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Social Distancing: A Neurophilosophical Perspective

- [April 7, 2020](#)
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The COVID19 pandemic is poised to become the single most disruptive event of our generation. At the time of writing, the pandemic has already started to profoundly alter our ways of life, and we already have glimpses of the tectonic shifts to come in the global economy and geopolitics. The current epidemic is, rather ominously, occurring just over a century after the Spanish flu, considered the deadliest pandemic in history. Yet, numerous factors are completely [different](#) today than in 1918. In 1918, most doctors had never seen a virus before, although they knew viruses existed because, in 1892 and 1898, respectively, two scientists had discovered the [Tobacco mosaic virus](#). Today, it is possible to isolate a virus, find its genetic sequence and develop vaccines. Although insufficient to meet current needs, medical protective equipment today is better able to protect medical staff in the fight against the virus.

Nevertheless, while the medical reality of today is different from the one of 1918, there are similar factors that help spread, and contain, the virus then and now. After the first case was [officially](#) recorded in Kansas, on 4 March 1918, in soldiers later sent to the front, the virus quickly spread to the Western Front and, by [September](#), the first cases “directly traceable to soldiers, sailors or their friends” started to be recorded in the US, in Minnesota. In the midst of this fast evolving situation, and ignoring warnings, the city of Philadelphia decided to go ahead with a planned [parade](#) for 27 September 1918, drawing over 200,000 people. Just three days later, every bed in Philadelphia’s 31 hospitals was filled with infected patients, many of whom would die. Even so, public schools and other establishments were only closed on 3 October. A completely different situation emerged in St Louis, where, after the first cases were reported on 5 October, authorities started to close a series of public establishments just two days later, limited the number of streetcar riders and banned gatherings of more than 20 people.

The results of early vs delayed interventions spoke for themselves. In an extensive [2007 study](#) of these responses, it was clearly shown that a 14-day delay (from when the first cases were reported) in response led to approximately “three to five doubling times for an influenza epidemic.” In addition to the benefits of rapid interventions, the same study showed that the viral spread is renewed once these measures are relaxed.

In 2020, the spread of the novel coronavirus COVID-19 outside of China has followed a similar pattern of exponential growth, and [large gatherings](#) have provided a perfect breeding ground for its propagation.

From Inaction to Social Distancing

To slow the spread of the virus, hundreds of millions of people around the world are now officially in some form of isolation and have been asked to practice *social distancing*.

[Social distancing](#) is a “public health practice that aims to prevent sick people from coming in close contact with healthy people in order to reduce opportunities for disease transmission.” Typically, it requires large-scale measures, such as cancelling public events, implemented by authorities, as well as individual awareness and conscious decisions to avoid crowds.

Rationally, for most people, it is now clear that social distancing is critical in the midst of a pandemic—indeed, it is a matter of survival. Because it is not always possible to know who in the community is contagious, social distancing is the best way to limit the virus’ spread. Yet, social distancing remains a dreadful imposition to most people. Today, accustomed to an extraordinary degree of connectivity, frequent travel and liberty of movement, it appears all the more unbearable. However, social isolation is not only difficult in 2020. For many people experiencing the 1918 flu, some forms of isolation were very hard to accept. [For example](#), in Minneapolis, football teams opted to ignore the existing ban and tried to play in front of large crowds, until the police arrived and dispersed the crowds. In November 1918, the bowlers of St Paul drew up a petition to request permission to start bowling again.

Current calls for social distancing have been repeatedly ignored, even as governments have begun to impose tougher restrictions and punishments for those breaching the rules. In Italy, police [checks](#) between 11–17 March found that over 43,000 had violated the quarantine decree. Challenging as it is, the COVID-19 pandemic and the accompanying *social distancing* measures are most likely only in their earliest phases. It is quite likely that a few [rounds](#) of social distancing will be needed over the coming months, as subsequent waves of the disease can be expected.

This also happened during the 1918–1919 flu, and in other cases, such as in [Toronto](#) during the SARS outbreak. A recent [computer modelling](#) by Harvard researchers revealed that one single period of social distancing would not be enough because, in any scenario, there would still be enough cases to lead to a probable rebound in transmission. Intermittent social distancing, they suggest, could maintain the critical cases of COVID-19 within current capacities but this will prolong the duration of the epidemic well into 2022.

It is impossible to know, at the time of writing, how the epidemic will unfold over the coming months, and what other variables will impact its spread. One conclusion appears, however, indisputable at this point and that is the reality that social distancing will [last](#) for longer than we wish, and it will have profound—perhaps irreversible—consequences for our lives.

Neurophilosophy of Social Distancing

We have always known that we are deeply social beings and Aristotle’s famous saying that “man is by nature a social animal” has been an accepted dictum for millennia. Insights from neuroscience now allow us to understand this in deeper ways—and quite literally. We are for the first time able to grasp how social isolation and social interaction are expressed neurochemically, and the kind of neuroanatomical changes that occur in our brains in isolation/loneliness and in social interactions.

Furthermore, beyond the realm of clinical observations about how these phenomena are expressed in the brain, neuroscientific insights also inform us about the fundamental role of social interactions and the environment in human morality both generally and individually.

A neurophilosophical perspective on social distancing connects us to some of our primordial fears, but it also reveals highly complex elements of our social relations. Let us start with some of the psychological and neuroendocrinological effects of isolation.

