Levers of Behavior Change

A Guide to the Science and Applications

rare | CENTER FOR BEHAVIOR & THE ENVIRONMENT

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Introduction

Introduction

Designing an effective behavior change strategy is no easy task. People are complicated, and researchers have conducted thousands of studies to understand and explain human behavior. As a result, there are many possible ways of characterizing the motivations and barriers to behavior change. Rare's Center for Behavior & the Environment has developed a simple framework for behavior change insights comprising six behavioral levers.

What is a lever?

A lever is typically something that you pull to cause a change in something else. For example, if you think of a machine, a lever might be something you pull or switch to turn on the lights, cause an arm to move, or lift a weight. Using this metaphor, we define behavioral levers as types of strategies that we can apply to change behavior.

Each lever represents a category of evidence-based strategies from behavioral and social science. The levers are discrete and can be pulled in different combinations for different effects. Behavioral and social science principles help designers understand and analyze their core actors' motivations and barriers to behavior change. These principles also help to design effective interventions because we can link those motivations and barriers to ways to address them. There is no "right" framework for this, but we have found it helps to have some common language for the internal and external, personal and social, and conscious and unconscious reasons for change.

Why these levers?

For decades, the traditional environmental toolkit has consisted of strategies categorized into three common levers to change behavior: information, rules and regulations, and material incentives.

These levers can be effective in specific situations, but they are often insufficient on their own. Information does not necessarily lead to action, incentives can backfire or send the wrong message, and rules can be difficult to enforce. Research from behavioral science tells us about other powerful insights that could drive behavior change and enhance these commonly used tools. For example, people may make decisions based on their emotions, other people's expectations, and cues in their environments. By expanding the toolkit with additional levers — emotional appeals, social influences, and choice architecture — we can design solutions that reflect people's full range of behavioral motivations and barriers.

How is this framework different than other frameworks?

Many frameworks exist to capture behavior change insights. Some frameworks describe their behavioral principles and strategies as broad categories (e.g., automatic thinking, social, choice environment), while others list many specific behavioral, cognitive, or social principles (e.g., messenger effect, salience, loss aversion). Some frameworks distinguish between rational and irrational forms of thinking in the way they describe behavioral insights, and some also distinguish between 'fast' and 'slow' or System I and System II thinking.[1] These categories may help people understand the important difference between thought processes that are more deliberate and effortful (rational) compared to those that are more automatic and subconscious (irrational). However, such categories may lead people to develop rigid boundaries or oversimplified reasoning when selecting specific strategies for behavior change.[2] For example, emotional framings can appeal to our 'automatic' processing system given how we respond to emotional events, but they can also be intensely rational in pursuing individual needs (e.g., seeking safety from a threat).[3] A final category of frameworks is models or diagrams for behavior change; these can help us see patterns and lead us to look for connections that do not exist in our data.

Recent frameworks focus on behavioral principles that represent newer insights from behavioral science, such as choice architecture, that depart from the more traditional rational actor models. These frameworks tend to exclude strategies such as providing material incentives and information or enacting regulations. Our framework includes these levers to highlight their value and role in changing behavior. While behavior change *can* be as simple as using one lever, it's more likely to require a combination of them. The levers are designed to work together to overcome a variety of motivations and barriers. These behavioral interventions are designed broad enough to encompass a set of related tactics (e.g., social influences) and contexts, yet narrow enough to distinguish them from other levers.


Choice Architecture + + +
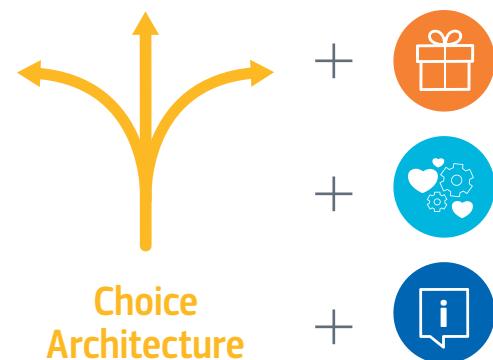
Where do cognitive biases fit in?

The levers are not designed to correspond to cognitive biases per se, but we encourage practitioners to evaluate the root barriers and motivations that may be enabling the bias to select the right lever. Cognitive biases are patterns of thinking reliably found in human decision-making. While these are interesting to identify in your data, knowing about a bias does not guide you on how to address it. The levers are designed as categories of intervention strategies for behavior change that intentionally align with principles of behavioral science. While there is some alignment between the levers and biases, they do not match for every scenario. For example, take the bias of risk aversion, where people tend to stick to doing what they know versus what they do not know, especially if risk is involved. In the case of farmers, there is evidence that social influences and information are helpful levers to help them overcome the fear of adopting new technologies.[4] Yet for others, material incentives and emotional appeals could be important through how the message and perceived benefits are framed.

Can the levers be universally applied across contexts and cultures?

This issue is often known as the generalizability puzzle: if something works in one context, will it apply to another? Thankfully, recent advancement in this space helps us begin to answer that question. Too often, those considering the scaling of a program focus exclusively on geography, asking whether a particular intervention was tested in the same country or region. However, asking *why* the intervention worked is critical as a starting point.[5] If you have a behaviorally-informed theory of change that includes psychological and social variables (such as the beliefs, knowledge, or attitudes that you expect to change for behavior to change), then that can give you clues about whether those variables apply in other contexts to use the same levers. In other words, if there are similar psychological reasons, motivations, and barriers for change, you can focus your behavior change strategy on localizing to the context rather than designing an entirely new intervention with different levers.[6]
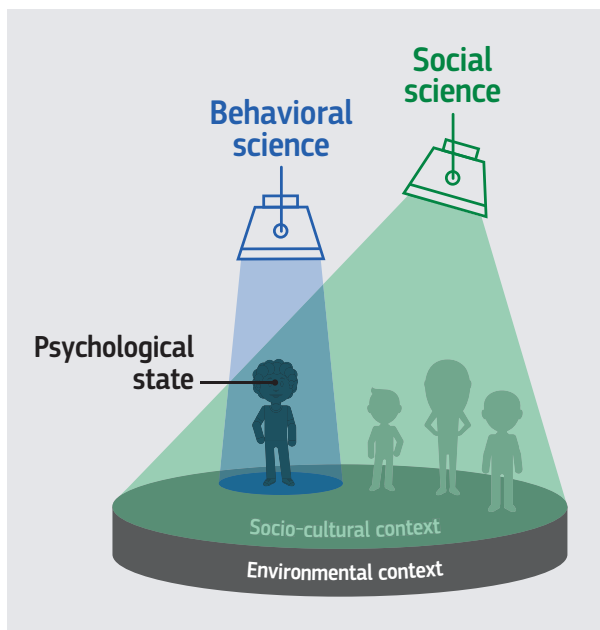

A diagram of how a person's psychological state and decisions occur at the intersection of socio-cultural and environmental contexts that can be observed using a behavioral and social science lens.

