

The Triple Helix at Johns Hopkins University

SCIENCE IN SOCIETY REVIEW



THE COVID ISSUE
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About The Triple Helix

The Triple Helix is an international network of undergraduate students that focuses on the dynamic relationship between science, society, and law. We aim to promote education and critical thinking about current developments in science and the implications of these issues within a broader societal framework.

The flagship journal of the Triple Helix is the Science in Society Review, which features articles that tackle scientific issues from any interdisciplinary lens including business, law, and ethics. In addition to these publications, the Triple Helix also hosts discussions, lectures, and conferences throughout the semester, so there is always something to look forward to!

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A Letter From the Editors

Dear Reader,

Welcome to the 2021 edition of Science in Society Review! This year's topic of choice was obvious: the COVID-19 pandemic. What began as an early spring break last year quickly escalated into a global crisis. The numerous challenges which we have been forced to confront, both individually and collectively, have in turn shaped our perspectives on the nuances of life and society.

The pandemic has pushed societal issues such as public health preparedness, healthcare accessibility, and racial equity to the forefront of public consciousness. At the same time, it has prompted much introspection into aspects of our inner lives, such as morality and identity. In what follows, you will find pieces exploring some questions in these areas, as well as their relevance to ourselves, our communities, scientists, patients, and society in general. These pieces serve to foster discussion, not only about the hardships we've faced, but also about the necessary changes we need to implement and the questions we must ask. Our hope is that they compel you to contemplate which changes we should bring with us into the future and how to maintain the momentum that the pandemic has triggered. We encourage you to read, share, and think about the conversations our writers have engaged in as you decide how to make your own contribution to the post-COVID-19 future.

Sincerely,



Naomi Doshi & William Shao
Editors-in-Chief, The Triple Helix at JHU 2020-2021

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The Source of Morality: Reason or Emotion?

Aryan Dugar

ABSTRACT: The problem of morality has garnered silent significance during the COVID-19 pandemic, wherein individuals' capacity to make decisions such as going out is affected by reason- and emotion-fuelled moral considerations, affected by and communal needs and desires. Current philosophical perspectives on the nature of morality are largely found on a dichotomous split that originated in the 18th century with Immanuel Kant's reason-centric and David Hume's emotion-centric theories. Recent studies in neuroscience and cognitive science, however, are undermining this by revealing a more interactive role of reason and emotion in making moral judgements. Considering this and the emotional toll of the COVID-19 pandemic, it becomes essential to implement lifestyle changes that preserve mental health, such as practicing mindfulness, to retain one's ability to make clear-minded moral decisions.

A year has passed since the emergence of the COVID-19 pandemic; around the world, physical distancing, self-quarantining, and face masks - deployed to curb the spread of the virus - are now the three clichés representing the COVID-19 zeitgeist.

On one hand, these measures are demonstrated to slow down the ongoing pandemic. On the other hand, they have forced a seemingly indefinite abstinence from the normalcy of daily life. This dichotomous split between science and self-interest has tremendously tested people's capacity to make decisions that seem morally sound: for instance, should one act in the interest of others' and their own physical health and stay in, or should they instead fulfil their heart's desire and go out?

To answer this question, one needs to know what it means to act morally. Is it the unconditional adherence to a law dictated by reason, or is it contingent upon personal needs that one follows? Individuals may have personal answers, but there exists no consensus on the nature of morality in moral philosophy, the branch of philosophy studies it. In fact, moral philosophers diverge broadly in their approach to this enigma: some follow the footsteps of Immanuel Kant, an 18th century philosopher, in attributing morality as stemming from reason; while others embrace the sentimentalist theory of another 18th century philosopher, David Hume. This binary view results from the conventional experience of reason and emotion as distinct mental faculties with distinct operations: emotions are felt as subjective, impulsive and lending color to our lives; while reason is detached, objective and drives the technological progress of mankind.

Although morality has historically remained under the jurisdiction of philosophy, the recent fields of cognitive science and neuroscience have attempted to unravel how humans make moral decisions through a rigorous, empirical scientific approach. Delving into the phenomena of moral decision-making in the human brain, an emergent pattern calls for a change in our understanding of the nature of moral judgements. Rather than being based in reason or emotion - as philosophy deems it - the sciences are revealing that moral decision-making may be a function of a deep yet subtle interaction between rationalistic *and* emotional processes.

Emotion and Reason, Considered Philosophically

Hume's moral philosophy stems from his empiricist theory of mind, in which he says that all human knowledge is derived through experience of either the outside world or the mind's inner workings. He declares, "Reason is [...] a slave to the passions, and can never pretend to any office than to serve and obey them".

The passions are equivalent to desires and feelings - hence, it is the experienced emotion that Hume views as the central engines of our will. According to him, it is the passions - and never reason - that motivates us to act in any situation, including those implicating morality. In asserting this primacy of the passions, Hume also means that reason cannot serve to evaluate them. For example, to say that something is reasonable, we assess its accuracy to the object of reference - hence, we hold the claim 'this duck is white' to be *unreasonable* in reference to a yellow duck. However, we have no such object to compare the accuracy of the passions to - they

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have their original and only existence in the mind. So, reason can neither precede the passions when it comes to determining our goals, nor can it serve to critique them.

Asserting the passions as the foundation of his ethics, Hume then states that our moral purpose is to identify virtues by considering what traits other individuals approve of. Traits such as being helpful or intelligent, for example, are given praise by society because they are either agreeable or useful. However, as individuals approve of a trait, they must be detached from personal subjective ambitions, and rely solely upon a benevolent consideration for other humans. So, under this view, an action like physical distancing would receive approval for being useful in preserving others' health – it would, for Hume, be a virtue that one should follow.

Taking the opposite stance, Kant refutes the applicability of the passions. He opts for the intellect that, having discovered objective mathematical laws, can also lead us to the objective moral law. Directly opposed to Hume's conception, this objective consideration of morality shapes Kant's ethical system into one that is unconditional, necessary, and obligatory for any rational agent – humans included.

Kantian ethics is based on the categorical imperative – compulsory moral commands deduced through reason. There are four formulations of the categorical imperative, each acting as a general principle that moral actions must be 'consistent' with. One of these is the Universalizability Principle, which states that one must act according to a principle of action (a maxim) that she, in following, can decree as a universal law without contradiction. Suppose that one wants to lie in order to procure a loan. Then, her principle of action, or maxim, is, 'I will lie to procure a loan I knowingly cannot pay back'. To check if this is morally right according to the Universalizability principle, she must decree it to be a universal law i.e. everyone can and should always lie in order to procure loans they knowingly cannot pay back.

