomes of interest. Probably the most common type of evaluation, this aims to answer questions like, "What is the impact of my campaign on the consumption of rhino horn?" or "What is the impact of new enforcement processes on compliance with no-take zones?"

Subgroup (segment) analysis.

This is usually supplementary to an impact evaluation and research intended to illuminate variation in impact between subgroups. This aims to answer questions such as, "To what extent does the impact of my campaign differ for men and women, or between those who have a previous record of corruption versus those that don't?"

Process evaluation.

This is also often supplementary to an impact evaluation and aims to understand the 'how' and 'why' of the intervention's impact. A pure impact evaluation may only look at the final outcome of an intervention, whereas a process evaluation allows us to 'open the black box' and thus understand the impact of an intervention in more nuanced terms. It seeks to evaluate the mechanisms through which the intervention works and understand the delivery of the intervention to identify any problems.

Knowing the mechanics of an intervention's success helps us extrapolate beyond the context of the particular trial and predict when, where, and with whom an intervention might work more broadly. Process evaluations can also be used as a diagnostic tool to help us understand any issues in delivery of the intervention, such that it might be improved next time. Typical questions include the following: *What were the recipients' experiences of the intervention?; What were the motives for changing their behavior?; Did all intended recipients actually receive the intervention?; and Why did some not act on it?* In this manner process evaluations are also integral to the development of a 'theory-of-change,' which aims to illustrate the mechanisms and logic of an intervention's impact. Bear in mind a process evaluation may have its own segment analysis associated with it, i.e., does the mechanism of the intervention differ for different segments of the population?

Exploratory research.

This is research with no a-priori hypothesis being tested but rather an open-ended exploration for interesting findings. Typically, this involves data analysis looking for trends and non-causal relationships that exist in the data.

Note there are two distinct types of exploratory research. In the previous chapter, we described an 'explore' phase of fieldwork to understand the context and help inform the design of interventions. Here, however, we refer to exploratory research (as in not pre-specified or with specific hypotheses in mind) undertaken on data collected during a trial or experiment. Exploratory analysis is inherently less rigorous due to the very high risk of drawing false-positive conclusions: when we look for patterns in the data long enough, we are almost guaranteed to find them. This is why our primary analysis associated with an impact evaluation should be pre-specified (that is, planned in advance before we start exploring the data).

STEP 2: IDENTIFY YOUR OUTCOME MEASURE

What is your intervention designed to impact? For our purposes this would normally be the target behavior, like rates of illegal logging, amount of meat consumed, levels of corruption, or number of people complying with a practice. Often, we might measure multiple outcomes; for example, we might measure both the number of people donating to a conservation cause and the size of those donations, on the premise that our intervention might impact both. Sometimes the outcome measure may not pertain to a concrete behavior, but to an attitude or belief, such as awareness of the illegality of eating pangolin, or attitudes towards a local conservation program. But we must be aware that not all outcome measures are created equal. As discussed previously in this report, due to the value-action gap, as well as self-report bias (the tendency to answer how we think we are expected to), attitudes, levels of awareness, or self-reported behaviors are generally not a good proxy for what we actually care about — peoples' actions.

To keep our evaluation robust, it is useful to classify different types of outcome measures:

Primary outcome measures.

This is the metric of most importance to the research. Usually, the prevalence of a behavior we are trying to change.

Secondary outcome measures.

These are either of subordinate or peripheral importance to the main research question (e.g. reductions in accidents, where the research is primary focused on air quality), or those which make little sense in their own right but which add second-order detail to primary outcomes (e.g., if the primary outcome is the prevalence of eco-driving, a secondary outcome might be the extent to which eco-driving styles sustain after the intervention).

Intermediary outcome measures.

These metrics are 'en-route' to the primary outcome measure we care about, often relating to a particular theory-of-change we have with respect to the behavioral mechanisms on which our intervention depends. For example, if testing the impact of an email campaign on a particular behavior, the email opening rates may be an intermediate outcome of interest.

Proxy outcome measures.

