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Behavioral Science for Sustainability: Lessons for Cyprus

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Abstract

Cyprus is not immune to poor policy-making. The lack in understanding human behavior is at the heart of the sustainability challenge. This study aims to showcase the importance of incorporating behavioral insights to help policy-makers increase the efficiency of their directives and speed up progress on sustainability goals. It provides an overview of why and how the behavioral element (from sticky habits to cognitive biases), when ignored, hinders traditional policy-making efforts (information provision, incentives, regulation). Drawing from our recent work for Cypriot authorities, we discuss the behavioral array of forces capable of driving change when applied judicially. Our findings highlight three directions in which policy-making in Cyprus can be enhanced: improved understanding of the drivers behind local behaviors before designing policies, targeted communications design for changing habits, and overcoming problems with existing policies with behavioral science methods.

Keywords: Behavioral Science, Behavioral Economics, Climate Change, Environment, Policy, Sustainability

1. Introduction

1.1 Cyprus is not immune to poor sustainability policies

Like the rest of the globe, Cyprus is experiencing the effects of climate change, especially through extensive droughts and the associated impacts on water supply, high temperatures, biodiversity and air quality (Republic of Cyprus, 2022). But the country is underperforming in terms of managing per capita greenhouse gas emissions. In comparison to its European peers, the country has been slow in reducing its emissions since 2005. With a population of 0.2% of total EU-27, Cyprus accounts for 0.26 % of total EU greenhouse gas (GHG) emissions, placing its performance below the European average. In 2019, it was the 11th most carbon-intensive economy in the Union (European Parliament Briefing, 2021). Moreover, the country faces significant challenges in implementing other environmental policies in the fields of waste management and nature protection (European Commission, 2022).

In view of this track record, Cyprus's policy-makers are facing significant challenges in implementing, in a timely manner, the European Green Deal – EU's roadmap for sustainability (European Commission, 2021). With an overarching objective of reaching net-zero GHG emissions by 2050, the Deal includes numerous parameters, from sustainable diets and

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greener transport to energy efficiency in buildings, reducing waste and moving the economy from a linear (take-make-consume-waste) to circular (reduce, reuse, recycle, recover) economy.

1.2 Human behavior is a key contributor to the sustainability challenge

At the heart of poor policy-making is ignoring the contribution of human behavior. People, in their many roles as citizens, consumers, household decision-makers, employees and investors, determine a significant proportion of global GHG emissions – as much as 62% in the United Kingdom, according to the Climate Change Committee (Ivanova et al., 2020). Unequivocally, most of the essential cuts in emissions hinge on behavioral changes. From embracing green technologies (like electric vehicles and enhancing energy efficiency in buildings) to lifestyle changes (including less red meat and dairy, more reuse and repair, less driving and more active travel). The way we travel, what we eat, how we heat ourselves, how we power our appliances, how we manage our waste, how we handle broken things, and so on, matters.

But changing behaviors is easier said than done. The roots of this challenge lie in how people make decisions in real life. From small, repeat decisions to bigger, infrequent ones. Since the advent of behavioral economics, we know that human decision-making is much removed from the rational choice models that traditional policy-making is based on. That's because we are boundedly rational - we lack the cognitive capacity to process information that is vast or complex. We tend to get stuck in our ways and make short-sighted choices. Without realizing or admitting it, we are influenced by cognitive biases, emotions, what our peers think and the general context in which we decide. We default to saving mental energy by taking shortcuts (heuristics) and have a high preference for doing things the easy way.

The conundrum of how people decide sits at the heart of the sustainability challenge. As they stand, sustainability practices are perceived as too expensive, inconvenient, lacking appeal, or just too far removed from our conventional routines. For instance, electric vehicles are seen as too expensive, insulating roofs can be disruptive, most popular Cypriot dishes are conventionally meat-based, riding a bicycle feels unsafe and abnormal, public transport is scarce and inconvenient in most places, and there are minimal solutions for repairing and reusing products (European Environment Agency, 2022).

This means that, currently, Cyprus's economy, culture, infrastructure and business landscape are not well designed for people who want to live sustainably without making sacrifices or disruptive changes – and that includes most of us[1]. As such, if we simply ask people to make these big changes towards sustainability to save the planet or avoid EU fines, without making it *easier* and *attractive* for them in everyday life, we can't expect to have the desirable, let alone long-lasting, impact.

1.3 Untapped potential from behavioral insights

To make sustainability behaviors easier and more attractive for people, we first need a more nuanced understanding of the obstacles people face when trying to make greener choices (Albarracin et al., 2024). Alongside structural barriers (like lack of convenient bus routes), we

[1] This is by no means unique to the case of Cyprus. Very few countries are actively taking steps to make sustainable living the easier choice. Here, we focus on Cyprus with the aim to provide some useful guidance on how to achieve this for the island.

must also understand the cognitive, social and psychological factors that influence environmental decisions (like perceptions about safety and image).

To that end, behavioral science insights, the study of how people make choices in real life, is making significant contributions to understanding and advancing climate change mitigation efforts by governments around the world (e.g. Nielsen et al., 2024). The use of behavioral science into policy-making is already a widespread and celebrated tool in the policy-making arsenal of global organizations and local governments. The United Nations embrace behavioral science as part of their quintet of change: the cutting-edge skills needed for accomplishing change (United Nations, 2023). The World Bank, World Health Organization, OECD and most of its 35 member countries have specialized teams that incorporate behavioral science into their work with striking results. Since 2010, the governments of The Netherlands, France, the United Kingdom, Denmark, Finland, the United States, Australia, New Zealand, Canada, Japan, Indonesia, India, Qatar, Saudi Arabia, and Singapore have set up national behavioral insights entities that help with policy-making (Thaler & Sunstein, 2021). The leverage of behavior insights is also embraced by EU Policymakers via the EU Commission's Competence Centre on Behavioral Insights.

The result from embracing behavioral science in public policy is an evidence-based approach, that incorporates experimental and empirical evidence on human behavior to realistically explain what shapes behavior and decision-making. It builds on the traditional policy tools (information, incentives, regulation), turning them into their more effective, behaviorally-informed versions that can enable policy-makers to meet sustainability goals without increasing, and even reducing, the economic burden.

