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COVID-19: INTRODUCTION TO IPBC ISSUES

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INTRODUCTION: CORONAVIRUS, THE ECOLOGICAL CRISIS AND DRIVERS OF BEHAVIORAL CHANGE AND NON CHANGE

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IPBC THOUGHT PIECES SERIES 1.

Coronavirus, the ecological crisis and drivers of behavioral change and non change.

Introduction.

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Summary

The Covid19 virus crisis and the strategies to reduce its sanitary impacts offer many parallels to the ecological crisis, important to the IPBC's goal of working on behavioral drivers of change and non change. These raise many questions: what is the status of behavioral sciences relative to the other sciences on those issues? What are the interactions between objective facts and their subjective interpretation? Are all parallels between the sanitary crisis and the ecological one, good ones to make or are some parallels unjustified and non applicable? What lessons can we draw from reactions to Covid19 measures that can be applied ***or not*** to reactions relative to ecological transition efforts?

The texts published here do not pretend to address all possible issues linked to this complex question but they do avoid some of the magical, overly positive or wishful thinking as seen in the media since the beginning of the Covid pandemic, including scientific ones. These IPBC's (International Panel on Behavior Change) articles propose interesting food for thoughts on the factors playing a role in our capacity to change ***and to resist*** change. They are based on informed observations and research results undertaken by scientists working on drivers of behavioral change and non change from many disciplines.

Preamble

> *April 2020, the confinement has ended but mask wearing has become compulsory. My son and I are entering the subway in Marseille, France. A young man follows us closely, jumping the barrier without paying. And without a mask. My son says, cynically, "hey, pretty good, two illegal gestures in one second!". We go down the stairs to find the same young man smoking a cigarette. "Wouah, 3 infractions in less than a minute and two of them, health related!"*

When one lives a crisis, especially a worldwide one, it is easy to see it as more important than it really is, and even believe that it may be "the end of the world as we know it". Some crises are as important as they seem, while others still remain underestimated until it is too late... Anxiety, fear and stress come into play and our ways to deal with this perception of a crisis vary greatly.

A French national study shows that fear of the disease (along with the sorrow from deaths of loved ones) is causing a significant increase in anxiety and depression, in addition to anxiety and despair about the future due to the lockdown's economic consequences[1]. Some of us will go into denial, others will become doomsday prophets or conspiracy theorists while others still will start believing in a revolution in mentalities and modes of living. Rising questions and finding answers to these different issues are part of the IPBC's preoccupations.

The IPBC was created in the wake of the Manifesto for its creation, signed by over 1000 scientists and experts. Our goals are to:

[1] https://www.lefigaro.fr/flash-actu/covid-19-la-sante-mentale-des-francais-encore-degradee-par-la-crise-sanitaire-qui-dure-20201104

- integrate the various disciplines and wealth of data related to drivers of behavioral change and non change,
- extract robust and relevant indicators and levers,
- eventually develop global models and trajectories.

The articles published here do not aim to justify nor condemn different reactions or policies to the Covid19 crisis. As scientists interested by behavioral change and resistance to change, rather, we aim at observing, understanding and explaining in a multidisciplinary fashion the diversity of behavioral reactions to the Covid19 measures and to ecological transition efforts. We also think it is important to bring behavioral sciences' understanding to the public attention, through a series of "informed food for thoughts" articles that also discuss potential lessons for ecological transition efforts – for which much has been written but not always with much methodological precaution. The texts offered here come from sociology, psychology, design, management and neurosciences.

Introduction

When looking at the Covid19 crisis and especially the policies to contain it, the ***casual*** observer will have noticed a variety in people's reactions. The ***trained*** observer will also have observed this variety but s/he will have analysed some of it. S/he will also distinguish the virus from policies, the policies from the heath aspects as well as the causes from the effects and its consequences, including economic ones.

Both would be able to observe, while walking about, that some people follow guidelines almost religiously, washing their hands everywhere and never forgetting to wear a mask. Some of them even insist that others follow this protocol, which even led to some cases of physical violence. The same observers also notice some people not wearing a mask at all, or perhaps provocatively, wearing it under the chin, perhaps in some sort of social or political provocation... In Grenoble, France, the public transit body reminded on public speakers in the spring of 2020 to "*please, wear a mask on public transits*". They then changed it to "*it is compulsory to wear a mask*" to, finally, from august 2020, "*we remind you that is compulsory to wear a mask over your nose and mouths*". This was due to the fact that people would wear a mask so as not to get fined but would not wear it correctly because of incomfort. Still, most people respected the best they could most of the time. Indeed, many of us got so used to wearing a mask, we at time forgot it was right there, in the middle of our face.

> *October 2020, the second wave of the Covid19 pandemic has started. Wearing a mask is so habitual now that I sometimes forget I am wearing even when I ride my bike. This morning, it is raining, so instead of using my bicycle, as I do usually, an in-grained habit, I hop on the tram. I find people are looking at me weirdly and I am thinking that the second confinement is getting on people's nerves.*
>
> *I hop off, and as I am about to enter my usual bakery, I realize why they were looking at me this way: I was not wearing my mask, I had completely* ***forgotten****. The fact that people wore one around me and so, very visibly, did not even remind me of my mistake...*

Then, in some countries, such as the UK and France, we saw in the first few weeks of confinement 'panic buying' in supermarkets, but not in other countries, such as in Italy. This panic buying did not really occur at the start of the second wave, suggesting that people had learned from experience, and were reassured that consumption goods would be available.

If one goes back to the beginning of the crisis, we saw in every country that people kept going to public spaces to enjoy their usual activities, avoiding or ignoring sanitary rules, especially with the early spring days. These reactions followed official statements describing the urgency and informing the population about safety measures and good behaviors to be adopted. Later on still, we saw in several countries anti-mask movements emerging, arguing against the loss of individual freedom and lock down measures due to the loss of revenues by individuals and small businesses. While people's ethics, civic sense of duty and responsibility were called upon by health and public officials, this was insufficient in terms of

compliance, according to medical opinion – and what medical sciences understood at that point[2] - regarding non compliance's effect on contagion (which raises deep issues regarding our capacity and willingness to change lifestyles for climate change). This led heath officials to publicly denouncing the population's "irresponsible", "uncivil" and "dangerous" behaviors. The initial call for individual responsibility in the first few weeks was thus replaced in many countries by increased regulation, including compulsory confinement and fines. But not everywhere: in Northern European countries, the strategy aimed at "herd immunity" (building a collective natural immunity against the virus), which would reduce impacts on the economy and make vaccines useless. In many Asian countries, where wearing a mask is part of the culture, enforcing it was not difficult. In others still, such as the USA, wearing a mask or being tested for the virus was considered by many to be an attack on individual rights.

This diversity of reactions as well as policies (which changed over time) in the face of rather homogeneous scientific national and international recommendations has to be understood in a ***context of the fuzzy and complex relationship between science, policies and daily perceptions, attitudes and behaviors which in turn raise the issue at the IPBC's heart: drivers of behavioral change and non change***. Yet, the message was deemed to be clear:

i) abundant medical information was provided non-stop via all media channels;
ii) the health crisis impacts everyone either through the disease and even more so through health policies that have deep economic impacts;
iii) clear directives were provided regarding the adoption of new behaviors and social norms;
iv) testimonials and support for those exposed to sickness (including medical and grocery workers, etc.) were regularly broadcasted as a reminder of impacts and for solidarity and responsibility.

Potential parallels (and differences) to climate change were largely treated by the media and observers of all types, including scientists but one comes readily to mind: even with a rather unified and consensual scientific output (as published in the IPCC reports), the variety of national policies and individual reactions is phenomenal.

Thus, observing all of this, the ***questioning*** and ***methodical*** observer of human behaviors asks: why; what accounts for this diversity at both the individual and collective levels?

Reactions to COVID-19: analyzing drivers of change and non change)

Since March 2020, many publications have offered analyses and observations on this diversity. They were written by thinkers, sociologists, economists, philosophers, and of course, medical sector actors – who had never received so much press and attention nor had so much influence on the policy making process. The general population has indeed, never been so exposed to this type of scientific health debates, which rarely cross the public-at-large threshold. Words like "epidemiology", "sanitary risks levels", "clusters" or "patient-zero" and "R+" passed into daily language and conversations while health ministers' names became known to the general public. To the ***questioning scientific*** observer, what was striking was that these publications were just as diverse as popular reactions. Three categories can be identified.

The first are epidemiological and medical analyses of the virus situation, its propagation, with the related proposed health measures to contain it. One of the main issues covered, if not *the* main one, was not purely scientific, however; it was our health system's capacity to deal with the number of patients (number of reanimation beds, trained staff, impacts on other diseases, and so on). In other words, it was not a biological issue but a mix between organisational, human, infrastructural and economic resource – as well as past long term health care system policies. These had very direct consequences on how to deal with the virus, since, if we had had sufficient medical facility capacity, there would have been no need for confinement, and thus very little impact on the economy, work, daily mobility, vacation and school.

The second category of publications came from survey companies and private actors, including surveys with thousands of respondents and small ones with barely a 100. These publications number in the

[2] Leaving aside the point that this community was not immune to debates and scandals – see The Lancet scandal.

hundreds but received comparatively little, with a few exceptions, public attention for the most part, being aimed at a small targeted public.

The third category is composed of observers from different disciplines (made up of scientists, philosophers and social commentators) who put forward two main arguments, largely diffused by the media, and a minor one. The first major argument is that the Covid19 would 'kick-start' efforts for ecological transition. There would be an "*after-Covid19 society*". Few actually explained how this would come to be, as if the crisis alone would suffice. These most often focused on how the implementation of ecological transition measures would provide answers to the present crisis and on how to prevent another one while contributing to ecological transition efforts. In this argument, the distinction with health measures was not often clear. Yet, we saw how varied reactions were, especially if we take into account that perceptions related to the health crisis are quite different from those associated to the ecological one.

It was striking to note that while many of these authors raised scientific questions, they adopted a normative language when answering those questions: "*a new society will emerge*"; we would witness "*a rupture in our living styles*" or "*in our mentalities and modes of consumption and production*". In some cases, this argument was presented as an injunction, with the "*necessity to change*" made repeatedly by many high ranking officials, experts, commentators and NGOs, who re-used the usual messages regarding ecological transition efforts. Interestingly, these 'conclusions', which were presented as obvious, were actually seldom based on empirical evidence from the behavioral sciences. Fortunately, there were methodologically sound studies, and while they represented in the early stage, the minority report, they became more common as time evolved.

This IPBC publication aims to bring its contribution to this last category, focusing on the issue of drivers of behavioral change and non change in a time of Covid 19 health measures. What does an analysis of reactions to these measures teach us about drivers of behavioral change and non change in a context of ecological transition efforts? Are they so similar that a direct parallel can be made or are the situations so different (and their perceptions) that comparison is meaningless? The simplistic answer is, of course, both and everything in the middle, hiding a real deep underlying complexity, the iceberg's visible face being the diversity of populations' behavioral and attitudinal reactions. The invisible part belongs to those drivers of change and non change. To IPBC researchers, this meant asking the following questions: which drivers of behavioral change and non change are specific to the Covid19 crisis and to ecological transition efforts and; which are common to both and; what can they teach us about ecological transition efforts? This necessarily means raising other research questions:

- What is the complex, triangular relationship between science, political decision and individual/collective behaviors? For example, from an individual point of view, why should I - or not - make efforts to comply to new social norms or to rules edicted by above, for a risk that is almost inexistent to me? This applies to both Covid19 and ecological issues.
- What is the role of trust and legitimacy between actors in this triangle? For example, who should be trusted in the message conveyed: scientists who do not always seem to understand real life living conditions and needs – be it for health or ecological objectives – or political leaders who have changed their position relative to what a good sanitary behavior is, following their experts' advice?
- What is the relationship between scientific information and lay understanding of ecological efforts and covid19 – and their connection to daily life?
- Which, therefore, Covid19 measures are not applicable to ecological efforts and even, which are to be avoided as they would be counter-productive?

Behavioral sciences can make a real contribution to understanding and make recommendations for what may seem at first sight to be natural science issues (virus, biodiversity and climate equilibrium). We need to remember that while atmospheric sciences are important to tell us how and why climate change is caused (increase in greenhouse gases in the atmosphere), ***human activities*** are the cause. Looking to natural sciences for answers to our production and consumption activities is thus necessary but entirely insufficient. While behavioral sciences are better equipped for this, the best approach is by far multidisciplinary. And while medical sciences are important to tell us how the Covid19 operates,

propagates and affects people, these sciences cannot tell us how and why people react to measures (policies) aimed at containing it. Indeed, in this regards, humans are akin to buses (whose brain is the bus driver) filled with viruses (who act as free riders) with the objective being to avoid traffic jams in hospitals. While atmospheric sciences, as well as glaciology are essential to explain how a CO^2 molecule will propagate and fix it itself in the high atmosphere, they offer explanations on how the engine works but they cannot tell us how to change human activities that emit greenhouse gases nor how to reduce impacts. For this, we need behavioral sciences in the large sense of the term, including neurology, sociology, economics, political science, psychology, law, management, philosophy and many others.

Before presenting the articles, let us now expand a little on some of the parallels and differences between the covid19 sanitary crisis (and the economic crisis) and ecological transition efforts, reflecting on some of the lessons to be learnt and some of the traps to avoid when making such parallels. IPBC's articles expand on this point, each from their own point of view.

A few parallels and differences with ecological transitions efforts

Both the Covid19 and the ecological crises have a point in common: all actors are expected, and even are required, to change their modes of living and their behaviors. But there is one fundamental difference: the changes expected, necessary or required for ecological transition are far deeper and more numerous, basically affecting all aspects of our lives and they are to be sustained in the long term.

Indeed, in ecological transition efforts, we are admonished to become vegetarians, stop using our cars, retrofit our homes, improve our heating system, refrain from using air conditioning, stop unnecessary air travel, etc[3]. While these are all valid measures, backed by evidence from the natural and technical sciences, they are seldom fully translated into practices, except for a minority of citizens, despite long standing scientific work regarding present and future climate impacts and catastrophes. And when they are converted into new behaviors, it is often incompletely and at times with negative rebound effects.

The rebound effect[4] arises when behavior decrease the expected improvement in energy efficiency precisely *because the actor is informed that consumption is decreasing*, and thus may *lead to counterproductive behavior, thus raising the issue of the role of information as a driver of change or non change, in behavior change*. The rebound effect varies from one technology to another and according to the behaviors studied: heating, lighting, meat consumption or travel... This raises an interesting point regarding behavioral drivers of change and non change: the rebound effect is ***not*** a form of rejection or non acceptability. It works precisely because the technology or measure is adopted and used but not according to the conditions expected from the designer which do not take into account attitudes, expectations, perceptions and representations behind daily real behaviors.

Then, a widespread explanation for the failure of information to cause changes in living modes is that we do not perceive (see, feel) climate change impacts nor the loss of biodiversity because people are far away both geographically and temporally (2050 or even 2100) from most consequences. Thus, the explanation goes, the ecological crisis is **so abstract that it does not mean anything *experientially* speaking, and thus, that it cannot be a driver of lifestyle changes**, the so-called "perceptual distance". As this seems to be a valid explanation, many actors propose what appears to be at first sight an easy and elegant solution: technologies. Two important elements need to be discussed here.

The first relates to the technological approach. But behavioral sciences have long shown that technical solutions are also a social phenomenon – that science is also embedded in a society. The idea then is to make a technology 'acceptable' to potential users by educating them. This implies that a technology is designed by "enlightened" actors, a design to which the user must adhere, without any deviation in use

[3] Radical ecologists will argue the need to stop having children.

[4] Well developed by S. Sorrell (2007). *The Rebound Effect: an assessment of the evidence for economy-wide energy savings from improved energy efficiency*. A report produced by the Sussex Energy Group for the Technology and Policy Assessment function of the UK Energy Research Centre.

from the specifications, based on the designer's assumptions about the user's practices, (what Akrich[5] called "inscription", referring to how behaviors are supposed to conform to technical capacities, limits and functions).

Focusing on innovation from a purely technical point of view leads to the view that technical and economic tools are enough to define both the right objectives and the methods to reach them, as if they were value free. This contributes to considering users as a "problem" to be resolved through information, as if the technical solutions could not be on their own also sources of problems. We also find this in high energy efficiency building design procedures and new smartgrids used for energy management, often based on false assumptions regarding energy behaviors. Indeed, from the users' point of view, it is more simply that the technological solutions do not correspond to their daily needs, habits or desires and capacities. ***But this argument also applies to information as a method to change behaviors***.

Strategies based on scientific information alone or on technologies can lead to different forms of rejection, ranging from passive ignorance to minimal use and to ones with negative effects. To be noted as well is that the user may adopt a solution for objectives or reasons that are different from the designer's objectives and intent, with the final outcome being suboptimal energy consumption decrease results. Thankfully, new more "pragmatic" approaches have been gradually developed but much remains to be done and analysed, especially in a multidisciplinary research strategy that would offer a more complete understanding of drivers of change and non change for ecological transition efforts.

But let us go back to the perceptual distance argument which puts forward that temporal and geographical distance of a crisis is related to lack of interest. The COVID19 crisis has shed strong doubts on this explanation: it affects and kills people now and here; we know people who have it or we caught it; and almost all of us have felt the impacts of containment policies – unemployment, limited mobility, less proximity with friends and families, inability to hold funerals and weddings,... Yet, even with all of the reality of its impacts, there is still a wide variety of reactions, as we saw above.

> People did adapt to lock down rules from one phase to the second but they also learned how to play with these rules. Hence, a wine tasting merchant offered false professional permissions for mobility for wine tasting classes. Some high school students in Grenoble, France, paid an infected, identified, student 5 € to declare that he had met them face to face, so that they would get an extra week's vacation...

The point of this introduction is of course not to offer answers to these complex and deep issues but to highlight some of them so as to show the utmost importance of going beyond natural sciences and start taking behaviors very seriously regarding their impacts on effort at changing. This is at the core of the IPBC's objectives, its very *raison d'être,* with a multidisciplinary approach because we believe this is the only way to partially capture human complexity and draw conclusions based on scientific evidence. The different chapters of this covid19 and ecological transition publication address these issues each in their own fashion, based on researcher's long experience and extensive research agenda on behavioral change. The tone and level is not that of peer-reviewed scientific journal, but rather as 'informed food for thoughts' of some parallels and differences between the two crises and more importantly, regarding the differences in actors' perceptions, understanding and behavioral reactions to these crises.

Roberto Casati's paper offers a good introduction, in a personal tone, to the different factors and approaches used in the other papers. He investigates several categories of drivers of behavioral change and how they can be put to work in the cases of pandemic management and ecological transition efforts. While he briefly discusses a spectrum of options available both at the individual and at the collective level, he points at an under-evaluated and under-analyzed driver: space and object design and the role it could play.

[5] M. Akrich (1992). « The De-scription of Technical Objects ». Shaping Technology/Building Society. *Studies in Sociotechnical Change*, 20524.

Christian A. Klöckner, Benjamin Gardner and Bas Verplanken address the issue of routines, ingrained automatic behaviors that require energy from the brain. They explain the usefulness of routines while pointing that they also become sources of obstacles to proper adaptation to new situations out. They write, "in situations like the COVID-19 pandemic, automatic triggering of behavior can be dangerous, because it leads us to fall back on undesired behaviors even if we intend not to perform them", thus raising the question of the limits of intention and decision taking. Making parallels with ecological transition efforts, they point out that many of our old habits are not compatible to the new transition objectives. However, they also put forward that the global disruption caused by the COVID-19 and its measures may open a window of opportunity to change detrimental environmental habits while dealing with the pandemic. But this requires strategic thinking.