However, if this happens, loan-givers would stop granting loans on the basis that loan contracts are not honored by individuals. Resultantly, it becomes impossible to procure a loan in this scenario – since the maxim contradicts itself as a universal law, it does not obey the categorical imperative, and one can never act on this maxim. In this way, the categorical imperative results in the conforming of the rational agent to universal laws that are detached from their emotions and consideration of circumstance – so, one cannot lie to procure a

knowingly unpayable loan, whether they want to fund their binge-drinking or their mother's life-saving surgery.

The two philosophers clearly have unique conceptions of morality. For Hume, morality stems from a benevolent responsibility felt by all humans for other humans, whereas Kant deem morality to be in the adherence to objective laws derived through reason - for him, "morality is to action what truth is to thought", sums up Alexander Host, a PhD. candidate in the Comparative Thought and Literature Department at Johns Hopkins University. Considered together, however, Kant and Hume offer a holistic view of how we generally justify moral actions – either on objective fact, or on positive emotional impact.

Emotion and Reason, Considered Physiologically

The explicit dichotomy between reason and emotion in moral philosophy is, at first sight, an intuitively justifiable assumption: in everyday experience, the occurrence of emotions feels automatic and transient, whereas several aspects of reasoning require cognitive effort. In these ways, emotion and reason are experienced as distinct faculties. This is backed by the scientific paradigm that attributes emotion to the evolutionarily prior limbic system, and rationalistic cognitive functions – such as planning and decision-making - to the more recent evolved prefrontal cortex. Different neural circuits seem to be responsible for emotional and rationalistic processes.

Nonetheless, these two faculties do interact and work with each other; humans employ several strategies, such as consciously reappraising perceptions of a stimulus, to regulate negative emotions. Reason and emotion do interact with and influence the function of the other. This paradigm is backed by neurological investigations of humans as they engage in moral decision-making and social evaluations (i.e. theorizing about other people's thoughts, feelings etc.) - it suggests that complex behaviors, like moral decision-making, recruit neural circuits implicated in cognitive and emotion-inducing, or affective, functions.

This is not so surprising. Consider the question of wearing a face mask during the pandemic. One may feel an initial emotion, such as apprehension, towards it; and they might engage in deliberative social evaluations, employing memory, reasoning and empathy to consider the norms of their surroundings and predict others' response to their action. Clearly, they would be employing both

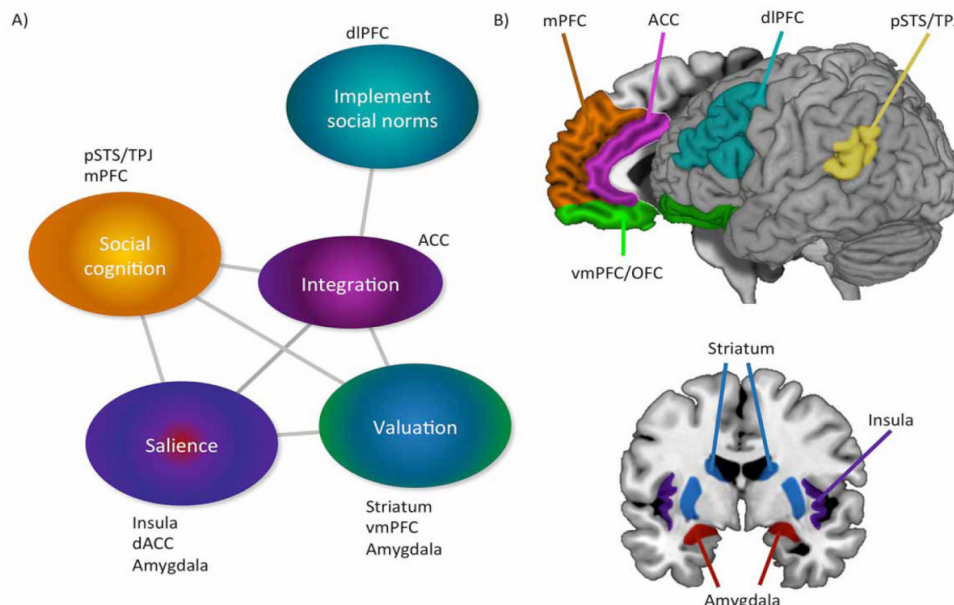
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cognitive and affective processes to reach a decision. This is a mere simplification - moral decision-making is a computational mess, and research has found that it entails coordinated activity between brain regions associated with “perspective-taking, salience processing, executive control, valuation, and social norm compliance” (Decety & Yoder, 2017; Krueger & Hoffman, 2016) (Table 1, Figure 1).

Structure-function associations are very useful for neurologists. Using neuroimaging techniques that indicate activity of brain regions, neurologists are able to deduce the functional elements of complex behaviour, like moral decision-making. Relying on this, Joshua Greene, a philosopher, neuroscientist and experimental psychologist at Harvard University, has approached the computational

Function	Regions
Predictive representations of others’ mental states, beliefs, and intentions.	pSTS/TPJ, PCC, and mPFC
Perception of harm; determining action’s harmful or beneficial consequences	aINS, ACC, and the amygdala
Integrating intent and consequences to determine appropriate moral judgements	Lateral parietal cortex and dlPFC
Maintain stimulus-value associations, central to reward learning	Ventral striatum, amygdala, vmPFC, OFC
Integrates inputs from above regions; involved in determining anticipated reward of other actions	ACC

List of cognitive functions that may take place during moral decision-making, and the brain regions associated with them (Decety and Yoder, 2017). Legend below.



TPJ - temporoparietal junction; ACC/PCC - anterior cingulate cortex; vmPFC – ventromedial prefrontal cortex; mPFC – medial prefrontal cortex; dlPFC - dorsolateral prefrontal cortex; pSTS - posterior superior temporal sulcus; aINS - anterior insula; OFC - orbitofrontal cortex

Figure 1. (A) Schematic representation of function, associated brain regions and their inter-connections. (B) 3D representation of cortical areas implicated in moral decision-making. (C) Sagittal section illustrating the sub-cortical areas implicated in moral decision-making (Decety and Yoder, 2017).

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complexity of moral decision-making with focus on reason and emotion. Greene and colleagues developed the dual process theory. It proposes that two processes - 'automatic' emotional responses, and more deliberated cognitive responses - impact decision-making in morality-laden stimuli.