Of course, we should be mindful of the context in which we are working. We all have uniquely lived experiences and make our decisions within a particular environmental, social, political, and cultural context. Lessons from social science help us see how social structure defines an individual's identities and roles within a community, as well as how an individual's actions can shape the social structure for themselves and the network in which they are embedded. From this perspective, the feedback system of socially defined identities and roles creates the foundation for individuals to make choices.[7] Common identities addressed in the social sciences include gender, race, ethnicity, religion, socioeconomic status, and various culturally specific positions of power through prestige and authority. Both formal rules, such as laws, and informal rules, such as social norms, can dictate directly and indirectly how individuals of certain identities can or must behave, with their behavior then feeding back into socially defining those same rules.[8]

An understanding of the socio-cultural context in which a behavior occurs is essential information for any behavior change intervention's design. Before working with the levers, behavior change designers should dedicate adequate time to mapping out the systems surrounding a behavior. These systems will likely significantly impact the behavior levers and strategies available, whether behavior change is feasible, and, if so, for whom. In understanding this broader context, designers learn about the options that are available to different actors, who carries decision-making power, and the behaviors that could reinforce or challenge existing power structures. The Frame and Empathize steps in Rare's Behavior-Centered Design approach can help uncover these key dimensions.

Behavior-Centered Design Journey

1. FRAME

2. EMPATHIZE

3. MAP

4. IDEATE

5. PROTOTYPE

6. TEST

7. LAUNCH

8. ASSESS
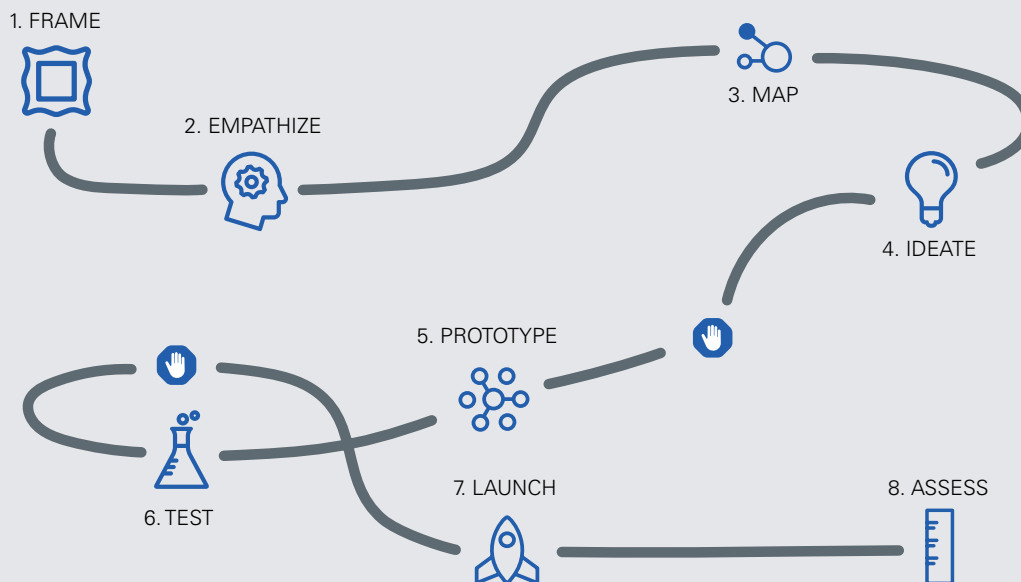
Behavior change designers bring information gaps and assumptions into their work when they are not embedded in the context in which they wish to effect change. Self-aware designers benefit from noting any personal assumptions or biases upfront before they take the time to understand the behavior and context. Designers should also consider co-designing with the stakeholders of the behavioral problem to ensure they have an informed perspective at each step of the process and gain a deep understanding of the behavioral problem before generating any solutions.

How to use this guide

Each of the following chapters is dedicated to a lever. These chapters will capture the definition of the lever, a background of the behavioral science that supports its core principles and strategies, lever applications, and other tips such as lever combinations. When designing your behavior change solution, we recommend reviewing your research on target actors and behaviors to select which levers and strategies are most appropriate and effective for your given context. Each lever contains many different and related strategies, so selecting the right ones is both an art and a science, involving testing and feedback. Reviewing the steps of Behavior-Centered Design provides additional guidance about when to apply the levers to your work. We hope that the stories of application will also provide examples of what they look like in the real world to help you be more successful.

Emotional Appeals

Using emotional messages to drive behavior

About Emotional Appeals

Emotions, such as pride, fear, and anger, are ever-present in our decisions. Our emotional reactions to messaging, ideas, others' behavior, and options presented to us influence our actions. This influence occurs through the discrete emotions we experience, as well as how certain ideas align with our values and sense of self, social groups, and community. In all cases, how something makes us feel gives us important information about how we are likely to act.

Growing research shows that emotions motivate our actions. Sometimes we talk about emotions as irrational or separate from reason, but we can be emotional *and* deliberate.[9] Many emotions have evolved to guide us to make decisions that help us achieve our goals or become better equipped to deal with life events, including ones that may not manifest at that specific time. For us to care about something, to feel something, it probably has meaning to us — that's worth paying attention to.[10] As a result, leveraging emotions and tailoring messages to what matters most to people can be useful behavior change strategies.

