On the Moral Psychology of the Pandemic Agent

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Abstract

What should rational agents who want to act morally do during a pandemic: think for themselves or follow expert advice? In threatening situations characterized by uncertainty and significant risks to themselves and others, agents have epistemic and psychological needs that influence their decisions and are vulnerable to biases affecting their estimation of risk. This chapter considers the need for certainty and the optimism bias among other relevant factors. The presence of these influences on decision making suggests that in a crisis, such as a pandemic, agents are not in the best position to make decisions without relying on expert advice and support. However, in situations such as the initial stages of the pandemic, political and scientific authorities disagree on the best course of action and their recommendations conflict. Moreover, political leaders and scientific experts facing an uncertain threat are not immune themselves from epistemic and psychological biases. This chapter argues that citizens should not bear the sole responsibility of making complex decisions and estimating risks, and should be able to access sources that are marked as epistemically credible. For this to happen, institutions such as governments and scientific communities need to put in place structural measures to avoid and counteract biased decision making.

1. INTRODUCTION

Extreme events such as pandemics bring out the best and the worst in people. During the COVID-19 pandemic there have been outpourings of help as well as mad scrambles to secure the last roll of toilet paper for oneself. In the early stages of the pandemic, we realized how challenging it is for individual agents and governments to make good decisions under extreme uncertainty. Individual agents had to decide what risks are acceptable for them to take and governments had to decide whether and when to lock down. In this context, we witnessed risk-taking behaviour by political leaders and citizens alike, which was subsequently justified as being acceptable under the circumstances.

Due to some facets of human psychology, it is particularly difficult for agents to make good decisions in situations of uncertainty. These facets include the mere unpredictability of the events, difficulties in assessing unexpected threats, knowledge gaps among laypeople and

experts, challenges in regulating emotions (particularly in managing anxiety and stress), and time pressures. In this chapter, we consider some of the challenges for good decision making in an uncertain world, using the COVID-19 pandemic as our test case. In particular, we discuss psychological and epistemic factors affecting decision making. We examine the tendency to avoid uncertainty by confidently adopting an explanation of the events before all the relevant evidence is available, letting that explanation guide choice and action. We also consider the tendency to believe that one's future will be either better than it is likely to be or better than that of one's peers, behaving as if potentially threatening events are more likely to affect others than oneself.

Here, we focus on how individual agents' decisions and policy decisions are influenced by a number of cognitive biases and motivational factors. Whilst there are no easy answers to the question of how rational agents should behave in a pandemic, we close by making some recommendations that might help mitigate the threats and uncertainties affecting human psychology at a time of crisis.

2. DECISION MAKING IN AN UNCERTAIN WORLD

At the start of the COVID-19 pandemic and for large parts of 2020 and 2021, many countries found themselves in various stages of lockdown. Both at the government policy level and at that of personal conduct, people disagreed, sometimes quite radically, about the severity of the threat and the best course of action to contain the effects of the pandemic. To an extent, disagreement continues at the time of writing: while in Western countries most COVID restrictions no longer apply and life has largely gone back to how it was before the pandemic, in some Eastern countries many restrictions still apply—for instance, China is still pursuing a zero-COVID strategy. Not just at the policy level, but at the personal level, too, people's appetite for risk, their perception of risk, and their view of what constituted morally acceptable behaviour in the face of significant health risks varied significantly. In the face of so much disagreement, we consider two questions: 1) What factors influence decision making in a period of uncertainty and anxiety such as during a pandemic? 2) In the light of those factors, how should individual agents and political leaders decide what the rational and moral course of action is at the time of a major crisis?

The early stages of the pandemic were marked by extreme uncertainty about the risks countries and individual citizens were facing. How lethal was the virus? How was it transmitted? Would face coverings be effective in reducing infection? How quickly would the virus spread? Who was most at risk from it? Would it be possible to achieve herd immunity? When (if ever) would there be a vaccine and how effective would it be? Were there any long-term health effects to worry about? Different answers led to different decisions being made, and sometimes decisions were diametrically opposed.

Some people stopped all unnecessary social interactions, working from home and refraining from seeing even family and friends. When it was necessary to go out, they used face masks and gloves, frequently washing their hands and keeping distance from others. They were also cautious in what they considered acceptable risk imposition on others, self-isolating for long periods of time and wearing face coverings even when it was no longer required. Other

people denied the devastating effects of the virus and acted in ways that were almost indistinguishable from how they had acted prior to the pandemic. They refused to comply with safety recommendations and even actively protested against such measures. One common attitude was to claim that the restrictions imposed by governments undermined their personal freedom (Murphy-Hollies and Bortolotti 2021). Some citizens broke COVID regulations, for example by socialising with others when it was not allowed or by going to work as usual or travelling after having tested positive for COVID. One prominent case was that of the UK Prime Minister at the time, Boris Johnson, who participated in a birthday party for himself in Downing Street (BBC News 24/1/2022). Another notorious case is that of Scottish MP Margaret Ferrier who took the train from London to Glasgow after learning that she had tested positive for COVID, because she did not want to self-isolate for two weeks in London (BBC News 18/8/2022). Similar disagreements applied to attitudes towards vaccination. People disagreed not only about whether it was in their own interest to get vaccinated and receive boosters of the COVID vaccine to avoid infection, but also about whether they had a duty to be up-to-date with COVID vaccination as a way of helping to reduce the spread of COVID through the community.