These are imperfect/indirect metrics of something else we would ideally measure. For example, self-reported behavior may be a (often weak) proxy for actual behavior, or the number of border seizures may be a (potentially inaccurate) proxy for the number of people trafficking wildlife products. We use proxies because they can be easier to obtain and may, by virtue of being reliable in their own right even if not perfect, still be more reliable than alternatives such as self-reported behavior. When budgets are limited and no perfect measure of behavior exists, it is quite reasonable to follow the existing data and aim to measure something that is available and reliable, so long as we are aware of the caveats of doing this.

Other considerations

When we have multiple outcome measures, we must be aware of the inflated risk of false-positive results. In other words, if we run statistical tests on 20 difference outcomes, we're likely to find one significant result simply by chance. To control for this, it is good practice to limit our outcomes to only those that we deem important and to relegate others to secondary or exploratory analysis (such that it is interesting to know but isn't retrospectively claimed to be the main result just because it came out as positive). If after this we still have several primary outcomes we want to measure, we should undertake 'multiple comparison corrections,' which make the threshold of claiming statistical significance more stringent to counter the inflated probability of spurious results.

Additionally, as behavioral scientists seeking to influence the adoption of certain conservation behaviors, our outcome measure will relate to a behavior (or awareness or attitudes, if those are what we are interested in), rather than a conservation outcome. For instance, if we want to test the impact of a social norms intervention on the rates of compliance with no-take marine zones, our outcome of interest will be compliance through fishing behavior. As

behavioral scientists the ultimate impact, on fish stocks, is not our primary concern. In other words, we are seeking to promote compliance because we already know that increased compliance is good for fish stocks. If it is not known that no-take zones are good for fish stocks, then certainly this should be evaluated as the first priority, but it is a different research question and not one best answered through a social norms intervention. In reality, research is driven by pragmatism, compromise, and budget constraints, and so there may be reason to include an outcome on actual fish stocks. We should at least recognize this as an extension of the direct objective of the intervention that is to increase compliance among fishers.

STEP 3: IDENTIFY THE BEST RESEARCH DESIGN AND TOOLS

With the main objective being to run an impact evaluation of a particular behavior change intervention or campaign (and with subgroup analysis, process evaluations, and exploratory research being additional elements of this, rather than standalone objectives), we must next determine the best research design. A wide range of options is available.

Randomized controlled trials

Randomized Controlled Trials (RCTs) are the 'gold standard' of impact evaluation research designs. They aim to identify the causal impact of an intervention or some other change on outcome(s) of interest. They do this robustly by incorporating two key components: 1) the presence of a counterfactual sample who do not receive the intervention (creating a 'treatment' and 'control' group), and 2) random assignment of the sample population into these two groups (or more, as there may be multiple different 'treatments' we wish to compare against the control and each other, such as different variants of campaign materials).

The purpose of the control group is to identify what would have happened without the intervention. Without this counterfactual, it would be impossible to attribute any differences we see in our outcomes to the intervention itself, as other extraneous factors may have confounded us. For example, if we want to measure the impact of a campaign on meat consumption among US citizens,

a subsequent drop in meat consumption may be down to our campaign or may have happened anyway due to wider, cultural shifts. Only a good counterfactual group (who also experience the same cultural shifts, but don't experience the campaign) can address this problem. The purpose of allocating the sample randomly is to ensure that the two or more groups are like-for-like in every respect except for their receipt of the intervention (treatment). Randomization achieves this if the sample size is large enough (through the law of large numbers).[a] Small samples risk 'randomization failure' (imbalance between the groups on confounding factors). This is one of the two major reasons for having large samples in experiments, the other reason being to maximize statistical power (our chance of detecting an impact of the intervention, if one really exists).[b]

We outline the basic structure of an RCT below.[c]

Randomization strategy and clustering

When we randomly allocate our intervention to a sample population, we must be wary of spillover and contamination. Spillover occurs where those in the treatment group interact with the control participants, who therefore indirectly benefit from treatment. For example, if testing an educational intervention, we might attempt to deliver it to half the students but not the others; however, since students talk to each other, those in the control group might indirectly be exposed to the treatment. A similar concept, contamination occurs where control participants directly receive treatment, perhaps because a treatment is delivered in one region, and control participants from another region travel into the treatment region.