Principles & Strategies

Leverage emotions in specific contexts

Six emotions are particularly relevant for environmental work: pride, hope, fear, anger, the prospect of shame, and interest.[11] Each of these emotions has associated behaviors based on ways that emotion evolved to help our species over time. For example, pride functions by getting people to engage in and demonstrate to others that they have performed a socially-valued or prestigious act.[12] Therefore, pride could be useful for spreading a new norm of desirable, pro-environmentally behavior in a community. On the other hand, anger functions as a motivation for negative sanctioning of norm-violating behavior, which could be useful for stopping a behavior or stabilizing current behaviors.[13] Furthermore, interest causes people to approach what they find novel, whether they are people, places, things, or experiences, and it helps to increase current knowledge.[14] Incorporating interest-generating materials into our behavioral solutions can support community engagement with new behaviors. Knowing this, we can think about how we might apply emotions strategically as a part of behavior change interventions.

Tips for success

- Be mindful of display rules — the local norms around which emotions are acceptable to show and how — and gender dynamics for emotions in different cultures, as this may influence which emotions are appropriate to feature.

- Make information feel relevant and personal.

The strategies:

- **Pride:** Use to motivate people to show others what they have done when they have achieved a goal or done the right thing.

- **Hope:** Use to motivate people to start a behavior when they can achieve a desired outcome while facing a challenge.

- **Fear:** Use to motivate people to avoid risks when they experience uncertainty or an immediate threat to their wellbeing.

- **Anger:** Use to motivate people to confront others when they witness injustice or experience threats to personal autonomy.

- **Interest:** Use to motivate people to seek information when something is novel and complex.

- **Prospect of shame:** Use to motivate people to avoid an action when others might find out about socially undesirable actions.

See it in action

→ An experiment on the effects of different emotions on support for climate policies found that hope and fear increase support for climate policies across ideologies.[15]

→ Interviews with climate activists in Denmark and Sweden revealed the power of using anger and hope to create collective action movements. Anger can motivate people to confront others about things they find unacceptable, and hope helps motivate people to start a behavior when they envision a better future outcome. The sequence of collective anger transitioning to action through hope has been effective — hope propels action while collective action generates hope and manages fear.[16]

→ 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.[17]

Personalize the message

Emotional responses show up in our values and attitudes as well. We all have different experiences and belief systems that can shape what messages we find compelling. For example, messages of sustainability tend to be effective only among those already onboard; we tend to discard, ignore, or downplay information that goes against our existing worldviews and beliefs, and bias us towards information that validates us (also known as confirmation bias).[18] We are also more likely to respond to messages and consider information that is personalized to us, our context, and what we care about.[19] Similarly, we are more likely to pay attention to something that comes from an individual human rather than a faceless organization. Evolution has helped us to empathize with people we know to form group bonds; abstract statistics do little to stir our emotions or compassion.[20] When we are thoughtful about our messaging and tailor it to our core actors, we can be successful in getting through to them.

The strategies:
- Put a human face on campaigns and focus on a single story over abstract statistics.
- Tailor messages to make them personally relevant, relatable, and appealing.

Tips for success

- Be intentional when selecting which emotions to evoke based on the context and desired behavior.

- Don't assume 'negative' or 'positive' emotions as less effective — let the data and context guide you.

See it in action

→ A US university research team wanted to see if they could reduce household energy consumption through different messaging strategies. Their most effective message was appealing to households' existing values of health that linked energy use and pollution to childhood asthma and cancer. The program reduced energy consumption by 8-10% consistently over 100 days and nearly 20% among households with children.[21]

→ The World Resources Institute and Behavioral Insights team found a key insight 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.[22]

→ Mexican non-profit Centro de Investigación y Servicios Profesionales A.C. (CISERP) developed a range of community engagement materials promoting pride in ancestral agricultural practices and in the native Tsotsil language to increase adoption of the milpa crop-growing system. As a result, 90% of the 324 milpa farmers adopted the agroecological practices promoted by the campaign and 80% of the targeted farmers began using and exchanging native seeds.[23]

Photo Credit: Project Cane Changer

How positive emotions boosted sustainable sugar cane farming

The problem

Excess runoff from sugarcane farms into the Great Barrier Reef impacts reef health. In recent decades, the Australian government has tried to encourage farmers to modify their practices to be more sustainable through enacting laws and offering economic incentives. Despite these efforts, change has been slow and insufficient.

The solution

Through their research, the Evidn team learned that sugar cane farmers felt the public saw them as part of the problem by polluting the reef, not part of the solution. Project Cane Changer emerged with a few strategies to increase the uptake of farmers' sustainable behaviors and change the poor reputation of farmers. Cane Changer's slogan, "Setting the Record Straight," was a messaging strategy to change the public's perceptions of farmers. The Cane Changer team also identified that being a sugarcane farmer and residing near the Great Barrier Reef was central to their identity. Feeling part of the community of sugarcane growers was positively correlated with a desire to improve farming practices. This further boosted farmers' sense of pride in being stewards of the reef. Finally, the program offered trainings on sustainable practices to increase farmers' feelings of self-efficacy and belief that they were part of the solution. After three years of the program, sustainable agricultural accreditation increased by over 300%, leading to practices that sent cleaner water into the Great Barrier Reef.[24]

OTHER LEVERS APPLIED: **Social Influences**   **Information**

Social Influences

Leveraging the behavior, beliefs, and expectations of others

About Social Influences

Humans are deeply social creatures. We have evolved to be highly sensitive to the actions of those around us and to use people's expectations and beliefs as guidance about how to act. Social norms shape how an individual's actions are influenced by others' beliefs and actions as well as what others think an individual should be doing. One type of social influence is "descriptive norms," where we perceive what people are doing and thinking as 'normal.' Another type is reputational, which researchers call "injunctive norms," where we consider how people think about us, which shapes our reputation in a group.

As a result, observability of our and others' behaviors, promotion of 'normal' behavior and beliefs, and accountability measures among our social networks are all important. Social norms can become self-enforcing once a community expects a given set of behaviors, making this lever especially powerful for lasting behavior change.

Principles & Strategies

Make the target behavior observable

How observable our behavior is, such as whether people can see us making decisions, impacts our choices as we are often more willing to break social rules in private. Peer pressure and the need to maintain our reputation help us to comply when our self-interest may lead us astray from socially acceptable behavior. 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 recognition, which we can amplify by making the behavior more noticeable to others or increasing the level of social reward. This principle works in conjunction with the next one of highlighting good behaviors to reinforce the perception that they are normal. Social proof of what behaviors are common and 'right' encourages others to do them as well.[25]

Tip for success

Be sure to highlight norms that are trending in the direction you want, rather than in the direction you do not. Sharing that a small proportion of people are doing the target behavior may not motivate people since it sends the signal that the behavior is uncommon.