At the level of national policy, a range of responses was witnessed, with leaders in countries such as the UK, the US, and Brazil openly prioritising personal freedom —at least in early 2020—and expressing a more optimistic outlook towards the possible outcomes of the pandemic than their colleagues in other countries. Policies in countries such as China, Korea, New Zealand, and Italy were more heavily influenced by a desire to reduce the risk of death for the elderly population and less inclined to prioritise the values of personal freedom and freedom of the markets. Other countries were unique in their responses, generating curiosity and a lively debate about the likely success of their policies. For instance, in 2020 Sweden pursued a policy that has been defined by commentators as “light-touch” or “anti-lockdown” and was at least partially motivated by the hope that herd immunity could be achieved (Rice 2022). So, in Sweden very few restrictions on public life were imposed compared to other countries, in line with the emphasis on safeguarding citizens’ autonomy and on trusting citizens to adopt safety behaviours without the need for mandates. Over time, it emerged that, with new variants and reinfections, herd immunity wasn’t really a viable strategy, even if one was prepared to bear the cost of lost lives. Indeed, as of August 2022, the number of lives lost to COVID-19 in Sweden has greatly exceeded the number of lives lost in other Scandinavian countries (Stewart 2022).

The uncertainty surrounding an event like the pandemic is in some respects different from other situations where the outcome of agents’ decisions and actions is difficult to predict. As Nicholas Shackel (2022) argues, events like the COVID-19 pandemic involve uncertainty which is *irresolvable* in the short term, because it can only be resolved once we have a considerable amount of data to feed into models and predictions. Ionnidis and colleagues (2022) list some of the failed predictions in the early stages of modelling the pandemic; one of their examples is the Massachusetts General Hospital News predicting far more deaths on re-opening than in fact occurred. Similarly, reopening in the summer of 2021 in the UK was often predicted to lead to 100.000 cases in the short term, but case numbers peaked at around 50.000 in the summer and only rose steeply with the omicron wave. Of course, estimates didn’t always err on the side of being overly pessimistic, there were many predictions that were rosier than actual events turned out to be.

These mismatches between predictions and outcomes do not suggest that modelling was bad or even that predictions were faulty. Predictions can only ever give a probabilistic estimate of a range of outcomes, and it is the most spectacular, worst case scenario ones which will be picked up in the media but also in contingency planning and decision making. Rather, the important lesson here is that the early pandemic was a point in time where *it was impossible to tell* what the most probabilities of each possible outcome were. All decisions had to be made based on insufficient evidence, but nevertheless, decisions needed to be made. Furthermore, these decisions were morally important and had significant implications, because they could make a huge difference in terms of lives saved or lost.

In the following two sections, we consider agents' epistemic and psychological needs in the context of an uncertain event that is likely to cause distress and anxiety. When people form beliefs about the future and have to make decisions based on such beliefs in scenarios fraught with uncertainty, their thinking and decision making are especially vulnerable to a host of biases and motivational factors. We focus on two main factors. First, people have *a need for certainty*. People need to come to some certain expectations about what is going to happen so that their decisions can be grounded in their perceived knowledge of reality; and they have a psychological need to think of themselves as having an equally good or better idea of what is going on as their peers, to restore their sense of control in a volatile situation. Second, and relatedly, people have *a need to feel good about themselves and their prospects*. This often manifests in a sense of being unique and superior to others, which gives rise to forms of exceptionalism in a crisis and is not just manifested in people's claim to have knowledge about a critical situation, but also in their tendency to see themselves as better than average at avoiding threats. Similarly, people see their own future as rosier than that of other people, predicting that the weeks, months, and years to come will not hold major crises and failures.

3. FILLING GAPS AND RESOLVING UNCERTAINTY

Human agents are notoriously bad at tolerating uncertainty, as the copious evidence that people need to resolve uncertain situations to feel less anxious shows. Shackel (2022) diagnoses something he calls *uncertainty phobia* when people make predictions in situations characterized by uncertainty that is irresolvable at the time. This results in people treating a given prediction as having a certainty that is not evidentially warranted. When people are confident without good reason, this may be costly to them in terms of rushing to the wrong course of action prematurely. It also typically means that people are irresponsive to changes in the evidence that should undermine their conviction in a given belief.

As Shackel concedes, there are situations where it is good to be more certain than the evidence warrants:

> [I]magine that you must leap over a yawning chasm to save your life, and we know that you are more likely to succeed if you act with certainty that you will succeed. In such a case, it may be practically wise to become (however temporarily) uncertainty phobic so that you can acquire the certainty you need to succeed, despite this being theoretically irrational. That people have this ability may even be an evolved tendency. That being said, a lot of the time uncertainty phobia is badly irrational. (Shackel 2022, p.286).

Although Shackel may be right about the theoretical irrationality of being more certain than the evidence warrants, the case of the pandemic, like the case where we need to leap over a chasm to save our lives, is one where making a decision before all the relevant evidence is available may be a necessity and even the rational course of action. Furthermore, when policy makers are trying to persuade others to abide by their decisions, as was the case when leaders had to adjust COVID regulations on the hoof, the appearance of certainty in the knowledge underlying their decisions might have helped justify these decisions. Interestingly, in science communication, a recent study found that disclosing uncertainty did not affect the credibility of the news, the trustworthiness of the experts, or the objectivity of the scientists' information (Ratcliff and Wicke 2022). However, in a political context where a crisis is unfolding, acknowledging uncertainty can undermine trust and authoritativeness.