Both spillover and contamination undermine our ability to robustly estimate the true impact of the intervention. The most common solution is to 'cluster' treatment delivery, randomizing by, say, classroom or perhaps by school,

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a   Note that by randomly allocating our treatment across a large sample, we can rely on the randomisation to ensure our two groups are balanced (equivalent) at baseline (before intervention). We therefore do not need to collect data before the intervention. However, it is nonetheless common to run 'balance checks' to ensure randomisation has successfully created equivalent groups – these are statistical comparisons between the two groups on the outcome measures of interest at baseline (if the outcome measure can be measured at this point), and on other characteristics such as key demographic variables.
b   Note that random allocation to the treatment/control groups is not the same thing as 'random sampling', by which we generate our whole trial population from a random sample of the wider population of interest, to ensure the results are representative of that population (see comments on 'representativeness' later)..
c   Note that an 'A-B design' is essentially an RCT, but comparing two variations of an intervention of process (A and B) with no control group. This is appropriate if we want to know which version performs better, but are uninterested in their absolute impact relative to nothing.

rather than by individual pupil. This aims to keep the treatment and control groups isolated from each other. Our outcome measure may still be at the level of individual student (e.g., test scores, or individual attendance to a conservation scheme).

However, clustering comes with trade-offs. Our statistical power is usually reduced because we have fewer truly independent observations: each observation within a single class will be correlated as they share other features in common. We also risk randomization failure, since randomizing ten schools into two groups of five schools will less reliably give us like-for-like treatment and control groups than randomizing the 2000 pupils at those ten schools into two groups of 1000 pupils.

It is therefore best to randomize at the 'lowest' level possible without risking spillover or contamination (where randomizing the sample into groups 'by pupil' is lower than 'by classroom,' which is lower than 'by school').

Quasi-experimental studies

The main benefit of an RCT is that bias is avoided in the simple and elegant design of the trial, and therefore analysis is simple and there is no need to statistically control for bias. However, running an RCT is not always possible, in which case a quasi-experimental study may be the next-best option.

A quasi-experimental design is one that contains elements of a true experiment, but other elements are missing. Most commonly this means the intervention has not been randomly allocated to the sample. For instance, treatment may have been self-selected, such as if trying to evaluate the impact of an app to help people reduce their meat consumption. This may depend on people voluntarily downloading the app, which we must compare to people who have not (here, the two groups clearly differ in various attitudinal, and possible socio-demographic characteristics). There may be solutions to this that allow us to maintain a true RCT, such as selecting a sample from only those who downloaded the app, and then disabling certain features among a random half to test the impact of those features. However, this is not always desirable. Similarly, we might need to cluster our intervention delivery, for instance running a campaign in one region and comparing it to another region. Unless we can do this across a sample of many regions, we won't have equivalent treatment and control groups as the two regions will differ.

In situations such as these, the general aim is to try to recreate the conditions of a 'true' RCT. Recall the two critical features of an RCT: first, we have a counterfactual (control group). This rules out the option of simply doing a longitudinal study (pre-post comparison) among those who receive the intervention, as we won't be able to

disaggregate the impact of our intervention from changes that might have occurred anyway. Second, we want our control and treatment group to be comparable to each other before the intervention is delivered. This is achieved through randomization of a large sample in an RCT but through other means in a quasi-experiment. Most commonly we use 1) matching (in which we create a control group that we know is comparable on any variables we can measure) or 2) difference-in-difference (which doesn't aim to remove differences between our two groups, but simply measures them, so we can account for them). We might also combine the two: attempting to create matched groups but recognizing this won't be perfect, so we account for any residual differences between them.