Additionally, 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 private intentions. We often make a great effort to 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 more visible, it becomes more significant to break this promise in the future, and we invite people to hold us accountable for that behavior. Group incentives can also be effective as we a) monitor each other's actions to ensure we don't miss out and b) feel a sense of responsibility not to let others down since our behavior links to a shared outcome.

The strategies:

- Publicly broadcast who has and has not engaged in the target behavior.

- Provide a way for people to show they are doing the target behavior.

- Encourage public commitments or pledges to drive the target behavior.

See it in action

→ Program designers identified that reducing energy consumption during peak periods was a public goods problem: everyone was better off reducing their air conditioning usage to stabilize the electric grid, but each individual did better free-riding on the reduction of others. In creating an energy reduction program, designers found that increasing observability increased participation because others would know whether each actor participated. They designed an intervention that made sign-ups to the program public rather than private, which led to a threefold increase in participation.[26]

→ The organization TRAFFIC recruited traditional medicine practitioners to publicly pledge to refrain from using rhino horn. By socially binding these practitioners to their commitments and making the new norm more visible in the practitioner community, the program has already led to a measurable reduction in the use of illegal wildlife products.[27]

Tips for success

- Consider the socio-cultural context for desired behaviors and whether there are any risks to people showing publicly that they have adopted them.

- Trusted messengers must also be credible in the target behavior of interest. Ideally, a good messenger is popular and trusted to do the behavior correctly. Be wary of using celebrities as messengers unless they are experts or experienced on the behavior change topic.

Highlight others who are doing the target behavior

The behavior of our peers influences us for multiple reasons: we infer from their actions that it's a sensible or appropriate thing to do (e.g., if many 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.[28] However, we often have skewed perceptions of what's normal, so correcting these misconceptions by showing what the majority is doing can shift behavior. Providing social proof of what others are doing is particularly helpful when people are uncertain about what to do.[29] Where behavior is not widespread, it helps to share clear examples and personal stories that are relatable, memorable, and highlight individual successes. These stories can show others how they won't be acting alone. Beyond describing people's current behavior, recent studies have demonstrated the power of *dynamic norms* as well. Dynamic norms go beyond describing what people are doing now by describing what behaviors people are starting to do or doing more. These messages send a signal to others to join the growing movement and not be left behind.[30]

Social identity theory highlights that we care about who is taking action. We adopt the norms and practices of our perceived 'in-group' but often refute those of our 'out-group'.[31] This means that our peers, or individuals who changed their behavior and used to be 'just like us,' are both relatable and credible. Beyond peers, we trust the advice of those who are credible experts and have perceived legitimate authority.[32] 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 organization).

The strategies:

- Share that people are currently doing the target behavior.

- Promote cases of success with the target behavior.

- Leverage credible and trusted messengers doing the target behavior.

- Facilitate peer or community exchanges where others can observe and gain support for the target behavior.

See it in action

→ A United States state forest designed an experiment to see whether posted signage, personal communication from a uniformed forest naturalist, or a combination of both had an impact on 'leave no trace' behaviors such as littering, tree damage, and improper disposal of human waste. The most impactful strategy was a forest naturalist demonstrating proper behaviors as a key and trusted messenger.[33]

→ An intervention in Belén, Costa Rica successfully reduced water consumption by high-consumption households by 4-5% by sharing descriptive norm information about their neighbors' water use.[34]

→ Across several countries, farmers were more likely to adopt new techniques or to sign up for agri-environmental schemes if the recommendation comes from other farmers[35] or if they know that other farmers have signed up.[36] Compared to a control group, a set of French farmers who were told that 80% of their peers intended to renew their payments for ecosystem services (PES) contract (or that 20% of their peers did not intend to renew) were 18% more likely to report that they were willing to sustain their current sustainable practices.

→ In Namibia, the 'Rhino Rangers' program supports local communities in choosing rhino custodians from within their communities and then pays, trains, and equips these rangers to carry out rhino monitoring. The positions increased rangers' social status and made them advocates for rhino conservation within their communities. During this time rhino sightings were at a record high of 918 separate events, and in just five years, poaching had declined by 83%.[37]

Share social expectations about the target behavior

Norms are only effective if there is enforcement or accountability. The belief that others will know if we do the problem behavior or that they believe we should be doing the target behavior are powerful motivators.[38] We are not willing to risk the social repercussions of breaking from the group's norms and therefore are more likely to comply. Creating opportunities to show support or situations to learn about the social expectations for a behavior can reinforce accountability.[39] A final motivator is reciprocity: we have the innate tendency to return favors and feel guilty when we do not. This psychological drive pushes groups towards harmony and cooperation and supports existing social norms.[40] For example, when someone does something nice for you or gives you a gift, you will likely feel more inclined to do something nice for them in the future.

The strategies:

- Provide visible indicators that signal support for the target behavior (e.g., hats, badges.)

- Communicate that people think others should be doing the target behavior.

- Highlight the possibility of social sanctions for doing the problem behavior.

- Create situations in which people feel like they should reciprocate.

- Create conversation around shared beliefs and expectations.

See it in action

→ In Perú, a local campaign promoted the importance of natural resources, as well as the individual and collective benefits that reciprocal water agreements could have on the community for upstream and downstream users.[41] Downstream users compensated upstream farmers in exchange for their environmental management upstream. This campaign resulted in water users signing 25 reciprocal water agreements, collectively protecting 362 hectares of threatened habitat in the Quanda micro-watershed.

→ After a successful social marketing campaign in Laos shifted community norms around the illegal hunting of tigers, state officials introduced a wildlife crime reporting hotline. This hotline enabled citizens to report any suspected tiger hunting and reinforce local norms and expectations for hunting behavior. In the six months when the hotline was operational, state officials received 250 citizen calls that led to 22 arrests.[42]

→ A study in Colombia showed that they could align farmers' expectations and behaviors to conserve their forests by providing collective payments only when all farmers achieved a forest conservation goal.[43]

Photo Credit: Jason Houston for Rare

How peer support and observability increased solar adoption

The problem

Historically, a variety of barriers — including cost, access, and lack of implementation knowledge — have prevented the widespread adoption of solar energy. Despite a recent increase in accessibility and decrease in cost, many communities, especially those of low and middle income, do not have the same rate of solar energy adoption.