The theory was inspired by an experiment involving two versions of a famous philosophical thought experiment, the Trolley Problem. In the switch version of the problem, one can save five people by pressing a switch that maneuvers the trolley towards one person. In the footbridge version, the five people can be saved by pushing a large person off the footbridge and into the trolley's path, stopping the trolley but killing her. Greene reasoned that participants demonstrate either a utilitarian judgement by maximising the number of people, or a duty-based (i.e. deontological) judgement that, respecting the rights of the individual, does not act to willingly sacrifice her.

It was found that participants generally chose the utilitarian decision in the switch version and the deontological decision in the footbridge version. The former was attributed to cost-benefit reasoning, whereas the latter was attributed to a stronger emotional response evoked by the more "personal" action of pushing a person in the footbridge scenario.

Greene et al., (2001) tested this by observing participants' brains through functional magnetic resonance imaging (fMRI), as they were presented with several 'personal' and 'impersonal' moral dilemmas. In personal dilemmas, findings indicated increased activation of regions associated with emotion – such as the default mode network (DMN), and large areas in the medial prefrontal cortex, medial parietal cortex, and the TPJ. In contrast, impersonal dilemmas elicited higher activity in the frontoparietal control network, attributed to reasoning. Greene et al., (2004) also found increased dlPFC activity in utilitarian judgement, and increased amygdala activity in "personal" dilemmas. Not only were the results consistent with existing knowledge of the functions of these structural regions, but they also revealed the neural processes recruited to frame moral evaluations in a variety of scenarios. In this case, regions involved in affective and cognitive mechanisms were correlated with deontological and utilitarian decisions, respectively.

The influence of affective processes is further corroborated by several studies. In healthy individuals, Shenhav and Greene (2013) showed that activity of the amygdala is associated with

self-reported emotional reactions and deontological judgements to harmful actions. Similarly, in a study by Crockett et al. (2010), citalopram, a drug that temporarily increases emotional reactivity by influencing the amygdala, increased the frequency of deontological judgement. When contrasted with a study by Perkins et al., (2012) on lorazepam – an anti-anxiety drug shown to increase frequency of utilitarian judgement – a clear cause-effect relationship can be perceived between amygdala activity, suggestive of emotional stimulation, and the occurrence of deontological judgements. These studies clarify one part of Greene's theory – brain regions associated with affective activity do affect moral judgements.

Similarly, Greene et al. (2008) prove the second assumption of the dual-process theory – that controlled cognitive processes affect moral evaluations. In their experiment, participants were presented with personal moral dilemmas such as the footbridge dilemma. One group responded under usual conditions, and another group engaged simultaneously in an attention-requiring task that increase cognitive load i.e. the effort required by reasoning processes. It was hypothesized and demonstrated that increasing cognitive load would interfere with and increase the reaction time for utilitarian moral judgements, but not affect-driven deontological judgements, by interrupting participants' ability to reason about the dilemma. Greene's dual process theory does have merit, but there are alternative theories inspired by Greene's landmark study on the switch/footbridge comparison study. For instance, Ochsner and Helion (2018) suggests that "affect is generated and transformed by both automatic and controlled processes, and moral evaluations are shifted accordingly". It suggests that the likelihood of making a utilitarian or deontological judgment may be rooted in the regulation (and not the overriding) of affect by cognitive processes. In either case, the perspective from contemporary neuroscience is that both reason and emotion are implicated in how humans make moral evaluations.

Blurry Borders?

Traditional moral philosophy and contemporary neuroscience offer unique glimpses into the role of reason and emotion in moral decision-making. The former field stems from an intuitive distinction between reason and emotion. The major split is traced to Immanuel Kant, who asserted that moral principles ought to be 'objective on a priori grounds' and cannot implicate emotions, and David Hume,

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who asserted that only emotions can motivate our actions and, resultantly, moral judgements. Findings from neuroscience, however, can only critique Hume's thesis, and not Kant's. This is because it is solely Hume who theorizes an idea about what human nature is. Human nature and the mind, however, constitute the study of cognitive science, which approaches the question with modern technologies and paradigms that Hume lacked. Nonetheless, it has shown us that Hume's thesis about morality is imprecise: although there is, as Hume suggests, a significant consideration of social approval/disapproval influencing our moral decisions, Greene has consistently demonstrated that humans also make deontological judgements that emerge from an internal sense of duty. However, Kant tells us not how moral agents do act, but rather how they should act, in order to be moral. Unlike Hume, Kant is indifferent to the empirical study of human nature as he establishes the categorical imperative as the ultimate moral truth. Resultantly, neuroscientific findings cannot target his theory – at the same time, Kant's theory about what morality ought to be cannot evaluate neuroscientific theories about what morality is. Instead, the debate between Kant's and Greene's paradigms is a much more fundamental one concerning the study of morality: should moral theories address how humans ought to act, or rather describe how they already act? Therefore, focusing on what constitutes morality as it currently exists in human nature, neuroscience clarifies that the apparently polar opposites of reason and emotion do act together. Realizing this, emotion and reasoning are both crucial to moral decision-making, perhaps even in ways that cannot be consciously separated (Saunders, 2016). This is an especially significant consideration during the ongoing pandemic, which has significantly affected emotional well-being, with one study revealing a 74% stress-associated drop in reports of personal emotional well-being (Yang and Ma, 2020). Research has shown that general affective states, or moods, can impact cognitive processes underlying moral decision-making. Pastötter et al. (2013) demonstrated that negative moods inhibit one's willingness to act on a presented solution to a moral dilemma, regardless of what the solution was. An emerging 'treatment' being investigated to facilitate emotional well-being by regulating stress is mindfulness meditation. Originally an ancient Eastern tradition, its study was pioneered by Herbert Benson, who demonstrated that such meditation effectively alleviates stress by initiating

the 'relaxation response', the body's counter to the fight-or-flight response. It has been demonstrated to alleviate anxiety, ameliorate heart rate and blood pressure, and even affect brain structure. Lazar (2000) employed fMRI to demonstrate that a simple form of meditation activates neural regions associated with attention and regulation of the autonomic nervous system (which controls the fight-or-flight response). This indicates possible advantages in harbouring increased self-awareness, decreasing overall stress and alleviating negative emotions and feelings. Similarly, Bhasin et al. (2013) found that the relaxation response upregulates pathways involved in energy metabolism, and downregulates activation of the NF- κ B protein, known to play a central role in stress, inflammation, and cancer. In fact, this downregulation was more pronounced for long-term practitioners than those trained during the study. Scientists have found several links between experienced stress and inflammation, and the relaxation response can ameliorate both conditions, ensuring the sanctity of both physical health and one's capacity to make sound moral judgements. In a time marked by the isolation and stress resultant of the COVID-19 pandemic, caring for your emotional sanctity is essential to not only maintain an optimistic outlook, but also to have the clarity and health of mind to make the appropriate moral decisions. Even though two highly influential philosophers, Kant and Hume, deem morality to be resolved exclusively by reason or emotion, neuroscience has begun to question this dichotomy, suggesting a greater unity of the two faculties than was previously imagined. With reference to our introductory question, it is indeed the case that, in making the right decision, humans rely on cold, detached rationalistic thinking and personal, subjective sentiments.