1.4 About this study

This study aims to showcase the importance of incorporating behavioral insights to help policy-makers increase the efficiency of their directives and speed up progress on sustainability goals. Based on the premise that if governments want to encourage sustainable behaviors they first need to develop a deeper understanding of what drives people, we discuss the behavioral array of forces capable of driving change when applied judicially.

We draw from our experience at the Cyprus Institute, as the first research unit in Cyprus that applies behavioral science for public policy design, to highlight some directions in which policy-making can be behaviorally enhanced.

We structure our study as follows: we first take a look at the sustainability challenge through a behavioral lens. We focus on the power of sticky habits and how cognitive biases reinforce their grasp, creating a gap between good intentions and actions (Section 2). We then switch the perspective to that of policy-makers and charter the road from traditional policies to behaviorally-informed ones which, global evidence shows, work better. We address the three key policy instruments of education and information, financial incentives and regulation, as well as introduce choice architecture, the fourth option available for designing policies (Section 3). Our study culminates in addressing policy-making in Cyprus and provides specific recommendations in three areas: understanding what drives local behaviors before designing policies, boosting existing policies with behaviorally-informed problem-solving methods, and designing effective strategies that target cultural changes (Section 4).

2. The sustainability challenge through a behavioral lens

While most of the essential cuts in emissions hinge on behavioral changes, the very nature of the climate change threat is what makes it challenging to address. By the vast majority of people, it's perceived as a gradual threat, marked by uncertainty. It is psychologically distant in terms of time and geography, as well as in comparison to the daily experiences, habits, and cultural norms of the majority of people worldwide.

To figure out how we can achieve change, we first take a deeper dive into how behaviors form, how they shape local culture, and why they are difficult, but not impossible, to change.

2.1 We can think in two ways, but mostly choose the easiest one

In a single day, most people make around 35,000 decisions (anecdotally) - from what to wear to work to avoiding an obstacle when walking. To cope with so many decisions we use mental shortcuts, known as heuristics. Nobel laureate Daniel Kahneman explains this process using the dual model of cognition. As he explains, people use two cognitive systems for collecting information and making decisions (Kahneman, 2011):

- A fast system (labelled as System 1) that is essentially automatic, intuitive, and unconscious. It operates effortlessly and quickly, by relying on heuristics (mental rules of thumbs) to make judgments and decisions.
- A slow system (System 2) that is deliberate, analytical and conscious. It requires energy and effort.

In everyday life, we rely a lot on System 1. That is, we react to familiar situations based on learned patterns without much conscious effort. The way this manifests is in the form of habits that we develop and stick to. We also rely on ingrained heuristics and biases that are not always appropriate in the face of our fast-evolving world. Conversely, System 2 is less relied upon in daily life. Rather than making deliberative, fully rational choices when provided with accurate and adequate information (like statistics on the effect of consuming red meat), people are often restricted by limitations in information processing, attention, cognitive capacity, and self-control (Hertwig and Grüne-Yanoff, 2017). If we are accustomed to having kebab with friends while watching a football game, we are more likely to default to this socially acceptable habit rather than reconsider our stance towards climate change and search for a vegetarian option.

In the next paragraphs, we explore the effects of 'sticky' habits and cognitive biases that result in a gap between good intentions and climate-friendly actions.

2.2 In the grasp of 'sticky' habits

Each day, we perform a variety of tasks that may seem automatic and require minimal conscious effort. Some tasks are straightforward and do not demand much skill, while others are more intricate and challenging. Regardless of the level of skill required, we often perform these tasks without consciously recognizing our actions (Clark et al., 2007). In fact, studies show that approximately 45% of everyday behaviors are repeated in the same location, almost every day (Wood, Quinn, & Kashy, 2002). They are what we call 'habits'.

Habits can be thought of as "automated response dispositions that are cued by aspects of the performance context (i.e., environment, preceding actions)" (Neal et al., 2006). As opposed to

conscious acts that require deliberate thinking, like driving to a new dentist's office, habits are automatic behaviors, like driving to work along the same route, cooking familiar foods, or choosing what to eat (Schleicher & Töller, 2024).

People often adopt habits through observation and social learning. When we see others around us engaging in certain behaviors, we are more likely to emulate those behaviors ourselves (Cialdini & Trost, 1998). In this way, cultural norms and practices propagate to younger generations and newcomers. And this happens with relative speed and ease because shared habits serve as markers of identity within a group, making people feel they belong. This sense of belonging and connection with those around us that comes by engaging in certain habitual behaviors is one of the principal drivers of human behavior (Baumeister & Leary, 1995).

Habits can also be thought of manifestations of a group's culture. When certain behaviors are consistently practiced within a community or group, they become ingrained and normalized. Over time, these habits contribute to the reinforcement of cultural norms and values. For example, if punctuality is highly valued within a group, the habit of arriving on time for appointments or meetings becomes widespread (and vice versa). From casually throwing garbage out of the car window, to ordering kebab on a football night, habits both reveal and reinforce the underlying culture of a group.

Changing habits and cultures is difficult but not impossible. Cultural habits can evolve over time in response to changing circumstances and influences (Clark et al. 2007). As societies adapt to new information, technologies, social dynamics, and systems, their habitual behaviors may also shift over time. When a critical mass of individuals within a group adopts certain new habits, those habits then start to become entrenched in the cultural fabric, reshaping cultural norms and expectations.

But the path to achieving the desired change is through addressing head-on the numerous behavioral obstacles that make it difficult to change our daily habits and routines. For instance, our aversion to taking risks and dealing with uncertainty ('Will I be on time to work if I take the bus?'), our inclination to seek out information that confirms our existing beliefs ('My friend who tried this vegetarian dish said it wasn't good'), the influence of past investments that lead us to persist in our chosen course of action even when it's not in our best interests ('My car is still in good condition'), and our tendency to conform to social norms ('I don't know anyone who repairs their shoes instead of buying a new pair') (Behavioural Insights Team, 2023). All of these factors, and more, diminish the likelihood of us changing our habits. They make habits 'sticky'.