Decision makers were caught in a bind. They needed to be prepared to change their minds and be responsive to evidence in order to make decisions that were well justified. But they also needed to convince themselves and others of the rationality of the decisions they were making, and to sustain their and other people's motivation for acting accordingly. Underplaying uncertainty is particularly tempting when decisions require significant sacrifices and may be difficult for other people to accept. But to consider the decision sufficiently grounded in the current evidence means that the decision maker becomes less sensitive to potentially conflicting evidence that may emerge at a later stage. In recent studies on risk taking in financial investments, researchers found that "high rather than low need for cognitive closure can lead to a lack of openness to new information": people are less likely to update the beliefs they feel they have already established as true (Disatnik et al. 2015).

3.1. Need for cognitive closure

The need for cognitive closure (NFCC) is described as "a desire for a quick and unambiguous answer to a question and an aversion to uncertainty" that "may indeed act as a motivational factor that determines successful coping with uncertainty" (see Czernatowicz-Kukuczka et al. 2014, based on the classic work by Kruglanski 1989). The effect of NFCC is that agents exit critical situations faster and thus better manage their anxiety: taking a stance about the situation in order to remove the uncertainty reduces people's sense of risk and increases their estimation of the correctness of their predictions. NFCC is tightly linked to the uncertainty phobia we described earlier.

The need for cognitive closure can be both a stable personal characteristic and a situational phenomenon that depends on the circumstances (for instance, it manifests more strongly when there is a time pressure on decision making). There is empirical support for the view that people who are more prone to stress and anxiety exhibit NFCC to a higher degree: in a recent study on college students during the pandemic (White et al. 2022), those who manifested a greater NFCC were also those who suffered greater distress as a result of unpredictable situations.

What are the consequences of NFCC?

> [H]eightened levels of this need foster cognitive activities aimed at the attainment of certainty. This need promotes 'seizing' on information that promises closure quickly and 'freezing' one's own judgment once it has been formed. By contrast, lower levels of this need promote thorough information processing in order to arrive at accurate judgments. (Pica et al 2021, p. 691)

The NFCC has an important connection with doxastic conservatism, that is, with the common tendency not to revise or give up a belief that has already been adopted, even when the belief seems to be disconfirmed by new evidence. What does this mean? If agents arrive at some conclusion about a problem without waiting for all the relevant evidence to become available, they will be less open to questioning that conclusion on the basis of new information (see Pica et al. 2021).

3.2. Need for uniqueness

The need for uniqueness (NFU) is defined by Snyder and Fromkin (1977) as "a positive striving for abnormality relative to other people". Agents have contrasting needs. They need an affiliation, so they want to belong to a group and feel like their peers (leading to a sense of conformity), but they also need to stand out and reaffirm their identity (leading to the sense that they are special and unique). Just like the NFCC, the NFU, too, is a personality trait that some people exhibit more than others and a trait that becomes more accentuated when the environmental circumstances change. One situation that increases the NFU is the presence of a threat characterised by uncertainty (Tilner et al. 2022).

When nobody really knows what is going to happen and what the best course of action is (often not even the experts), one way to restore control and reduce anxiety is to claim superior knowledge or a privileged access to the truth. This explains why conspiracy theories emerge in moments of crisis: such theories are often used to justify agents' failure to accept official explanations for the threatening events and their failure to follow the rules imposed by the authorities. It is not a coincidence that the NFU is associated not only with conspiratorial thinking but also with violent forms of non-conformity such as extremism (Rottweiler and Gill 2022).

In general terms, people with a high NFU value independence, anti-conformity, and present themselves as inventive and high-achieving. Usually, the NFU is manifested in consumer choices: people who need to feel unique are more likely to choose unusual items that set them apart from others and express their identity—brands exploit this tendency in advertising. But the same need can be manifested in other ways too, for instance by having unusual beliefs. While beliefs are not strictly speaking things that people consume and (materially) possess, they do express identity. In its cognitive dimension, the NFU is manifested as a unique way of understanding the world and has been correlated with the adoption of non-official explanations for significant events (Lantian et al. 2017; Imhoff and Lamberty 2017). Especially when the information available is scarce, people with a higher NFU are more likely to endorse conspiracy theories. As Lantian et al. (2017) put it, "people who cultivate original views about the world convey to others the special nature of their personality" (page 161).

When we examined the need for closure, we saw that believing that one's decisions are well supported by relevant evidence helps justify those decisions to others. Another way for decisions to look well-grounded is for the agent to appear confident about their decision-making process, even when the choice made differs significantly from choices made by other agents dealing with similar circumstances. People like the idea that their ideas and decisions are different from other people's: they often convey this by saying that they are less gullible and better informed than their peers. The NFU is problematic when the person who acts on it is not in the superior epistemic position they claim for themselves; and thus their sense of superiority is illusory—as when someone with no formal qualifications and limited experience in the knowledge domain claims that they know better than epistemically authoritative sources such as government advisors and other experts. Illusory or not, claims to epistemic superiority can influence risk perception.