Grażyna Wąsowicz and Jan Poleszczuk take on a double, sociological and psychological angle, by addressing the issue of threats to social systems' routines, to which institutions and individuals within will react differently. They look into psychological mechanisms related to needs and motivation, media and social information as well as emotions experienced in a situation of a perceived threat which differs from the ecological crisis. Results of research conducted during the COVID-19 pandemic illustrate some of the issues discussed, such as the messages conveyed and received and their impacts.

Klaus G. Grunert and Lucia A. Reisch discuss the extent to which nudging techniques have been used to make people adapt their behaviour to the COVID-19 pandemic and what we may learn for the application of nudging to areas such as mitigation of climate change. They explore how the current situation may allow us to learn how nudging techniques interact with other sectors of behavioural change. They suggest that implementing lasting behavioural change requires a combination of techniques appealing to the brain's inherent laziness (they call the brain a cognitive miser') and of techniques appealing to the human desire to build coherent self-identities.

Camille Lefrançois looks at power relations and domination as obstacles to ours society's adaptation capacity, highlighting the fragility and rigidity of our organizational system. On this point, her paper presents two behavioral and cognitive dimensions that can hinder or promote adaptation, individually or collectively. The first dimension concerns the concept of Gregarious Positioning, which implies inter-individual and inter-group power relations; the second concerns more specifically so-called adaptation mechanisms, and is in opposition to our habits. She also investigates the impact of these dimensions on our capacity to adapt to ecological transitions efforts.

Csilla Ágoston and Attila Varga explore some mental processes and drivers of human behavior behind people's decision to act or not to act on climate change mitigation and COVID19 measures. Drawing upon the scientific literature on drug prevention and health promotion programs as well as on information transfer and attitude formation, they highlight the importance to address people's emotional reactions as a driver of behavioral response. As people's environment-related attitudes and behaviors can be changed by well-designed combination of economic incentives and communication strategies, they highlight the importance of addressing emotional responses in these strategies, in order to reach effective psychological adaptation to change,.

These texts do not pretend to address all possible not to be exhaustive on the issues addressed but they do avoid some of the magical or single-angle thinking too present in the media, including some scientific ones. They also propose interesting food for thoughts on the drivers of behavioral change and non change that play such an important, yet largely under estimated and still badly understood roles, in transition efforts.

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COVID-19, THE CHALLENGE TO CHANGE HABITUAL BEHAVIOUR, AND IMPLICATIONS FOR THE TRANSITION TOWARDS SUSTAINABILITY

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COVID-19, the challenge to change habitual behaviour, and implications for the transition towards sustainability

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Summary

The mitigation of the COVID-19 pandemic requires rapid and fundamental changes of individual behaviours. Many of these (e.g., greeting rituals) are so mundane and routine that under normal conditions, we would not spend a thought on them but rather perform them automatically. The 'habitual 'nature of these behaviours is beneficial because it allows us to do our regular actions without burdening our limited mental resources. However, in situations like the COVID-19 pandemic, automatic triggering of behaviour can be dangerous, because it leads us to fall back on undesired behaviours, even if we intend not to perform them. Parallels can be made for ecological transition efforts, many of our old habits not being compatible with new conditions. Findings from habit research can help in the COVID-19 situation to make behaviour change more successful. At the same time, seeing the substantial disruption COVID-19 has put on societies around the globe potentially opens a window of opportunity to change detrimental environmental habits while dealing with the pandemic. This requires new models for how societies are organized and economically.

Glossary

Cognition / cognitive – relating to brain functions.

Habit – a strong association between a behavior and a specific situational context, where encountering the context triggers the behaviour automatically; habits are established by repeatedly performing the same behaviour successfully in the same context.

Habit Discontinuity Hypothesis – assumption that habitual behaviours will be discontinued if people are no longer exposed to the contexts that trigger them; it provides a limited, often short window of opportunity to reconsider those behaviours.

Implementation Intentions – concrete mental plans for when, where, and how to perform a new behaviour.

Routine – a fairly rigid sequence of actions, which often is at least partly automated, and which does not require attention to be performed; established by repetition.

Script – a mental blueprint for what kind of behaviour is expected / to be performed in a given situation.

Situational Cues – characteristics of a situation that work as triggers for the habitual behaviour associated with the situational context. These characteristics become situational cues to habitual behaviour through repeated performance of the behaviour in the presence of the cues.

Introduction

The COVID-19 pandemic has had a profound effect on individual human behaviours, both directly and indirectly. Alongside hygiene-related behaviours like hand washing, everyday social behaviours such as meeting people, travelling, attending events, working arrangements, and even the configuration of physical distance around other people have been fundamentally disrupted by the pandemic and associated restrictions. COVID-19 even means changing the way we greet each other, which is deeply ingrained in both culture and routines: while Japanese for example just have to continue bowing, French

or Spanish people have to stop kissing each other on the cheek. Many of the behaviours that people were encouraged to stop performing are, however, deeply engraved. They are repetitive routines that we engage in on 'autopilot', with minimal prior thought; that is, they are habitual. In this thought piece, we explore the barriers habitual behaviour poses for effective COVID-19 mitigation, but also the opportunities and difficulties the pandemic offers for triggering substantial changes in human behaviour related to the necessary ecological transition, as well as differences between the two.

COVID-19 and habitual behaviour

Every day, people face thousands of decisions on which behaviours to perform. These can be 'big' decisions like purchasing a new refrigerator or a house, but the large majority are small decisions which regulate our daily functioning. People have only limited mental resources, and using resources for one task diminishes capacity to do other tasks at the same time. If we had to consciously plan every morning how to brush our teeth, to switch off the light every time we leave a room or to wash our hands when we have been to the toilet, our cognitive resources would be so heavily burdened that we would be unable to function in our daily life.

The cognitive mechanisms which enable us to deal with such situations are forming habits, establishing routines and developing scripts that tell us automatically or with mental shortcuts what to do in a given situation without the need to involve more complex evaluations (Klöckner & Verplanken, 2018). This frees cognitive capacity for use on other tasks. Habits, routines and scripts are acquired over time by successfully repeating the same behaviour in the same situation. While a behaviour may be intentional the first time it is performed, it becomes more habitual after several successful trials. When habits become very strong, the mere exposure to a situation is enough to trigger the associated behaviour.

An excellent example for how such routines are established is the training we go through to learn to ride a bicycle: While at first all our attention needs to be directed to not falling off the bike, after some successful repetitions the movements needed to ride the bike become automatic, allowing us to start directing attention to finding our way. Once we established a travel habit for our regular trips, we can even use the time on the bike to (mentally) prepare some work-related presentation without getting into an accident.

While establishing such habits has significant advantages, they also come with a cost: The more habitual a behaviour, the more locked-in the established behavioural patterns become, the more difficult it becomes to change it. When control over a behaviour is transferred to situational cues, the behaviour loses our attention, and we process less information that could inform our decisions regarding whether to continue performing the behaviour. Even where people do consider new information and consequently decide to do alternative behaviours, they may continue to act habitually despite their new intentions. In other words, strong habits make it more difficult to change the respective behaviour and we will be less receptive to information or communication which is not in line with our established habits (Verplanken, Aarts & van Knippenberg, 1997). Overriding strong habits requires a high level of cognitive effort, which can pose a substantial barrier to behaviour change. Especially in situations where we are already under cognitive stress (because we have a demanding task to finish) or distracted, overriding habits can become impossible, and we slip back to the old behaviour (Gardner, Lally & Rebar, 2020), which is a challenge to traditional awareness campaigns that often address the intention of people to change their behaviour without recognizing underlying habits.

So how can habitual behaviour be changed?

If motivation to change is strong enough and people are not put under other cognitive pressure, they are able to spend the effort necessary to first disrupt the activation of old habits, then deliberately change their behaviour, and then eventually develop new habits. This process of habit substitution involves a

temporary switching of “cognitive gears" (Louis & Sutton, 1991), while "novel and discrepant conditions" provoke such gear switches, a description that certainly qualifies for COVID-19 associated measures. However, such switching is intellectually demanding and can lead to fatigue. It has been shown that people may succeed more with changing their habitual behaviour if they form what psychologists refer to as implementation intentions (Bamberg, 2002), especially if the habits were not too strong (Webb, Sheeran & Luszczynska, 2009). Such implementation intentions are very concrete plans which can promote the substitution of one context-related action with another, such as "tomorrow evening when I go to the grocery store to buy food and stand in front of the sweets, I will buy apples instead" or “next time I am in the grocery store and select fruit, I will not touch them until I have decided in order to avoid spread of COVID-19”. It is assumed that such implementation intentions are able to override habits because they establish a new association between the situational cue (the sweets in the store) and a behaviour (go to the fruit section instead of habitually grabbing a bag of sweets).

Another efficient way of disrupting habits is to capitalise on context changes that accompany major life events (e.g. when people become parents, start a new job or move house), purposefully disrupting contexts that support habits so that the established habits are no longer triggered (e.g., by closing roads or car parks so that travel habits fail; Brown, Werner & Kim, 2003), or indeed naturally occurring events such as the COVID-19 pandemic which has made a lot of our daily routines impossible. This has the added benefit that, in the new context, people will typically (have to) form new habits (sometimes even because they are forced to show a new behaviour like wearing masks). Both kinds of interventions have been referred as the "habit discontinuity hypothesis", which states that habits can be "disturbed" via context changes, and that these changes make people more receptive to new solutions (Verplanken, Roy & Whitmarsh, 2018). The main assumption is that the disruption of an established habit by circumstances that prevent it from producing the same satisfactory outcome as before opens a time-limited window of opportunity where people are more prone to make conscious decisions. If one succeeds in creating new habits during this time, sustainable behaviour change can happen and the new behaviour will be maintained. If behaviour is not changed within this window of opportunity, a fallback to old habits is likely.

Third, establishing positive habits can be a powerful tool to create new, desired, stable behavioural patterns and, in the case of a previous habit disruption, anchored in a new context. Gardner et al. (2014) showed that providing parents with knowledge about how to create healthy feeding habits based in habit theory was both successful in establishing such habits and appreciated by the parents as it enabled them to automatise behaviours which before required a lot of cognitive effort. Thus, habits can not only be seen as a barrier (as in case of habits going against a behaviour change) but also as a tool for making behaviour change resilient against relapse (namely if new habits get established during the intervention program; Lally & Gardner, 2013). ***But what does this tell us about COVID-19 measures?***

For many of the measures targeting individual behaviour to prevent spread of COVID-19, the described mechanisms of establishing habits and breaking habits are insightful. Next, we analyse the main interventions implemented by governments and health authorities around the world through the lens of habits research and offer recommendations for their implementation.

Coughing/Sneezing into the elbow.

To avoid infectious droplets spreading, one of the main recommendations made by many authorities is to cough and sneeze into a handkerchief or the elbow. To which degree habits are a barrier to implementing this behaviour depends on whether it was custom in a country prior to Covid-19 or not (which is related to cultural norms creating these habits over long periods). Where sneezing or coughing into the hands was custom, changing this behaviour can be demanding, because taking up the hands in case of a cough or sneeze coming up is an automatic response learned from early childhood and learning a new habit requires attention and social feedback (support for sneezing into the elbow, social sanctioning for

sneezing into the hand). It appears, however, that people seem to adapt to the new habit relatively well since the new behaviour is easy to perform and, given public awareness and concern about Covid-19, the social costs (bad image, accusatory looks...) of violating expectations are relatively high. However, even if hygienic coughing/sneezing practices appear to be established successfully, action slips can be observed in situations where actors are distracted and "forget" to control themselves (e.g., Orbell & Verplanken, 2010). It is to be expected that such slips will become less frequent the more habitual the new practice becomes. But more difficult seems to be to establish healthier habits of avoiding to touch the face, nose and mouth with your hands when ***not*** sneezing. This behaviour is highly automatic, often occurs precisely when people are distracted (e.g. when concentrating on a task), and no clear social pressures appear to exist around this. If infections from unconsciously touching eyes, mouth and nose are to be prevented, attention by the individual, but also health authorities, needs to be given to increase focus on keeping these behaviours in the focus for some time to allow new habits to develop.

Nudging hand hygiene.

Frequent and rigorous washing of hands as well as using disinfectants when hand washing is impossible, is another common recommendation. From a habit perspective, this behaviour should be relatively easy to implement where hand washing routines already exist (e.g. after a visit to the toilet). The challenge here is to achieve the required intensity as shorter hand-wash routines might be established already, so a reminder at the washbasin with easy instructions for how to assess the correct duration could be helpful. In the longer run, even technical solutions like timers could be helpful, but also creative solutions like a sensor that plays 'happy birthday' twice (or some other 20-30s tune) from the moment that people turn on the tap may work to transform the existing hand washing habit into the new, more intensive one. Such an intervention would be related to the popular "nudging" concept, which aims to design the context for behaviours in a way which makes it the easiest solution to behave in an expected way.

New context-specific hand hygiene routines – for example before entering or leaving a public building (e.g., workspace, supermarket, restaurant) - cannot on the other hand build on existing habits as this kind of behaviour was uncommon before COVID-19 in most countries. To establish this new habit, a clear change of the situational context is recommended, for example putting up a barrier leading to a dispenser of disinfectant fluid at the entrance of a shop, making it difficult to enter the shop without disinfecting. Making this behaviour develop into a habit requires sanitizers being offered in public buildings. The experience of the first COVID-19 months shows that such strategies seem to succeed reasonably well to establish new habits among customers. It will be interesting to see how long such new practices prevail and if they really are translated into new habits. It is both possible that the behaviour is engrained into a new habit and will be performed automatically when the dispensers are met or, for other people, that the dispenser blends into the background of the scene and will no longer trigger sanitizing. Furthermore, it will be interesting to see if people generalize such habits to other contexts, e.g., use hand sanitizers more also in their private space.

Social distancing.

Keeping a physical distance to other people not living in the same household is another key measure to avoid infection. Depending on the country, 1-2 meter distance is recommended. This also includes restraining from physical contact such as hugging, shaking hands or kissing. Physical distance between people, including both familiar others and strangers, is regulated through both cultural norms and individual preferences (Hayduk, 1983). However, even if there are intercultural differences, keeping a distance of 1-2 meters is uncommon in almost all cultures. This leads to unconscious routines for how we position ourselves with respect to others in situations where we communicate with them, but also when we pass others in supermarkets, in queues or when we take seats in public transport, theatres, cinemas, football stadiums and the like.

While physical distancing efforts were generally successful in the early and most restrictive stages of public lockdown, which were characterised by high perceived threat and corresponding strong motivation to keep the distance, it is apparently more difficult to act against prevailing cultural norms of smaller distances after societies opened up again in summer 2020. Many examples can be found, where people "forget" to keep the distance, especially in situations where they are distracted or in a particularly good mood like in a restaurant or bar. This issue has of course more explanations than just habits (e.g., social needs of being part of a group and not being seen as the "coward" holding the distance any more), but established habits make it easier to fall back. Even though social distancing may have been adopted by many people, it appears to have been supported solely by conscious motivation, and does not appear to have become habitual. Rather, pre-existing habits of minimising distance appear to have re-emerged, such that visible reminders to maintain distance are often ignored. Habit-based changes to support social distancing might therefore focus more on blocking the enactment of habitual behaviours that minimise social distance. An example would be physically altering spaces to make it less convenient for people to be positioned close to each other (e.g., by blocking or removing seats or by assigning clearly defined spaces to be in for individuals in public space which has been seen through the blocking of one seat out of two in public transports and theatres for example). This brings us back to the discussion on breaking habits through external intervention.

Wearing face masks.

In many countries, wearing masks covering mouth and nose has become mandatory in public space. This is a behaviour that before COVID-19 was uncommon in many, especially Western, countries around the world. Interestingly, it spread well in most countries and became apparently habitual within just a few weeks, potentially because there was no habitualized behaviour locking people into an alternative behaviour. As a face mask is a very visible behaviour, the high social pressure might have contributed to this tendency. However, even if face masks are generally supported by people in most countries and the frequency of wearing them is high, habit-based challenges occur when people in their established daily routines forget to take masks with them to wear later during the day. It also needs to be taken into consideration that there is a rather visible minority of strong opponents of mask-wearing in many countries. Their strong opposition might even stimulate the majority to be more consistent in wearing masks, or undermine the social norms to wear masks if they are getting a large enough group, whose main argument is often based on the issue of freedom. So for mask-wearing habits to succeed in the long run, more effort needs to be placed on making them available at the points where they need to be put on, by providing them there or by establishing preparatory routines so that people have masks with them, when they are supposed to wear them. The importance of habitualizing preparatory health behaviour has also been outlined by Gardner et al (2019).

Home-working.

Working from home has been recommended to avoid close contact to other people at the work place or on the way to work. Large proportions of the work force have thus gathered experience with new work arrangements. Closing down offices and public transport disrupted efficiently existing routines and habits regarding where, when and how people work, as well as how they travel there. Even after reopening societies and allowing working in offices as well as using public transport again, travel patterns and work arrangements seem to have changed on a more permanent basis with home officing being both more accepted and more appreciated.

At the same time, it appears that the number of people using public transportation is substantially reduced also after full service was available again, with both increasing bike traffic and walking on the one hand, and increased car travel on the other as a consequence, the latter obviously not being sustainable. Interestingly, changed work and travel habits have also implications for related health and environmental behaviours: For many workers, the trip to work used to be their daily exercise (if they used the bike or

walked) and many work places had introduced programs to establish healthy eating habits and habits of short exercises to counter the negative effects of sitting in front of a computer screen the whole day (Smith et al, 2015). Such habitual behaviours are not activated in the home office, and there is a danger of detrimental health effects. Thus, a focus on establishing health working habits in the home office is strongly recommended. It is to be expected that this is more difficult in the home context, though, without the social control of colleagues or superiors.

And what about a second wave?

The short analysis in the previous sections shows that habit theory has an important contribution to make in designing COVID-19 measures which include individual choices. Most of the behaviours affected are to be regarded as habitual, which means that it is important to consider the degree of potential behavioural lock-in caused by existing habits, but also the potential for the protective behaviours to become habitual, so that people do not need to keep up the level of attention initially necessary to perform the behaviours. This is particularly relevant for facing the second wave of COVID-19, which is now manifesting in many countries. The more habitual the protective behaviours have become, the easier it is to maintain or reactivate them. In the second wave, we can observe that for many people, some of the protective behaviours have in fact been implemented into daily habits as hand-washing, wearing masks and keeping a larger distance to people have become automatic. However, there are also indications that this is not true for all people and in all situations. Potentially, the strategy to open up societies in summer with a narrative presenting the COVID-19 as being under control led to people returning to their old habits. Reaching the same level of alertness a second time is much more difficult than reaching it the first time, because people get also used to the COVID-19 threat. Furthermore, there is a need for actively creating new health-supporting habits due to new societal arrangements for work or other activities post COVID-19, such as more home officing, which will be an important instrument during wave 2 and beyond.

Implications for ecological transition efforts

The COVID-19 pandemic and its associated measures also have implications for ecological transition efforts, necessary to address the environmental challenges societies face. Also in this domain, we must inevitably face up to the challenge of changing individual and collective behaviours, and also here many of the behaviours that need to be changed are habitualized. This means that the principles of habit formation and habit disruption are of high relevance.