There is a further challenge in that, even if we are *convinced* that we should make some changes, there are cues such as time and location that prompt the automatic repetition of past behaviors, without us getting the chance to make a conscious decision in that moment. That is, we operate using System 1 instead of re-evaluating with System 2 thinking. We choose the meat-based meze when out for dinner, and we throw away the torn pair of shoes instead of repairing. Under this light, the failure to change habits doesn't necessarily come from weak willpower or a lack of comprehension of environmental matters and the seriousness of climate change. It comes rather from the potent influence of situations in triggering familiar responses through System 1 thinking.

The importance of habits cannot be overstated. Among the portfolio of factors influencing behaviors (including knowledge, skills, attitudes, beliefs and emotions), habits emerge from research as the most powerful determinants of behavioral change (Albarracín et al., 2024). Policy

interventions designed so as to address habits have thus a greater chance of success than mere information or traditional incentives.

To sum up, habits compel us to continue our established actions, even when we genuinely intend to behave differently. Even when we are convinced that we should. Thus, creating a chasm between our good intentions and eventual actions. Since habits are a crucial policy level for behavioral change, we next dive deeper into how cognitive biases reinforce undesirable habits.

2.3 A chasm between intentions and actions

There exists a well-documented gap between our general intentions to adopt eco-friendly behaviors and our actual daily actions (Grimmer & Miles, 2017). This gap persists on account of some cognitive, social and psychological factors that play havoc with System 1 thinking and, to a lesser extent, System 2. Through a behavioral lens, these factors pose the biggest challenge, or inversely, can act as powerful drivers when leveraged properly.

Hyperbolic discounting (or present bias). People tend to discount future outcomes, overly focusing on the present (Ainslie & Haslam, 1992). Since acting pro-environmentally is often less pleasurable, it costs more, and it may be more time-consuming, personal comfort often prevails (Steg et al., 2014). For example, driving comfortably in your car to your favorite restaurant may only take 20 minutes, while using public transportation may take an hour. Heavily favoring the present moment also means that immediate costs and rewards have a stronger impact on us compared to those in the future (Wittmann & Sircova, 2018). This becomes particularly significant because many environmentally friendly options carry high upfront costs, and even though they lead to savings in the long term, our present bias works against them. For example, this is the case when thinking of investing in electric cars and energy efficiency renovations.

Status quo bias. People have a general aversion to change (Samuelson & Zeckhauser, 1988). Status quo bias exerts a strong influence on most people, causing them to maintain existing habits and arrangements or stick with the default option, even when alternative options might be better or more beneficial. This bias can arise from various psychological factors, including comfort with the familiar, aversion to uncertainty or risk associated with change, and the effort required to make a decision or implement a change. Status quo bias complicates matters by making large-scale changes challenging to implement, particularly when aiming to transition towards energy efficiency or renewable energy sources, for instance.

Optimism bias and avoidance. People struggle to really acknowledge the consequences of their actions (Anderson, 2003). People can be unrealistically optimistic, thinking that things will work out well, despite objective evidence indicating otherwise. Within the realm of climate change, this bias has significantly hindered both private and public initiatives aimed at mitigating emissions and fostering adaptation to risks such as extreme heat, wildfires, flooding, and drought.

Social norms. Social norms are "patterns of behaviors or values that depend on expectations about what others do and/or think should be done" (Constantino et al., 2022). They are the unwritten rules and expectations that govern behavior within a particular society or group. They dictate what is considered acceptable, appropriate, or desirable behavior in various situations, from dress codes, language usage, customs to values. They are often learned through socialization processes, such as observing and imitating others, receiving feedback and reinforcement from

peers and authority figures, and internalizing cultural values and beliefs. They are one of the strongest drivers of human behavior because of our need for belonging as well as the need to maintain a positive image of ourselves (Baumeister & Leary, 1995). And one way to do achieve belongingness and a positive image is by keeping our behavior consistent with the social norms we and our peers have come to internalize as were growing up (Cialdini & Trost, 1998). As a result, if we perceive that a behavior is not the norm, we are unlikely to do. For example, studies show that the majority of people say they're willing to fly less, to walk and cycle more, or to repair and reuse products, but don't consider these to be common behaviors (Behavioural Insights Team, 2023).

Motivated reasoning and moral licensing. People are adept at rationalizing their own inaction or undesirable action (Kunda, 1990; Blanken & Zeelenberg, 2015). Motivated reasoning takes place when people selectively interpret information or evidence in a way that supports their pre-existing beliefs, preferences, or desires. This tendency is rooted in an individual's effort to justify their beliefs or actions, protect their self-esteem, or maintain consistency with their identity or group affiliations. As a result, it hinders critical thinking and open-mindedness. Moral licensing describes the phenomenon where people allow themselves to engage in morally questionable behavior after performing a virtuous or morally upright act. Essentially, people may feel that they have earned "credit" for their prior moral behavior, which then gives them permission, in their own minds, to behave in a less morally acceptable manner without feeling guilty. For example, someone who regularly recycles may feel morally licensed to purchase products with high carbon footprints.

Cognitive scarcity. People cannot think about everything that affects them, and if they are busy, poor, elderly, or sick, they are likely to exhibit cognitive scarcity (Mullainathan & Sharif, 2013). Cognitive scarcity is a phenomenon well-documented by psychologists: if the mind is focused on one thing, other abilities and skills—attention, self-control, and long-term planning—often suffer. This means that people will not attend to important matters, even if their well-being is very much at stake. At any point in time, individuals and institutions have many issues and challenges on which to focus, and climate change might seem insufficiently pressing or urgent.

Framing. How choices or information is presented affects our decisions (Tversky & Kahneman, 1985). Equivalent information can be more or less attractive depending on what features are highlighted. Many environmentally relevant decisions, such as what type of transport to take or whether to recycle waste, are influenced by how the options are presented. For example, studies find that making plant-based food more attractive through language (e.g. 'field grown' rather than 'meat free') can roughly double the demand for it (Behavioural Insights Team, 2020).

These factors showcase the importance of understanding human behavior in environmental policy. Effectively, if we want to encourage sustainable behaviors we first need to develop a deeper understanding of how people think and the factors that drive fast and slow choices.