A problem for national policy at a time of a crisis is that, when NFU and NFCC are combined, the decision maker is less likely to listen to advice that diverges from their own view, something researchers have called *egocentric advice discounting* (Yaniv and Kleinberger 2000). In general, agents are more likely to value their own view than a conflicting view held by other agents because they are better acquainted with the justification for their view than with the justification for other agents' view. But in addition to that understandable asymmetry, when making decisions, people tend to discount advice from others if the advice conflicts with the course of action they want to take. This seems to be influenced by two factors: how confident they are that they are right, and how trustworthy they judge the advisors to be (Wang and Du 2018). We have reasons to believe that even people who are convinced of their own uniqueness and act accordingly maintain some level of trust in some individuals, groups, and institutions. As Neil Levy (2019) aptly observes, endorsing something like a conspiracy theory requires a low-trust condition (low trust towards authorities who promote the official theory) and a high-trust condition (high trust towards oneself and members of the non-mainstream group responsible for spreading the alternative theory).

Conservatism with respect to one's beliefs and theories also applies to collective decision making (Larson et al. 2020): when a group has discussed different possible courses of action and settled on a consensus, it is extremely resistant to external advice that conflicts with the achieved consensus. Governments at the time of the pandemic were facing similar challenges: they had to make decisions that appeared to be justified by the available evidence and they needed such decisions to be accepted by the majority of the population to be effective at changing collective behaviour. Once an initial course of action had been agreed on, changing that in the light of new information or medical advice proved extremely hard.

4. UNREALISTIC OPTIMISM

Aversion to uncertainty at a time of crisis is not the only factor that affects belief formation in situations where people lack sufficient evidence to be sure of an outcome. It interacts with numerous other biases and affective influences on cognition. For example, confirmation bias

may interact with NFCC to amplify irrational certainty. Another factor that affects our predictions of risk is unrealistic optimism.

4.1. What is unrealistic optimism?

A *Guardian* article from 2020 cites Johnson' optimistic assessment of the likely trajectory of the pandemic:

> The next 12 weeks could "turn the tide of this disease", Johnson told the daily Downing Street press conference on the pandemic, saying it was possible to "send coronavirus packing in this country, but only if we all take the steps we have outlined" (Walker 2020)

It is of course difficult to discern to what extent Boris Johnson's statements reflected his actual beliefs. But this was almost certainly a statement partly driven by what he wanted to believe and by what he felt the country wanted to hear. What we see in Johnson's statement (if we take it at face value as a statement of belief), is an overly optimistic prediction for the future.

When we talk about predictions being unrealistically optimistic, some clarification is in order: a prediction can be *optimistic* (in the sense that it anticipates a good outcome) without being *unrealistic*, even if that good outcome does not come to pass. If one thinks that a good outcome was the most likely one, one might be correct, even if the bad outcome then occurs. So, for example, if Jenny gets breast cancer and the chances of full recovery are 90%, she is justified in thinking that most likely, she will make a full recovery, even if she ends up being one of the 10% who don't. Of course, there are complicating factors, for example, there may be further evidence specific to Jenny's case, e.g., family history or other risk factors that suggest she is more likely to be one of the 10%. But if all she knows is the recovery rate statistic, an optimistic prediction is warranted by the evidence, even though she cannot be *certain* of a positive outcome (Jefferson et al. 2017).

What is called the *optimism bias* or *unrealistic optimism* in the literature is the tendency to adopt and maintain a specific kind of optimistic belief, whereby an agent thinks that their own future will be better than it is objectively likely to be or better than that of comparable others (Shepperd et al. 2013). This is also known as self-specific optimism. In order to establish how a positive belief about the future compares to the objective likelihood of an event happening, people need information that frequently isn't available. It is easier to tell when people are being optimistic in the comparative sense, thinking they will have better outcomes than a similar other. This kind of bias seems to be underwritten by asymmetrical belief updating, where people are more likely to take on board positive information (information that makes a good outcome appear more likely) and ignore negative information (information that makes a bad outcome appear more likely) for themselves than for others (Sharot, Korn, and Dolan 2011; Kuzmanovic, Jefferson, and Vogeley 2015; Kuzmanovic and Rigoux 2017). Importantly, this is different from the kind of confirmation bias we see in NFCC; rather than discounting new evidence altogether, evidence that makes a desirable

outcome appear more likely is taken on board, whereas evidence that makes an undesirable outcome appear more likely is ignored.

Tom might be unrealistically optimistic about the COVID pandemic, thinking that it will be over soon. While this belief may be unrealistic and optimistic, it isn't one where Tom has more optimistic expectations for himself than for others. By contrast, in self-specific optimism, Tom might think that he is less likely to get infected than a person of the same age, sex, and demographics. The latter is what is normally known as unrealistic optimism, and it is part of a set of other self-enhancing beliefs called *positive illusions*, such as the illusion of control (whereby one overestimates the control one has over outcomes) or the better than average effect (where one has an unrealistically rosy view of one's own abilities and personality traits). These different forms of optimism are not always carefully separated in the literature: for example, Eshel et al. (2022) do not distinguish between general unrealistically positive expectations and self-specific optimism when talking about unrealistic optimism.

4.2. Reasons for unrealistic optimism

Unrealistic optimism is a form of motivated cognition, where agents are prone to attending more to information that supports subjectively desirable beliefs. There is some evidence that positively biased information updating activates brain areas associated with reward (Kuzmanovic, Jefferson, and Vogeley 2016). Another cognitive factor that appears to underly unrealistic optimism is the *representativeness heuristic*.