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COVID-19 and Autism Spectrum Disorder

Nubaira Milki

ABSTRACT: The COVID-19 pandemic has drastically changed life as humanity knew it in a single year. The widespread distress has left meager time to narrow in on how this has affected groups of people that are oftentimes left voiceless, including the autistic community. This article delves into the issues in the Autism Spectrum Disorder (ASD) diagnosis process, and how funding is not enough to account for the disparities the autistic community is facing.

On March 11th, 2021, the Biden Administration signed the American Rescue Plan Act as an economic stimulus amidst the COVID-19 pandemic. Almost \$3 billion of this money was allocated to the Individuals with Disabilities Education Act (IDEA) funds. The IDEA funds assist states with providing free public education to disabled children aged 3 to 21 in the least restrictive environment. Additionally, the aid helps states fund early intervention to infants and their families for autism and other disabilities. This relief comes after a long period of struggles for autistic individuals, but it is not enough to end the battle. The reality is that the Autism Spectrum Disorder (ASD) diagnosis process comes with major flaws that have only been amplified by the pandemic. Funding cannot yet help an autistic individual who has not been diagnosed as autistic. The more delays this system faces, the more strain is placed on the autistic children and families that the system has yet to meet.

The Interagency Autism Coordinating Committee (IACC) is a federal advisory committee whose members are appointed by the Department of Health and Human Services. As the name suggests, the committee acts as a liaison between other government agencies and coordinates autism research and services. They also provide a channel for advocates to have their messages reach the federal government. Shockingly, the IACC has not met since July of 2019, well before the pandemic began. Had they been meeting semiannually, per their usual schedule, new services like telehealth or research into a better-coordinated system for diagnosis could have been some focuses of the committee. Now, devoid of this, autistic children, families, and educators have navigated the pandemic with many of their needs and issues unaddressed.

Autistic children have been through a strenuous past year due to the pandemic. The shift to online

learning makes it challenging for them to focus and for teachers to provide them with one-on-one attention. Even with the transition back to in-person classes, social interactions with masks mean half of the face is covered, making it hard to distinguish social cues that were already difficult to interpret. Most importantly, flip-flopping between the two situations with little notice beforehand disrupts routine—something very important to most autistic children. The ever-changing guidelines and prospects of the pandemic also contribute to this lack of routine and overall confusion. How can one be expected to adapt when it is hardly clear what they must adapt to? Every autistic individual has their own strengths, weaknesses, likes, and dislikes. This is why personalized support systems and care are essential considerations for serving the autistic community.

Getting an official diagnosis for autism may sound futile to many neurotypical individuals, but it opens up the door for several opportunities for both the child and their family. First off, it means the child will have an Individualized Education Program (IEP), which highlights the unique strengths and struggles of each learner while outlining the educational accommodations they will receive. Part of these accommodations may be joining a special needs classroom. These typically have fewer students, and thus more individual attention on the needs and learning of each child. The family will also be able to apply for funding upon diagnosis. For low and middle-class families, this is the gateway to affording appropriate therapies, such as behavioral, occupational, and speech to name a few. Funding can also go to technology or private lessons for sports or music. These activities build hobbies and life skills for the child.

Being diagnosed with ASD requires several stages of screenings, appointments, and referral meetings. It begins with a hunch, something that brings

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neurodivergence into question. With school and primary medical care shifting to virtual platforms, the burden falls solely on parents to observe signs of autism in their children. This can be a struggle to pinpoint, especially for parents who have no prior interaction with autistic children. Even when parents can clue in, accessing the path to diagnosis is not straightforward nor easily accessible for many. Lockdowns during the pandemic have delayed the diagnosis of over 128,000 at-risk children, according to Autism Parenting Magazine. The diagnosis system is heavily backed up, with little prospect of becoming more efficient considering the national shortage of developmental pediatricians, who diagnose and assess ASD. It is worth noting that long wait times are not a new issue, but rather have become an enhanced one. The pandemic has become the straw that broke the already-faulty-system's back. Prior to the pandemic, families had already been facing over 19 weeks before even receiving an initial appointment. This number will most likely grow with the delays placing increased pressure on the system.

To make matters more complicated, Autism Parenting Magazine also reports that more children are now prone to underdiagnosis or misdiagnosis. The pandemic has introduced a catch-22 for ASD diagnosis. Quarantine and lack of healthcare access may cause neurodevelopmental issues to remain unaddressed. This is a huge pitfall for a child's early years, during which therapy is the most effective. On the contrary, these times have tirelessly been referred to as "unprecedented." The adult population has seen nothing like it before, but for many children, it has become most of their life's worth of memories. Growing up in a time where faces are masked, interactions happen at a 6-foot distance, and families isolate themselves as much as possible comes with psychological impacts. This is not necessarily due to autism but can manifest itself as very similar symptoms. Assessments for autism cannot be done masked, as facial expressions and reactions are an important metric for clinicians to evaluate. Shifts are being made to telehealth and video call screenings that are unable to fully recapitulate the in-person behavior of a child. All in all, the pandemic created added demand for autism screening, logistical issues, and risk of misdiagnosis which can only be addressed once the psychology research is there to support it.

The historic stimulus expenditure is a step in the right direction. It is the most federal support given to the disabled community in over a decade. Money is needed to implement solutions, but the

solutions must be there. To keep on this path of progress, the federal stimulus must be allocated to eliminating waitlists, researching better methods for diagnosis, training more autism subspecialists, and expediting the funding process. While these issues are reflective of systematic problems, individuals can still help. For those unfamiliar with ASD, the Autism Society has a 30-minute, Autism 101 course on their website. For families, teachers, and autistic individuals, the Organization for Autism Research has a database of resources online. The earlier a child gets intervention, the more support they can receive in their crucial developmental years. As nationwide COVID cases decline and vaccinations roll out, it is prime time to address this issue, one that cannot be covered by a band-aid.