2.4 The sustainability challenge through a behavioral lens

The behavioral parameter of the sustainability challenge then arises as follows: our habits form, to a large extent, in response to our surroundings and how we perceive these to be. In our quest to save mental energy and other resources, we choose behaviors that, compared to the alternatives, are perceived as easier, more attractive, convenient and/or more socially acceptable. Once habits form, they become 'sticky' and, over time, they help shape the local culture, in this

case, with respect to sustainability. The culture reinforces and propagates these habits to younger generations. For someone to go against the established norms and defaults it takes real physical, cognitive and psychological effort. It's therefore no surprise that not enough people do it, even if they know they should, even if they would like to. For behavior change then to take place at a critical mass, the surrounding environment or choice architecture, in which people make these decisions needs to change (Thaler & Sunstein, 2021). This means that it's not just a mindset shift that can be fixed by targeting System 2 and raising awareness. It's more about making it easy and attractive for System 1 to respond.

In the next section, we charter the road from traditional policies to behaviorally-informed ones which, evidence shows, work better.

3. From traditional to behaviorally-informed policy-making

Traditionally, policymakers have had three main tools in the traditional kit: (1) education and information through environmental labels on products and outreach campaigns; (2) economic incentives such as taxes, subsidies, and price adjustments; and (3) regulations like bans, rules, and industry standards. While these tools are important for altering consumption patterns, a thorough understanding of the fundamentals of human behavior is also essential (United Nations Environment Programme, 2017). Without it, approaches tend to be based on wishful thinking: a society characterized by deliberative decision-makers and individuals who weigh the costs and benefits, based on their own values and preferences in order to maximize their self-interest in the long run (Thaler, 2016). And citizens immune to the restraining power of 'sticky' habits and underlying cognitive biases and heuristics.

As such, efforts to change human behavior—whether on an individual, household, or larger scale—can lead to limited or unexpected results. Next, we explain why and how the three traditional policy tools falter and how they can be improved by becoming behaviorally-informed. We also present the fourth option of choice architecture and a practice-based framework that helps implement it.

3.1 Education and Information

Policy-makers often design policies that focus heavily on providing information, believing that knowledge alone will lead to behavior change. The motto that 'we just need to raise awareness and educate people…' is often re-iterated among some business leaders, policy makers and the public. This is far from the truth as meta-analysis report that at least 80% of the factors influencing pro-environmental behaviors do not result from knowledge or awareness (Kollmuss & Agyeman, 2002). As we described in the previous section, the mechanisms behind habitual behavior and System 1 thinking present a unique challenge when it comes to changing behavior through conventional information campaigns. While informational interventions aim to alter beliefs, changing minds doesn't always translate to changing behavior, especially when it comes to habits (Webb & Sheeran, 2006).

3.1.1 Why facts don't change minds

The traditional approach is to think that if people understand the facts, they'll make the right decision. But we know that's not true when we self-reflect about all of the good decisions that we

don't follow through concerning our personal habits. From not exercising as much as we know that we should, to not eating the things that we know are good for us. Even looking at life-endangering behaviors, like texting while driving, people do it despite knowing they shouldn't (Oviedo-Trespalacios et al., 2020).

The same applies for climate change: information alone is not sufficient to drive big changes in behavior. Indicatively, in a meta-analysis of studies on the impact of information provision on behavioral change shows that the effect of information is a mere 2-3% (Nisa et al., 2019). Diving deeper into the behavioral causes behind the inefficacy of information in achieving sustainability, we find several reasons.

The central reason is people's **dual system for thinking**, as explained earlier. Interventions aimed at changing habits often focus on altering people's values through facts and statistics. However, habitual behaviors typically aren't driven by values, as they no longer require deliberate thought or consideration (Verplanken & Wood, 2006). This holds true even when the consequences are personally significant. For instance, despite widespread awareness of the health risks associated with behaviors like overeating, excessive alcohol consumption, and physical inactivity, 63% of deaths globally are still due to diseases linked to these automatic behaviors, including cancer, cardiovascular disease, diabetes, and respiratory disease (Ash et al., 2012).

Almost invariably, it is a case of **information overload: "*This is too much.*"** This relates to the difficulty in understanding an issue and effectively making decisions when one has too much information presented to them at once (Gross, 1964). Information overload refers to both the amount of sources as well as the amount of information from a single source, like the burden imposed by long texts and densely-written posters. In an age where people are bombarded with vast amounts of information from various sources, information overload is a real challenge.

Further, a very common obstacle is that of lack of **self-efficacy: "*How much of a difference can I make?*"**, coupled with the fear-inducing approach adopted by information campaigns (Yang & Weber, 2019; Bloodhart et al., 2019; Chiang et al., 2019). Self-efficacy is the belief in our ability to make a positive difference. This is very much reduced when we consume messages dramatizing the over-arching negative impacts of climate change without providing any sense of hope. Such fear-inducing messages tend to overwhelm people thus diminishing their optimism, self-efficacy and sense of control over environmental outcomes.

Moreover, **psychological reactance theory** documents the human response to the loss of personal control. When free choice is limited through messages that evoke guilt (or other means), the need to retain our freedoms makes us want to engage in the reprimanded behaviors significantly more than before (Brehm, 1966). Nobody enjoys being lectured, and our natural tendency is often to resist such messages, defensively doubling down on our existing behaviors and rationalizing them. While guilt can occasionally motivate behavior change, it tends to be effective only when the behavior in question is easy to adjust. If the behavior requires some form of sacrifice, such as monetary cost or inconvenience, people may find it easier to disengage entirely from the message to alleviate their guilt. This applies well to sustainability behaviors (Schneider et al., 2017; Konrod et al., 2012). As such, messages that evoke guilt risk alienating the audience and achieving the opposite effect. A recent example is the attempt of the Peterborough council to promote increased recycling by affixing labels reading "Waster" onto the bins of households that were not practicing sustainable waste disposal. The approach backfired as local residents perceived the labels as patronizing and offensive, branding them as "insulting and derogatory" (Behavioural Insights Team, 2021).

In addition, information can fall on deaf ears due to **belief perseverance: *"That doesn't sound right".*** When people encounter evidence that runs counter to their beliefs, instead of reevaluating their position with critical thinking, they are swift to reject the incompatible evidence (Ross et al., 1975). Whether through news sources, social media, or personal discussions, contradictory facts cause people a sense of threat, that can even feel like a personal attack (Taber & Lodge, 2006). Researchers have identified this phenomenon in a number of studies, including ones about opinions toward climate change mitigation policies (Hart & Nisbet, 2012).