As argued earlier, one key strategy to change habitualized behaviour appears to be identifying moments of habit discontinuation and build an intervention program to establish new habits within such windows of opportunity. Habit discontinuation is caused by disruptions of established behavioral patterns, and COVID-19 might be regarded as the most profound short-term disruption of societies many countries in the world (especially in the global north) have seen in the last decades. Societies have been locked down, and the ways people work, shop, spend their leisure time, and meet have at least temporarily changed completely. So even if behavior which is detrimental for the environment is likely more engraved in complex and potentially stabilizing habit structures than the new behaviors which are now established during the pandemic, the disruption of societies may be an important opportunity for more permanent shifts toward establishing new environmentally-compatible behaviors.

This would involve replacing old habits (e.g., travelling, work meetings, consumption), which are no longer elicited because the cues that trigger them are no longer encountered, with new, more desirable behaviors. Also, research suggests that under these conditions, people are more likely to reflect on values important to them (Verplanken et al., 2008). The COVID-19 restrictions could thus be harnessed by

capitalizing on changes in everyday contexts which is conducive to new, pro-environmental and sustainable habits (e.g., less job-related travel, more home-off icing, local tourism, etc.), while discouraging the resurfacing of the old unsustainable patterns. The rupture that COVID-19 has caused around the world might thus not only be a window of opportunity because it disrupts established habits, but also because it reorients many people to reevaluate choices that have been taken for granted over a long time in the domains that were disrupted by COVID-19 (e.g., work travel).

Many people had, and used, the time to rethink what is important to them during the lockdown. It will be interesting to see what the outcome of this reevaluation will be. For some, it might be the dedication to change their lifestyle more permanently, whereas others might feel that they deserve a break from change when COVID-19 is finally over. Furthermore, habit theory tells us that the old, undesired, habits may not wholly disappear: they remain 'dormant', resisting extinction at least for some time (e.g., Walker et al., 2014), and unwillingly being reactivated when people are re-exposed to the old cues, especially when they are tired, stressed or inattentive. If people return to unchanged old contexts to which they have not been exposed for some time – for example, going back to the office for the first time in months – old habits are likely to re-emerge, and so behavior may return to pre-COVID 'normality' if work conditions remain the same. However, if old contexts appear to have changed significantly such that they no longer trigger old habits, people may form new habits as they learn a 'new normal' (e.g., more home off icing). Both forms of behavioral adaptation will likely occur for people, based on the strength and causes of their motivation to change, the extent to which they are able to focus on disrupting their old habits, the behaviors they perform, and the contexts that characterize the 'new normal'. So, even if people are motivated to change, attention should be put on establishing new habits and avoiding reactivation of old habits, for example by implementing lasting structural changes that remove or otherwise modify the cues that trigger the old habits (e.g., by using the opportunity to restructure a city's transportation system and improve the biking infrastructure, which was done in many cities). An interesting question for future research would be if such old habits can be adjusted by greening them, so that the outcome would be more pro-environmental even if the old habit still prevails.

Making COVID-19 the starting point of a more substantial societal transition would require, however, that individuals are motivated to change their behavior or are forced to change. As effective as the lockdown has been to substantially reduce environmental pollution in many places around the world, the societal and individual costs for achieving such large effects in short time periods have become very tangible, with at times severe psychological stress and health induced effects. It cannot be taken for granted that people will be willing to make the same (or even larger) sacrifices for an environmental cause as compared to a health crisis. There is a potential danger that the COVID-19 experience reduced people's motivation to act against climate change and other global crises as they learned firsthand how one version of the low-emission society could look like. It will be key to understand that disrupting societies is not enough to establish lasting behavior change, but that a process of establishing a culture of change to sustain the motivation of people is also very important to keep up the necessary support for radical measures. This is easier in cases where personal health is under an immediate and temporary threat (even if COVID-19 and its related measures might affect us for years, they will be over some day) than in a more abstract environmental crisis which also requires permanent changes in society.

It should also be acknowledged that some COVID-19 measures have negative environmental side effects such as the re-emergence of plastics and disposable products for hygiene reasons or the recommendation to use the car to avoid contact with other people in public transportation, as well as used masks littered in public spaces. In these cases, it is important to make sure that no habits develop from these temporary measures that will counteract pro-environmental behavior in the future. A shift in communicating about alternatives to public transportation by authorities can already be observed: While initially, the car was promoted as a safer alternative, many authorities now promote biking and support that by providing the

necessary infrastructure (e.g., by changing the layout of the traffic system during and after COVID-19 like many cities in the world did). However, overall, as much as the COVID-19 situation may be disruptive and difficult for many people, it can provide a unique opportunity to make significant and lasting changes to everyday behaviors which under normal circumstances may prove very difficult. This depends, however, on the willingness and capacity of people to continue to change their lives also when COVID-19 is over.

Conclusions and future perspective

Habit theory helps us to understand why some COVID-19 measures are easier to implement and to maintain than others and how information-based intervention campaigns as well as structural changes, should be designed to make lasting behaviour change likely. Habits can be both a barrier for change and a motor for establishing new behaviours and reducing the mental effort for people to maintain newly adopted behaviours. At first glance, this applies to health related behaviours during COVID-19, but the societal disruption and the potentially triggered reorientation of people's priorities during the crisis might also have implications for the ecological transition, which must not be put on hold during the COVID-19 crisis.

It will be interesting to see whether the processes of change started during the pandemic will be beneficial for the ecological transition or not and how this will be embedded or not, and if so how, in larger changes of societies (e.g., by coupling economic COVID-19 aid for industry to ecological improvements). Both outcomes are possible, since people might feel they deserve to be "compensated" for the sacrifices during the crisis, as well as their fear of a worldwide economic crisis, such that they consume even more environmentally damaging products after, or they might change their priorities, and so their behaviours, for good.

It might for example be that reduced needs for mobility last longer than the COVID-19 crisis. On the other hand, some of the measures during the crisis (e.g., recommendations to avoid public transportation or the increased use of plastic packaging) might establish new habits with negative environmental effects at a time when alternative mobility practices had not yet taken hold in a majority of the population. It will be a highly relevant empirical question whether and how COVID-19 changes people's perspective on environmental issues and the willingness to respond to them.

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TO ACT OR NOT TO ACT
– SIMILAR PSYCHOLOGICAL MECHANISM OF BEHAVIORAL CHANGE IN RELATION OF COVID19 HEALTH CRISIS AND CLIMATE CHANGE

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To act or not to act – similar psychological mechanism of behavioral change in relation of COVID19 health crisis and climate change

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Abstract: Exploring mental processes and the drivers of human behavior has always been one of the main goals of psychology. The aim of this paper is to present several theories of psychology suitable for explaining why people decide to act or not to act on climate change mitigation and the measures to slow the COVID19 epidemic down. We have long known from the scientific literature on drug prevention and health promotion programs that in addition to the facilitation of information transfer and attitude formation, it is also important to address people's emotional reactions to the topic of climate change and the COVID19 pandemic, since it can affect their behavioral response. There is growing scientific evidence that people's environment-related attitudes and behaviors could be changed by well-designed combination of economic incentives and communication strategies. In this article, we would like to highlight the importance of complex approaches in order to reach effective psychological adaptation to change, which can form a basis for eco-friendly lifestyles and may help to adapt better to the current health crisis.

Key terms:

Ecoanxiety: continuous feeling of fear of environmental damage and/or ecological disasters.

Ecological grief: a feeling of loss caused by environmental destruction and climate change.

Eco-guilt: the feeling which could occur if someone could have done an environmentally friendly action, but for some reason decided otherwise.

Ecoparalysis: the inability to meaningfully respond to the climatic and ecological challenges.

Human benefit approach: an awareness raising approach on environmental issues emphasizing that behavior changes for the environment should also be beneficial for people.

Self-efficacy: the confidence in taking effective action.

Social identity: a person's sense of who he or she is based on his/her group memberships. The person internalizes the membership as a part of his/her self-concept and forms a shared group identity.

Solastalgia: a feeling of distress caused by environmental change to one's local environment.

Theory of cognitive dissonance: the theory assumes that a state of "dissonance" emerges when people simultaneously have two cognitions that are psychologically inconsistent. Because it is an unpleasant condition, people may be motivated to eliminate or reduce it.

In the course of its history, humankind has had to face threats to its existence. Elements of nature, diseases, wilderness, hostile foreigners and other factors have caused much fear, anxiety and pain on the one hand and inspired development of magnificent civilizations on the other. These challenges were very diverse and usually specific to geographical areas. Our era is the first in history when humankind is sharing common challenges globally, the growing global ecological crisis, which is moreover caused by the global

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civilization itself. That is why the traditional solutions to these challenges cannot work anymore. New technical developments, new infrastructure, new medical solutions alone will never meet the challenge of sustainability for the global society. In order to take steps to sustainable societies, we need citizens to understand the consequences of their own behaviors and to be able to find joyful ways of living within the planetary boundaries provided us as a solid framework of our co-existence. In this paper, we explore a few theories of psychology that are suitable for explaining the barriers of action regarding climate change and the COVID19 pandemic and formulate some recommendations to overcome these barriers.

Whether we talk about climate change or adaptation to an epidemic situation, it is important to mention some classical theories from the field of social psychology and health psychology that are suitable for explaining behavior. We are social beings, thus, expectations from our peers, from the direction of our community, inevitably affect our behavior. Rashid and Mohammad (2012) emphasize the importance of the social identity theory and the theory of cognitive dissonance in the initiation and maintenance of environmentally friendly behavior. According to the social identity theory, when we define ourselves as a member of a group, we also begin to identify with the group's values – which can determine the acquisition of norms related to environmentally friendly behavior as well as COVID-related policies.

The theory of cognitive dissonance indicates that an unpleasant state emerges when people simultaneously have two cognitions that are psychologically inconsistent, and they are highly motivated to eliminate or reduce it. According to Rashid and Mohammad (2012), this kind of dissonance can arise when people develop certain habits in some area of their lives (e.g. the workplace) and therefore later feel the need to adopt this behavior in other areas of their lives, or when they have strong pro-environmental attitudes but acting on them has its disadvantages (e. g. the environmentally friendly product is much more expensive and so a more polluting one is purchased). Although cognitive dissonance can be a "double-edged sword", as action can move in either direction to reduce dissonance, some experiments show that cognitive dissonance can increase environment-friendly behavior by increasing the salience of the discrepancy between people's norms and behaviors (Rashid & Mohammad, 2012). Since these theories are applicable for several kinds of behaviors, it is worth to consider how they may explain people's acceptance of the rules to be followed during the COVID19 epidemic. For example, if people experience cognitive dissonance because of the measures introduced due to the pandemic or simply because of the uncertainty of the situation, they can shift their focus from leisure activities with friends to other important things like health and family (Li et al., 2020) or pleasurable indoor activities; this kind of reframing may serve as a constructive way to reduce cognitive dissonance. If those people who have strong environmentally friendly attitudes give up some of their activities that are risky in the current situation (e.g., traveling abroad for a vacation), it may have a dissonance-reducing effect in two ways: by complying with the regulations and being in harmony with their attitudes by protecting the environment. If the dissonance-reducing effect is not attractive enough to the individuals, then, of course, they may still prefer to maintain the risky behavior. However, there is another factor that can facilitate the behavioral adaptation to the new norms and regulations instead of confronting them: social conformity. If we consider a behavior to be normative, followed by the majority of people, we often feel an urge to practice the same behavior, like the participants did in Asch's classical experiments[2]. Although several people still chose not to follow the group, non-conformity has its price: an interesting fMRI[3]-study revealed that certain areas in our brain that are responsible for negative emotional states activate when we go against the group's norms (Berns et al., 2005). It is therefore our common responsibility to emphasize norms that work in a direction that prevents the spread of COVID19 and promotes ecofriendly behavior.

[2] https://www.simplypsychology.org/asch-conformity.html

[3] Functional magnetic resonance imaging

We have long known from the scientific literature on substance use prevention programs that complex approaches should be adopted to achieve behavior change (Bellet et al., 2001). Programs that are based on merely providing information are less effective in reducing, delaying, or preventing drug use, as opposed to interactive programs that also involve the recipients and focus on the development of interpersonal skills (Tobler et al., 2000). Therefore, in addition to the issue of information transfer and attitude formation, it is important to address people's emotional reactions to the topic of climate change and the COVID19 pandemic, since it can affect their behavioral response. We also know from studies on drug, alcohol and tobacco prevention programs that seeing scary messages related to substance use is not effective when we would like to achieve behavior change; it can be even counterproductive[4] – and this is something to keep in mind when we send or receive messages related to climate change or the coronavirus epidemic. Scary pictures and strong messages may evoke intense anxiety that can lead to panic and paralysis and paradoxically cause indifference and apathy, especially if the message aims at inducing strong fear while not providing any solutions to the situation. This is a possible explanation for the fact that some people ignore or discount certain messages that are considered to be too threatening for them. Instead of taking action, people will then choose other strategies such as self-justification, defensively avoiding attention regarding the topic, denying personal vulnerability or distorting the message – and this may also partly explain the development of climate skeptic and virus skeptic attitudes.

Recent theoretical papers and empirical studies have started focusing on phenomena such as ecoanxiety (Searle & Gow, 2010, Verplanken & Roy, 2013), ecoparalysis and solastalgia (Albrecht, 2011) as well as eco-guilt (Malett, 2012) and ecological grief (Cunsolo & Ellis, 2018). Similar emotional reactions can be anticipated regarding the COVID19 epidemic. According to a recent paper, the coronavirus pandemic will increase the prevalence of prolonged grief disorder in a similar way as natural disasters (Eisma, Boelen & Lenferink, 2020) and people are more likely to experience moral injury (Maguen & Price, 2020) or anxiety related to the pandemic itself (Lee, 2020) or experience economic anxiety due to the COVID19 crisis (Mann, Krueger & Vohs, 2020). However, ***it is still not clear whether these emotions will act as facilitators or obstacles to take action***. Opinions are divided on the adaptive or maladaptive effects of ecoanxiety, with some seeing it as an obstacle to sustainable behavior, as it has a paralyzing and demoralizing effect and therefore needs to be treated or mitigated (Usher, Durkin & Bhullar, 2019). Others see it as a possibly stimulating, mobilizing and therefore necessary feeling for environmentally friendly action. For example, we have evidence from a nation-wide population study in Australia (Bradley & Reser, 2016) that higher climate change worries and higher climate change risk perceptions were associated with higher felt responsibility to act, self-efficacy, adaptation, and pro-environmental behavioral engagement, highlighting that the distress that people feel over climate change can have positive effects on taking responsibility and engage them in environmentally friendly behavior. It is a hopeful result that risk perception and self-efficacy were correlated, which means that those who see the risks of climate change very clearly do not necessarily experience feelings of helplessness, which Bradley and Reser (2016) qualify as "motivated control". In any case, support groups have already been set up for those who feel that climate change is a particularly concerning issue for them.

The mentioned studies suggest that no attempt to change people's behavior could be successful without taking into account people's need for mental health, positive emotion or as Strife phrased, without using the "human benefit approach" (Strife 2010). The most obvious link between environmental conservation and people's wellbeing is the fact that time spent in natural environments are relaxing and healing for people and good for people's well-being (Hartig, Mang & Evans, 1991; Franco, Shanahan, & Fuller, 2017). There is growing consensus among researchers that lack of time spent in natural environments leads to

4 https://www.prevention.org/Resources/348ad797-5165-4695-885f-1e958b8f5591/IneffectivenessofFearAppealsinYouthATODPrevention-FINAL.pdf

several physical and mental health problems including obesity and hyperactivity (Louv2005). Connection to nature is not just simply good for people's health but could motivate environmental behaviors too. Recent research on the effects of COVID-19 lockdowns reveals that public awareness of nature and the environment improved due to the increased experience with local natural resources. It may also strengthen public support for changes which are necessary for sustainability (Rousseau& Deschacht 2020). It seems that lockdowns proved to people that it is not enough if there are nice and green spaces available on weekends and vacations, and that for sustainable futures, we should transform all of our living areas into green and livable spaces as much as possible.

Palmer and Nael's classic research on the life history of successful environmentalists prove that positive experiences in nature are good predictors of environmentally friendly behavior. This was mentioned by 90% of the respondents (1994). Therefore, if we would like to motivate people to act environmentally friendly, the first step should be to offer as many natural experiences available for them as possible (https://natureforall.global/). That is why greening our cities, making natural experiences available for people living in urban environments (e.g. https://10minutewalk.org/) could be a key factor not just for making cities more climate friendly and urban people healthier and feeling better, but also to motivate them to change their behaviors into a more environmental friendly direction. And last but not least, it is more advantageous to spend time outdoors instead of crowded indoor settings, which could be an effective way to reduce the spread of coronavirus infections (in the case where there are no restrictions on outdoor events or strict lockdown policies implemented, of course). The good news is that even in lockdown situations, very small steps help a lot. For example, a study came to the conclusion that it is much better for office workers to see natural elements from their office window (Kaplan, 1993) and –although to a lesser extent–even the placement of posters depicting natural images can improve people's well-being (Kweon at al. 2008).

Another important fact to take into account is that psychological studies show the feeling that one is serving the wellbeing of the whole planet could significantly contribute to personal happiness (Csikszentmihalyi, 2003). It is worthwhile to note that feeling one is helping the planet does not necessarily mean that the concrete action is actually helping the planet on the long run. For example, plastic bags were invented to save trees, to be substitute for wood-based paper bags, and so to save the planet (Weston, 2019), but nowadays we have to save the planet from plastic bags. Nonetheless, the intention to serve the planet could be a key to personal happiness. Kasser's research has shown that materialistic, money-oriented motivations which endanger sustainability also endanger people's own happiness and health (Kasser, 2002). The reason behind this is that taking care of just your own interests will not simply destroy your connections with nature and people and so isolate yourself from nature and from other people, but could also create distress and anxiety about your wealth, and about people and circumstances threatening your wealth. Working for the common good of people and the planet may mean that one does not look at other people and other beings on Earth as resources or threats for one's wealth but as partners with whom one shares this planet, and with whom you could live in harmony. The point of this argument is that these seemingly altruistic and ethically motivated actions are actually good for your own mental health and so there is no need for significant self-sacrifice: living in an environmental-friendly manner and enjoying a fuller life at the same time. The human benefit approach puts forward that it is not enough to prove to people that their action is good for the environment, animals or even other people. There is a need to always point out what the actions' non-ecological advantages are. This does not mean that all people are selfish, rather it means that we should not think in categories like selfishness versus altruism. Instead, we should emphasize and communicate that environmentally friendly behaviors could easily be good for the actor and beneficiaries too. While the human benefit approach can make a real contribution, we should note that it cannot work if the actor does not perceive the environmental problems at all, whether it is because this perception is due to a lack

of information, repression of inconvenient information or not caring. Fortunately, there are several ways to encourage people to start thinking about environmental issues.

Growing scientific evidence shows that people's environment-related attitudes and behaviors could be changed by well-designed combination of economic incentives and communication strategies (Heidbreder, 2019). For example, communication on environmental issues can cause eco-guilt and higher level of eco-guilt can enhance eco-friendly behavior (Mallett, 2012), under some of the conditions described above. So, external motivations, like taxes, fines and laws, and negative feelings described above are not useless or are not to be avoided in any case. They could serve as triggers of environmental friendly behaviors if they are accompanied with human benefit approach on the long run. If not, they could also turn people away from environmental issues or even could cause psychological harm to people. Indeed, media reports about climate and ecological challenges as well as opportunities for action are often alarming and contradictory, which easily generate dilemmas and lead to ecoparalysis: an inability to meaningfully respond to ecological challenges (Albrecht, 2011), or even could lead to environmentally harmful behavior patterns like hedonism and consumerism. Even environmental education in schools could cause negative feelings and could make students turn away from environmental issues if they cause untreated negative emotions like fear, anxiety and guilt (Ewert, 1986, Csonka, 2020). Therefore, there is a need to carefully plan by taking into account the actual knowledge and emotions of particular people about nature and their readiness to meet nature. We thus see professions like nature coaching emerging (https://www.naturecoaching.net/). As we stated above, the need for reconnection with nature is getting a momentum during COVID lockdowns, not just because people feel nature's healing effects but also because they are linking human destruction of nature to COVID-19, which leads even to an increase in the support for wildlife conservation policies (Shreedhar & Mourato, 2020).