Matching (Exact matching and Propensity Score Matching).
Matching techniques aim to create a control group that is matched to the treatment group on all important variables. This will always be imperfect, because we can only match on observable characteristics, and some bias is still likely to exist on unobservables (albeit we benefit from the fact that the observables we match on will often be correlated with other unobservables).

Many matching methods exist. The first choice should generally be exact or coarsened exact matching, where each treatment participant is matched on every known characteristic to a control participant. However often there are too many variables on which to match ('the curse of dimensionality'). A suitable method in this case is Propensity-Score-Matching (PSM). PSM aims to identify the observable characteristics that predict someone's propensity to have the treatment. For example, we can ascertain which characteristics (age, income, education level, address, etc.) predict someone's likelihood of downloading an app with plant-rich recipes. We can then build a control sample that has the same propensity to adopt the app based on their known characteristics. The control group is therefore defined by characteristics, which means they are just as likely to have adopted the app, albeit we know they did not.
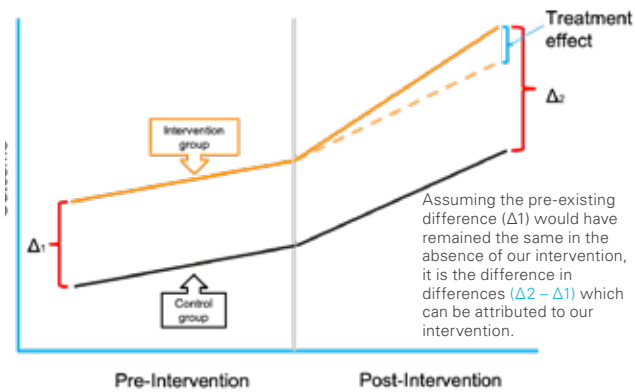
Difference-in-differences (diff-in-diff)
An alternative solution for a non-randomly allocated treatment is to accept that the two groups are different at baseline (before intervention), but to measure and account for this difference. This is possible if we are able to measure our outcomes before intervention. Sometimes this is straightforward, because we can retrospectively access data (as with energy billing data, for example). Other times this must be considered in advance of the intervention being delivered, to include an extended period of baseline data collection.

The principle of a difference-in-difference technique is therefore to measure the difference between the two

groups before the intervention is delivered, and again after the intervention is delivered. It is the difference between the differences that can be attributed to the impact of the intervention itself. We illustrate this simple logic of a diff-in-diff design in the image to follow. For instance, if we want to reduce the number of Chinese workers in Uganda from bringing ivory and pangolin scales home with them, we might use two large construction firms operating in Uganda: one receiving a campaign, the other not.

Assuming the pre-existing difference (Δ_1) would have remained the same in the absence of our intervention, it is the difference in differences ($\Delta_2 - \Delta_1$) which can be attributed to our intervention.

Recognizing that IWT seizure rates already differ between the two, we might see the following (where 'outcome' is seizures per month).

Diff-in-diff designs rely on the critical assumption of 'parallel trends.' This assumption dictates that in the absence of the intervention, the difference between the two groups would remain constant, i.e. their trends are moving in parallel. To test this assumption, we need multiple data points before intervention.

Laboratory experiments

The laboratory (online or in-person) offers a controlled environment in which to test hypotheses. Their main advantage is that the researcher has great control over all factors and usually has the opportunity to measure things with great precision and specificity. This means, for example, we could measure such things as eye-movement and gaze, or comprehension and retention of information when testing the design of campaign materials. By having such control over the environment, we can be highly confident that measured effects are attributable to the intervention being studied. This means they have very high internal (causal) validity.

However, their main drawback is weak external validity, or our ability to generalize the result to real-world contexts. There are often many reasons why a result identified in a lab would not be observed in the real world. This can sometimes be partially addressed, for example, introducing real financial incentives to mimic real-world consequences, or undertaking 'lab-in-the-field' studies where controlled experiments are done with the target audience in their environment. As with all research designs, we should use the appropriate tool for the job, and these pros and cons

should be borne in mind when considering a particular research question.