Finally, **inconvenience: *"It's too difficult, never mind"***, in all its forms, is a most important obstacle. Many green options face genuine hurdles related to all sorts of inconvenience, issues that cannot typically be resolved solely through the provision of information. These include a range of factors, from economic and time considerations to the complexity of the process, what others will think, how likely it is to remember and so on. An abundance of studies testifies to how friction costs (details that make a task more challenging or effortful) can make the difference between doing something or putting it off – sometimes indefinitely (Behavioural Insights Team, 2014).

3.1.2 How behavioral science can improve communication

For all the aforementioned reasons, people can't just assimilate the facts, make the objectively best decision and follow through with it, even if they are well-informed and convinced. For information to influence behavior, there must already exist high motivation and opportunity to act, and the only (significant) barrier is poor knowledge. This was, for example, the case during the Covid-19 pandemic, when daily press conferences and clear, action-oriented slogans like 'hands, face, space' influenced the behavior of the segment of the population already keen to protect themselves and their loved ones from the virus. But in general, this is not the case with sustainability actions.

The way to improving communications through the lens of behavioral science is for policymakers to go beyond the content (*what* they want to communicate) to the framing, formatting and timing of messages. By leveraging some of the cognitive biases that trip System 1 to making suboptimal choices, policymakers can design communication with these in mind. For example, simplifying information and connecting tangible consequences to sustainable practices can go a long way in gaining people's attention, much like seeing the effect that illness has on one specific child is much more impactful than reading statistics. Further, invoking pride rather than guilt has much better results in encouraging (or discouraging) certain behaviors (Patrick et al., 2009). We are also heavily influenced by who communicates information and take information more seriously if, for instance, the messenger has perceived authority (formal or informal), they are similar to us and evoke positive emotions, as the example of David Attenborough shows (Webb & Sheeran, 2006; Durantini et al., 2006, Hayns-Worthington, 2018). Framing also matters in the sense that we are more responsive to information depicting potential losses (in terms of something we currently own or enjoy) rather than highlighting potential gains of the same magnitude (Kahneman & Tversky, 1984). These are only a few ways in which behavioral insights can, depending on the context, enrich communication of information.

3.2 Financial incentives

A second policy tool is in the form of monetary incentives. Traditionally, policymakers assume that people are sensitive and responsive to incentives, especially those of a financial nature. That,

if sufficiently incentivized, people will make the desirable choices. As such, incentives are widely used by governments to tax behavior that is deemed undesirable (e.g., taxes on cigarettes) and subsidize behavior that improves well-being (e.g., tax relief on pensions). Taxes and subsidies work well in some domains of life by changing the costs in a typical cost-benefit calculation. However, they are not always suitable or effective. Not only the costs associated with incentive programs can make them prohibitively expensive, but the use of economic incentives can occasionally backfire. Here we lay down the key reasons why financial incentives have proven ineffective and how they can be improved through behavioral design.

Low value for money. Oftentimes, financial incentives can be both expensive and ineffective. A prominent example is given by researchers Chetty et al. (2014) who demonstrate the low value for money of incentive policies to increase retirement savings. They show that each $1 of government expenditure on subsidies increases total savings by individuals by only 1 cent. On the contrary, cost-free behaviorally-informed policies that take into account the power of *default* options, such as automatic employer contributions to retirement accounts, increase savings by much more.

Crowding out intrinsic motivation. Financial incentives can erase the joy we feel in doing something. Studies show that when incentives such as subsidies or other forms of financial rewards are introduced for an activity people already enjoy doing, they become less intrinsically motivated to perform that same activity (e.g. Deci, 1971; Lepper et al., 1973). Known as the *overjustification effect*, this tendency describes the shift of focus from personal enjoyment (intrinsic motivation) to the external reward (extrinsic motivation), which overshadows everything else, including any personal or social benefits. Central to the explanations around the overjustification effect is *self-perception theory* – the idea that we learn about our likes and dislikes by observing our own behavior, and then making inferences from those observations. This essentially means that we form our motivations post-activity, contrary to common belief. In turn, this serves to avoid *cognitive dissonance* – we strive to be consistent within ourselves and are driven to make changes to reduce or eliminate an inconsistency (Tueanrat & Alamanos, 2023). As such, people tend to infer that if they are being paid to do something then it must be boring or difficult or bad. The result is decreased long-term interest and inferior performance. This attests to why monetary incentives can act as boomerang in the long-term, reducing desirable behaviors instead of increasing them. It raises the alarm on the importance of designing incentives better, accompanying them with vocal support, as well as considering forms of non-monetary incentives, such as fast-lane planning permissions for green buildings (Olubunmi et al., 2016).

Legitimizing undesirable behaviors. Financial disincentives (or penalties) risk amplifying undesirable behaviors by *shifting perceptions*. This is well demonstrated by the study conducted at an Israeli nursery which highlights the force of *unintended consequences* (Gneezy & Rustuchini, 2000). Confronted with the problem of parents picking up their children late, the nursery started imposing fines to reduce tardiness and better manage their operations. But instead of a decline, they experienced an increase in the number of parents who showed up late. This happened because many parents switched from seeing lateness as a social ill that caused inconvenience and embarrassment, to viewing it as an additional service they legitimately paid for. The fines shifted perceptions around the value of lateness and the cultural norms that accompany it. As a result, the nursery's new policy had the exact opposite effect than what they had intended.