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Picking Our Brains: The Case for the Brain as a Basis for Personal Identity

Shourya Arashanapalli

You come home Friday night all stressed out after a hard day's work.¹ You decide to walk into a convenience store, where you know exists a laughably large variety of chocolate bars. Assuming you have good taste, suppose you want to buy a Twix. You notice several Twix bars in the bin in front of the check-out counter. You know that all of the Twix bars are indeed chocolate bars and have a delicious caramel filling. Say that you pick one out and purchase it. How would the Twix you choose differ from any of the others you could have chosen? Both the purchased and un-purchased Twix bars are in the same category of candy perhaps, but it would not be accurate to say that they are the same chocolate bar—after all, one of them is in your hand and the others are still in the bin! They both have some key differences that distinguish them from each other: perhaps the texture/taste of them, or simply the fact that they are arranged of the same ingredients in a unique way. In a way it seems that the Twix you did buy and the ones you did not buy have no virtual difference between them, but in another sense it seems that the Twix you bought could not possibly be the exact replica of the ones you did not buy. So we notice this strange dichotomy of similarity between the chosen and unchosen Twix bars. When speaking of the Twix that was purchased: (1) it was non-identical to the others (it could be specified which bar was bought and which were not), (2) it was identical to the others (all of them were the same kind of chocolate bar). Attempting to understand the essence of identity for Twix bars seems silly, but is analogous in exposing the difficulty of locating identity in human beings. The problem of personal identity for human beings is a far more complex endeavor. There is widespread disagreement within the fields of cognitive science, philosophy, and psychology in exploring what makes us, us. What is there to distinguish one person from another over time? Are there any conditions that may account for someone being the same person over time? If so, what are the necessary and sufficient conditions for a person at some earlier time to be identical with that person at some later time?²

An immediate response may be that there are

no conditions! One may question whether any such conditions exist given that the traits of an individual are subject to change throughout one's life. Some may even argue that the events that occur in our lives affect the basis of personal identity.³ I sympathize with this idea. It is clear that the events of one's life may shape or influence your identity: this I do not dispute. However, the question of identity that I intend to tackle is about what makes it such that I persist over time despite these certain changes that I undergo. With this in mind, responses to this question of personal identity by those who think it has a definite answer tend to be of two sorts:

Either it is suggested that some sort of physical criterion—such as having the same brain—serves as the basis for identity over time, or it is suggested that some sort of psychological or mental criterion—such as having the same personality—serves that role.⁴

I hope to show that the brain best captures personal identity due to its *sui generis* nature and its responsibility for the complex behaviors that could even call personal identity into question. I will then state objections to why some may consider it inferior to psychological criteria of personal identity (e.g. personality, memory,) and respond to them.

When attempting to pick apart the salient differences between persons, the simplest basis that comes to mind is what makes them unique. Every person that inhabits this world has their own body, in which is situated their own brain. There is no one who has the same exact body and the same exact brain that can be distinguished from someone else who shares that body and brain. This is not simply a broad generalization but something that can be independently verified. It is known that each person has a distinct genome that dictates how neural tissue develops from a person's inception as an embryo. It is the capabilities of this developed brain and its interaction with one's body that allows one to establish their personal identity. While the content of one's personal identity must vary from person to person (by definition), their origin is the same—from one's possession of a brain.⁵

The link between personal identity and the

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brain does not derive from the events that occur throughout our life. In other words, mere experience before or after some point in time cannot change one's identity—at least not in a way such that we can say this person is no longer them, that they are no longer the same person. I hold that our personal identity of course can be developed and molded by our experiences and our memories, but cannot be replaced or wholly determined by these things. This is a rather sturdy version of identity and thus is best suited to be grounded in something physical like the brain. The reason for this is that it allows for identity to be grounded in a more objective manner. Objective criteria of personal identity are more desirable because they allow for a clear standard by which we can judge whether a person is the same person over time. Subjective criteria (like personality, memory) lack this advantage because their verification is restricted to the person whose identity is being disputed.⁶ This framework of identity of the brain does nonetheless depend on spatial and material parts/elements. It does not so much matter what follows or precedes activity of one's brain, but whether that brain is composed of the same parts or elements as another brain. In this case, elements refers to the biological constituents of the brain (from neurons, ganglia, lobes to hemispheres).⁷ Because no two brains share the exact same elements, less so the particular arrangement of those elements, this appears to be a strong candidate for personal identity given that it is able to distinguish persons in a practical way.⁸ A common worry to this conception is that one's identity lies not in something physical but rather psychological, for that is responsible for the way that one lives their life. This worry voices that what makes a person that person, is dependent on their particular psychological characteristics (attitudes, beliefs, prejudices, thoughts). It is understandable that this is an intuitive way of thinking about identity: when persons interact with one another, one of the most important factors of interpersonal relationships is the compatibility of personality and virtues.⁹ The fan of the psychological identity criterion may say one's character is determined by one's personality and one's actions, all of which are shaped by one's psychological attributes. To this, I would claim that the psychological attributes for which one's character is praised or criticized are functions of the behavior of the brain.¹⁰ The psychological view tacitly presupposes what the brain view draws to fore—that brain states individuate psychological states. To put it simply, without brain states, there are no psychological

states. The psychological manifestations of one's personality are a product of the complex interaction of all the neurons within the brain combined with their interaction with the circumstances of the outside world. The influence of these external circumstances are not intrinsic to the person but are rather variable.¹¹ As for the brain, this is a constant standard that remains true to one's personality traits in spite of the changeable environment that someone may inhabit. If one analyzes the origin of such psychological attributes, one would come to the conclusion that these are ultimately derived from the brain, the organ that houses and allows the instantiation of these attributes.¹⁰

In discussions regarding personal identity, there are two notions of identity that often arise. Only one of these is relevant to examining what constitutes the personal identity of a human being. There is the notion of numerical identity, which refers to whether something is one and the same thing. There is also the notion of qualitative identity, which refers to whether two things share similar qualities. Because the latter is less restrictive, it is possible for two objects (and more importantly, persons) to be qualitatively identical but not numerically identical. Recall the Twix story, the purchased Twix bar is qualitatively identical to the remaining Twix bars in the bin because all of them were the same kind of chocolate bar—namely, Twix bars. However, the purchased Twix bar is not numerically identical to the remaining Twix bars in the bin because they are clearly separated in space; it could be specified which bar was bought and which was not.¹²