> People judge their likelihood of experiencing an event based on how well they match their stereotype of the people who experience the event. For example, when asked to estimate their risk of getting in an automobile accident relative to the average driver, the question itself seems to prompt thinking about someone who drives too fast, mixes alcohol and driving, and is inattentive to other drivers (Perloff & Fetzer, 1986). In comparison to this prototype, people naturally conclude that their risk is lower (Shepperd et al. 2015, 234).

When agents assess the likelihood of an event happening, they envision the kind of person to which that sort of thing typically happens to. If they don't fit that stereotype, they think that the event is less likely to happen to them. Both motivational factors such as the desire for a positive outlook as well as cognitive factors such as the representative heuristic contribute to unrealistically optimistic explanations.

4.3. Unrealistic optimism in the pandemic

Unrealistic optimism is a commonly observed phenomenon in the pandemic (Salgado and Berntsen 2021; Kuper-Smith et al. 2021). In a recent study by Salgado and colleagues, people thought that they and those close to them (e.g. a partner or a family member) were less likely to be infected with COVID-19 than a comparable acquaintance of the same age, sex, and geographical location. They also found that people who exhibited that kind of self-specific optimism believed they were more likely to engage in protective measures such as hand-washing and wearing face masks. The authors hypothesize that there might be a causal link

between optimism and the belief that one is more likely to engage in protective behaviour. People might think they are less likely to get infected *because* they believe they are more likely to take precautions.

An even more pronounced self-specific optimism bias was found in people's predictions as to whether they would pass the disease on to others, but no self-specific optimism was found in people's prediction of the likelihood of getting severe COVID if they did get infected. (Kuper-Smith et al. 2021). One plausible hypothesis is that unrealistic optimism is affected by perceived control. If a person does get infected, it is under their control whether they isolate, whereas the severity of the disease once the infection is contracted is not under their control.

This is consistent with the finding that, by increasing people's sense of control, optimism contributes to their sense that they can do something meaningful to avoid threats or respond to setbacks, resulting in more marked changes in behaviour and consequently to better outcomes (Bortolotti et al. 2019). Even when the sense of control is excessive and illusory, it does seem to have a positive effect on motivation. A sense of helplessness, instead, may lead people to think that they are powerless and unable to change how the events impact on their lives. Applied to the pandemic, if people think it is in their power to avoid infection by adopting certain preventative behaviours, then they will be more likely to follow the health and safety recommendations than if they thought that infection is inevitable.

One might object that if belief in control means that one is more likely to do things that will in fact reduce risk of infection, then optimism is not *unrealistic*. There are two ways to interpret the relationship between beliefs about avoiding infection and engaging in health-promoting behaviours. One is that engaging in health-promoting behaviours supports beliefs about likelihood of avoiding infection. No obvious bias in there. The other is that beliefs about likelihood of avoiding infection lead to and support health-promoting behaviour. That is one claim made in the literature of unrealistic optimism. It is because one believes that they can avoid infection that one engages in health-promoting behaviour in the first place. Now in this case, the prediction becomes a more realistic one over time as self-fulfilling prophecies do.

However, there are two further caveats. First of all, people might be unrealistically optimistic about the level of control they have. The illusion of control is a well-established bias. Furthermore, the fact that people believe that they are more likely to take precautions doesn't mean that they actually will. Instead, this belief may be another instance of unrealistic optimism, this time optimism about their capacity to turn good intentions into good actions that have significant costs. For instance, there is evidence that people are likely to overpredict their likelihood of engaging in socially desirable behaviour (Epley and Dunning 2000). So, whilst it makes sense to think that one is less likely to avoid infection if the behaviour that results in infection is under one's control, one can be unduly optimistic in one's perception of control or in one's expectations regarding one's own future behaviour.

What was the effect of unrealistic optimism on risk taking in the pandemic? We as authors of this chapter differ in our levels of optimism about the effects of unrealistic optimism. Bortolotti has stressed the positive features unrealistic optimism can have for motivation and

agency (Bortolotti 2018), whereas Jefferson has highlighted the danger that optimism can lead to complacency and inaction (Jefferson 2017). Clearly, there is a case to be made that optimism supports motivation and action by presenting certain desirable goals as more easily attainable than is the case. Agents need to believe that there is some likelihood of success in order to consider the pursuit of their goals worth the effort. However, there is a risk here that people are exhibiting compounded unrealistic optimism: they are unrealistically optimistic about their own future behaviour, which then has knock-on effects on their optimism about specific outcomes.

Overall, the data on the connection between unrealistic optimism and risky behaviour are very noisy – there are studies showing no link between unrealistic optimism and protective behaviour (Kuper-Smith et al. 2021), as all participants in the study reported that they adhered closely to protective measures against COVID. Some studies show a positive association between optimism and intention to engage in protective behaviour (Salgado and Berntsen 2021), and others a negative association between optimism and intention to engage in protective behaviour (or, in other words, a positive association between optimism and risky behaviour) (Pivovar et al. 2022; Shukla, Mishra, and Rai 2021).