Ignoring loss aversion. Incentives are usually framed as rewards that will be received upon behaving in a desirable way. This framing ignores people's general propensity to *loss aversion* –

that we dislike losses more than we like gains of the same amount (Kahneman & Tversky, 1979). For example, to this effect, a review of trials of treatments for obesity involving the use of financial incentives finds no significant effect on long-term weight reduction (Paul-Ebhohimhen & Avenell, 2008). On the contrary, experiments on weight loss framed in the domain of loss (e.g., by asking participants to deposit money into an account, which would be returned to them if they meet weight loss targets), show significantly better results (e.g., Volpp et al., 2008). Similarly, a range of studies across domains, from blue collars to teachers, demonstrate the increase in performance when people receive a bonus at the beginning of the year with the premise that it will be taken away if they don't meet the performance standards, versus receiving the performance-based bonus at the end of the year (e.g., Fryer et al., 2012). In the same vein, some governments have reframed speeding penalties from adding points to taking away points from a predetermined, endowed number – causing drivers the sense of losing something of value, rather than accumulating penalty points as a 'badge of achievement' for being 'racers' (Corr & Plagnol, 2023). These studies and more attest to the significance of tapping onto the right framing when designing incentives.

Untapped potential of lotteries and prize draws. While marketers have caught up to the allure of prizes and lotteries, governments still prefer uniform, direct cash transfers to reward citizens. Besides the costly nature of such incentive schemes, they are also problematic because of how people form valuations, which is through *reference points* (Kahneman & Tversky, 1979). Just as objects appear bigger when they are closer, evidence suggests that the perceived value of something depends on our perspective. For example, the smaller our salary the bigger the cash transfer will seem. As such, "small" cash transfers will not appeal to more affluent individuals – but setting the cash transfers too high will be extremely costly. The solution to this conundrum is based on another behavioral phenomenon: how we *assess probabilities*. Economic theory presumes that we view changes in probability in a linear fashion – for instance, the shift from a 5% to a 10% probability is regarded the same as the shift from 50% to 55%. However, evidence indicates that people give more importance to small probabilities than the theory predicts (Kahneman & Tversky, 1984). As such, people overweigh the small chance of winning, leading them to engage in prize draws and lotteries with much more fervor than rational choice models predict.

3.3 Regulation

As a third option for achieving change, governments can opt for 'hard' measures such as regulations, mandates and bans, compelling citizens and corporations to adopt or avoid certain behaviors. An example of this is banning smoking in enclosed public places and workplaces which has proven effective – the year after the ban was enforced in the UK in July 2007 saw 1200 fewer emergency admissions to hospital for heart attacks (Bird et al., 2020). The threat of incurring a substantial fine effectively discourages many individuals from breaking this regulation. Coupled with the ability of the local authorities to enforce the regulation, this measure was successful.

But hard measures can also backfire. A prominent example is that of the National Prohibition in the United States which was enforced between 1920 and 1933. While alcohol consumption initially decreased and some public health benefits were realized at the start of Prohibition, consumption gradually increased over time. The alcohol ban faced significant opposition and ultimately failed as a preventive measure. *Psychological reactance theory* anticipated the public's resistance to losing a key freedom. Furthermore, Prohibition was implemented without

considering the ineffectiveness of state-level bans and at a time when 19th-century social norms were being challenged (Lewis, 2013). The Prohibition serves as an example of how overcorrecting a problem can make it worse, e.g. causing an increase in organized crime - illegal production and distribution of alcohol became a lucrative business for organized crime syndicates, leading to a significant rise in criminal activities and gang violence.

Another reason why regulation can fail to have an effect may lie in its design. Complex language and lack of clarity, lengthy texts and bureaucratic structures, frequent changes, accessibility issues, insufficient guidance and offering of alternatives can result in people ignoring rules. In such cases where the compliant path is deemed as too difficult or confusing to follow, people can easily rationalize that "others aren't doing it anyway" (Hunt, 2023).

The behavioral science approach helps to design regulation and accompany it with softer interventions, so that the resulting combination actually helps people self-regulate rather than rebel or ignore it. Diving deeper in the example of smoking bans, the fines imposed for violating the ban and imposition of large taxes on cigarettes, were accompanied by two other significant effects. Firstly, the ban narrative villainized second-hand smoking. It made smokers feel bad for smoking close to others and created a movement by non-smokers for their right to clear air. This is quite remarkable considering the lack of scientific evidence for the harm of second-hand smoke. Secondly, around that time, the industry had come up with the predecessors of Iqos - alternatives to cigarettes that mimic the smoking experience (Littman et al., 2022). The availability of this accessible, cheap, socially acceptable alternative enabled people to *substitute* one behavior for another – a transition that is much easier to achieve compared to stopping a behavior altogether.

Another example of a well-designed measure is how the state of Texas solved their problem with litter in 1986. Up to then, despite spending $20 million annually on trash removal, highways were increasingly littered. The authorities decided to seek a marketing campaign to help tackle the issue. This led to the creation of the "Don't mess with Texas" campaign that drastically reduced littering (by 54% in one year), and continues today, featuring many famous Texans, including Willie Nelson and Matthew McConaughey (Nodjimbadem, 2017). The tremendous success of the campaign lies in how it harnesses people's social identity, sense of duty and pride, leveraging a powerful intrinsic motivator—residents' desire to protect and honor their state. It also helped to shift social norms by making littering socially unacceptable. Importantly, the slogan was simple, memorable, and direct, making it easy to understand and recall, and it was delivered by then-influencers such as popular athletes and other celebrities.

3.4 Choice architecture

A fourth policy option that has recently become available to policy-makers through behavioral science is choice architecture which describes the careful design of *how choices are presented*. As 'choice architects', policymakers design the context, process, and environment in which individuals make decisions. Through purposeful design, they leverage predictable patterns of cognitive thinking, especially those connected to System 1, to guide people's choices. In essence, nudging creates an environment in which one is free to choose, but certain decisions are more cognitively taxing than others. For instance, in trying to reduce the use of plastic bags in supermarkets governments imposed a 10p levy to make reusable bags more appealing.

This approach is commonly referred to as the concept of *nudge* (Thaler & Sunstein, 2021). As a stand-alone policy option, a nudge retains freedom of choice (it is liberty-preserving as opposed

to regulation that restricts and gives rise to psychological reactance and undesirable second-order consequences) and does not alter economic incentives. Nudges can also be used to enrich the aforementioned three approaches, in ways similar to those we discussed. In general, citizens knowing how a food choice influences personal health, environmental sustainability, or animal welfare alone isn't sufficient to prompt dietary changes. Such information campaigns are most effective when used alongside changes in the choice architecture, such as enhancing the accessibility, convenience, attractiveness, and affordability of plant-based foods. This can include ensuring that plant-based options are prominently displayed in supermarkets, restaurants and online food delivery platforms (Behavioural Insights Team, 2020).