One powerful application for laboratory studies is as a precursor to a field trial. For example, we might test multiple variants of an intervention, or to hone certain design elements in detail and in a manner that is often quicker and cheaper than a field trial. The most promising design can then be run in a field trial compared to a control group.

Surveys, focus groups, and interviews

Surveys, focus groups, and interviews are not research designs. They are research tools for the collection of data. When campaigns are said to be evaluated through consumer surveys, commonly this means asking questions such as, "Are you more or less likely to purchase a tiger amulet after seeing this campaign?" This is generally meaningless; there is no counterfactual group to compare the responses to, and there will be severe self-report bias as respondents err towards the answer expected of them. Even sincere responses won't reflect real-world behavior, which is determined by many forces beyond self-reported intentions or attitudes.

However, surveys can also be used well. All of the above research designs (RCTs, quasi-experimental, lab experiments) could use surveys to collect outcome measures, such as attitudes towards an ivory ban, or awareness of a local conservation effort. Alternatively, we might use surveys to collect other demographic data, such as age, gender, and income, to run balance checks, assist with our matching, or to feed into our statistical analysis as control variables. Within the context of a robust trial design, the issue here is not with using surveys per se, but rather with ensuring the data we collect support a reliable outcome measure for the thing we care about.

More specifically, surveys are appropriate for subjective outcomes (such as people's experiences of an intervention, including metrics of emotion, awareness, comprehension, or attitudes). They are also fine for outcomes where respondents have no conscious or unconscious reason to be untruthful, such as capturing basic demographic information. They are flawed but sometimes necessary where we rely on memory (e.g., keeping a food diary to measure amount of meat consumed). Here, we can often be confident the self-reported behavior is at least correlated to actual behavior, so making comparisons between two large groups should still be reliable. They are more flawed for outcomes where there may be a motivation to be untruthful (e.g., illicit consumption of wildlife products, or where respondents otherwise aim to please the researcher with the correct answer), or where we infer something beyond the face-value of the response (e.g., assuming that attitude changes lead to behavior change, which they often don't).

Where we must rely on self-reported behavior, various techniques exist to improve the validity of responses. These generally aim to create some kind of anonymity, so respondents feel comfortable giving the truthful answer. For example, the 'unmatched count technique' presents a list of behaviors to respondents and asks them how many they do, without specifying which. By comparing two groups' responses, one who receives a list of ten irrelevant behaviors and one who receives a list of the same ten plus the one relevant behavior, we can estimate the prevalence of the relevant behavior in our sample. Similarly, if we want to understand how many times people have bought ivory, we can ask them to add a random number between -10 and +10 to their response. Their own behavior is then hidden within random noise, but across a large enough sample, the average response will be accurate (as the random numbers average to zero). However, these methods present a major trade-off: they rapidly become convoluted and we may do more harm than good by reducing respondents' comprehension of the question. Simple reassurance of confidentiality and anonymity can often be just as effective, or asking people, "How often do you think your friend does X?" instead of "How often do you do X?" All of these approaches have pros and cons, and the skills of a good researcher are invaluable in designing the best solution.

Beyond surveys, we might use focus groups, interviews, ethnography, and other qualitative research tools. These are generally less suited for quantifying outcomes, due to lack of precision and researcher bias. These tools are unavoidably subjective and interpretive to the observing experimenter. However, they bring value by capturing great depth of insight. They are key components of process evaluations to understand the mechanisms, customer journey, and experiences of an intervention. They are also useful in early exploratory research to create hypotheses, or to aid the design of an intervention through a better understanding of the problem and the people to whom we are delivering the intervention.

Ultimately, we must aim to use the most appropriate tool for a particular purpose. Importantly, the data-collection tools (including surveys as well as more concrete sources of data) should be employed within a robust research design, RCT or otherwise.

Other considerations

Non-compliance
Non-compliance may occur with treatment. For example, if our intervention is the provision of an app, we may randomly divide our population into a treatment and control group and provide the app to the treatment group only. However, we cannot force people to download and use the app, and so only a self-selected fraction of our treatment group will truly be treated.