We would like to highlight the importance of psychological adaptation as well, which can form a basis for eco-friendly lifestyles and can probably help to adapt better to the current health crisis. According to Bradley and Reser (2016), adaptation encompasses changes in people's cognitive, emotional, motivational and self-regulatory processes that make possible for the individuals to come to terms with a threat, adjust to it while maintaining one's own psychological equilibrium. They found that those with higher psychological adaptation were more likely to accept anthropogenic climate change, had greater objective knowledge about climate change, were more distressed because of climate change, felt responsibility to act and were more engaged in taking tangible actions. The lack of adaptation, on the other hand, may lead to the lack of acceptance of the crisis and can indicate that the individuals will be less likely to feel that they are part of the solution as well as the problem and to reduce their household carbon footprints. Therefore, psychological adaptation is a key variable when we want to enhance behavior change. These same people were also more likely to have personal experiences with environmental events – this is in line with our previous statement, namely that there are several beneficial consequences of the higher connectedness to nature. But how can we apply the concept of psychological adaptation for the COVID-pandemic and how can it help to facilitate the change in behavior in the COVID19 health crisis?

First of all, psychological adaptation defines responses to longer-term stress, and the COVID epidemic creates a long-term stress situation – at least compared to other epidemics and occasional stressful episodes in people's lives. Although there is no research yet that has directly examined psychological adaptation in the context of COVID, we could assume that higher psychological adaptation to the challenges raised by the current pandemic would be associated with higher felt responsibility and behavioral engagement. Some current results support this idea, at least partly, showing that the adoption of precautionary measures and obtaining accurate COVID-related health information led to decreased psychological distress (Chen & Bonanno, 2020). It would also suggest that the capacity to act plays a role in reducing cognitive dissonance in an adaptive manner, compatible with transition goals.

In the last part of our paper, we will review the results of some current studies aimed at exploring the possible interrelations of public opinion and worries regarding climate change and the COVID19 pandemic. Several large-scale studies related to environmentally friendly attitudes, behavioral attempts, distress and worries regarding climate change were conducted before the COVID19 pandemic, but it would be very interesting to see how these two global crises affected each other's perception. Based on the "finite pool of worry" hypothesis (Weber, 2006), which indicates that having concerns about one topic would decrease the worry about other issues, we could expect that worries regarding climate change have decreased during the COVID19 lockdown. However, according to the results of a current national survey in the USA (Leiserowitz et al., 2020), the perception and attitudes related to global warming is quite consistent with the results of a survey before the pandemic. The majority of the Americans still agree that global warming is happening and that it is mostly human-caused and 92% of them are somewhat worried or very worried about climate change.

Pizmony-Levy, Verschueren & Kessler (2020) carried out a study on a representative sample in the USA where they directly examined the relationship between the concerns about global climate change and views towards the coronavirus outbreak. They found that those who tend to be more concerned about climate change are more likely to see the epidemic as a major crisis as well. For example, of those who were "very concerned" about climate change, 85% thought that the coronavirus outbreak is a significant crisis, and only 3% of them thought that it is a minor problem. For comparison, of those who were "not at all concerned" about climate change, only 26% thought that the coronavirus outbreak is a significant crisis, and 15% of them thought that it is not a problem at all. It is even more interesting to see the responses to the open-ended question which aimed to reveal how people's opinion about global climate change transformed as a result of the coronavirus outbreak. Pizmony-Levy and his colleagues (2020) identified different themes based on the answers. Some people thought the lockdown had even beneficial effects for the environment (e. g. the pollution subsided) as people consume and travel less. The second narrative – which had a scientific or an almost religious overtone in certain cases –indicated that the two phenomena are related to each other (e. g. mother nature is punishing us with the coronavirus because of our carelessness; the pandemic is a self-correcting mechanism in the environment). Another group thought that both climate change and the COVID19 outbreak pose great challenges for humanity and that climate change is worsening. These narratives can help us understand people's reactions to global crises and we can learn from them how to adapt to the new challenges – the first narrative for example can draw attention to the direct consequences of our behavior and point out the fact that if a lot of individual action adds up, it does have an effect on the environment.

Conclusion

Humankind so far was very successful in tackling the problems it faced, so we could hope that the new ecological challenges caused by globalization and climate change will give a rise to use human creativity and adaptability for a more sustainable world. We can hope that today's ecological problem will end up next to other solved environmental problems such acid rains or ozone destruction in future history books. For this to happen, we need effective ways for initiating the needed behavior changes globally. Overall, the main obstacles to behavior change may be the lack of clear norms, the insufficient messages that evoke too strong emotions without offering appropriate solutions, or the lack of comprehension of the crises. On the other hand, we can promote desirable behavior change by helping people to turn their guilt or anxiety into meaningful action and by using the human benefit approach to point out that our actions can be beneficial for every party. We hope that our thoughts above could contribute to the search of these ways.

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"AFTER ME, THE FLOOD…"

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"After me, the flood…"*

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Summary

Our society's confrontation with COVID highlights the fragility and rigidity of our organizational system on many levels. From a societal point of view, some parallels can be drawn between our adaptation to the COVID crisis and the perspective of the climate crisis. In the Humanities and Social Sciences, the notion of adapting to events is addressed in many areas. On this point, this paper present two behavioural and cognitive dimensions that can hinder or promote adaptation, individually or collectively. The first dimension concerns the concept of Gregarious Positioning, which implies inter-individual and inter-group power relations; the second concerns more specifically so-called adaptation mechanisms, and is in opposition to our habits.

**"After me the deluge…" would have been a sentence of the king Louis XV indicating that he did not care what would happen after his death and his reign, referring to the biblical flood.*

Glossary

Adaptative Mode *or* Logical-mathematical System– Cerebral mode of functioning allowing the creation and implementation of coping strategies and representations.

Automatic Mode *or* Heuristic System– Cerebral mode of functioning allowing the implementation of routine strategies and representations.

Compliance– The state of being too willing to do what other people want you to do

Gregarious Positioning– Tendency of an individual to manifest behaviors that can be related, in a very restrictive way, to an excess or a lack of confidence in oneself and/or in others.

Meta-Skills–Ability to manipulate, judge the relevance of, and step back from implementation.

Norm–rule of judgement, behaviour or action, implicit or explicit, rational or not, to which the majority of a group of individuals refer.

Sociopathy–Personality disorder that includes a tendency to distrust social norms, as well as an indifference to the emotions and rights of others.

Introduction

I am not a doctor, nor a climatologist or a politician, I am not Greta, but... am I a game player? How much can I gamble with the risk of COVID and climate change to myself, to others? How much am I willing to bet, what's the stake (my ego? my fear of looking weak? my conformism?), and what makes me want to bet big? Who's bluffing?...

Let's see how the concepts of Gregarious Positioning and adaptive processes can help me to advise…

Gregarious positioning.

Gregarious Positioning (PG) refers, in neuroscience, to behaviors related to self-confidence, trust in others, and power relationships. These behaviours have been represented on two dimensions, the "Dominance/Submission" dimension and the "Marginality/Integration" dimension (cf. figures 1 & 2, from Fradin & Lefrançois, 2014; see also Kumaran, Melo & Duzel, 2012; Gurtman, 2009). A low level on one of these dimensions can be considered "*normal*", but this profile is considered pathological beyond a level of [2] (see figure 1).

PG behaviours would have initially allowed for early forms of collective organization (Cheng & Tracy, 2016). Indeed, group life requires sharing food, assigning certain more or less pleasant roles, determining who will be the mating partner, etc. The characteristics of dominance and submission make it possible to spontaneously attribute, without any other form of negotiation, access to privileges for the former and leftovers for the latter. It is recognized, in several animal species including humans, that misinterpretation or neglect of such an organization can lead to serious consequences in the life of the individual (aggression, exclusion from the group, killing, cf. Watanabe & Yamamoto, 2015). Although unfair, this system would have contributed, in the first instance, to limiting conflicts within groups. Indeed, if all the individuals belonging to a group had to quarrel daily over access to food at the expense of others, this would have constituted a considerable loss of energy, a dispersion of collective activity that would have distanced the group from other more strategic actions such as hunting, reproduction, care of offspring, management of external threats, etc. In the absence of more civility, evolution would have found at this stage a tyrannical but effective means of keeping the species alive. Some scientists note, however, that this archaic form of hierarchy has been destabilized over the centuries by another, more meritocratic, form of social organization, based on moral values (cf. Cheng, 2020). As we shall see, the PG-type hierarchical system shows in practice harmful limits for the human species at this point in our social organisation (and potentially more). From an evolutionary point of view, this could explain why this form of organization would need to be supplanted by a more elaborate systemic one.

With regard to marginality, the preferred evolutionary hypothesis would be that the marginal individual may have had a "*watchman*" role, living on the periphery of the group, thus destining him or her to apprehend dangers outside the group, especially from other groups (cf. Raihani & Bell, 2019; Fradin & Lefrançois, 2014). At the opposite, the integrated profile has been given the role of "*pacifier*" or "*re-conciler*", aiming to calm intra-group conflicts and perhaps to encourage and reassure the group about its ability to deal with external threats (cf. Fradin & Lefrançois, 2014; Koski, 2007).

Neurobiology of the GP.

PG behaviors, observable in many animal species (monkeys, rats, bats, etc.) seem to be globally linked to the activity of the amygdala brain region, an archaic cerebral area related to the species' evolution (cf. Amaral, 2006). This region is involved in the genesis of fear, particularly social or inter-individual fear. It allows us to unconsciously process information (hormones, speech, the dominant's head for example is often raised, high gaze, rounded bust[1], while the submissive generally has a rather low gaze, is a little bowed, the prosody of the voice is rather low, strong, slow in the dominant, hormones, speech, etc.) indicating whether the individual facing us is more or less threatening and whether it is better for us to lend him our allegiance. We would thus be endowed with a bio-behavioural system detecting as quickly as possible the social rank of others (cf. Peschard et al., 2016; Witkower et al., 2019).

In this framework, we will see, through the characteristics of PG's behaviors, how the threat posed by COVID certainly engenders fear of the virus, but could also distil inter-individual, inter- and intra-group conflicts. Obviously, GP behaviors cannot explain everything, but we can observe their manifestation in the multiple disputes and power struggles that may arise at the international level, between society and

[1] Beware not all people standing upright are necessarily dominant! Education (classical dance, for example), or other characteristics may contribute to a dominant-like posture.

local or national leaders of certain countries, in the mistrust of certain government representatives or part of the population towards health recommendations, experts and institutions, between generations, between different cultural and socioeconomic categories, etc.

What influence does dominance have on individuals and crisis management?

Work on dominance and submission suggests that these can be a major impediment to any form of sustainable, complex and coordinated adaptation of society in itself and in its interaction with its environment. However, while dominance seems morally unappreciable (see Table 1), it does not inspire as much reluctance as we might imagine. Indeed, studies by McAleer et al. (2014) show that one tends to give more credit to a deep voice, which is more often the attribute of dominant individuals. At the same time, Andersen & Kilduf's (2009) study indicates that dominants would be considered more competent than others simply by viewing photographs of individuals with facial expressions of dominance, compared to individuals with submissive or neutral expressions. One can suppose that the very automatic and "*animal*" interpretation of the dominant's attributes is probably intended to limit the questioning of the dominant, and thus conflicts. The seductive capacity of dominants also means that they are sometimes portrayed as charismatic, funny and sympathetic (in the sense of "cool"), rather than somewhat perverse and sociopathic (Reijntjnes et al., 2016).

Dominance, however, is a problem in managing crisis situations because of its propensity for conflict, intimidation, etc. It is a problem because of its pleasure in seeing certain groups oppressed by others and resulting, for example, in the neglect or even endangerment of the most fragile from the point of view of exposure to the virus, or the oppression of the most vulnerable populations in the face of climate change. Its difficulty in making excuses aimed at mitigating inter-group conflicts (in the sense that this would, in its eyes, jeopardize its position as dominant) participates in the outbreak of conflicts. Its difficulty in respecting constraints and rules even if they are deemed relevant(as for wearing the mask, the obligation to wash one's hands, respecting minimal distance, not polluting, not throwing one's cigarette anywhere, not running one's car engine and unnecessarily disturb the neighbours from a noise point of view and for air quality, to take one's bicycle rather than one's car which would be an easy solution, not over-consuming while neglecting the impact on the planet and the generations not so much future and already present generations, etc.) is a big problem too. The same is true for its desire to preserve its privileged position and thus the power relations that underlie it(by proclaiming its mistrust and disregard for health precautions - beyond well-founded economic concerns, or by taking an active part in the destruction of life, for pecuniary purposes, in a dynamic of crime against life, with disregard for the survival of certain populations, ecosystems and the equilibrium of us all, etc.), inciting it to annihilate any form of thought or more adapted societal structuring, etc. (Fradin et al, 2014; Kleppesto et al. 2019).

This last point defuses the illusion of adaptive character that could be attributed to dominance. Any behaviour that is part of an adaptive and complex dynamic, and thus part of an elaborate form of intelligence, is discredited by the dominant because he tends to interpret it as a threat. This threat lies, in the eyes of the dominant, in the fact that an individual reappropriating his capacities of thinking can foresee how he is abused by the dominant, and defend himself consequently. The dominant often attempts to nip access to knowledge (in the broadest sense) in the bud, by discrediting and ridiculing in an abusive manner, without argument or with vague and false arguments ("*I was told that*..."), entities and individuals who are carriers of factual information and who risk fuelling critical, informed and personal thinking (scientists, historians, experts, etc.)[2].Such technique seems to be used by many climate and COVID sceptics. Another technique is also to start with "*I'm not a doctor but*..." or "*I'm not a climatologist but*...", the sequel often giving way to a questioning of the experts which is not always - to be completely

[2] Research itself is unfortunately not free of power games and dominance either...

honest - fully informed, nor in a perspective where all the ins and outs of the situation are taken into account, but which suits us well.

It generates conflicts of the *divide and rule* type, by imposing an omerta in such a way as to deprive its interlocutors of any form of constructive consultation. The dominant impulsively protects its privileges and the power relations from which he struggles to free itself, even if he must suffer in the long run. This description is of course not new, and is largely illustrated by attempts to discredit and intimidate against the freedom of the press, access to education, scientific information, against "weaker" populations, etc., which can be observed throughout history. Moreover, the intelligence of the dominant is often justified by the fact that he dares. His excessive self-confidence, his feeling of invincibility, the tendency of his audience to excuse many of his exactions, allows him to act without reluctance, where others would assess the risk or immorality of their actions twice. In reality, dominance's capacity for action is more a matter of difficulty in inhibiting certain cognitive processes, however ill-adapted they may be, than of audacity (cf. van Kleef& Cheng, 2020; Galinsky et al., 2003). The GP in general does not constitute an intelligent or evolutionary system in the sense that it is not capable of learning (and therefore of complex adjustment in itself): its behaviours are highly standardised, observable independently of socio-economic category and manifest themselves very early in the development of the individual, without necessary mimicry in relation to the entourage (Halpern et al., 2020; Reijntjes et al., 2016). Moreover, these behaviours impose themselves on the individual, without adjustment to reality, and even in awareness of the inherent danger (for oneself and for others) of giving in to these behaviours. Thus, they are not adaptative when faced with a new situation or risk such as covid and the ecological crisis.

The concept of PG sheds light on some of the keys of a "crisis of humanity" (religious wars in which religion becomes an alibi for power that is subordinated to the PG system, but also sexism, school and professional harassment, etc.) and how it can be maintained, aggravated, because of a simple archaic system of gregarious regulation. In the same way, the COVID phenomenon or the prospect of climate change and the associated socio-economical-geographical inequalities (depletion of water resources, food, living space) may appear to be powerful catalysts of these behaviours (cf. Hendrix & Brinkman, 2013; Reno, 2011), which themselves would contribute to the maintenance of inequalities, the neglect of environmental warning signals, etc. In other words, certain crises (implying a notion of survival, endangering health, resource depletion, etc.) can lead to the emergence of behaviors, practices and attitudes that are not the most adaptive (as opposed to other behaviors and attitudes). While some populations or leaders tend to prefer the risk of COVID to that of an unprecedented economic crisis, this does not explain the neglect of barrier gestures and minimal precautions. An individual who is not a doctor, in relatively good health, may, by not being impacted strongly by the virus, be inclined to think that he or she is being imposed unnecessary and, moreover, restrictive gestures (wearing a mask, social distancing, etc.). What is more challenging is the resistance to reasonable doubt and to the consideration of what could potentially imply the non-respect of these gestures for the life of others, and yet who is informed by the media and institutions.

Blasgov (2020) was able to show that among a population of 502 online participants, traits associated with friendliness and awareness were related to approval of social distancing and hygiene, as well as sensitivity to health messages in general. On the other hand, personality traits related to sociopathy, meanness and dis-inhibition (symptomatic of dominance) predicted low adherence to health behaviours and the intention to knowingly put others at risk. Most participants preferred a compassionate message, while darker traits predicted disinterest in such messages. Dominance could thus be largely implicated in neglect or resistance to the application of precautionary principles in the face of COVID and/or the "biological-economic-climatic-social" emergency. This is due to the fact that they may represent: a constraint in one's daily life; a directive experienced as a submission to a system; a demonstration of

vulnerability and fear where the dominant prefers to show his strength and absence of fear[3]; an obligation of precaution towards the weakest that the dominant lives as an outrage; a threat of reorganizing society into a system more supportive and therefore less favourable to the emergence of dominance...

What about submission, marginality and integration?

The way in which submission responds to dominance is not more likely to improve collective adaptation. If the submissive individual is scrupulous, he is also servile to the dominant (cf. Lefrançois et al., 2011). He can thus serve the cause of the dominant, and participate in the maintenance of a PG-type hierarchy. In psychopathology, we speak of the *Stockholm syndrome*, but this phenomenon can also manifest itself at lower levels of severity (see Table 2). Subjects are inclined to rely on what dominant people say, judging them to have better decision-making power than most other individuals, being also more seduced and intimidated by them than the average. Submissives easily pledge allegiance to the dominant, dare not contravene the dominant's words and actions out of fear, and sometimes even abound in them and show overzealousness. The paranoid tendency of marginality, on the other hand, conforms to conspiratorial interpretations, thereby fuelling fear and mistrust rather than more rational pragmatism. Finally, integrated individuals, whose characteristics may manifest themselves as a tendency to believe in an extreme and irrational way in a superior force protecting them from everything and inciting them to communion, may have a tendency to take inconsiderate risks, all the more so when they have been warned that their strategy was dangerous.

The role of socialisation...

It is important to note that some individuals, who may have benefited from early education that allowed them to channel and tame their GP profile, are more likely to act and think according to their values and ideals than according to their GP. Nevertheless, there is a better understanding today of how unsustainable such an organization may be, and how quickly it can set a standard that is neither wise, sound nor strategic. As La Meurthe would have said, "*Worse than a crime, it is a fault*". The advantages of GP behaviour, however, lie in the fact that it is eminently predictable because it is repetitive and rigid. For example, a dominant often accuses the other of his own actions in order to distract attention from his own actions. In this way, he potentially provides information about his own actions, past or future, which allows others to play a game they can benefit from? It is also known that he will be either insensitive or will be tempted to defy messages inviting empathy and inciting him to take care of others. It would therefore be particularly interesting to study the type of communication and strategy that channels or encourages the orientation of GP behaviours towards less deleterious actions, to study the preventive value of describing GP behaviours (with individuals who themselves have GP behaviours, but also in our understanding of our social interpretation biases).