It is also possible for two persons to have the same psychological characteristics. Two persons may have identical personalities, but still may be different with different lives, families, and experiences.¹³ One can imagine two individuals who grew up in a political environment that was charged with propaganda and social turmoil such that these persons had very similar personal ideologies and outlooks of the world. If these two were to meet each other they would find an incredible amount in common, they may even share the same likes and dislikes—yet it cannot be said that they are the same person. These two individuals can be said to be qualitatively identical but not numerically identical. But in the eyes of the fan of the psychological identity criterion, they seem to be both qualitatively and numerically identical—i.e. not only are they the same type of person, but they are also the same person. But this cannot be the case. Despite the degree to which they are like each other, these individuals are indeed disparate persons. The similarity and nature of

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personality creates a problem in that there does not appear to be a way to distinguish these persons within the realm of psychological distinction: one has to find an independent criterion to ensure that these persons are not identical. Any hesitation to this case is implicitly pivoting on the assumption that personalities cannot be perfectly equal. This could be true, but there is little evidence for a method that adequately delineates personality as an elaborate break-down of the essence of a human being. While there is surely uncertainty in functionings of the brain, the categorization of the unique nature of the brain is not a contested matter. Relying on the brain criterion brings more clarity to the situation; these two individuals do not share the same brain so they must be different persons and thus have different personal identities.

One can imagine a grave situation where two identical twins are raised in separate rooms of a house that are themselves completely identical. Every interaction that these twins have with anyone outside of their rooms is timed simultaneously and is performed in exactly the same manner such that they live the same lives only split apart spatially (for the entirety of their lives). In this extreme case, these two twins have the same experiences, the same life, and strikingly similar personalities given that they are identical twins. Yet I would venture that the fan of the psychological identity criterion would be hesitant to say that these two twins are in fact the same person. Even someone who believes that one's identity lies in one's memories and experiences would have trouble saying that they are the same person even though these two persons lived essentially the same life (there may be minor differences due to the sheer difficulty of realistically creating such a scenario). On the psychological (or even memory) criterion, these twins are supposedly qualitatively and numerically identical, suggesting that these twins are identically indistinguishable. But again, this cannot be the case. Even identical memories are fickle in their capacity to constitute the identity of a person.¹⁴ Notwithstanding that these identical twins have identical genes, they do not have identical brains as neuroplasticity leads to anatomical changes in the brain in response to environmental stimuli, rendering their brains discrete with regards to personal identity.¹⁵ All in all, it is possible for persons to have nearly identical personalities or experiences and yet be different persons. The possession of a unique brain has less "leg room" for accounting for personal identity than psychological attributes like personality or memory. These psychological

attributes may be ways to indicate qualitative identity but do not meet the mark of numerical identity. Such non-physical attributes have a quality of potential substitutability that is not present for a physical attribute such as the brain. In the cases where these factors seem to be held constant, the latent assurance that the persons indicated by these cases have different identities lies in the recognition that psychological attributes and memory are a product of the constitution and conduct of one's brain.

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A Look Towards Yesterday for a Better Tomorrow

Picking up the pieces from 2020 so that 2021 might be better.

Jerry Yang

ABSTRACT: While Covid-19 was the first truly global pandemic of the modern era, it is unlikely to be the last. This article discusses the various different approaches governments around the world have taken to fight Covid-19, the contexts those approaches were implemented in, as well as the public health, economic, and political impacts of such policies. Only by analyzing all of this information with reference to one another can policymakers design countermeasures to tomorrow's pandemics that are more effective and less disruptive than the current response.

In the 19th century, Louis Pasteur championed the germ theory of disease and John Snow became the father of modern epidemiology. Since then, mankind's ever-progressing mastery of the natural world combined with the creation of a modern public health apparatus has slain the reapers of old. The last massive pandemic was a hundred years ago. Smallpox is all but extinct. Tuberculosis, once known as the white death, has been confined to the history books. The Bubonic plague that once killed nearly half of Europe can now be treated by a visit to a doctor's office. Nonetheless, as today's circumstances make all too clear, humanity has not yet bucked history's motif of fast-spreading diseases burning through populations like an out-of-control wildfire.

The world is more interconnected than ever and is dealing with a whole new host of problems like antibiotic resistance and climate change that only make the rise of a new perfect storm all the more likely. The current pandemic is a baptism by fire for countries around the world as they put new and untested policies into the field. Public health officials should take note of what worked and what didn't in preparation for tomorrow's threats. The response here in the United States is widely regarded as a failure for a variety of reasons ranging from a lack of coordination on the federal level to a lack of scientific involvement in political decision making. Lack of funding in public health departments combined with an inefficient healthcare sector formed a weak foundation for any sort of public health response which was only exacerbated by a slow government response.¹ Further, the strategy at the federal level was to delegate responsibility down to the state governments with the intention of allowing the states to tailor their response to their particular circumstances.² However, this

approach failed to adequately address what was fundamentally a national crisis, leading to blunders like states getting into bidding wars over a limited supply of ventilators. The end result was more than 12 million cases and 250,000 deaths, an infection and death rate per capita significantly higher than comparable developed countries. Nonetheless, there are still lessons to be learned from other countries. This article will analyze 3 countries in particular (South Korea, the United Kingdom, Sweden) since each have comparably developed economies and health systems and have responded to the pandemic in drastically different ways. It is important to note that this discussion will not only focus on case and death counts; economic and political impacts will take center stage as well. Total lockdown of a country's citizenry for a month would theoretically solve the pandemic but taking such a blunt approach without auxiliary policies creates its own problems and likely wouldn't work in the real world anyway. Despite being close to the epicenter of the pandemic and having little time to prepare, South Korea's response has been widely lauded as highly effective. Nonetheless, this begs the question, what policies did South Korea use? Starting at the beginning, South Korea began screening and quarantining travelers from Wuhan as early as January and tamping down on travel from China more broadly in early February thus giving the government precious time to formulate a wider response. Afterwards, the government rapidly stepped up testing capacity and began opening "drive-through testing stations" which allowed citizens to get tested quickly while minimizing the chance of transmission. On top of this, a mask rationing system was put into place to avoid shortages. In March, the government rolled out a GPS-based app designed to aid social distancing measures and showed the user where