5. EFFECTS OF BIASES IN THE PANDEMIC – THE GOOD AND THE BAD

Two things emerge from the above discussion. First, biases should not automatically be seen as negative features of human cognition, because they often enable individuals to cope with uncertainty, retain a sense of agency, and consequently, preserve the motivation to act. Second, the biases described above flourish in times of extreme uncertainty and threat, such as a pandemic, and they can mutually reinforce each other: In an interview on the *European Science Media Hub*, Arie Kruglanski explains the link between NFCC and the pandemic:

> Our place in society depended on us being able to take care of ourselves, economically and physically, and all of a sudden, we are weakened, and our freedom is reduced. That is the main impact of the pandemic; the fragility, the vulnerability, the susceptibility, and the fear that this uncertain situation raises because it contains very bad possibilities. Now, what does it do to people? When you have that kind of uncertainty, you have a 'need for closure' and you want certainty — but not just any certainty, you want a certainty that will promise good outcomes and will tell you what you can do in order to improve your outcomes. So, when you feel threatened, frightened, or vulnerable because of the pandemic, then you want a certainty that things will be good. This quest for specific certainty — as a promising and optimistic certainty — is a major consequence of the pandemic (Photopoulos 2021).

There is further empirical confirmation that the pandemic leads to increased NFCC: Sachdeva (2022) finds that "perceived risk is the most important construct for predicting cognitive closure". It is not just the unpredictability of the situation that increases NFCC, but also its threatening nature. So, we would be justified in believing that people experienced higher need for closure during the pandemic, and that the need for comforting certainty was one of the motivational aspects driving the optimism bias. Clearly, if the goal of reasoning is accurate belief and risk estimates, then the need for closure and the tendency to believe what

is reassuring to believe are bad news. However, such tendencies have psychological benefits in terms of reduced anxiety.

How the tendency to settle for a fixed and positive outlook affects behaviour and decision making depends on further factors. When agents consider what is likely to happen, they settle on an explanation that supports their risk estimate. How they behave depends on the details of that explanation. An interesting study confirms this:

> Whereas conspiracy beliefs describing the pandemic as a hoax were more strongly associated with reduced containment-related behavior, conspiracy beliefs about sinister forces purposefully creating the virus related to an increase in self-centered prepping behaviour. (Imhoff and Lamberty 2020, page 1110).

As Imhoff and Lamberty argue, when people recognised the risks but attributed the pandemic to malevolent others, they took more precautions, but they did not listen to the sources that they believed were involved in creating or spreading COVID-19. Rather, they chose to come up with their own measures to be safe. So, if they thought that COVID was due to the Chinese creating a virus in a lab in Wuhan, they acted to protect themselves from infection but did not listen to the wisdom coming from China (e.g. they did not trust face masks to reduce transmission).

The need for cognitive closure in the context of responses to the pandemic was combined with another need, the need for uniqueness. Buzzell and Rini (2022) argue that in the presence of an overwhelming amount of information from more and less reliable sources, and in a context that is both threatening and uncertain, people are drawn to "epistemic superheroics":

> Some people are unwilling to wait for the authorities – scientific experts and health officials – to handle the situation. They feel a need to draw on their inner power and solve the epistemic problem through sheer force of cognitive will. They hunt for data in obscure journals (despite having no background in medicine) and recalculate the statistics offered by public authorities (despite not understanding sampling correction techniques). Most of all, they brave the sneering of "sheeple" who simply accept conventional wisdom. They seek to become an epistemic superhero, a person who can single-mindedly unravel conspiracies and rescue the truth. (Buzzell and Rini 2022).

Instances of "epistemic superheroics" were evident in the justification of national responses to COVID-19 by some political leaders. One striking case was the then-President of the US Donald Trump, who clearly underestimated the impact of coronavirus despite being advised differently and expressed overly optimistic predictions about the development of the pandemic (see e.g., Mangan 2020; Beer 2020). The attitude we recognise in Trump's 2020 speeches, which we can summarise with the sentences "We know more and can do better", is a direct outcome of the need for uniqueness (NFU).

The need for uniqueness did not only affect political leaders. In March 2020, self-declared "expert" in holistic health Kelly Brogan was filmed stating that she "personally didn't believe in germ-based contagion" and that belief led her to deny the existence of all viral infections including those attributed to COVID-19 and to the conviction that the deaths attributed to the virus were instead caused by fear. She claimed that germ-based infection did not fit her

conceptual framework and did not drive her to act in ways suited to prevent transmission of germs. For instance, she mentioned that when one of her children has a runny nose, she is not less likely to drink from their glass because she is not afraid of catching anything. This is a clear case where presumed expert knowledge is linked to decisions that imply a certain perception of risk: as for Brogan viruses do not make us ill, there is no need to avoid them. However, she thought fear could kill people, so she advised people to stop being afraid of COVID.

When people underestimated the risks, they were often motivated by denialism or the belief that COVID-19 was not as big a threat as the authorities were suggesting. As a result, they did not engage in behaviour that would have reduced their chances of being infected or passing on the infection. We can see that this is particularly likely when optimism, NFCC and need for uniqueness come together in such a way that people come to believe that scientific authorities and the media are presenting an overblown estimate of health risks. Eshel and colleagues (2022) state that discounting the risks is one factor that helps psychological coping in the pandemic but supports vaccine hesitancy. Claims such as "The physicians' reports on the danger of the COVID-19 pandemic are exaggerated" appear to be motivationally driven and also associated with decreased anxiety (Eshel et al. 2022). It's plausible that thinking that the risk of COVID has been exaggerated by the authorities fulfils both the need to believe in a positive future and the desire to feel that one is 'in the know' and not just blindly following instructions.