Choice architecture represents a broader shift from traditional regulation to behaviorally-informed policies. To help implement it, policy-makers can use insights derived from behavioral science research through frameworks such as EAST.

3.4.1 EAST: A framework for changing behavior

The EAST framework is an acronym that stands for Easy, Attractive, Social and Timely. Though not a comprehensive summary of all there is to know about behavioral science, it's suitable and useful for busy policymakers, in that it provides an accessible, simple way to make more effective and efficient policy. Developed and published by UK's Behavioural Insights Team in 2014, it's one of the most popular frameworks for thinking through and designing behaviorally-informed policies. Its four parameters rest on tapping System 1 thinking more effectively when designing policies. It can be briefly explained as follows (Behavioural Insights Team, 2014):

- Making it 'Easy' is about reducing the friction costs (factors that make a task more challenging or effortful). This can be achieved by, for example, making the desired option the default, reducing hassle factors such as bureaucracy and accessibility, and simplifying communication.
- Making it 'Attractive' involves increasing the likelihood that a policy will be noticed by attracting attention and designing rewards and sanctions for maximum effect. For example, using salient design, gamifying activities to make them more enjoyable, targeting people's aversion to loss, and designing behaviorally-informed incentives.
- Making it 'Social' addresses the influence of social norms. This may include highlighting visible peer behaviors that are deemed desirable, selecting influencers as messengers, and encouraging people to make commitments to others.
- Making it 'Timely' focuses on the effect of timing. Examples include prompting people when they are likely to be most receptive (such as when they are making a new start), emphasizing the immediate costs and benefits, and helping people plan in advance.

To experience the EAST framework in action, the plastic bag levy serves as a good example of a behaviorally-informed measure.

3.4.2 Example: The plastic bag levy

In the United Kingdom, the implementation of a plastic bag charge in 2015, initially set at 5p and increased to 10p in 2022, has resulted in a remarkable decrease in usage by 97%, according to data by the UK Government (Gov.UK 2022). Presently, the average shopper in a major UK

supermarket only uses about three plastic bags per year, a stark contrast to the 140 bags used per person back in 2014.

The impact is remarkable considering the tiny size of the levy, both in absolute value and also in comparison to the items it carries. The explanation for effectiveness of the 10p charge for a plastic bag lies in its behavioral impact and the fact that dis(incentives) almost always carry psychological baggage (Behavioural Insights Team, 2022).

- **Easy: The plastic bag charge acts as a default**. Instead of automatically receiving a bag by the cashier before you even ask for one, you now have to actively request one. Before the levy, the opposite was true. Having to make this extra effort, prompts people to think twice before requesting a bag.
- **Attractive: It makes costs salient and taps on loss aversion**. Unlike hidden costs, the explicit charge for plastic bags makes individuals more aware of the monetary value attached to using single-use plastic bags. This heightened awareness, especially for something previously received for free (making zero cost the reference point), makes the cost feel more impactful. Conversely, as losses loom larger than gains of the same amount, if people were offered a 10p bonus for not using a bag, the effect would not have been as much.
- **Social: It establishes a social norm**. The plastic bag charge, along with the broader awareness it has generated, makes requesting a bag more socially unacceptable, as it goes against the prevailing norm of reducing plastic waste. This breach of the norm can lead to feelings of embarrassment or shame. It has become a taboo, at least in countries like the UK.
- **Timely: It serves as a timely reminder**: Given the growing awareness of the environmental impact of plastic, the charge prompts individuals to act on their intentions to reduce plastic usage. It helps people remember these intentions at the right time.

4. Policy recommendations

By employing these four behaviorally-informed policy tools, scientific studies tell us that policy-making in Cyprus can achieve large strides ahead. We focus on three areas that merit attention, based on recent work for Cypriot authorities[2].

4.1 Understanding the drivers and obstacles behind local behaviors

One of the biggest challenges in Cyprus (and beyond) is that policy makers don't really try to uncover what drives or impedes people before designing behavioral change policies, but rely on traditional policies of the past. Pressed with time, overconfident based on narrow views and personal experiences and impeded by groupthink, policies are recycled form year to year, with minor adjustments, despite limited success.

What's more, even when they set out to uncover the drivers and obstacles behind behaviors, they investigate the wrong things - they focus singly on capability, knowledge, skills and cognitive ability to perform a behavior. For example, 'do people know how to separate solid waste for

[2] See the behavioral insights section of our list of publications here: https://www.cyi.ac.cy/index.php/stedi-rc/research-information/stedi-rc-scientific-publications.html

recycling?' Undoubtedly, in order to do something, one typically needs to possess the necessary knowledge and skills. However, merely having the knowledge and ability to execute a task does not guarantee that one will actually do so in practice, as our paper demonstrates. Various factors, such as motivation, environmental cues, and external influences, play crucial roles in determining whether individuals will put their knowledge and skills into practice (Michie et al., 2011). Indeed, beyond knowledge, studies show that factors such as values, emotions, social norms, (e.g. what individuals perceive others do or expect of them) and practical factors (e.g. how difficult or expensive it is to carry out certain behaviors) drive climate-resilient behaviors (Mitev et al., 2023).

We know from behavioral science that, when setting out to investigate the local context (via, for example, surveys), policymakers and their advisors should try to capture not just the knowledge of a person about sustainable behaviors or EU Directives but also their beliefs and attitudes, motivations, and any environmental and social opportunities that might impact behavior. Along this vein, a 2021 study by UK's Behavioural Insights Team, surveyed 3,604 people across six countries: Austria, Germany, Ireland, Italy, Switzerland, and the UK (Behavioural Insights Team, 2021). The aim was to explore some of the barriers to green actions. By focusing on 19 such green actions (e.g. wear clothes until worn out, repair & reuse goods) the study measured the perception of people for each action with respect to: concern about climate change, willingness to take action, perceived normality, perceived ease and knowledge. It answered questions such as: Is there a lack of knowledge about the behavior or how to do it? A lack of perceived normality or social desirability? Or a lack of confidence in being able to take up the action (self-efficacy)?