The solution

Over the last decade, researchers have been exploring whether solar energy adoption is "contagious".[45] Their study found that the mere presence of a solar roof project increased the average number of installations within a half-mile radius by nearly 50 percent. The Solarize program organizes events to make solar installations even more visible and works with people called "solar ambassadors." Solar Ambassadors are local, trusted people who select solar installers, educate their neighbors, and connect them with resources about solar energy that would most resonate. Solarize also worked with local and state officials to promote solar energy alongside volunteers. The solar installer followed up with interested residents to offer a discounted price for solar panel installation, which decreased with each resident sign-up. The installations were completed in a public and easily observable setting. Given their rooftop placement, these panels remained an observable reminder of renewable energy to neighbors and other community members. Campaigns running for 20 weeks reduced the cost of solar by 20% and increased solar installation by three times in participating communities. In three years, the campaigns helped create a change from 800 to 12,500 low- and middle-income homes with solar. Moreover, 90% of residents reported high satisfaction with their installations, with more than 80% stating they would recommend solar energy to their neighbors.[46]

OTHER LEVERS APPLIED: **ℹ Information**   **🎁 Material Incentives**

Choice Architecture

Changing the context in which choices are made

About Choice Architecture

Subtle cues in our environments about what to do and how to act are everywhere. While we may not realize it, the digital and physical spaces surrounding us are often designed with particular goals in mind. Employing the choice architecture lever means deliberately designing a choice environment that influences people's decisions — some call these "nudges." For example, we can direct people's attention or leverage cognitive biases to shift choices towards or away from certain options implicitly. We can also provide support and shortcuts to help people reach their behavior change goals. One way to think about choice architecture is like a GPS — it's a guide that gives you a recommended route on where to go, but you can always turn it off if you prefer.[47] These strategies help us quickly identify what to do, often subconsciously, in the moment.

Principles & Strategies

Direct attention

Given humans' limited cognitive bandwidth and attention, we can support people by reducing informational clutter and bringing options to the forefront. For example, we can make options more salient to direct our attention to the most novel or relevant ones. Alternatively, we may re-order options or make the good options more available, both of which have been shown to influence our choices.[48] 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.[49]

There is also a wealth of evidence that our decisions are predictably skewed by our reliance on heuristics (mental shortcuts) and our susceptibility to biases, especially when a set of choices is presented to us.[50] As a result, designers can frame information and choices in a way that harnesses or addresses these biases for pro-environmental goals. 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). 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 now. We can also help people make different decisions by making the long-term consequences of their decisions more salient and being mindful of the order of options presented.

The strategies:

- Make the target behavior the default option.
- Prompt a decision between options.
- Draw attention to the target behavior by making it salient.
- Emphasize long-term benefits of behaviors over immediate ones.
- Emphasize variables that frame your target behavior as the correct choice.

Tip for success

Use choice architecture and nudges to support people's goals as much as possible. People are very sensitive to manipulation and may respond poorly to feeling that someone is trying to control their actions. Being transparent about your intentions has been shown to not hurt a solution's impact.[51]

See it in action

→ An intervention seeking to increase green energy consumption for 40,000 German consumers swapped the typical 'opting-in' policy on green energy contracts to one where consumers were automatically enrolled unless they 'opted out', which created ten times more subscriptions.[52]

→ A research team in the western United States found that adding and relocating recycling bins to increase their prominence increased recycling efficiency by 23% on a university campus (and decrease the number of recyclables in the trash by 13.38%).[53]

→ A study in Nordic countries found that they could nudge potential phone buyers into making greener choices, like used phones, by simply altering how their options were presented. Where only 4% of customers typically chose to buy a used phone, 29% made that choice when the 'green' alternative of purchasing a used phone was actively offered. For screen repairs, the corresponding percentages were 87% when actively offered, and 67% when not.[54]

→ In India, researchers conducted a field-based choice experiment with farmers to select between current seeds and newer, drought-tolerant seeds. Farmers who were more risk-averse and loss-averse were more willing to adopt the new seeds that had a greater chance of increasing yields. A similar experiment in Ghana found that more risk-averse aquafarmers were more likely to adopt new technologies.[55]

→ A lab experiment looked at the effect on sales of high-emissions foods (e.g., beef soup) by adding food labels that described the energy used to make the product in lightbulb minutes. Those who saw the label purchased 50% fewer high-emissions products.[56]

Simplify messages and decisions

Sometimes behavior change is as simple as removing small hassle factors, or friction, in bureaucratic or technical processes.[57] Some researchers refer to these inconveniences as "sludge" (the opposite of "nudge") and show where small things like having to fill out tedious paperwork, decipher confusing language, or take extra steps can make pro-environmental behaviors less likely.[58] Humans are further presented with an overload of information and complex decisions every day. We need support to filter out the noise, focus on that which seems most relevant and salient, and adopt fast decision-making rules to navigate this complex world.[59] Decision aids like rules of thumb, checklists, and mnemonics are various strategies that help us deal with this complexity, making it easier to make good decisions or ones that align with our goals.

The strategies:

• Streamline complex decisions to focus on key information or action.

• Provide shortcuts for a target behavior with many steps or options.

→ The 'Eetmaatje' Measuring Cup, developed in partnership with the Dutch Creative Brands Group, aims to reduce food waste in Dutch households by making it simple to measure the exact quantities of rice or pasta needed to feed different numbers of people. The cup simplified choice for consumers through a nudge that helped make healthy and environmentally-friendly portion sizes salient and easy to achieve. Of those provided with the cup, 77–87% reported that it helped them waste less pasta, with 50-80% stating that they used the cup most times that they prepared meals.[60]

→ A field study found that specialized lids deterred non-recyclable items from being placed in the wrong bins and clarified which items should be recycled. The presence of these lids increased recycling rates by 34% compared to those bins without specialized lids, and the number of bins that contained non-recyclable items was reduced by 95%.[61]

→ Across six European countries, the addition of 'lifespan' labels to various products such as suitcases, printers, trousers, sports shoes, coffee makers, washing machines, vacuum cleaners, and smartphones increased the purchase of longer-life products by 13.8%.[62]

Tip for success

Choice architecture tends to be most effective when the behavioral intervention scope is small to medium in size. For example, this includes situations with a small target audience, small effect sizes are acceptable outcomes, and the target behavior is malleable (i.e., does not require a major norm change).