However, this attitude facilitates risky behaviour with ensuing health costs, both for the individual themselves and for others. Furthermore, it means people do not have the flexibility which is needed in the ever-shifting landscape of the pandemic, because they do not easily revise their beliefs in the face of new evidence. This can be seen in everyday cases where people's risk assessments and the decisions based on them are adversely affected by the way our cognition interacts with a situation like the pandemic. The fact that citizens were first advised not to wear face masks and advice then changed led to initial resistance in some and refusal in others. Because of their need for cognitive closure, having settled on the belief that "Face masks don't work" or "Face masks are not needed", it was difficult at a later stage to revise that belief. In addition to these everyday cases, the combination of biases and uncertainty is a breeding ground for conspiracy theories and extreme responses, especially when combined with a desire for uniqueness.

6. MORAL DECISION MAKING IN TIMES OF CRISIS

Especially at the start of the pandemic, rational decision making became a minefield, both at the level of policy and at the individual level. At the level of policy, political leaders had to decide between lives and livelihoods. Should there be a national lockdown to protect the vulnerable or should businesses and schools be kept open in order to protect livelihoods and children's education? Should countries pursue a zero COVID strategy or accept that the virus will become endemic? More recently, countries had to decide whether to implement mandatory vaccinations, either for the whole society (as initially planned in Austria) or for specific professions, such as medicine and social care.

Governments faced two problems: they had to balance different goods (e.g. education versus health), but also estimate the likelihood of specific outcomes given specific policies. In other words, even if a government had decided how many lives it was willing to sacrifice in order to keep schools and businesses open, it also needed to be able to come up with a good estimate of what measures would achieve that outcome. If it got those estimates wrong, it would not be able to achieve the trade-off of costs and benefits it was aiming for. Consequently, there was disagreement about what should be achieved or traded off, but also about whether the measures taken were likely to, or necessary to, achieve what they set out to achieve. Our discussion of cognitive biases and behavioural tendencies at times of crisis addresses the question about whether people can make good decisions if they are badly placed to estimate the likelihood of certain events. Which goals should be prioritized in rational decision making during a pandemic is a further question we did not cover here. However, it is worth noting that disagreement about likely outcomes and disagreement about desirable goals for action interact. If there is disagreement about risks, one side can argue that trade-offs between personal liberty and public health are not necessary, because risks have been overstated.

Individuals, too, had to decide which risks in their personal conduct were acceptable and which ones were not. Our survey of cognitive biases and behavioural tendencies suggests that people are generally not well placed to make realistic risk estimates. Problems with uncertainty mean that agents' confidence in risk estimates is not justified, and their risk estimates are likely to be coloured by biases in numerous ways: they are influenced by motivated reasoning, but also by the way information is presented to them and by their experiences, be these their own direct experiences, or those they encounter in anecdotes and stories. How can individuals make better decisions in the context of pandemics? It seems that doing a risk benefit analysis and assessing the likely results of their actions every time they decide whether to wear a mask in the shop, get vaccinated, or meet with friends is not a promising strategy, due to the many factors that bias risk estimates. Even though agents have the best intentions and aim to achieve a positive result (stop infection), this result may not be best achieved by trying to work out by themselves how likely they are to infect someone or get infected if today they go shopping without a mask. Paraphrasing Buzzell and Rini, agents should not approach their epistemic environments as superheroes, and leave the superheroics to fictional characters.

We argue that individuals are better off following general rules that are aimed at avoiding spreading the virus, rather than making their own risk assessments. However, following the rules that, for example, a country sets is only a good strategy if that country is getting it right. As we have discussed, countries have disagreed about what the right course of action was. This is because the problem of making decisions under risk iterates. Political leaders and scientists may have access to more reliable information than ordinary citizens in some contexts, but in the unexpected COVID-19 pandemic they faced radical uncertainty as well. They were also subject to biases when making decisions: as discussed above, they were often prone to optimism and a need for uniqueness and such biases affected their risk estimates. Although members of the scientific community may be better trained at evaluating certain forms of evidence than other citizens, we witnessed a lot of epistemic superheroics by well-established intellectuals and renowned scientists who expressed views about how the pandemic would evolve when they lacked the required disciplinary background. A common

observation on social media exchanges during the pandemic was that overnight everybody had become an epidemiologist. Furthermore, given the high level of uncertainty, there was quite a lot of disagreement between scientists.

As political leaders, scientists, and other citizens have to deal with biases and uncertainties when assessing risks and making decisions, steps must be taken to control and counteract the effects of those biases and the effects of uncertainty on decision making. Government officials have far more resources available to them than ordinary citizens, and they are expected to legislate for a whole population, meaning that their decisions are more impactful than those of other citizens. The need to include structural measures to counteract biases in their prediction and decision making is thus even greater for people invested with responsibility.