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infected people were. People not in compliance with social distancing regulations were required to wear electronic wristbands and visitors to bars and clubs were required to register their identities via QR code. While all of this was happening, multiple rounds of financial aid were sent to provincial governments and families, rents were lowered, and campaigns for upcoming elections were moved online.⁴ The centerpiece of the South Korean response, however, is its combination of large amounts of testing with its emphasis on contact tracing. Whenever local outbreaks occur,

public health officials use contact tracing to figure out who came in contact to whom and to isolate the infected. Recent research has shown that this kind of response is perhaps even more effective than traditional lockdowns.⁵ So with all of this said, the question remains of how effective these policy choices are. In terms of cases, after an initial peak, the number of cases dropped quickly into the double digits and stayed there for months with only a few spikes in infections owed to local super-spreader events that were traced to large gatherings such as churches or large entertainment



South Korean Covid-19 Testing Station – South Korea’s coronavirus response centered around ramping up testing capacity early and using that information to better target containment efforts.³

facilities.⁶ There was later another smaller peak in August followed by a larger peak (part of a global second wave) happening at the time of writing. In this respect, the South Korean model has been widely lauded as a huge success. Surprisingly, the South Korean response has also seemed to work in preserving the health of the national economy as well. Projections for 2020 estimate that South Korea will only see a 1% shrinkage in GDP over the entire year making it the 2nd fastest growing among major economies.⁷ Political opinion was initially split on the government’s harsher stance on lockdowns but has since turned for the better with a solid majority supporting the government response.⁸ The pandemic has increased public confidence in a government that was previously losing support due to lack of promised anti-corruption reform and sluggish economic growth. However, critics of the

government maintain that the response was too invasive of individual rights. Publicizing testing data and making the location of known infected persons easily accessible by the aforementioned app led to social ostracization and has been criticized as an invasion of privacy. It seems that in the pursuit of an effective government response, some tradeoffs had to be made.

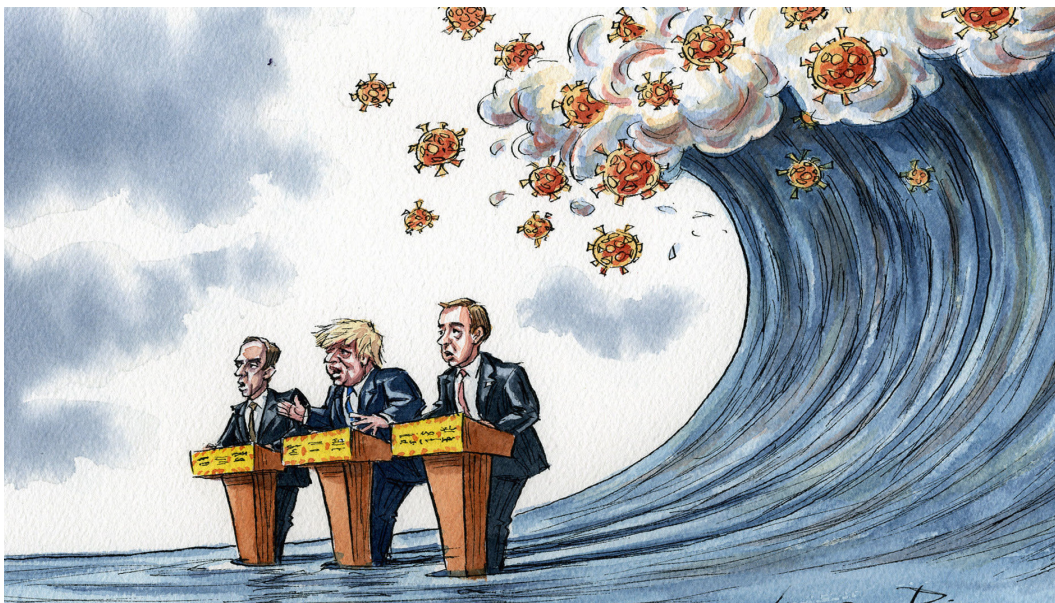
Nonetheless, it is important to understand why these policies worked as well as they did in South Korea to figure out how these results are generalizable to other countries. The core factor that separated Korea’s response from that of the rest of the world was plainly the difference in preparation. Recent epidemics such as SARS and H1N1 influenza that resulted in the deaths of hundreds of South Koreans are still prominent in the Korean collective consciousness.⁹ South Korean public health officials

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were thus already aware of the need to rapidly ramp up testing, identify the infected, and limit social interaction to keep transmission rates as low as possible. Moreover, government responses in previous epidemics were widely lambasted as inadequate and uncoordinated with citizens prioritizing public health reform higher than in other developed nations. The experience ultimately taught politicians in the country that, though any effective response would require many different organizations and institutions to work in tandem, a strong government was expected to take the lead in organizing this collaborative effort.¹⁰

On the other hand, the United Kingdom's response mirrored that of the United States in more ways than one. Much like their ex-colonies across the Atlantic, the UK governing system devolves a significant amount of power down to more local levels of governance. Scotland, Wales, and Northern Ireland have latitude to make some of their own Covid-19 regulations. Using this approach, did the UK do any better than the United States?

Local transmission in the United Kingdom was first recorded in late February. However, no major government action was taken until mid-March when a ban on mass gatherings was put in place. About a week later, Prime Minister Boris Johnson closed all schools and announced a UK-wide lockdown (with minimal travel exceptions for grocery shopping and medical care). While the UK originally began with a contact-tracing strategy in February to contain the virus, this effort was largely dropped by early April in favor of other measures. After a month and a half of lockdown, on May 10, Boris Johnson announced an easing of lockdown restrictions and allowed people to return to work. Lockdown restrictions were further rolled back over the rest of the summer. However, this wasn't to last as the government began tightening restrictions again in September to respond to another significant rise in cases. Social gatherings were largely banned, curfews were instituted, and mask wearing was mandated. In mid-October, Boris Johnson announced the use of a 3-tier system in England wherein different areas are



Political cartoon of the UK's 3 major party leaders ignoring a wave of viruses – The UK's early coronavirus response was slowed for political reasons.¹¹

subject to 1 of 3 levels of restrictions based on the level of transmission in the area. Around the same time, regional governments in Scotland, Wales, and Northern Ireland instituted their own tier systems with stricter restrictions than Johnson's and 2-week "firebreak" lockdowns. Johnson would follow suit, instituting a 4-week lockdown in England starting on November 1.¹² Lastly, it's worth noting that all of this is occurring with a backdrop of last-minute high-importance trade negotiations with the

European Union that communities are preparing to adapt to post-Brexit.