We can also look at the type of education that can prevent the appearance of such behaviours, of judgments that are more emotional than rational, while at the same time reinforcing critical and informed thinking (cf. Halpern et al., 2015). The second part of this article, less dystopian, deals with this subject, or how to be individually and collectively smarter and more adaptive in the face of crises such as COVID and climate change.

Compliance and norms: individual and collective adaptation to current challenges

Asch's team (1951) proposed a series of evaluations in which the tested individual was asked to compare the length of sticks of significantly different sizes. The sticks' length had been chosen so that there could be no ambiguity as to the perception of the difference in length. The test individual was then placed in a

[3] We will speak here of "fearlessness" rather than courage, since courage implies an awareness of risk and overcoming that risk in a situation where the individual feels that he or she has no other more relevant choice. The dominant is often reluctant to acts of courage; he will prefer to expose those around him to danger rather than her/himself, even if s/he pretends otherwise, with some bravado.

group of individuals, who he could believe were subjected to the same test as him, but who were in fact accomplices of the experimenters. The study showed that when the majority of the accomplices indicated that the rods were of equal size, the test subjects mostly aligned with this response, and even ended up being convinced of it. This study illustrates the concept of compliance, which can be defined as an alignment of the actions, behaviors and thoughts of individuals in a group, and thus calls for a standard.

The norm can be defined as a rule of judgement, behaviour or action, implicit or explicit, rational or not, to which the majority of a group of individuals refer. The study of these concepts is very important in understanding individual and collective decision-making processes. From an evolutionary point of view, conformity or compliance would have made it possible to limit conflicts, to facilitate the bringing together and maintenance of the link between individuals, and thus the transmission of genes, etc. (cf. Coultas& van Leeuwen, 2015). However, the virtues of compliance and respect for the norm have been particularly undermined by various studies such as those of Asch and his collaborators, and, worse still, by Milgram's famous studies (1963), which showed how easily one can comply with an immoral and cruel act.

The Abilene Paradox, developed by sociologist Jerry Harvey in 1988, also evokes the fact that a group of individuals can agree to commit themselves and go through with a process that is not desired by any of the members of the group, and without anyone questioning the merits of this process at any time. Nobel Prize winner Herbert Simon, for his part, evoked the notion of limited rationality which would imply, because of the cognitive limits of individuals, that they would opt for a more desirable and satisfactory strategy at first sight (with a low cognitive cost?) rather than an optimal strategy.

In the midst of a health crisis, we can legitimately ask ourselves what incites us to act and to adopt one reasoning rather than another and one behaviour over another. Is it resistance to change, tinged with alibis that prevents me from including barrier gestures in my daily life? Is it conformism or submission to authority that pushes me to apply these gestures, or on the contrary a form of discernment, of adaptation, altruism? Can there be a form of compliance in yielding to the pressure of certain groups claiming the right to freedom from barrier gestures? The above-mentioned studies do not indicate how to protect oneself from such biases, how to assess the relevance of the thoughts that are imposed on oneself. From this point of view, it would be interesting to study what can help us to be more discerning about the risks incurred in the face of climate change... but is the concern about the climate problem, here too, and as some climate sceptics would say, a fashion effect, in other words a form of compliance, or an unfounded warning aimed at stirring up fear and sacrificing the current liberal system? Or is climato-skepticism itself the fruit of a form of conformism and gregariousness, seeking by all means to preserve its routines and a potentially unequal socio-economic system? To what extent is intimidation of and marginalization of whistleblowers (death threats, personal attacks, discrediting of their words, mockery, attempts to marginalize and infantilize environmentalists even though they are increasingly numerous, attempts to draw attention to people rather than to the logic of their arguments) important information that prompts me to think beyond criticism?

The influence of the adaptive mental mode.

In cognitive neurosciences, two generic mental modes of functioning are recognized. The first, called *automatic mental mode* or *heuristic system* (cf. Houdé, 2003; Lefrançois, 2009), is supported by the activity of posterior and lower brain areas, and would allow the application of known, routinized strategies or representations in response to a known situation. The second mode - called *adaptive mode* or *logical-mathematical system* - would be mainly supported by the activity of the prefrontal cortex[4] (PFC), and would allow the elaboration of new strategies and representations in order to face new and/or complex situations, which cannot be solved with standardized responses or reactions. The adaptive mental mode thus elaborates strategies and reasoning in adjustment to the situation, which is not the

[4]The prefrontal cortex is a cerebral region located at the front of the brain, just behind the forehead.

case with the automatic mode, which encourages us to apply ready-made solutions, quickly, but without more discernment. Houdé thus declares that "*To think is to refuse, to think against others, against oneself, and to seek the truth against one's beliefs*". Houdé implies that one must try to resist what comes most quickly to mind, and to have a critical and reflexive attitude on what one spontaneously believes to be logical... especially when it comes to important issues! The Einstellung effect (Luchins et al., 1959) illustrates how, faced with a problem, people may tend to favour the application of a known and controlled strategy for the sake of cognitive economy in the short term (it seems at first sight less costly to think less and adapt less... even if it may cost us much more in the long term!), even if this is judged less effective than a more appropriate but less controlled solution. These researchers had also observed that the more an individual yielded to the Einstellung effect, the lower his or her IQ was found to be. The question that then arises is whether our intelligence - the intelligence that allows us to adapt to the complexity of the world - lies in our ability to inhibit biases and controlled but ineffective strategies? In this respect, Houdé's team hypothesized the existence of a third system known as an inhibitor, also supported by the anterior regions of the brain, which has the capacity to inhibit the automatic mental mode when it proposes a strategy that is not adapted to the situation. But to what extent and how can the adaptive and inhibitory systems be stimulated?

Fradin et al. (2008; and Lefrançois, 2009) have identified six bipolar dimensions, in which one pole designates a faculty of the automatic mental mode, and the other a faculty of the adaptive mental mode (Figure 3). The PFC, which supports the adaptive mental mode, constitutes an extraordinary machine for continuously selecting, sorting and prioritizing relevant information. From this information processing can emerge a more effective solution than a strategy applied automatically and blindly. Not that the strategies implemented by the automatic mode are always ineffective, but it is nevertheless interesting to know that in case of a problem, the automatic mode does not adjust the strategy to the situation. Concretely, just like the PG, the automatic mode can present an obstacle to adaptation in case of a crisis (such as COVID or climate crisis), contrary to the adaptive mode, which brings solutions and a better critical sense. For example, aircraft pilots have detailed procedures to apply in emergency situations or during specific maneuvers. If a failure occurs that is not among those planned and covered by these procedures, the pilot can waste precious time looking for a procedure that does not exist and can, moreover, in automatic mode, content himself to apply a procedure that is not adjusted to the new failure, or abandon the controls because he/she cannot see any new solutions (cf. "*Certainties*" mode, Figure 3). If I am more quickly in "*Curiosity*" mode (I try to find out what's going on, take into account the indicators, etc.), "*Acceptance*" mode (I take into account the reality of the problem and don't hide from it), "*Nuance*" (there is an unknown failure, certainly, but how unmanageable is it?), "*Taking a step back*" (what room for maneuver do I have, how can I get out of the framework of what I know in order to hope to glimpse other solutions), etc., I will be more able to find a solution to the problem, I'm probably more likely to see a new strategy. In adaptive mental mode, a new strategy does not imply a random strategy, since in practice the PFC continuously plans the action and selects the relevant information in order to generate adjusted solutions in real time (Lefrançois, 2009). Brosch et al. (2018) have shown that individuals who are primarily focused on their own person (including the dominant ones) feel less concerned about the long-term consequences of their actions. By extrapolation, it can be assumed that they may have difficulty using their adaptive mental mode, a mode which allows us to consider the consequences of our actions (for example, what are the consequences for one, two, three, four, etc. people that I meet and that they meet in turn if I do not wear the mask and if I am a healthy wearer?), to adopt the most sustainable solutions (what are the consequences for my children, etc.?), etc. On the other hand, this work shows that individuals who feel concerned by interests other than those related to their own person have a greater ability to consider the long or even very long term consequences of their actions, and accept more easily the efforts required for a transition.

How can these notions be integrated into the covid and socio-climate perspectives, individually and collectively?

There is a lot of work that shows a variety of ways to stimulate our adaptive skills. Mindfulness - which is an essentially cognitive form of meditation-activates the PFC region, regulates the activity of the amygdala center of social fear (cf. Lutz et al., 2008), improves executive functions (ability to concentrate, take a step back, etc.) and interpersonal relationships. Other studies concerning methods related to mindfulness, *a priori* stimulate the CPF and the adaptive mental mode also point in this direction (cf. Fradin et al., 2008; Lefrançois, 2009). Knowing this, what about the impact of certain approaches such as the teaching of empathy in Danish schools, but which would undoubtedly provide greater awareness of the causes and consequences of individual and collective actions in the short or long term? We might suspect that such approaches solicit PCF capacities - such as *Curiosity* (towards the other, what he/she feels, etc.), and *Acceptance* (in the sense of considering the other as part of a reality with which I have to deal), etc.. Can we also deduce from this that such practices could improve our ability to make a critical, informed judgment, in adequacy with the situation that presents itself, in the short as well as the longer term? At this stage of the research, and given the urgency of appropriating the means to act and think in adequacy with the destabilizing reality that presents itself to us, it would be very interesting to know how these various practices, whether they are of the order of "cognitive trickery" or training in more advanced "meta-skills", can help us to prioritize and select the relevant information.

Conclusion

Although I am not a doctor, a climatologist or a politician, the global crisis and the differences of opinion that I am facing force me to think about my actions and the relevance of my judgment. Knowing that, while admitting that the health arguments I am confronted with (covid contagion, preservation of the most fragile, etc.) seem uncertain, I try at the very least to analyze the situation beyond my immediate interests. Should I be bothered by my understanding of it? I try to consider several strategies, several hypotheses - including the most unpleasant ones - and the long-term consequences of each of these scenarios.

At this stage, I personally have nothing against applying barrier gestures. I'm expressing banalities here, but it seems that it is not self-evident. By respecting these gestures, I don't have the impression of being conformist, nor of posing a problem if it were only conformism on my part. So when in doubt, I take the precaution to protect my family and friends, and participate in the best way to limit this economic drift that the circulation of the virus probably does not help.

At this stage, I am inundated with institutional or scientific information from all sides (humanities, biological and meteorological disciplines, etc.), all of which point to a rapid invitation to change one's behavior in order to limit the environmental and societal problems that arise. This information seems to me to be dramatically convincing and adds to my own observations. Where is my cursor between automatic and adaptive mode? If nevertheless I was still sceptical, would I try to understand what makes me doubt - *I hope so* - (don't I trust these many opinions?)? Does, admitting this simply not help me? As a scientist, what about the scientific distance and doubt that require to raise questions regarding what may seem obviously true to all? Or am I afraid of being seen as an extremist environmentalist and would I rather show that I have no opinion on the subject? Would I carefully reconsider the arguments of the climate sceptics, without forgetting to observe their behaviour: are they disdainful, aggressive, seeking to humiliate other scientists, or are they in a substantive debate, an analysis of the situation and a peaceful and open search for solutions? Are they categorical and certain, or do they leave room for the possibility of such a crisis? Do they consider all the indicators when arguing their case?

For some, I am not a gambler. But considering the risk, I think I am, on the contrary, a good gambler: I know when to stop and how much not to bet. I don't want to bet on the fact that the virus will not affect,

directly or indirectly, me, my family, my friends with asthma, immunosuppressed, old and not so old, etc. I'm not very seduced by the idea of killing someone, without even realizing it, without perhaps even knowing it one day(...to be honest, I prefer not to know), when I would have been a healthy carrier. So I take my precautions, a bit like the young person who was taught to use condoms, even if it's not very pleasant, and even if my partner pushes me not to use them "*because it's less nice*" .

As a behavioral scientist, I've learned a little bit about recognizing the bluff, and others' bluff, as well as the bluff that would make me lie to myself. This knowledge encourages me not to bet more on the climate emergency and its consequences, already consumed and active, and not to give more credit than necessary to overly vindictive, aggressive, blurred words that divert attention from what is essential.

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Annexes

Dominance	5	*Sadism, cruelty, perversion*
	4	*Violence for no apparent reason*
	3	*Pleasure to destabilize*
	2	*Self-pity, tendency to blameothers*
	1	*Flattery, seduction*
	0	**Neutral attitude, Assertiveness**
Submission	-1	*Tendency to be obsessive, guilt*
	-2	*Servility, irrational guilt*
	-3	*Superstition*
	-4	*Panic, fear of going crazy*
	-5	*Melancholic depression*

Figure 1: Levels of Submissive and Dominant behaviors

Integration	5	*Illumination, mysticism*
	4	*Feeling of being able to communicatewiththings*
	3	*Feeling of being able to readthoughts*
	2	*Perception of the meaning of things*
	1	*Ease not applicable*
	0	**Neutral attitude, Assertiveness**
Marginality	-1	*Discomfort without object, pushing to withdraw*
	-2	*Feeling of living separatly from others*
	-3	*Misunderstood megalomaniac*
	-4	*Feeling of exclusion*
	-5	*Paranoïa, feeling of being threatened*

Figure 2: Levels of Marginality and Integration Behaviors

Table 1 : Behavioural Manifestations of Dominance, and Behaviours to Distinguish from Dominance

	Manifestations of dominance	***To be distinguished from…***
Relationship to power	Need to exercise more or less tyrannical power over others, over minorities, the most "fragilised" (because of their state, condition, etc.), through various means (financial, sexual/sexual aggression, moral, physical aggression, theft, etc.).	To be distinguished from simple leadership, which translates into a willingness to accompany the group towards a more sustainable and equitable balance.
Relationship to the rules	Need to violate them in the objectives of demonstrating "non-submissiveness"/or lack of docility and superiority to any form of power, low tolerance to frustration	To be distinguished from the feeling of having to break the rules out of conviction or out of vital need (economic or other).
Relationship to the constraint	Cannot tolerate constraint, especially if it is intended to protect others	To be distinguished from a true feeling of inequity
Relationship to health	Need to demonstrate one's strength and "invincibility" by exposing oneself to risks (tobacco, alcohol, drugs, viruses, etc.), and by	To be distinguished from the misunderstanding, lack of awareness or disbelief associated with a risk warning.

	ridiculing those who take precautions (thus inciting the most vulnerable to take risks) or seeking to discredit speeches inviting people to take precautions (whether scientific or authoritative).	
Relationship to Privileges	Need/pleasure to impose the fact of having more rights than duties, while seeking to impose more duties than rights on others. Assumed asymmetrical and unequal vision, often hidden for strategic reasons.	To be distinguished from a form of blindness in the face of the needs of others, a lack of awareness, or a punctual and conjunctural need.
Relationship to others	Seduction, alternation of sympathy and antipathy intended to destabilize, pleasure in humiliating (especially the weakest or intelligent people), shameless lies, pleasure in swindling and deception, excessive sensitivity to humiliation, lack of empathy, more or less obvious perversion, etc.	To be distinguished from seduction intended to enter into an exchange with the other, to distinguish behaviour associated with revenge and resentment, to distinguish from the difficulty of resist in gone's desires, etc.

Table 2 : Behavioural Manifestations of Submission, and Behaviours to Distinguish from Submission

	Manifestations of submission	***To be distinguished from…***
Relationship to power	Difficulty accessing the sense of legitimacy that relates to any form of power, responsibility or decision-making / tendency to consider that the dominant is "right" or more able to think and decide - outside of any argumentation	A form of modesty
Relationship to the rules	Tendency to be scrupulous in respecting the rules, fear of making mistakes (especially if they lead to consequences for others, especially the dominant), tendency to guilt	To be distinguished from a simple tendency to respect the rules of life in society, notably because of values, convictions, etc.
Relationship to the constraint	Resistant to constraint, sometimes imposes unnecessary constraints on itself out of scrupulousness	To be distinguished from a personality with a taste for effort
Relationship to health	Cares less about his or her own health than the health of others, but may feel vulnerable to exposure to certain risks	To be distinguished from a simple precautionary principle, a reasoned consideration of the risks, etc.
Relationship to Privileges	Tendency to impose, without realizing it, more duties than rights, blind asymmetrical and unequal vision in favor of the dominant one	To be distinguished from a form of valorization of the gift of self, but which would be more in favor of the most vulnerable and destitute than the dominant ones

Table 3 : Cognitive functions associated to the adaptive and to the automatic mental modes

Automatic Mental Mode	**Adaptive Mental Mode**
Routine: attraction for the habit, the known, the tradition, the standard, the mastery, the procedures	**Curiosity**: openness to the unexpected, vigilance
Perseveration: search for control, insistence in spite of the inefficiency of a strategy, defence of principles and rules before any other thought.	**Cognitive Flexibility**: ability to see a situation for what it is (rather than what you want it to be), in order to resolve it more quickly
Simplification: adoption of a binary, trench, Manichean (true/false, black/white, etc.) view of a situation. Mechanism aimed at easier categorization and memorization, and less cumbersome processing than if one had to reconsider all the information of a situation each time it arises. Nevertheless, this simplification is reductive in nature and takes us away from reality.	**Nuanciation**: a more subtle vision of the events, making it possible to consider gradients (more or less dramatic, more or less solvable, etc.), openness to further investigation or questioning to deepen the understanding of the situation and provide a solution.
Certainties: tendency to consider that one's thought is "true", belief that the world is limited to what we perceive of it, conviction that our perceptions are "all reality"	**Relativity:** the ability to step back, to not be satisfied with what one perceives at first sight, to consider that each vision is relative, from one individual to another, from one situation to another, etc. Ability to consider short, medium and long-term consequences
Empirism: search for the best known solution, a ready-made recipe that works from the very first try, without the need for more complex thinking.	**Logical thinking**: rationalization, looking for logical links between causes and consequences (even if these links are unpleasant)
Social desirability: tendency to think, decide, and act based on how others see us, on how we are perceived by others, rather than on what is relevant and reasonable to think, say, or do.	**Personal opinion**: the ability to individualize one's thinking, to maintain the integrity of one's reasoning for solutions to a situation, to consider the logic of the arguments and information presented to me, to be open and fully consider the opinions of others without being conformist.

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ARE PEOPLE BEING NUDGED DURING THE COVID-19 CRISIS?

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Glossary

Choice architecture: Choice architecture is the design of different ways in which choices can be presented to consumers and citizens, and the impact of that presentation on their decision-making.

Priming: Priming is a phenomenon whereby exposure to one stimulus influences a response to a subsequent stimulus, without conscious guidance or intention.

Reference group: A reference group is a group to which an individual or another group is compared, used by sociologists in reference to any group that is used by an individual as a standard for evaluating themselves and their own behavior.

Social contagion: Behavioral or social contagion is a type of social influence. It refers to the propensity for a person to copy a certain behavior of others who are either in the vicinity, or whom they have been exposed to.

Summary

Nudging has been proposed as in instrument to achieve behavioural change that requires neither force nor extensive cognitive effort. We discuss the extent to which nudging techniques have been used to make people adapt their behaviour to the COVID-19 pandemic and what we may learn for the application of nudging to other areas of behavioural change, especially mitigation of climate change. We argue that the current situation may allow us to learn how nudging techniques interact with other attempts at behaviour change, and suggest that mitigating lasting behavioural change will require a combination of techniques appealing to the 'cognitive miser' and of techniques appealing to the human desire to build coherent self-identities.