To address non-compliance and self-selection bias, we could draw upon the quasi-experimental designs described above. For example, we could analyze only those who used the app, against a fraction of the control group who have been matched to the successfully treated cohort.

Alternatively, it may be more appropriate to run an 'intention to treat' analysis (ITT). An ITT compares all those offered the app to all those in the control group. In other words, we use the groups originally intended for the RCT, and we simply acknowledge the non-compliance. This means we are answering a slightly different research question: we are no longer measuring the impact of the app on those who use it, but the impact of providing the app on the whole treatment group. This will be a weaker impact given some aren't using it, but if you want to know the benefits of producing and distributing this app, this is actually the more relevant real-world scenario. Moreover, since this is still a true RCT, it is a robust approach and free from bias. If the researcher also wants to know the impact of the intervention on those who actually adopt the app, an average treatment effect on the treated (ATT) can be estimated from the ITT.

Statistical power and sample size
Statistical power is our ability to detect a difference between two populations (i.e., to detect an impact of an intervention) if a difference is truly present. The larger the sample, the more able we are to detect a small difference and deem it statistically significant (that is, highly likely to be real and not merely due to chance). The intuition of this can be explained as follows: If we believe a coin to be unfairly weighted, we might toss it multiple times to test this hypothesis. If we toss it four times and receive three heads (75 percent) we cannot draw confident conclusions: there is a fairly high probability that this outcome could be observed purely by chance. If, however, we toss it 4000 times and receive 3000 heads (also 75 percent), we can be highly confident the coin is weighted (the probability of this happening by chance is extraordinarily small). In other words, the more observations we have, the more statistical power we have to detect an effect of a given size. Obtaining more observations is achieved by either having a larger sample size, and/or by collecting multiple successive data points per individual where appropriate (e.g., measuring weekly meat consumption for 12 months after the intervention, rather than for 2 weeks).

We therefore run power calculations to determine the sample size required for a trial. This is a function of the 'power' (the chance we have of detecting an effect if there is one present, conventionally set at 80 percent), the threshold of statistical significance (the certainty we require to conclude that an observed difference is real, conventionally set at 95 percent), the level of natural variation in the data (more variation masks the effect, so larger samples are required), and the effect size we expect

or need to be able to detect (smaller differences between groups require larger samples to detect, so in the above example, if we received 60 percent heads instead of 75 percent, we would need to toss the coin more times before being sure it was weighted).

Representativeness

A finding is considered representative if it can be generalized to the wider population to which the intervention might apply. For example, if we only run a pilot experiment in one region, we may be unable to generalize results to other regions, if other regions differ on characteristics that might alter their response to our intervention. Similarly, if severe self-selection bias occurs such that only a particular 'type' of person receives the intervention during a trial, we may use matching or another quasi-experimental technique to generate a comparable control group and thus robustly estimate the impact of the intervention on that group of people, although the result might not be representative of the wider population. It can be helpful to run representativeness checks on the treated sample population, comparing their key demographics against datasets from the wider population.

STEP 4: PRE-SPECIFY YOUR RESEARCH PROTOCOL AND THEN LAUNCH THE TRIAL AND COLLECT DATA

Researcher bias, seeking out and focusing on the result we would like to see, is a very real problem even among the most conscientious researchers. For instance, if the data suggest our intervention had no impact, we'd

be more inclined to triple-check the analysis and run additional tests on secondary outcome measures than if we find a significant effect. It is therefore good practice to pre-specify the research and evaluation strategy before data are collected, clearly specifying the hypotheses, the primary analysis and outcomes, and the statistical tests to be used. Additional tests on other outcomes or alternative statistical analysis can be undertaken but would generally be secondary or exploratory, and thus not detract from the main result.

As you can see from these steps, there is a lot to consider when rigorously evaluating a behavioral intervention. We recognize it is not easy and hope that these steps give you some resources, tools, and insights moving forward.

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