Use timely moments and prompts

We are much more likely to change our behavior during moments of disruption, transition, or natural decision points. This is partly because old habits have been paused and partly because the hassle is temporarily removed (for example, we are more likely to upgrade our appliances when we have just moved homes, while the house is empty and we're doing renovations anyway). Periods of transition are also powerful for psychological reasons; the 'fresh start effect' is one example where people are more motivated to set goals at a temporal landmark, such as the New Year, starting a new job, or a birthday.[63] They help us leave prior failed attempts at change in the past and create a new image of our present and future selves. Therefore, prompts to act help provide information at the right time and place.[64] For example, a reminder to enroll in a conservation program might be most effective right before the renewal deadline.[65]

The strategies:

- Target moments of transition and habit formation.
- Provide prompts and reminders about the target behavior.

See it in action

→ Development researchers have underlined the importance of precise timeliness in the provision of incentives. They found that offering discounts for fertilizer right after harvest, rather than right before planting, can significantly increase adoption by helping farmers plan to set themselves up for success for the coming year, and farmers have more money to spend after harvest.[66]

→ A study on university employees in the UK found that those who relocated and received information about pro-environmental behaviors were more likely to adopt those behaviors after eight weeks than those who had not relocated over the same period.[67]

→ At Indian informational technology firms, an intervention to limit unnecessary printing involved posting signs near printers and around the office as reminders. These also invoked an injunctive norm with a sad face to provide a social signal supporting behavior change. The intervention reduced per person daily paper wastage in the firms who received the reminders by 4–6 sheets compared to firms in the control condition.[68]

→ On a California University campus, researchers found that putting prompts in a visible place to use less water (and conserve energy) while showering tripled water conservation behavior from the baseline data. Asking students to model this behavior boosted conservation behavior further.[69]

Facilitate planning and goal-setting

Many people struggle to act on their intentions and achieve subsequent goals. There are several reasons for this 'intention-action gap,' including daily distractions, conflicting intentions, or small hassle factors (e.g., having to rinse a yogurt cup before being able to recycle it).[70] We also consistently overestimate our future performance or the likelihood that good things will happen to us, and in turn, underestimate adverse events.[71] Implementation intentions 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.[72] Commitment devices can further be helpful by binding people to future actions based on choices made in the present.[73]

The strategies:

• Provide support in making a plan to achieve the target behavior.
• Leverage personal commitments in the present to limit future decisions.

See it in action

→ A study found that public commitments combined with prompts to create lists in advance about what they plan to buy at the grocery store could lead German households to reduce food waste.[74]

→ Highlighting transport information and encouraging people to deliberately plan their car trips has been demonstrated to be quite effective in reducing car usage.[75]

→ A corporation found they could increase employees' energy conservation behavior by asking them to set clear goals around using less energy with their computers over a few weeks.[76]

Tip for success

Keep in mind the ways choice architecture is separate from other levers such as material incentives, rules and regulations, and information: a) it does not eliminate choices, b) it does not change the incentives or disincentives of doing a behavior, and c) it goes beyond giving factual information. Choice architecture works because of the reliance on cognitive biases or habits in more automatic decision-making moments, where material incentives, rules and regulations, and information connect to our deliberate and rational patterns of thinking.

Photo Credit: Rare

How a decision aid reduced lobster overfishing

The problem

Local Bahamian communities identified that fishers were catching too many immature lobsters, which was affecting the long-term success of the fishery.

The solution

The program designer conducted surveys, interviews, and observations of community members in local fishing villages. The research revealed that fishers were already motivated to reduce their catch of immature lobsters but lacked the support to do so. The campaign "Size Matters" provided a simple, easy-to-use measurement tool so fishers could quickly assess whether a lobster was large enough to keep. This campaign resulted in the Bahamas' spiny lobster fishery being the first in the Caribbean to receive the Marine Council Stewardship certification.

OTHER LEVERS APPLIED: **Emotional Appeals**

Information

Providing information on the target behavior is,
why it matters, and how to do it

About Information

Humans are intrinsically motivated to learn, so information is important to us. However, not all information is the same, and it's typically not sufficient for changing behavior on its own.[77] There are a few different types of information that are useful to identify:

- Declarative knowledge is knowing what a behavior is,

- Procedural knowledge is the ability to know how to do a behavior, and

- Effectiveness knowledge is the ability to describe the behavior's impact on an environmental challenge and why it matters.[78]

Additionally, building self-efficacy, the belief that someone has the ability and skills to achieve a certain outcome, and sharing feedback can help people feel more confident in themselves to start and keep doing a behavior.[79] Providing the right type of information, and in a form that resonates with your audience, supports behavior change.

Principles & Strategies

Build awareness and understanding

When a behavior is new, abstract, or complex, helping people understand the behavior can support greater adoption. Beyond providing spaces and materials for people to learn about behaviors, communicating clearly about target behaviors is also important.[80] Information is useful before, during, or after a behavior is performed, and feedback supports people in knowing how to do the behavior correctly.[81] Information can further correct or update existing beliefs about a behavior or environmental topic, especially when people have received misinformation in the past.[82] For many, providing relevant information about a behavior helps people make more informed decisions and feel their behavior is more meaningful.

The strategies:

- Provide informational forums, meetings, or materials that describe the target behavior and its importance.

- Communicate about the target behavior in a clear, concrete, and unambiguous way.

- Give feedback on performing the target behavior.

Tips for success

- Identifying the specific type of information needed (e.g., procedural, declarative) to support behavior change is more valuable than general information-based strategies.

- Information is not always a prerequisite for people to engage in certain behaviors. While it may seem like a necessary part of any solution, there are behavioral interventions that work without people knowing what a behavior is or why it is important.