Human behaviour and the COVID-19 crisis

There is widespread agreement that dealing with the COVID-19 crisis requires that people change their behavior – at least temporarily. In order to reduce transmission of the virus, people should reduce contact with others, keep physical distance when meeting and increase hygiene measures such as frequent hand washing. All this has led to calls for a host of behavioural changes, some more severe than others. Reducing mobility has been one of the more drastic ones, including the avoidance of travel, moving about, or even leaving the home. Some of these behavioural changes are of little practical importance but are close to central cultural norms, like no longer shaking hands for greetings. Other measures have had profound consequences for the quality of life of people, like a reduction of meeting others and social gatherings.

Behavioral change has been central to social and environmental policy for decades, with mixed results. More recent examples include the desire to make people eat healthy, to use public transport instead of private cars, to reduce pollutants, and to recycle and reduce waste. It is widely known that changing people's behaviour is difficult, especially when the main tool used is just providing information on the desired behaviours. But only parts of human behaviour are based on well-reasoned deliberation and rational following-up of stated preferences (as assumed in economic models); much of human behaviour is linked to cultural norms and habits that have developed over time and can be difficult to break, even if the human agent in question has a desire to do so. Behavioural change at the individual level may thus require changes at both the institutional and cultural levels. Moreover, empirical consumer research and

behavioural economics provide convincing evidence that people's decisions and behaviours are systematically influenced by biases, and that people are "cognitive misers" as they tend to use mental short-cuts (so-called "heuristics") for everyday decisions, and that the contexts of a decision – a store design/layout, a website, but also time pressure or visibility of a behaviour – play a decisive role in what we do or buy.

Behavioral change during the COVID-19 crisis differs from other areas where behavioural change may be desirable from a policy perspective. It is known from research on habit formation and habit breaking that these are linked to stable environments in which the behaviour takes place, and that disruptive events in one's life are therefore conducive to developing new patterns of behaviour. The COVID-19 crisis is such a disruptive event, with very direct implications for daily life. Such large-scale disruptive events are relatively rare, and we can therefore ask what might be learned about conditions for successful behavioral change from the pandemic. And we can also learn a lot from so-called natural, real-life experiments about the acceptability and effectiveness of policies and measures taken against the spread of the pandemic. For instance, comparing regions and countries with mandatory (forced) vs. only suggested (persuasion) face mask wearing can provide insights into cultural norms and social contagion (Frank, 2020), but also into the measure's effectiveness.

Traditionally, there have been two ways of bringing about behavioural change: by force and by persuasion. Force usually involves legislation making certain types of behaviour mandatory, prohibiting other types of behaviour and threatening punishments in case of non-compliance. In the case of COVID-19 mandatory lockdowns, closed borders restricting mobility and the requirements to wear a face mask in certain environments are examples of this. Persuasion involves appealing to people's respect for others, civic sense and by pointing out positive consequences of the desired behaviour and negative consequences of the undesired behaviour, while still allowing people's freedom to do one or the other. In the case of COVID-19, appeals to wash hands regularly, restrict travel to the absolute necessary, and reduce social contact to immediate family members have been examples of this.

More recently a new way of bringing about behavioural change has become very popular: nudging. A nudge "is defined as an intervention, from either private or public institutions, that affects people's behavior while fully maintaining their freedom of choice" (Sunstein 2020, p. 4). Nudging is the idea to bring about behavioural change without the use of force or mandates, and without relying on elaborate attempts to convince people about the desirability of certain behaviours. Nudging as a concept has become very popular, not least because the use of force to bring about behavioural change is notoriously unpopular, particularly amongst those whose behaviour is to be changed, and because the persuasion approach has been shown to fail in bringing about major behavioural changes in the areas where it has been used massively, including the promotion of healthy eating or more sustainable lifestyles.

Nudging approaches have been widely used to influence behaviour in the COVID-19 pandemic– for example (but not only) in New Zealand, Australia, Germany, and India. Governments and health agencies all over the world have tried to make their communication tools, information pitches, as well as soft and hard regulations more effective by using knowledge from behavioural science. Reminders to wash your hands, practical advice of what to do when you have tested positive, easy and hassle-free access to tests, priming and framing of warnings, the choice of color scheme on "corona apps", highly salient visible duct tape distance holders in supermarket cashier zones, the use of social norms (e.g. new forms of greeting each other; about what is a responsible gesture and what is not), and so on. The World Health Organization has set up a behavioral team (following the UN, the World Bank, and others) to make systematic use of such insights in the followingmonths and years, focusing for instance on how to deal with vaccination avoidance.

Nudging - what it is

The basic idea about nudging, as popularized by Thaler and Sunstein (2008), is to draw on insights from behavioural science to design non-coercive behavioural interventions by making changes in the environment in which people make choices – i.e., the 'choice architecture'. The nudging idea has been mainly framed as a departure from what used to be the mainstream approach to non-coercive behavioural change in public policy, namely to appeal to people's awareness, as noted above. In Thaler

and Sunstein's original treatment on nudging, this is linked to insights into systematic deviations from an economics-based understanding of rationality (i.e., following up one's preferences) in human behaviour. But this goes beyond economics as people are "cognitive misers", their decisions are heavily influenced by biases and use heuristics; emotions and social influence play a major role; as do decision contexts and situational "noise". Empirically (and maybe unsurprisingly), people act and decide like "humans" not like "econs".

The theoretical base of nudging is still quite loose, and indeed nudging has been drawing on a large range of theoretical elements in the behavioural sciences (i.e., the three overlapping fields of cognitive psychology, social psychology and behavioural economics) to support its various forms, to the extent that there is a common core. It relates to dual processing theories of the human mind, like the popular System 1/System 2 distinction proposed by Kahneman (2011). According to this distinction, System 2 is conscious, slow, and deliberative, whereas System 1 is unconscious, rapid, and automatic. Decisions to buy a house or start a new job are for most people, based on conscious reasoning and hence based (at least partly) on System 2 processes. Decisions to pick up a chocolate bar at the cashier, kiss your partner in the morning, or put your newspapers in the recycling bin, are most likely based on System 1 processes, where the behaviour performed is the one that seems intuitively right or natural, without conscious cognitive deliberation. Appealing to people's insights implies that behavioural change is mediated by System 2 processes but from the dual processing view, people are viewed as cognitive misers and engage in System 2 thinking only when strictly necessary. System 1 is quicker and often as reliable in judgments as System 2. Nudging is supposed to be able to change people's behaviour by largely appealing to System 1 processes, i.e. by changing behaviour without elaborate conscious cognitive processing. Four of the most commonly discussed forms of nudging will illustrate this.

The first is to make the behavioural choice to be promoted more *accessible* in the environment in which the behaviour takes place, like putting dispensers with hand disinfectant close to where people are encouraged to use it. The idea is that by reducing the effort of performing the behaviour, even very subtly, increases the likelihood of the behaviour taking place. This has been called "hassle reduction" or more pronounced: reducing "sludge" (i.e., anything that makes the desired action unnecessarily complicated or burdensome). The second is *social* nudging by suggesting that the behaviour to be promoted is the most common behaviour among people, or that it is the behaviour performed by a reference group. When reference group members are displayed as wearing facemasks then, people who relate to this reference group can just imitate this behaviour without having to weigh the pros and the cons. This is also discussed under the topic of "social contagion" by which an idea or behavior spreads through a population. Interestingly, recent research has shown that dynamic social norms (i.e., norms that are still developing) are more impactful than static (existing) social norms. Thus, people may start bumping elbows (instead of shaking hands), a quickly developing new social practice, based on the new norm of physical distancing as a responsible act. It reminds to be seen whether this new form of greeting stays after the pandemic.

A third form of nudging is *priming*, a psychological technique activating a concept stored in memory by 'subliminal' stimulation, i.e., below the level of consciousness, which in turn then can facilitate behaviour related to that concept. Facemask symbols at shop entrances and social distancing lines on the floor can prime the related behaviours even when no conscious attention is directed at them, making the desired behaviours more likely. They also serve as reminders. The fourth is default nudging, by making the desired behavioural option the default option, i.e., the one chosen by default when no deliberate choice is made to do something else. For example, travel service providers have largely changed their default booking conditions such that what you book can be cancelled or changed, whereas before the default was the cheapest option. All four forms of nudging require minimal cognitive effort from the person whose behaviour is to be changed which in part explains its efficacy.

Nudging thus covers a range of different tools for behaviour change and one must admit that the borderline between the more classical approach of appealing to people's insight and nudging is not always clear. A poster encouraging people to wash their hands at a workplace whilst spelling out the reasons for doing so, is a classical attempt to encourage a certain behaviour by appealing to people's

insight. It can also have a priming function and increase the likelihood of the behaviour even when people do not read the arguments provided for justifying the behaviour.

Does nudging work?

The short answer is that we do not know for sure, but there is increasing (yet patchy) evidence that it does, at least in the short term. Most importantly, the effectiveness will always depend on several external factors as well as on individual and social variables. For instance, we know that often women tend to be more open and reactive to nudges than men; studies have found evidence for a "white male effect" (i.e., lower risk perception, lower interest to follow social norms, high levels of over optimism as regards self-efficacy). There are also hints that cultures with high individualism tend to oppose nudges more than collectivistic cultures. However, this evidence is sparse and hence, cost-effectiveness will have to be tested in pilot trials case by case (which is part of the "good governance of nudging"). Recently, several systematic reviews have been published on the effectiveness of diverse nudges, particularly in the field of climate-friendly behaviour. Overall, the results are promising but require more substance as they tend to lack content analysis in real life situations.

A whole stream of research on the effect of nudging interventions has emerged, many conducted in the lab, but also in the field, often in closed environments in which people make choices, like selecting products in a shop or food in a restaurant. There is therefore a fair amount of evidence that some nudges work in some cases. There may be a publication bias here in the sense that unsuccessful attempts to change behaviour are less likely to be published, but at least, the published studies provide a good basis as a proof of principle for the most common nudges. Evidence has been emerging mostly regarding changing behaviour in the fields of healthy lifestyles, energy use, healthy and climate-friendly food and waste; sectors such as transport, housing or fashion have received less attention. But many problems still remain with these studies: many published studies are single factor studies looking at the effect of a single nudging intervention or; they study several factors simultaneously without making it possible to isolate the effects of these factors and; most published studies look at short-term effects. We still lack a broadly accepted contingency theory of nudging that could tell us which nudges work best under which circumstances. Efforts for such theoretical groundwork are under way, but before such a theory develops the use of nudging in behavioural change will always be on a trial-and-error basis, analysing empirical studies.

Nudging and COVID-19

The COVID-19 pandemic provides an interesting setting for studying the effect of nudges for at least two reasons. Firstly, as this is a global and life-threatening matter disrupting many people's lives, one could think that this should be a classical case where behavioural change can indeed be achieved by System 2 processes, i.e., by appealing to people's insights, and that nudges are not even necessary. However, one might argue that initial behavioral changes brought about by System 2 reasoning may be stabilized by following up with gentle nudges. But nudges in a COVID-19 context abound, and the examples in the previous section show this, no matter whether they result from intentional nudging interventions or just from common sense. Secondly, and more interestingly, handling the COVID-19 crisis has involved the use of all major forms of behaviour change interventions simultaneously: force, persuasion, and nudges. Lockdowns (with fines if they are not obeyed in many countries) have severely restricted people's freedom of mobility. Political leaders have solemnly underlined the seriousness of the situation and appealed to citizens to stay at home and restrict their social life. At the same time, nudges have pervaded everyday life and a variety of reactions to them have been observed. Obviously, the real world COVID-19 crisis is not a lab in which we can isolate the impact of specific factors on people's behaviour, but we could use the current experiences to start thinking more seriously about how the different attempts to change behaviour interact, and what the implications could be for a theory of nudging. We will try to give a few examples.

First, priming only works when there is a concept to be primed in the mind of the person and when that concept is linked to a desired behaviour. A picture of a facemask can only be a prime if the person to be primed knows what a facemask is, knows how to use it and has been engaged in this behaviour before. In other words, priming can only be expected to work if the primed person already has been exposed to

relevant information about the desirable behaviour before, and has consciously processed it to such an extent that it is available in their memory. In this case, the nudge only works when it can build on a more classical informational approach to change behaviour that precedes it.

Second, a behavior may occur primarily because it is facilitated by the environment, like disinfecting your hands because the dispenser is right in front of you. However, the behavior may fade out over repeated occasions because, in spite of the facilitation in the environment, it still requires a little bit of effort, and the environmental stimulus may become ignored once it becomes a familiar part of the environment. It is conceivable that the behavior may be upheld by giving informational rewards, i.e., telling people that disinfecting their hands reduces the likelihood of contracting the disease. In this case, the classical persuasion approach can be used to uphold a behavioural change originally brought about by a nudge.

Third, the use of forced behavioural changes by regulation changes default options for behaviour, and this may impact the way defaults work when the regulation is lifted. Closed borders have forced people in Northern Europe to have holidays in their own country, even though the default might have been to go south, to the sun and the beaches. When borders open again, this default may have been weakened, and people might engage in more deliberation when selecting their holiday destinations. A study analysing their motivations for their decision taking into account our argument would offer interesting information.

The above examples are meant to show that there is some interaction between force, persuasion and nudging in bringing about behavioural change, and that we need to understand these interactions if we want to bring about lasting behavioural change. In the nudging area, it is important to go beyond proof of principle studies and achieve an understanding of the boundary conditions under which nudges work and do not work.

Achieving lasting behavioural change

Can we learn something from the current crisis for behavioural change in other situations, and specifically for the role of nudging therein? One area where lasting behavioural change is called for - and many observers have written on this since the beginning of the pandemic - is mitigating climate change. However, it differs from the COVID-19 crisis in some important ways and this may have consequences on the use of nudging as a driver of behavioural change for climate mitigation and adaption.

Firstly, while there are people claiming that COVID-19 is a hoax or that its importance is overrated, there is a more widespread and widely shared sense of urgency than regarding climate change. Secondly, the COVID-19 crisis is expected to pass (although it has been getting increasingly uncertain on when that will happen), such that behavioural changes are regarded as temporary, whereas mitigating climate change requires lasting behavioural changes. Thirdly, as COVID-19 is regarded as a temporary crisis, there may be more tolerance for obligation (force) to achieve behavioural change.

Nevertheless, insights that we can gain from the COVID-19 crisis on the interaction of nudging with force and persuasion will most likely be applicable in mitigating climate change. Nudging techniques alone will not bring about the needed permanent behavioural changes, but nudging can help to ensure that insights brought about by information and persuasion are turned into actions, and that information and persuasion may be used to stabilize subtle behavioural changes brought about by nudging. To put it bluntly, nudges appeal to the cognitive miser and to the inherent laziness of human beings, whereas information and persuasion appeal to the human desire to build coherent self-identities where our behaviour is aligned with our values. Both approaches should not be viewed as opponents, as either/or, but rather as allies if we know how to use them in the light of transition goals. Good governance today also means finding the right approaches for the right problem type, target group and context at the right time and phase of a crisis.

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SOCIOLOGICAL AND PSYCHOLOGICAL VIEW ON SELECTED DETERMINANTS OF BEHAVIOUR CHANGE AND NON-CHANGE IN COVID TIMES

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Sociological and psychological view on selected determinants of behaviour change and non-change in Covid Times

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Summary

We take a sociological and psychological approach to describing selected phenomena related to the COVID-19 pandemic and climate change. Starting from the sociological approach, we assume that the COVID-19 pandemic and climate change are "adverse" events i.e., that they pose a threat to the routine of social systems functioning, which causes various reactions of systems and individuals. Then, reasons for the diversified behaviours of individuals are explained by psychological mechanisms of human behaviour related to needs and motivation, media and social information and emotions experienced in a situation of a perceived threat. Results of research conducted during the COVID-19 pandemic illustrate some of the issues discussed.

Glossary

Emotions: individually experienced affectual states of positive or negative valence (like feeling happy or sad) and arousal (to what extend the emotion makes an individual feel activated or deactivated).

Motivation: An individual's state that results from need activation; it initiates, guides and maintains goal-oriented behaviours.

Perception: an active, subjective process of receiving and comprehending information; the same information can have different meanings and values, depending on the context it is framed in.

Psychological reactance: an unpleasant motivational state, which occurs when an individual experience a threat to his needs of acting independently and having freedom of choice; it results in efforts to re-establish the sense of freedom.

Social system: integrated, complex system of cooperation (joint action to achieve the desired goals), coordination (division of work, tasks and functions) and communication (exchange of information, knowledge and using a shared set of symbols), and which also includes conflicts and power relations.

Social network: a set of individuals and organizations in interactions. Social networks can be sparse or dense. *Sparse networks* are characterized by weak connections between nodes (individuals), limited communication, and a large scope of freedom and independence of individuals' behaviour. As for *dense networks,* they have strong connections between individuals who behave similarly, on a basis of a common knowledge and thus have or consent more to limited individual freedom.

"Small world" network: social network in which nodes (individuals) are locally highly connected, but a few nodes only have the power to spread information between distant (separate) clusters.

Values: abstract, desirable end states that individuals aim to achieve (psychology); action systems (solidarity vs. liberal), integrating a social community or differentiating the positions of individuals in the system.

Introduction

In this chapter, we tackle the topic of behaviour change by adopting an interdisciplinary (sociological and psychological) approach to describing selected phenomena related to the COVID-19 pandemic and climate change. According to sociology, social systems create a specific social and cultural environment. In a state of relative equilibrium, they produce a particular type of routine that allows anticipation and planning of actions, and also gives a sense of normality to which system members - institutions and individuals - adapt.

Adverse epidemiological (COVID-19) or ecological (climate change) events pose a threat to the routine of social systems functioning. The size, consequences and change in the behaviour of institutions and individuals depend on whether the adverse event:

- Occurs rapidly or develops slowly,

- Occurs locally or globally,

- Is concentrated or scattered,

- The effects are reversible or irreversible,

- Who bears the consequences, and who does not,

- When the consequences take place (in the short or long term).

It is important to note that both, facts (e.g. objective information about prevalence of a threat) and their subjective perceptions (e.g. evaluation of a prevalence as low, medium or high) influence human behaviour.

The occurrence of a new adverse event means that well-proven strategies and habitual behaviours may be non-adaptive under suddenly changed conditions. It is to be expected ideally that new behaviours will emerge that are appropriate to the new situation. However, observations show that individuals react differently to adverse events and not always in the most successful or adaptive manner. We explain this differentiation by referring to psychological knowledge in the field of needs, motivation, perception, emotions and persuasion.

Social system, authority, and lockdown measures as direct drivers of behaviour change and non-change

Each social system has at its disposal mechanisms to deal with adverse events. Social systems can respond to them according to two models of action described in the theory of evolution. The "individual selection" model is the basis of liberal values, focusing on the protection of individual freedom, the protection of consumption level and routine behaviour; it assumes that the consequences of an event will be borne by vulnerable individuals, and that stronger individuals do not have to (as part of their freedom) incur costs to protect weaker individuals (like in Sweden, which resigned introducing lockdown measures).The adverse event is seen as a differentiating factor that reveals the individual's ability to cope with a problem situation. The second - "group selection" model - is the basis of solidarity values that protect the community (the main value is saving the lives of community members) and the whole community must be charged with the costs incurred by all, including the weaker, of coping with an adverse event (countries with lockdown measures). It is perceived as an integrating factor, revealing collective capacity to deal with a problematic situation. Under normal (routine) conditions, the two models are in balance due to political and cultural negotiation processes.