Through our current work, we are undertaking studies to investigate the drivers behind particular behaviors, such as the use of public transport, as well as advising the government on methodologies for supporting the greater efforts towards the Circular Economy. For example, as the Municipality of Strovolos launched a "Library of Things" to promote the circular economy[3], we helped them design a behaviorally-informed survey to capture the beliefs, attitudes and behaviors of local citizens. Questions included "How often do you think that people in your social circle repair their items (instead of buying new ones)?" and "What obstacles, if any, prevent you from repairing damaged items?". The results revealed that Strovolos's residents tend to underestimate how often their peers buy or use second-hand items. This insight is useful in that it gives the municipality authorities the statistics they need to craft a message to correct social norms and increase the perception of acceptability of using second-hand items.

4.2 Boosting existing policies with behaviorally-informed problem-solving

Behavioral science tools can also help with identifying causes of problems with existing policies. For example, in recent years, Cyprus has rolled out a number of energy efficiency funding schemes targeted towards different recipients, from households to corporations[4]. While most schemes were met with success in terms of the high demand generated and the number of recipients implementing energy renovations in their buildings, some were not. Despite their appeal (e.g. non-repayable financial aid up to 40%), there were too few applicants and absorption rates remained low.

[3] See https://circularlibraryforall.org/ and https://kykloikodromio.org/el/circular-economy-municipality-strovolos-kykloikodromio/

[4] See current schemes on https://meci.gov.cy/gr/sxediaxorigion.

From our conversations with the relevant policy teams, the problem was clearly identified as the low number of applications. But the reasons were unclear. Here are some snippets from our conversation highlighting the team's surprise at the low absorption rate (translated from Greek):

> *"They are all informed about the scheme. We've run a press release on our website and announcement in the evening news."*
>
> *"The process is the same as the digital transformation scheme which is very successful, and yet no one is applying here."*
>
> *"Certified experts take on the burden of the process, which makes it easy for companies to apply."*
>
> *"Applicants get their money back fast. The subsidy is received about 12 months since the application."*

To help the policy team broaden their understanding of the problem, we put together *user journey maps* for each application process. User journey maps are depictions of the steps and relevant actions required to get from where we are (e.g. learning about a scheme) to the end goal (e.g. applying to that scheme). The maps also include, for each action, the possible barriers (both structural and behavioral) that might make it difficult for the decision-maker to proceed. This exercise, infused with primary research from relevant stakeholders, helps uncover obstacles that were not thought of initially. To date, it has enabled us to recommend easy, low-cost solutions to such problems. Moving forward, the broader use of user journey maps can greatly benefit existing policies by boosting them and resolving existing problems, as well as help in the design of future policies, as we explain next.

4.3 Designing effective strategies for culture change

One of the usual complaints in the fight against environmental degradation is that "it's the culture", which insinuates that there is little that can be done to change it. Unequivocally, this approach is not unique to Cyprus's policy-making, as much as it is false. While it's hard to change, and can definitely not be done overnight, a culture can change over time with the right approach.

Recently, we advised authorities on how to design a communication strategy about Cyprus' Circular Economy Action Plan. As explained, culture is essentially made up of our small daily habits, most of which we perform automatically (System 1). That is, they are deeply rooted in our daily routine. They feel familiar, easy. And unfortunately, we tend to stick to habits that are familiar and comfortable, even if we are aware of the negative environmental consequences.

To change culture, efforts need to be gradual and targeted. We cannot massively adopt sustainable habits overnight. Nor will we be persuaded to change even one unless we feel that it directly affects us and that it is easy to do so. In today's economy of attention and over-information, where people are exposed to a huge amount of information and messages about many topics competing for our attention, we have no choice but to be selective about where we pay attention. But if we feel that an effort speaks to us, relates to us, and helps us adopt a better habit, we are much more likely to do so. In turn, this change in behavior is passed on to our subconscious as "I am a person who cares about the environment", it becomes part of our identity and contributes to improving other, unrelated behaviors.

When it comes to policy-making, generic messages often miss the mark and are less likely to engage, persuade or lead the audience to the desired behaviors. Instead, targeted actions to key audiences with a specific purpose are needed. Targeting and tailoring communication messages is a fundamental principle of effective communication and culture change efforts. It leverages the

way we think to increase relevance, attention, persuasion and therefore the likelihood of achieving communication goals. Targeting enables analysis through journey mapping, where the journey of the target audience is mapped, highlighting potential barriers.

In practice, this means the selection of certain groups of citizens (key audiences) and the formulation of specific, measurable objectives (e.g. a 20% reduction in the purchase of new pairs of shoes in 12 months). This will allow an in-depth analysis of current behaviors in order to identify the physical and psychological barriers that prevent this group of citizens from improving their Circular Economy actions on a permanent basis. For example, someone who wants to go hiking is likely to be faced with a lack of good alternatives for not having to buy new hiking shoes. Good alternatives would be to borrow or repair their old pair. But if they don't have easy, attractive, social and timely access to these alternatives, they are more likely to order online or shop for a new pair at the mall. Upon understanding these, both the physical environment and the Communication action plan can be adjusted so as to remove these barriers. Such small 'wins' can then be used to promote other sustainability actions among this group, as well as other groups of citizens.

5. Conclusions

For any government looking to promote sustainability, there exist many behavioral barriers posing real challenges that significantly slow down progress. The good news is that there are also many forces capable of driving behavior change when applied judicially.

Given the high cost associated with sustainability initiatives, policy-makers may exhibit reluctance in allocating funds to initiatives for behavior change. However, adequate funding is indispensable for the planning, design, testing, implementation, evaluation, and refinement of successful initiatives. Public agencies should prioritize the inclusion of such funding in their budgets, recognizing behavioral insights as an essential component of comprehensive sustainability policies. In turn, they will be able to economize on costly yet ineffective measures.

Moreover, attention should be directed towards enhancing the capacity of administrations to design and execute behavior change programs. The involvement of professionals, including practitioners and experts in behavior science, will be pivotal in determining the success of these initiatives. This becomes particularly pertinent when striving to advance up the sustainability hierarchy and progressively adopt more demanding practices geared towards waste minimization and alterations in consumption patterns.

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