See it in action

→ A United States study on flood prevention found that people who knew climate risks led them to be more proactive in acting on climate risks, separate from their exposure to those hazards.[83]

→ An experiment with grocery shoppers showed that those who received informational pamphlets in the mail with tips for waste reduction reported shopping more efficiently.[84]

→ A study on recycling behavior found that people were less likely to 'wishcycle' — recycling something because one hopes it can be recycled, often leading to recycling contamination — when they were given clear, visual information and feedback about what is and what is not recyclable.[85]

Provide step-by-step instructions and build self-efficacy

Building skills and confidence in a behavior is an important informational strategy for behavior change. This how-to knowledge goes beyond awareness-raising so that people can practice the behaviors on their own.[86] Environmentalists struggle to feel self-efficacy, especially in the face of large, systemic challenges.[87] Therefore, focusing on specific behaviors and providing clear instructions and training can make a difference. Boosting people's efficacy and skills to talk to others about a conservation behavior can further have a multiplier effect.[88]

The strategies:

• Offer training on the target behavior.

• Provide materials that give instructions on how to do the target behavior.

• Build confidence in being able to do the target behavior.

See it in action

→ A group of researchers aimed to reduce wild meat consumption among households in the Brazilian Amazon town of Tapauá. Among a series of interventions that combined economic incentives with community outreach strategies, cooking courses and recipes with instructions helped to reduce wild meat consumption by 62%.[89]

→ A study of students in Australia and the United States found that providing a definition of self-efficacy and asking participants to reflect on their skills for doing green behaviors led to higher intentions of buying green products.[90]

→ The International Center for Tropical Agriculture (CIAT), in partnership with the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) launched a series of information and communication (ICT) tools to help farmers in Colombia and Honduras make more climate-responsive farming decisions.[91]

Photo Credit: Liz Bennett

# How information revealed the dangers of buying exotic pets

The problem

Illegal and unsustainable wildlife trade remains a huge global challenge, with consumer demand as a main contributor.

The solution

A research team wanted to test what kinds of information may be effective in preventing people from purchasing exotic pets. They created a survey that tested different types of informational messages about species' diets, possible zoonotic disease, animal welfare, legal consequences, or species conservation consequences. Information on zoonotic disease and legal consequences led to a 39% decrease in their likelihood of buying an exotic pet.[92]

OTHER LEVERS APPLIED: **Material Incentives**
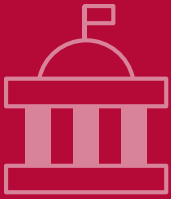
Rules & Regulations

Enacting rules that promote or restrict a behavior

About Rules and Regulations

The knowledge of rules and laws can encourage or prevent people from doing a behavior. While not everyone follows the rules, regulatory frameworks support behavior change because they can effectively communicate order in a system, causing most people to associate a certain behavior as "right" or "wrong." Some rules also work through perceptions of fairness based on what people think is appropriate or justified. In general, rules guide us about our environment and what will benefit us and/or others to do or not do.[93]

Principles & Strategies

Mandate or prohibit behavior

There are two main options for regulating a behavior — mandating certain actions and restricting or forbidding certain actions. These laws act as a formalized norm of allowed behaviors in a particular setting.

The strategies:

- Enact mandates that require or encourage the target behavior.
- Enact prohibitions that limit or forbid the problem behavior.

Tip for success

People have different responses to rules across contexts. Be sure to learn about how your target audience views different rules. Bans on behavior can also be very difficult to monitor or enforce, especially for behaviors done in private.

See it in action

→ As of 2017, at least 127 countries had some sort of plastic bag regulations of varying restriction levels, with Rwanda being a global leader in its enforcement and seeing measurable changes in plastic bag use and littering.[94]

→ The Endangered Species Act in the United States has been estimated to protect 99% of threatened or endangered species to date.[95]

→ In 2023, the European Commission enacted a regulation with an eighteen-month compliance timeline that requires companies selling to the European Union market to ensure their products are not contributing to forest degradation or deforestation.[96]

Photo Credit: Donald Tong for Pexels

How the Montreal Protocol saved the ozone layer

The problem

In the 1970s and 1980s, scientists discovered that chlorofluorocarbons and other substances were depleting the ozone layer. The ozone layer absorbs harmful radiation and prevents it from reaching the Earth's surface, where it negatively impacts ecosystems.

The solution

In 1987, a global agreement called the Montreal Protocol was introduced and universally adopted. Today, almost 200 parties have signed the treaty. The impact of this protocol led to a 90% reduction in these substances by 2010 based on projections and what could have been without this policy.[97] As of 2022, NASA scientists report that the ozone hole continues to shrink and attribute this to eliminating ozone-depleting substances in the last few decades.[98]

OTHER LEVERS APPLIED: **Social Influences**

Material Incentives

Increasing or decreasing real or perceived costs, time, or effort for doing a behavior

About Material Incentives

This lever is about costs and benefits in the broadest sense — money, time, convenience, or effort. In more theoretical terms, the use of material or financial incentives comes from early economic and rational actor theories such as utility maximization about how people make choices and develop preferences to further their interests.[99] These models explore how we can increase the value or attractiveness of a decision if it has fewer costs (such as time, money, and effort) and greater benefits.[100] As a result, material incentives were some of the first strategies recommended for behavior change and continue to be relevant in certain contexts.

Principles & Strategies

Make the behavior easy or the alternative hard

We can influence the amount of effort needed for a behavior by making the desired behavior easier. This strategy is particularly helpful when people perceive a behavior as challenging. Conversely, instead of removing barriers, we can *add* friction points or ways that make certain behaviors more difficult for behaviors we don't want people to do .

The strategies:

- Make the target behavior more convenient and accessible to do (e.g., remove barriers, provide substitutes.)
- Make the undesired behavior more difficult to do (e.g., create friction points and barriers.)

Tip for success

Material incentives can "crowd out" or "crowd in" internal or social motivations for doing a behavior, depending on the context. It's more likely they will crowd out when the cost or effort are not significant barriers to change, the payments are very short term, or the payments are disrupted. Crowding-in effects are more likely when benefits are non-monetary and/or collective, boost decision-making capacity, or promote social connection and trust.[103]

See it in action

→ Policymakers have found that providing benefits to electric vehicle (EV) drivers could encourage adoption: incentives like bus or transit lane access, toll-free parking or road access, as well as improving EV-relevant infrastructure all contribute to higher EV adoption rates.[101]

→ An experiment in dining halls at a United States university showed that removing trays led to less food waste, as it took more effort to carry multiple plates and glasses.[102]

Give rewards or penalties

Other than changing the time and effort for the behavior, providing incentives that affect someone's costs, time, or effort is another strategy for behavior change. While some incentives can crowd out internal motivations, there are times when behaviorally-informed incentives can support sustainable behavior or even crowd in other motivations.[104] The timing, type, amount of the incentive, and type of behavior all are important. For example, variable timing is often better than fixed timing because it reduces dependence.[105] Alternatively, fines are an option to discourage future behavior particularly when that fine makes the behavior either financially or materially prohibitive.