The COVID-19 pandemic is an adverse event that requires cooperation, coordination and communication under specific conditions, in which one finds different strategies to adopt. At the same time, it causes a conflict between the solidarity and liberal strategy, both on the level of authority (to introduce lockdown measures to protect people or to "sacrifice" people for the good of the economic and medical, system, and individuals (to change behaviour for safety and bear the costs of this change, or to focus on one's preferences?). The authority is faced with a dilemma resulting from the specificity of costs and their distribution: whether to choose an early intervention strategy and introduce lockdown measures (higher

social and economic costs, lower medical and biological costs), or to postpone the intervention and agree to lower social and economic costs, but higher biological and medical costs. The authorities in many countries have adopted a solidarity approach, assuming that the use of lockdown measures would serve as an externally imposed driver of behaviour change, which is to help manage an adverse event and accelerate the return to routine. It turned out that the response of individuals to the measures taken varied, especially over the long term, which illustrates potential discrepancy (tension) between social and individual level of action and population's expectations, which relate either to the collective approach versus the individual approach debate.

Psychological needs as drivers of behaviour change and non-change

Under normal (routine) conditions, orders and prohibitions imposed from outside pose a threat to the needs of independence and freedom of choice of individuals who feel an unpleasant state of motivational tension. This tension automatically, beyond conscious control, motivates individuals to ignore bans and even to act against them (often against their own interests too), hence protecting the need for independence and freedom of choice. This phenomenon is known as psychological reactance (Brehm & Brehm, 1981).

Lockdown measures, as coercive means introduced in the social system, attack the needs of independence and freedom of individual's choice. However, people differ in their sensitivity to coercion and external pressure. Some are less sensitive (low reactance), others are more (high reactance), and some are in the middle (average reactance), which explains the variation in people's responses to lockdown measures. Therefore, it should be assumed that one of the drivers of behaviour non-change is a high level of psychological reactance. Research on persuasive messages (in the health promotion domain) shows that psychological reactance is reduced by the content presented in a concrete language and emphasizing the possibility of choice (Miller et al., 2007), because they give the individual a basis for a feeling of control over the situation and his own actions.

Lockdown measures on the one hand, threaten the need for independence of individuals, and - on the other hand - they meet the needs of safety and life protection. Thus, lockdown measures create a conflict of needs: which needs will be more important for an individual (independence or security) and whether these preferences will be constant over time or not, can make the individual's behaviour ambivalent. The important point is that the occurrence of an adverse event, the threat to the routine, the introduction of restrictions and a conflict of needs all make an individual more sensitive to information than under normal conditions. The natural reaction of individuals in an uncertain stance is to look for information about the behaviour of others, friends and celebrities, leaders of public opinion and politicians. The media and social networks play a significant role as they are a source of credibility for individuals in assessing the situation. The credibility of information is a necessary condition for effective persuasion in any (new) situation (Greylink et al. 2016).

Media messages and the perception of an adverse event, consequences, costs and "victim" as conditional drivers of behaviour change

Under lockdown circumstances, the ability to obtain information from other community members (face to face) is limited. Thus, the key sources of information are: (a) the media, which can (or cannot) authenticate the existence of an adverse event and its consequences (and influence public's reaction by amplifying the event or downplaying the crisis), and (b) social networks of the "small-worlds" type (Watts, 2003), which are a source of information supplementing and verifying the media message.

From the point of view of an individual, information is a more powerful tool of motivation to change behaviour, when it confirms the presence of a threat in one's local space (and not, for example, in a distant country, on another continent), because then s/he assesses the risk of personal consequences of an adverse event and its effects higher (Van Bavel et al. al. 2020). As we will see, a similar point can be

made for climate change. Subjective risk perception as real and high motivates an individual to take protective behaviours against it and can favour adaptation to lockdown measures. Therefore, a credible message indicating the danger of "HERE and NOW" should be treated as a driver of behaviour change[1].

The media create the image of "victims" of an adverse event, a group of people particularly exposed to the consequences of falling ill with the COVID-19. In the common message, they focus primarily on age and point to the elderly. Identification of an individual with this group (be it a member, or caring about older relatives) should translate into a change in the daily routine and adaptation to the requirements of the situation (lockdown measures), even if that is against the need for freedom.

This analysis is documented by the results of a study conducted in Poland (in May / June 2020) with the participation of 1,308 people (CBOS, 2020). In the entire sample, 62% stated that they were afraid of Covid infection, but the highest percentage was obtained in the groups of older people, who also declared that they complied with the safety behaviours recommendations the most (Figure 1). And inversely, the younger were less likely to comply. Therefore, exposing a specific group in the media message that will suffer the consequences of the adverse event can be a driver of behaviour change, but mostly for those people who identify with this group only (they or their relatives belong to this group). For other groups of people, such communication indicating one specific group can thus be a driver of behaviour non-change.

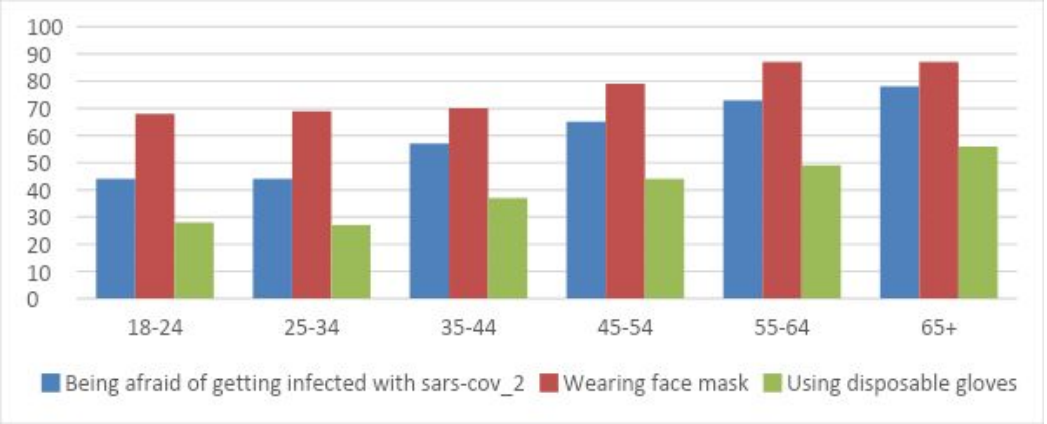

Figure 1. Age and fear of coronavirus infection and safety behaviours. Source: CBOS 2020.

Therefore, the key question is how to provoke a change in the behaviour of people who do not feel threatened by the consequences of an adverse event, who do not identify themselves with the image of the victim created in the media, and at the same time who begin to pay more attention to various sources of network information.

Referring to the values of solidarity, which the lockdown measures are based on, the requirement to change behaviour mean for them the need to incur certain costs without explicit benefits (e.g. resignation from a comfortable routine, loss of freedom and restriction of freedom, but also economic costs). It presents them with the dilemma of whether to focus on their own interests (keeping routine) or on the group's interests (protecting one group within overall population, e.g. of elderly, from danger). Therefore, without clear indication of the tangible benefits exposed in the media to balance these costs, it is difficult to expect readiness to bear them. Time (costs are incurred today, but benefits are deferred) and the identification of future beneficiaries are important parameters of the situation. The solidarity strategy must emphasize the interests of the next generation and fair distribution of benefits that will be enjoyed by all. Therefore, health, safety, and the climate must be presented (by the media) and perceived (by individuals) as a kind of public good (Parkhurst, 2017) to increase readiness to change behaviour.

[1]The psychology of persuasion is a well-developed science, and it is not possible here to refer to all its complexities. Suffice to say here that the effects of persuasion depend both on the features of the message itself, and on the features of the message provider. Hence, different sources of information will be perceived as credible by different groups.

What is also important in the media message is that it presents images documenting people who adapt to safety behaviours and those who do not comply with them (including representatives of the authorities). These messages model two types of behaviour. Behaviour based on the observation of "models" is a phenomenon well described in psychology, in Social Cognitive Theory ("SCT", Bandura 1986). It postulates that the readiness to imitate the behaviour of others depends on whether the given behaviours lead to positive or negative consequences, which may be perceived in many different ways by different groups or even an individual throughout his or her lifetime. This is a complex subject; suffice to say here that, from the individuals' perspective, observing in the media representatives of the authorities who do not wear a face mask encourages them to take the same behaviour, as it leads to positive consequences in the form of (immediate) comfort, protection of the need for independence and a sense of freedom. The behaviour of models derived from the sphere of authority may also have other consequences: undermine the credibility of the proposed systemic solutions to deal with an adverse event and cause uncontrolled processes of behaviour change (panic, frustration, de-legitimation of authority as a factor organizing the community to fight an adverse event).

The SCT emphasizes the importance of mass communication for shaping behaviour in various contexts, including those related to global phenomena (Bandura, 2011).Research on climate show this does not work well for climate-referred restrictions on behaviours or even behavioural change. This issue deserves further exploration elsewhere, but it does point to some differences between the Covid-19 crisis and climate change as disruptor of routines.[2] In the first case, the presentation of people who do not comply with the recommendations is a driver of behaviour non-change, while showing models promoting behaviour adequate to the situation is a driver of behaviour change.

The nature of communication in social networks determines the dissemination of knowledge about the occurrence of an adverse event. In sparse networks, limited communication causes the knowledge about the occurrence of an adverse event to spread slowly, individuals behave independently, so a change in behaviour (e.g. in relation to lockdown measures) can be less likely. In dense networks, information travels quickly, enabling rapid mobilization to change behaviour. At the same time, sharing common knowledge and delegating responsibility for the consequences of an event to institutions give a false sense of security and - inadequate to reality - overly positive assessment of the situation (Prell, 2011; Pruessner, 2012).This assessment may also translate into reluctance to change behaviour (and e.g. ignoring lockdown measures) because it does not lead to high perception of the risk associated with the situation and its negative consequences. According to the concept of a "small worlds" network, identification of people (nodes) is particularly important, with whom intensive contacts are not maintained on a daily basis (family, work), but who can act as a well-informed source, extending the range of available information. The "nodes" can be, for example, celebrities and opinion leaders, who will not only make the occurrence of an adverse event credible, but also will serve as models whose behaviour should be imitated.

Lockdown as a driver of indirect (and unintended) behaviour change

Lockdown measures, when respected, directly lead to changes in the behaviours indicated on the safety behaviours list: people did not wear masks before, did not use gloves, and under the influence of an adverse event and rules introduced by social system, they started to do it. But the application of the new behaviour rules related to the occurrence of an adverse event also indirectly influences other behaviours not included in the catalogue of safety behaviours, for example, optimizing food purchasing and use (www.coronacookingsurvey.com).This raises the more general issue of unintended and unplanned consequences of efforts to induce changes in behaviours, which also occurs in ecological transition efforts.

[2] The IPBC will of course raise these issues of social learning, social influence and persuasion in the field of behaviour change.

According to the declarations of respondents from 14 countries in different parts of the world, during the COVID-19 pandemic they made a list of needed products before they went shopping for groceries more often than before, and they threw away less food (Figure 2). Hence, as a result of the COVID-19 pandemic and the lockdown measures, less food was wasted. Maintaining such a trend on a massive scale and in the long term would be in line with the UNEP Good Life Goals (wedocs.unep.org) campaign, and could support the implementation of the 12th Sustainable Development Goal (sustainable consumption and production) and climate protection. However, the problem of the persistence of behaviour change arises: will these new behaviours continue once the crisis is over?

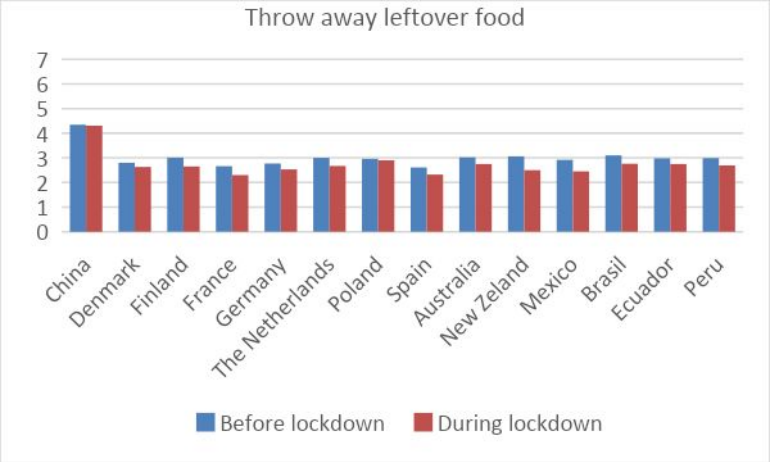

Figure 2. Optimizing food purchasing and use in the times of COVID-19 pandemic.

Source: www.coronacookingsurvey.com

From the perspective of the Self-Determination Theory (Ryan & Deci, 2000), immediate benefits of psychological kind (sense of security), economic kind (better use of financial resources), and social kind (belonging to a group of people sharing the same values) build external motivation (acting for external benefit) that does not lead to a permanent behaviour change. A permanent change of behaviour is possible when the motivation is internal (autonomous), i.e. when the goal to be achieved is related to personal values important for an individual, which include, for example, a clean environment (under the condition of feasibility).It is important to notice however, that people differ in their motivations and preferences for values. For some individuals pleasure and comfortable life may be more important than health or clean environment, and they will be intrinsically motivated to perform behaviours that are directly linked to the fulfilment of these preferred values (and not the new behaviours congruent with e.g. transition efforts).

Another indirect effect of the COVID-19 pandemic (and lockdown measures) can be an increased focus on health matters. The same study found that in nine out of 14 countries, respondents indicated that, compared to their pre-pandemic habits, they were more likely to cook their meals at home using healthy ingredients (Figure 3).

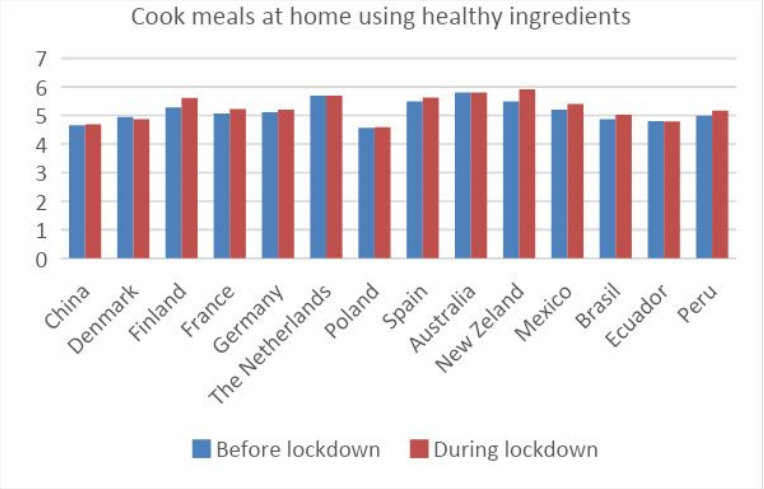

Figure 3. Stronger focus on healthy ingredients in the times of COVID-19 pandemic.

Source: www.coronacookingsurvey.com

Aggregated, averaged data presented in these graphs illustrate behaviour change, but a detailed analysis of the data obtained in Poland shows that (a) almost half of the respondents did not change their behaviour in each case, (b) some (from about 1/4 to 1/3) changed them in a direction that could be considered positive (i.e. they made a shopping list more often, cooked using healthy ingredients and threw less food away), (c) and others (up to 20%) changed their behaviour in a direction that could be considered negative (they made a shopping list and cooked less often with healthy ingredients, and threw away more food) - Figure 4. The key question is how to explain these differences between individuals' reactions. Some explanation and interesting results are provided by further analysing the changes in behaviour and their relation with emotions experienced by respondents during the COVID-19 pandemic.

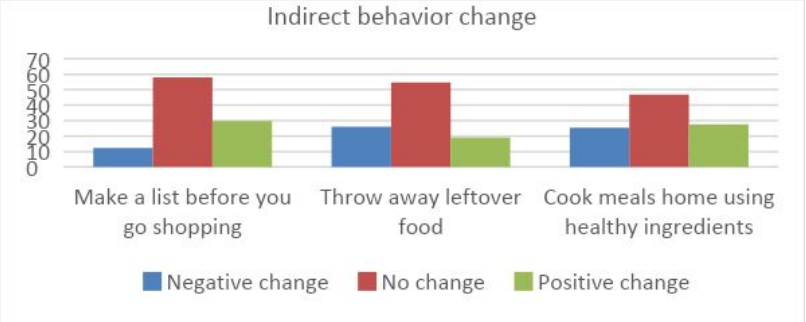

Figure 4. Directions of unintended by lockdown measures behaviour change (in Poland).

Source: coronacookingsurvey.com/Poland.

Emotion as potential driver of behaviour change

Emotions are one of the major drivers of behaviour, in a beneficial or harmful way. The COVID-19 pandemic certainly causes them, and the dominant emotion is fear, which is also contagious, especially in the age of social media contacts (Kramer et al., 2014). However, inducing fear of an adverse event is not a simple way to achieve behaviour change, as the reactions to fear are twofold. People who feel that they are able to cope with the new situation will react positively (in the sense of changing behaviour), when they assess potential self-efficacy as high. If it is estimated as low, various defensive reactions can occur, including resistance to behaviour change (van Bavel et al., 2020), as well as ignorance and avoidance.

Based on the research results, it is postulated that media messages aimed at arousing fear of an adverse event should also provide justification that the recipients of the message have sufficient skills to deal with a crisis situation effectively (Witte et al., 2000), e.g. by offering workable solutions. This raises some very serious issues regarding climate change awareness campaigns, often based on fear and a catastrophe to come, with little said on solutions or very rarely offering a positive alternative to our post carbon society.

While fear is indeed, a strong emotion that can paralyze or motivate to act, it is not the only one. As the study mentioned in the previous section shows, different emotions can cause different effects on behaviour change, but also in relation to the frequency of their experience. Figure 5 illustrates this observation. The largest number of respondents who did not change the analysed behaviours was in the group declaring that during the COVID-19 pandemic they never felt depressed (make a list before shopping) and nervous (throw away leftover food), and in the case of cooking with healthy ingredients - they felt restless sometime. Behaviour change in a positive direction occurred in the greatest number of people who felt depressed always (make a shopping list) and restless sometimes or always (cook meals with healthy ingredients). In the case of feeling nervous, the same percentage of people who experience a behaviour change towards the positive direction (throw away food less food) is observed, regardless of how often they experience the emotion.