Openness to new evidence can, to an extent, be structurally enforced by having regular reviews of new evidence and also by having different voices at the table which represent more and less conservative modelling of possible outcomes. It is important that political leaders do not surround themselves with people who have the same agenda or tell them only what they want to hear. Diversity of views and scheduled stock-taking to allow adjustment of predictions and actions are crucial for good political decision making—indeed having diverse views has been shown to counteract biased information search and biased decision making in groups (Schulz-Hardt, Jochims, and Frey 2002). The advice to policy makers for decision making in crisis is to explicitly acknowledge the possible impact of biases, have diverse groups working on projects, welcome dissenting views, and do some of the initial policy analysis separately to cut down on the danger of too quickly settling on a group view (Cash 2022).

This kind of labour-intensive monitoring of the evidence is not feasible for ordinary citizens. It is much harder for agents who do not have access to the latest science briefings to put in place measures to counterbalance their biases in such a way as to allow them to improve their own risk/benefit analysis. The idea that calculating the likely outcome of individual actions is often not conducive to achieving the best outcomes is familiar from discussions of utilitarianism and from Hume's discussion of artificial virtues (Hume 1998). Outcomes of individual actions are famously hard to assess, and this kind of uncertainty allows scope for rationalisation of problematic behaviour. Given these factors, agents are better served by adopting a higher order rule such as 'follow the scientific advice and guidelines in your own country', rather than trying to work out whether a certain action is beneficial in a certain situation. Clearly this requires a certain level of trust in the probity and well-informedness of one's own government, which cannot always be taken for granted. If this is not guaranteed, one might follow the advice of other epistemically authoritative sources, such as established scientists. Lack of trust in political or scientific authorities can have serious effects on behaviour leading to conspiracy theories and extremism.

However, no public health rule is perfect, and following what one's government recommends will not always be conducive to desirable effects, due to lack of consistency. In the summer of 2022, mask wearing was legally mandated in public transport in Germany but not in Belgium. Consequently, passengers travelling from Brussels to Frankfurt were asked to put on masks after crossing the border, having sat maskless in a crowded train for forty-five

minutes. Recommendations that are not evidence based or that are inconsistent are not recommendations that it is desirable to follow.

Nevertheless, public health measures depend on widespread observance. Attempts to flatten the curve early in the pandemic depended on populations largely observing the rules. Vaccinations, too, depend on widespread uptake for their effectiveness. Therefore, the majority of people need to observe rules consistently to achieve the desired outcome. Hume identified a similar problem for the observation of property rules. Hume called the disposition to obey and respect laws of property the *artificial virtue* of justice. He thought that observance of property laws was justified by the overall good effect for society, and that in order to stop second guessing those rules in the rare instances where they weren't beneficial, people should think of the observance of property rules (justice) as intrinsically valuable, rather than focusing on the consequences of the observance of each individual rule in a specific case. We thus have an artificial virtue, justice, for which it is acceptable, even desirable, to disregard its ultimate, consequentialist justification (Hume 1998).

Would this solution benefit the decision making of pandemic agents? Should we imbue the guidelines with a more absolute status that is divorced from the calculation of their actual consequences? Unfortunately, the strategy of divorcing the value of rules for behaviour from consequences is not likely work in the case of COVID-related health recommendations. There is too much variation between government advice in different countries for presenting mask wearing as an intrinsically good action. Even within the same country, advice changed frequently depending on new evidence becoming available. In order to be able to adjust to changing circumstances and new information, we *need* to think of COVID-related health recommendations as justified by their public health consequences. Which means that psychologically, a results-oriented justification cannot drop out of the picture, even if ordinary citizens leave the best strategy for achieving those results up to the experts.

Adjusting to new evidence and guidelines will involve some discomfort, as people need to work against tendencies such as the need for cognitive closure and the need for uniqueness. Closure will only ever be temporary. People can gain some stability and motivational power by thinking that following the science or government guidelines is a stable virtue or rule for action. But conforming to such a high-level rule will still require significant flexibility in the face of change. For example, it required a switch from not wearing masks to wearing masks when government advice changed.

Adherence to these rules can be reinforced by making their observance part of one's identity and group membership. You can think of yourself as one of the responsible people who follow government advice. This would provide some stability, which is sorely needed given the changing content of the rules. However, it will not resolve cases of synchronous conflict where different countries have rules of varying strictness. In the train example, no sensible risk estimate would recommend putting on a mask halfway through a long journey on a crowded train, nor would it make sense to take the mask off halfway through. As there is no consistently applied rationale for wearing masks across the whole journey, individual agents still have to make a decision based on their own risk estimates in these kinds of situations.

7. CONCLUSIONS

To conclude, the pandemic poses significant challenges to agents' ability to make realistic risk estimates and remain sensitive to new evidence about risks when making decisions. While biases don't necessarily lead to bad outcomes and can support a sense of agency, the risky behaviour and insensitivity to new evidence that result from these biases pose problems for decision making.

We suggested a division of labour. Structural measures should be put in place to prevent political leaders and government officials from developing undue confidence in policies that are based on incomplete evidence and to enable them to rely on advice by diverse groups of experts and advisors. This should also help avoid overly optimistic predictions by ensuring that policy makers remain sensitive and responsive to new evidence. It is important for other citizens, too, to become aware of potential biases and behavioural tendencies triggered by threats and uncertain situations, but they should not be expected to bear the burden of making challenging risk estimates and potentially life-saving decisions without support. Rather, citizens should be able to trust the advice of epistemically credible authorities, either their own government or (if their government is in the grip of exceptionalism and unrealistic optimism) the next available authoritative source that is epistemically credible (such as the relevant scientific community).

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