The strategies:

- Incentivize or reinforce the target behavior.
- Penalize or fine for cases of the problem behavior.

Tips for success

- Rewarding good behavior can also build expectations that these rewards will be ongoing and may need to increase over time for the same effect. Some people might see fines as the price for the behavior.

- Consider using behaviorally-informed incentives by combining material incentives with one of the other levers to boost its effects.

- Incentives can drain limited resources, so explore different payment schedules or program budget accommodations over the length of the intervention.

See it in action

→ Researchers conducted an experiment in Uganda to see the impact of providing cash incentives for not cutting down trees. The loss of forest over the lifetime of the project in the treated Ugandan villages was smaller (4.2% forest loss) than in the control villages that did not receive the payments (9.1% forest loss).[106]

→ Impounding or seizing vehicles is one of the most effective ways to stop illegal solid waste dumping.[107]

→ A growing number of European cities are introducing policies that allow citizens to access payment vouchers if they repair their items for up to 50% of the repair cost. Results from Austria estimate 260 tons of e-waste avoided the landfills in one year.[108]

→ In partnership with local hotels, the NGO ARCAS introduced a community engagement scheme that sought to encourage the sustainable harvesting of turtle eggs in Guatemala.[109] Though the scheme bans egg collection for most turtle species, it explicitly allows for the harvest of Olive Ridley turtles, if egg collectors donate at least 20% of the harvested eggs to hatcheries. The number of eggs rescued nationally increased from 60,000 in 2003 to 270,000 in 2015, doubling the number of turtles nesting on Hawai'i beaches.

Photo Credit: PRISMA

How providing materials made recycling easier in Perú

The problem

Waste management and disposal is a challenge in Perú, where over 20,000 tons of waste are generated daily. A local NGO, PRISMA, supported local informal recyclers to develop recycling microenterprises in an attempt to address the problem. PRISMA staff and recyclers visited households to enroll them in a recycling program that included providing information on waste separation and free recycling bags. The baseline data revealed few recycling households and high trash contamination among recycled materials.

The solution

PRISMA worked with a team of researchers to analyze the problem through a few thousand households in two different districts of Perú. Through a randomized experimental design, they tried nine different messages including social benefits, environmental impact, and local rules, but none had an effect. The research team learned that residents did not want to keep recyclables in their houses because they did not have space for them and for fear that they would attract insects, both of which could be alleviated with proper bin storage. As a result, they found that providing residents with plastic recycling bins was the only significant strategy to encourage recycling compared to different messaging. The households with a bin were six percentage points more likely to recycle, had less recycling contamination, and had a higher number of recycled materials than those who did not receive a bin.[110]

OTHER LEVERS APPLIED: **Emotional Appeals**

Common Lever Combinations

Exploring lever combinations

Designing successful behavior change interventions often requires a combination of levers to address people's motivations and barriers. The following pages explore some common lever combinations.

SOCIAL INFLUENCES

+ Material Incentives

Group incentives can be an effective way to motivate behavior, where a person's success is tied to others also succeeding. For example, if a person only receives an incentive if another person or their whole group reaches a shared goal, then they are more likely to work together. Reciprocity can also pair well with incentives; free samples or products can encourage people to participate in related programs.

+ Rules & Regulations

In many contexts, rules are more formalized versions of social norms, communicating what is considered right or wrong in a given place. You can use this to your advantage by enacting a law and supporting it with shared beliefs and messengers who follow the rules.

+ Information

For messaging campaigns, consider including quotes from influential or relatable figures, messages that create social comparison, or behavior adoption positive trends.

INFORMATION

+ Emotional Appeals

Customizing and tailoring information including key places, language, images, and references can help a group connect to the target behavior.

+ Social Influences

Messaging about others' actions or building tools and skills for people to converse with others about a behavior can be effective.

+ Choice Architecture

Providing feedback in timely moments can be an effective pairing of these two levers where people learn information at times when they can also act on it.

EMOTIONAL APPEALS

+ Information

Designing informational messaging that incorporates an emotional appeal can be an effective way to motivate behavior change. Combining details about what something is, why someone should care, or how to do something with familiar and personal references, context, and metaphors can help your message resonate.

+ Social Influences

While some emotions are individual experiences, others have social causes or consequences (e.g., shame, pride) that you must consider when developing strategies. Similarly, identities and values shared among groups often determine how people act.

+ Material Incentives

Emotions often correlate with real and perceived gains and losses. When sharing potential material rewards or consequences associated with doing or not doing a behavior, consider connecting those outcomes with how someone might feel.

RULES & REGULATIONS

+ Social Influences

Regulations are most powerful when supportive social norms act as informal rules about a behavior.

+ Material Incentives

Rules benefit from enforcement, such as incentives or penalties.

+ Choice Architecture

Visible and memorable rule prompts can help people remember and follow rules.

CHOICE ARCHITECTURE

+ Information

Providing feedback in timely moments can be an effective pairing of these two levers where people learn information at times when they can also act on it.

+ Emotional Appeals

Making behavior change opportunities more salient, easy to understand, interesting, and visually-appealing can draw on principles from both choice architecture and insights about people's values, interests, and life goals.

+ Material Incentives

In some cases, making a behavior easier involves significantly reducing the effort, time, or resources required in addition to changing smaller hassle factors and attention.

MATERIAL INCENTIVES

+ Social Influences

Offer financial or symbolic incentives where rewards are based on group performance, Additionally, the person or group providing the incentive may have an impact on how it is received.

+ Choice Architecture

Harness loss aversion by taking away or discontinuing payments with non-compliance. Offering incentives at a timely moment close to doing the behavior can also boost adoption.

+ Emotional Appeals

Use tailored language by key messengers and consider how you frame the incentive (e.g., "compensation" vs. "payments".)

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