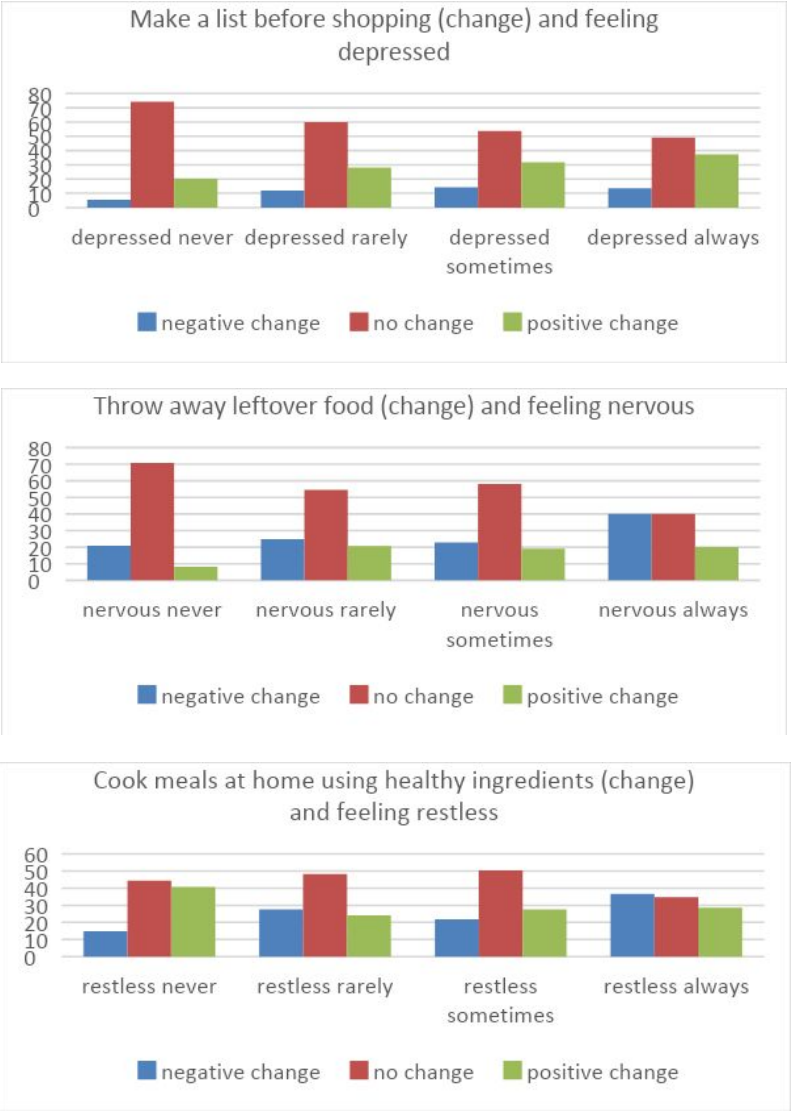

Figure 5. Behaviour change and non-change versus emotional states.

Analysing the influence of emotions on behaviour change was not the main goal of this study. However, the results indicate that emotions can be a driver of behaviour change or non-change, depending on which behaviour is the subject to change, which emotions accompany this change, and how often they are felt. Feeling negative emotions can also be a driver of behaviour change. More research is necessary on this point, but comparing the COVID-19 pandemic with ecological transition efforts could reveal interesting results, keeping in mind one major difference: ecological transition efforts raise a very large number of issues at all levels and for almost every sector of our daily lives. As such, there is a need here to analyse whether measures relative to transition efforts are more efficient taken as-a-whole or separately. Selected thoughts presented so far show that behaviour change and non-change in the times of the COVID-19 are complex phenomena, from which one may formulate preliminary conclusions about a few principles to be followed in order to prevent further climate change. They are proposed in the next section.

Implications for ecological transition

Adverse events such as COVID-19 pandemic and climate change are similar in the sense that they are both global in scope, large-scale and with some irreversible consequences (e.g. loss of health or death in the former and extinction of and some species in the latter). However, these events are different when described from the perspective of individuals' perception. The COVID-19 pandemic is perceived as an event of rapid dynamics (it occurred suddenly and will probably soon pass), current, disrupting the daily routine, concrete, highly credible, with tangible and personalized consequences for people that occur here and now, but affecting only certain social groups(in the short term however). Such perception leads to strong emotions that, under certain conditions, can motivate to change behaviours regulated by lockdown measures, which many people agree to. Climate change is perceived as an event of low dynamics (it develops slowly), postponed, not disturbing the daily routine abstract, not credible, concerning depersonalized beings (climate, earth) and with consequences that will happen in a future and affect future generations. Thus, strong emotions are more difficult to elicit with climate change. The generations cannot be protected with lockdown measures, neither (practically speaking) can the climate. This difference in the characteristics and perceptions of these events can make achieving behavioural change for the sake of the climate more difficult. Also because the necessity to change means a conflict between short-term self-interest versus longer-term collective interest (Van Lange et al., 2018) and requires individuals to bear certain specific costs of changing routines now for the benefit of future generations.

Indeed, the effectiveness of interventions aimed at inducing and consolidating behavioural change requires not only understanding the psychological reasons for the differentiation of individual reactions, both to the adverse event and to the measures or policies applied. In the case of the latter it is also necessary to recognize the many conflicting perspectives within which the individual operates: the perspective of social relations (which is more important: my self-interest and that of my group, or other members of the social system?), the social, personal and economic cost distribution perspectives (what costs and who is to be bear them for the good of which social group?) or the time perspective of benefits and costs (whether to incur costs now for the sake of future benefits, or to keep the routine now and profit now without worrying about the future).

Sociology and psychology are social sciences that have a wealth of knowledge about the functioning of social systems and individuals. On the basis of the selected elements presented here, the key seems to be:

(a) Building the perception of climate as public good and promoting climate and its protection as a personal value,

(b) Creating credibility of climate change as a current and concrete event (e.g. by media showing local - so far - consequences of climate change),

(c) presenting in the media models promoting the change of everyday behaviour, emphasizing the right to choose and self-efficacy of each person, and

(d) Building the image of a "victim" of climate change it will be possible to psychologically identify with (e.g. you, your children and your grandchildren, or someone of your in-group). The identification must be strong enough to give rise to the willingness to abandon the current routine and incur costs. It can be fruitful to promote the idea that 'bitter medicines' are better than 'sweet poisons' in the long run.

Conclusions / future perspective

In this chapter, we have indicated that various measures at the disposal of social systems (lockdown measures, media and networks) and knowledge of psychological determinants of human behaviour constitute a rich potential to be used in the process of behaviour change. However, the effectiveness of single measures is subject to different conditions. We have seen that the occurrence of a new adverse event means that well-proven strategies and habitual behaviours may be non-adaptive under suddenly changed conditions. But what about climate change and the biodiversity crisis which are long term and gradual? People are more likely to react in a different manner, probably less conducive to adopting new behaviours.

By analysing the differences and similarities of the COVID-19 pandemic and climate change, and by drawing on knowledge of behaviour change in different contexts, conclusions from the past experience of social systems can be extrapolated and adapted to present and future adverse events, including climate change. Given the complexity of both phenomena, it is a difficult task however. On the one hand, the pandemic has emerged suddenly, but it has been going on for a relatively, subjectively, long time, and the reactions of individuals to this adverse event show some dynamics; they are changing from a relatively positive reaction to lockdown measures to the more and more frequently observed reactions of resistance. On the other hand, climate change may appear gradual and distant, but periodic disasters in various places around the world affect local communities and species. Thus, both of these events' characteristics and potential dynamics of individuals' responses can make it difficult to simply learn from past experiences and make predictions about future measures and behaviours. In-depth analysis and research are needed to find the right way to communicate the climate change as adverse event and to develop and communicate appropriate measures and solutions to change behaviour.

Probably in the situation of every threat, there will be people who will not change behaviours or change them in the opposite direction to the desired one. Nevertheless, interdisciplinary efforts should be made to maximize the number of people adequately assessing the risk of negative consequences and ready to change behaviour. Social systems have the tools of cooperation, coordination and communication to achieve this goal. Much more research would contribute greatly to understanding behavioural factors in transition times.

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BEHAVIORAL CHANGE: WHY, WHAT, WHO AND HOW? PERSPECTIVES FROM COGNITIVE SCIENCES

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Behavioral Change:
Why, What, Who and How? Perspectives from Cognitive Sciences

Roberto Casati, *Board of the IPBC, Professor, researcher in Philosophy, CNRS, EHESS, Jean Nicod Institute (director), PSL University Paris (France)*

Summary

In this contribution, we investigate the levers of behavioral change, and how they can be put to work in the cases of pandemic and ecological transition efforts. We discuss a spectrum of options available both at the individual and at the collective level, and we point at the important role design could play.

Glossary

Affordance: feature of an object that invites one to perform a certain action.

Counter-affordances: feature of an object that blocks a certain action (e.g. speed bumps)

Design: art of finding solutions to use and habitability problems by the orchestration of features of objects and processes

Fake concepts: concepts that are empirically inadequate or misleading (e.g. “digital natives”, “war against the virus”)

“Greta effect”: a sudden change in mentality

Informative campaigns: campaigns that only deliver factual information (“wearing a mask prevents the spreading of infections”

Normative campaigns: campaigns that make behavioral recommendations based on a goal (“wear a mask to prevent the spreading of infections”).

Introduction

I have decided not to touch my face anymore, and I'm trying to fight the compulsion to do so. I have been told to wear a mask, to keep gel in my bag and to stop touching unprotected handles in public spaces. Day after day, we are confronted with individual and collective decisions that do not concern the usual rituals (which film to go see, change smartphone or not?) but that require a change in behavior, sometimes radical. Behaviors *do* change, they *can* change and, in some cases, they *have* to change, but *how* do you change a behavior? To answer this question in turn, you have to ask yourself not one, but four questions: Why? What? Who? How?

Four questions regarding behavioral change in a context of COVID19

Let us enlarge the picture and take the example of climate change, which offers an interesting comparison with the covid19 pandemic. With regards to climate change, we know *why* we need to change behavior: we have all the data, we want to prevent undesirable, and possible catastrophic scenarios from happening, and to a large extent, we know *what* to do: some choices - for example in the professional day-to-day life of our laboratories and institutes - have major individual level effects (reducing air travel or becoming vegetarian) and are one or two orders of magnitude more efficient (Wynes et al., 2019) than others (recycling printer paper). But *who* must change their behavior? The question of climate injustice (Samson et al., 2011) came up forcefully in France during the yellow vest crisis: why should those who need their car the most, especially in regions with a low density public of transport network, have to pay to finance the reduction of carbon emissions of people in cities that are well endowed with public transports, if the latter do not change their way of life in turn?

Finally, the *how*. Even if we have sorted out the why, the what and the who, we still need to ensure that behaviors change (and, on a permanent basis for at least some of them.) I have realized that I have to reduce my meat consumption if I want to help the planet. But realizing is not enough: I have to make a decision and then act upon it. But at the supermarket, I just put the chicken wings in the cart – my action does not square with my decision! Clearly, something went wrong, although it is difficult to find out exactly where things went wrong. To simplify, there are two well-defined extremes in the spectrum of possible options for inducing behavioral change.

One is the delivery of purely factual information: "Washing your hands reduces the risk of infection". “Reducing speed reduces carbon emission”. Behind this is the hope that this type of recommendation will be used sufficiently by the individuals in a population to allow results.

On the other extreme of the spectrum, we legislate and coerce: "You will be in lockdown for the next ten weeks." But while outright information may not be effective ("smoking is bad for your health"), coercion has indirect costs, such as the feeling of being patronized by the authorities, or of stepping into an illiberal social order, which in turn can lead to counter-productive behavior (crowded beaches and bars during the epidemic). The question is: what lies between these two extremes, and what perspectives can behavioral science offer to understand or to offer solutions? Several options exist. To begin with,

- we can decide to *set an example*, especially if we are in a position of authority: if, as a laboratory director, I reduce my air travel, I signal (Spence, 1973) that I really believe in it and that I am willing the bear the cost in terms of efforts or the loss of pleasure from travelling.

- We can invoke collective pressure. People conform to the social norm if this is made salient (“90% or our customers reuse towels” works better that “Think of the environment; reuse your towel” (Goldstein et al., 2010).

- We can (maybe) hope for a *change in mentality*, what we can now call the “Greta effect”. Changes in mentality do happen: planet ravel shaming set on quickly in 2019, as well as wearing masks in public closed places in most Western countries.)

- We can *give feedback*: drivers who are shown the contents of their car's "black box" and discover that they have exceeded the speed limit twenty times during the day ("Oh, I didn't realize") eventually change their driving style (Schmidt-Cotta, 2002).

- We can also run strong *campaigns*, both informative and normative ("Buckling up saves lives", or "Don't use your phone while driving", respectively). But we should keep in mind that many empirical studies show that campaigns on their own have little effect (as other contributors have pointed out), serving above all to generate a minimum of collective awareness that will later help to gain acceptance for coercive *measures*. It is the fact of having made buckling up compulsory that has had lasting effects (Girasek, 2007).

Another line of intervention is a review of *fake concepts* that modulate policies. Here are some examples.

- We talk about the virus as if it were an *agent*. Sometimes it is anthropomorphized, it is even credited with strategies, at times linked to warfare, which invites the idea that we are at war with a self-aware or intelligent entity, as we could be with mosquitoes or with troops of invaders. In reality, the virus is a small piece of matter carrying instruction to transform a certain cell that it encounters into a sort of 3D printer that diligently starts making other small pieces of matter with an instruction to transform a cell... and so on.

- So we must re-conceptualize ourselves. We are not "duelling""agent against agent". We are an organic store on whose shelves there are so many machines (our cells) that the viral instruction transforms into "customized" 3D printers to produce other viral instructions. We need thus to shut down the store,

prevent the virus, our customer, to do the shopping or get to the next store. And instead of saying "the virus circulates in Paris", we should say "Parisians are circulating the virus".

- We talk about the virus as if it were a single individual. "The virus is spreading, circulating, etc.". We ought to talk about *virions* instead, virus particles. This would allow us to quantify messages, make them vivid, more impacting. With every sneeze, hundreds of thousands of virions come out of the mouth and nose (as above: hundreds of thousands of instructions to customize the cells and make them into 3D printers; to turn vivid into graphic, I suggest to go and watch on the internet the many videos of breathing and sneezing recorded with the Schlieren technique.)

There are other options yet. In recent years, "*nudges*" (i.e. taking advantage of a robust cognitive bias to induce a desired behavior (see Grunert and Reisch's article on nudges in this series) have become fashionable (Thaler & Sunstein, 2009). One canonical example is the use of the default value in the request for organ donation: if you tell citizens that they are in principle obliged to donate, but that they can always choose not to do so, the donation rate is much higher than if you tell them that they are not obliged in principle to donate, but that they can always choose to do so. People have a bias to choose the default option (Johnson & Goldstein, 2003).

Incentives and *disincentives* can also be mentioned: preferential lanes for carpooling, free parking lots for electric cars, point-permits, reducing parking places by replacing them with restaurant or bar terraces. We have the right, and the need, to be creative.

It is not by chance that I am talking about creativity. In many situations, the real difference in behavior will require a good *design* of the environment we live in, as well as the set up of processes and infrastructure. More telecommuting and less open spaces = less contagion. More bicycle paths = fewer people in public transport and cars («Un vélopolitain pour Paris», s.d.).

In the design of private and public spaces, the key concept is that of "affordance", which translates as a natural invitation to perform a certain action (Gibson, 1986). Handles are made to be grasped, chairs invite to sit, doors to enter or leave. Good design builds an affordance structure that guides behavior without the need for an instruction manual and avoids information overload. The best airports are those with poor signage; the designer's mantra is that the need for signage is an indication of poorly designed environments (*Airports – Navigating the New Normal*, s.d.). Note that affordances could explain some of the mechanics of nudges (affordances are perceptual, nudges work on both perceptual and cognitive biases.)

All these measures and examples prepare for the following two questions: How best make them work together to get the best optimal results and what lessons can we learn from this overview of instruments for behavioral change?

Implications for ecological transition

What lessons can we learn from this overview of instruments for behavioral change?

First of all, we can see that the problem is not so much in the deliberation phase as it is in the monitoring and maintenance phase (Marcus, 2008): I know very well that I should not do it, but I inadvertently do rub my eyes a hundred times a day; I no longer wash my hands assiduously; and I unthinkingly touch the handles and bars in the subway. In some cases I can't do anything about it, I have to hold on so I don't fall down; I know I should not use my car just to go to the corner store but it is late and it is raining.

Second: we cannot pick a method at random, from a "shelf of available behavioral methods". There are no one-size-fits-all measures: hypnosis may work to quit smoking, but we cannot use it to stop people from hugging or shaking hands when they meet. We may further have to assess very complex trade-offs. Following some good practices (e.g the What Works Clearinghouse for education), we should assess

different policies on some key dimensions: cost, effectiveness, context, acceptability and feasibility among others. Halving class size may be effective for education, but it will be too costly; eliminating vending machines would be extremely effective for the public health, but prove contextually unfeasible; hanging clothes consumes less energy than a clothes' dryer but takes longer. The spring 2020 COVID19 lockdown was effective, but enormously costly at both the individual and global levels, and in some realities it proved to be contextually unfeasible.

Third, there may be no 'killer' strategy, and we should learn to use more than one small scope strategy at the same time, unleashing the power of synergies. But this is very complex, difficult to do and it requires a lot of data on drivers of behavioral change and non change.

Fourth, we may be focusing too much on how to instil desirable behaviors, and less on how to prevent undesirable behaviors. Think about the trick to make sure you do not forget your credit card when withdrawing money at the ATM. In the past, you would arrive at the ATM, withdraw the money and leave - forgetting the card. Eventually, banks found a *counter-intuitive process*: "withdraw your card in order to get your cash". The card is easy to forget, less so the money. This means that part of the design of the future for transition is probably a counter-intuitive design, which has to find the right balance between affordances and counter-affordances (Casati, 2019). We need it fast: handles are made to be grasped, they invite us to do so, and are therefore powerful vectors for spreading infections. In terms of research, there is a need to explore, categorize and formalize which 'intuitive' and 'counter-intuitive which measures are efficient or not for which types of behaviors and which sectors of daily life?

This is a major problem because we are faced with requirements pulling in different directions. A sense of cleanliness is highly appreciated in public places, which encourages a design that hides dirt instead of making it stick out, which in turn defuses barrier gestures. In a study by the Attoma Design Agency on what makes a public space look clean, it was found that "the markers of experience seem to be shape (if it has edges and nooks, the object seems dirtier), colour (not surprisingly, light colours are "cleaner" than dark ones) and tactile appearance (what is smooth is cleaner). But more generally (...) it appears that the stronger markers do not only involve the object, but the context and the environment as a whole. For example, very clearly, the perception of cleanliness comes from lighting, especially natural lighting, and from the perception of a space under control l" (Attoma, Personal communication).

If these are the parameters, can we use them to suggest that the spaces are actually dirtier than they appear, to limit contact, without making the experience of public attendance a nightmare? Will visually repulsive handles solve the problem? Will the elimination of bins on the public space (as in Ginza, Tokyo) reduce production of trash? Surely handles are but one way to open a door: foot or elbow operated mechanisms are available, photovoltaic cell controlled door openers are on the market. Design can make a difference here.

The words of Paola Antonelli, a global leading authority on design in her position as curator of the Department of Design at the MoMa in New York, help us to put the major issue of design into perspective: "I think that what designers will do in the future is to become the reference point for policymakers, for anybody who wants to create a link between something that is highfalutin and hard to translate and reality and people. And I almost envision them becoming the intellectuals of the future... But I see designers as designing not any more objects, per se, in some cases yes, but also scenarios that are based on objects that will help people understand the consequences of their choices" (Paola Antonelli, Interviewed in *Objectified*, documentary by Gary Huswit). She then stated in a more recent note: "I believe that humanity is doomed to extinction like other species before it. Designers won't be able to prevent this, but they can make sure that this end is still distant and elegant" (*Le Monde*, 3rd July 2019)". Today's imperatives may require a renegotiation of the role of elegance in the design of the objects around us

Conclusion/future perspective

There is neither a one-size-fit-all nor a 'killer' solution to the problem of behavioral change. Once we have individuated *what* change is needed, for *whom*, and *why* (which on their own are complex questions), the *how* remains an even more complex problem, prone to contextual constraints. Cognitive science can be useful in pointing out factors that make policies hard to accept and implement, in particular as the main problem appears not so much to decide to change, but to carry out the decision on long time-spans.

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