With all of this in mind, it's not too hard to see why the United Kingdom's response has been roundly criticized by its European peers. Beginning with a summary of the virus spread, the first wave of cases peaked in April, steadily fell over the summer, then started climbing again in August as a part of a second wave that continues today. In terms of lives lost, more than 50,000 deaths have been recorded

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in the United Kingdom due to the pandemic—the highest level of excess deaths in Europe. All things considered, it isn't hard to see why. In contrast to the Korean strategy of identifying and isolating the infected as fast as possible, communications from the British government often appeared to revolve around the concept of herd immunity wherein the government would pursue laxer restrictions and allow enough people to be infected and develop immunity to naturally stop the spread of the disease. This strategy would, of course, inevitably lead to more cases and thus more deaths. Additionally, there were chronic shortages of personal protective equipment for healthcare workers and it took a long time for testing capacity to ramp up. Initial estimates put the target testing capacity at 100,000 per day - a goal that wouldn't be reached until mid-May.

From another angle though, one would initially expect that while laxer UK restrictions may have led to more cases, the initial freedom afforded to citizens would lead to more economic growth than under a stricter lockdown and higher public approval of the government. However, this doesn't seem to be the case. The United Kingdom suffered a 20% drop in GDP which was *significantly* worse than the 9.8% average drop across OECD nations. The economic contraction here was exacerbated by the UK economy being heavily reliant on services and hospitality as well as the UK's uncertain Brexit position.¹³ The political front has likewise soured. Approval for the first lockdown began well above 90% (owing to historically favorable opinions about the country's health system).¹⁴ Since then, the public has turned on the ruling government with 64% of adults believing that Boris Johnson has no plan for the pandemic.¹⁵ Lack of effective national leadership contrasted with more effective regional leadership has also shifted opinions in Scotland ever closer towards independence.¹⁶

The big question, then, is how this situation got so bad. Commentators have put the blame on the government for making politically expedient decisions as opposed to decisions motivated by scientific expertise. The ruling conservative party had just won a historically large majority in December elections and was focusing on making the most of their newfound political capital to reshuffle high level bureaucrats and push through Brexit legislation. There was little public health preparation as the virus began to spread in China. The leader of the Labour party had just stepped down leaving the main opposition party leaderless

and unable to properly hold the ruling government to account. When the first wave began to wash over the British Isles, the national government ignored expert advice saying the government should have imposed the lockdown earlier and lifted it later. The story of Boris Johnson bragging about shaking hands in defiance of social distancing guidelines then testing positive a few days later is a good allegory for the UK response. Failure to take decisive and proactive action in favor of the more politically beneficial option only created more problems in the long run.

Finally, we come to the interesting case of Sweden. Instead of using lock downs and the like to preemptively stop the spread of the pandemic, Swedish policymakers instead chose to level no official lockdown. So, what happened? Did the virus flare up as one would expect or have the Swedes found something the rest of the world missed? General transmission in Sweden more or less started in early March. At this time, Sweden began by banning mass gatherings and moving colleges and universities online. A few weeks later, this would be followed up by a ban on visits to elderly care facilities. Interestingly enough, this is more or less the extent of Swedish restrictions during the first wave of the pandemic. The Swedish government had been making many public recommendations (Ex: working at home if possible, maintaining distance at restaurants) but no lockdown was put into place and schools for children under 17 were never closed.¹⁸ While counterintuitive, one of the upshots of this policy approach is the avoidance of what has been called "COVID fatigue" where people become disillusioned with restrictions and stop following them in addition to slowing the degradation of mental health that comes with long term isolation.¹⁹ As the second wave begins to rear its head, Sweden has begun adopting harsher restrictions but as of yet has not implemented a lockdown.

To say that Sweden's approach to fighting the pandemic is controversial is an understatement – its strange strategy has attracted high praise and vitriol from the WHO and other world leaders. The actual impact of the Swedish response is difficult to evaluate. Sweden has higher case and fatality rates when compared with its Nordic peers but these rates are still low compared with other European countries that actually instituted full lockdowns. Moreover, some recent studies note that Sweden's mortality rate was abnormally low immediately prior to the pandemic (and that the overall mortality rate for the year was about the same as

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the year before) ultimately suggesting that a larger vulnerable population lived in Sweden than usual.²⁰ The economic impact is likewise difficult to evaluate. Sweden's GDP fell by 8.6%, better than the European average, but this can be somewhat attributed to a majority of the Swedish people already being used to doing their work from home and thus having a somewhat naturally "Covid-proof" economy.²¹ Approval of the government response has slowly decreased over the year to 44%

today which, while declining, is still better than in countries like the United Kingdom.²²

As such, the last remaining question is...why? Why did Sweden pursue this counterintuitive policy and why does it seem to somewhat work? The answer to the first question is fairly straightforward: the Swedish Constitution guarantees the right of Swedish citizens to move freely within Sweden. It's legally dubious whether the central government could order a national lockdown even if they tried.



Swedish epidemiologist Anders Tegnell briefs the press – He was the architect of Sweden's lax Coronavirus response.¹⁷

On the other hand, the second question is harder to answer. One answer is that the Swedish people were already some of the most isolated in the world with a majority of homes occupied by a single resident as well as norms of giving each other a lot of personal space.²³ At the same time, Swedish culture dictates that government should trust citizens to take care of themselves without forcing them to do something and that citizens should follow government guidelines – a relationship naturally leading to a response centering around voluntary measures.²⁴ The Swedish response makes sense in these contexts but also makes it unlikely to work anywhere else in the world.

At the end of the day, this is an important conversation to have. Policymakers cannot brush the dirt off of their pants, shrug, and myopically assume that the world will return to normal. Antibiotic resistance, more frequent zoonotic shifts, and rapid environmental changes spurred on by climate change virtually ensure that the next great pandemic is just over the horizon. Countries must learn from one another to see what worked and what didn't. At the same time, the national conversation cannot devolve into the simplistic refrain of "do what South Korea did". As shown in this article, while South Korea may have been successful in containing its

own outbreak, the widespread applicability of its approach is doubtful for the simple reason that every country is different. Leaders must approach the infectious disease problem pragmatically, borrowing strategies from one another but tailored to their own specific situation.

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