Negative Impacts of Prolonged Isolation

Isolation, especially for prolonged periods of time, is known to be detrimental to mental and overall health. An extensive [2010 meta-analytic review](#), showed that people with stronger social relations had a higher chance of survival than those with weak social relations. The review evaluated health risks both in healthy participants as well as in patients with pre-existing conditions. After reviewing the data from over 300k individuals, followed for an average of 7.5 years, the evidence showed that adequate social relations led to at least 50% higher chances of survival.

The impact of isolation has not yet been studied in the context of the current pandemic, but we can draw on previous research on some groups, such as [astronauts](#), people placed in solitary confinement (who experience [damage](#) to certain cognitive functions) and Antarctica researchers, to understand some of the detrimental effects associated with prolonged isolation. [Boredom](#) can numb the mind, and invite depression and anxiety quite easily.

[Research](#) published in 2019 in the *New England Journal of Medicine* evaluated the result of isolation on a crew of nine polar expeditioners working at a remote station in Antarctica, and revealed significant changes in their brains as a result of physical and social isolation. Using magnetic resonance imaging (MRI) brain data obtained before, during and after the expedition, the study revealed reductions in the hippocampal volume of the dentate gyrus after the expedition. These results show that the brain shrinks as a result of environmental monotony and isolation. The study also monitored the levels of a protein called brain-derived neurotrophic factor (BDNF): the concentration decreased after the first quarter of the expedition, and had not recovered 1.5 months after the end of the expedition. These reductions in dentate gyrus volume and BDNF concentration are associated with lower cognitive performance in spatial processing and selective attention. A logical inference of the study was thus that “variations in social and physical environments influence hippocampal plasticity.”

Ancestral Fears, Power and Human Nature

While these findings cannot be taken deterministically, they can be corroborated by many similar studies on the impact of isolation. Recent research at MIT has identified a cluster of cells located at the back of the brain, in an area called the dorsal raphe nucleus (DRN), which are believed to be responsible for the feeling of loneliness. Moreover, [experiments](#) showed that, when mice were housed together, neurons in the DRN region were not very active. However, a period of prolonged isolation made these neurons sensitized to social contact and, when animals were reunited again, activity in the DRN surged.

Our aversion to practising social distancing now—and, most likely, over the coming months—is also to be understood in the framework of this neuronal mechanism that pushes us to seek social contact even more after isolation (or, in this case, the anticipation and fear of prolonged isolation). The MIT researchers’ elaborate description of their [findings](#) suggests that “in response to situations of social isolation or loneliness, individuals are motivated to re-establish social contact and pay greater attention to social stimuli.” This is backed by other [research](#), which showed that socially excluded individuals showed an enhanced memory for social events, a mechanism analogous to the way in which physical hunger results in selective memory for food; similarly, *social hunger* and the need to belong will lead to a selective memory for social stimuli.

Research has also shown that the feeling of isolation is not experienced uniformly and that relations of social dominance can potentially make isolation more agonizing. In their experiments, the MIT team also considered studying to what extent the size and relations within the social network had a bearing

on isolation. Like [primates](#), mice form hierarchies and relations of dominance when housed together—which are instrumental to the well-being and stability of the social group.

The experiments tested the hypothesis that the subjective experience of social interaction differs across the members of a social group, depending on their social ranks. The results showed that the dominant mice were more responsive to changes induced in DRN activity, which suggests that they were more susceptible to feelings of loneliness. Being the dominant one in the group, vs the subordinate one, leads to certain differences in how isolation is perceived, as one researcher in the group [explained](#): “if you’re the dominant mouse, maybe you love your social environment. And if you’re the subordinate mouse ... maybe you feel socially excluded already.”

In the real world, societies are extremely complex, with varying structural relations and institutions that guide those relations. Perhaps we cannot yet extrapolate all of these findings to the realm of human societies and groups, but it appears increasingly clear that there are, neuroanatomically and neurochemically speaking, differences in what social distancing will mean for different people.

In a previous article on the [neurochemistry of political power](#), I explain the salience of power to human relations, and the extreme neuro-behavioral responses in circumstances of absolute and unchecked power. The primary neurochemical (known to date) involved in the reward circuitry of power is dopamine, the same neurochemical responsible for the feeling of pleasure. Activating this reward circuitry in the brain leads to an addictive high, much like any drug, and encourages the repetition of those acts that ensure the dopamine flow.

Dopamine is responsible for reward-based circuitries and, at moderate levels, it has a very important role in learning. At extreme levels, it has been associated with recklessness, risk-taking behavior and even a sense of personal destiny. Even if we set aside extreme and pathological manifestations of power-seeking behavior, relations of power and hierarchies pervade all social relations. We can certainly imagine—in line with the aforementioned study—that social distancing, which prevents some individuals (even temporarily) from exerting whatever power they had, will be especially disagreeable to them.

Prolonged social isolation produces even deeper psychological and behavioral effects. These include increased [aggression](#), anxiety and a sense of persistent threat. For the more primitive parts of the brain, isolation triggers a host of neuro-psychological and neuro-endocrinological responses that are connected to brain regions responsible for threat surveillance and self-preservation. [Sociality](#) comes with costs (competition, risks of pathogen transmission, and exploitation) but it is ultimately critical to survival. A sense of isolation and loneliness increases the attention to negative social stimuli (e.g. threats, exclusion) and promotes behavior centered on short-term self-preservation. The range of neural and behavioral reactions to this sense of isolation includes sleep fragmentation, altered gene expression and immunity, decreased impulse control, cognitive decline and risks of dementia. In other words, in a state of perceived loneliness, the individual needs to become better prepared to detect threats and defend him- or herself.

A neurophilosophical perspective on social distancing reminds us why we cannot survive and thrive in loneliness—and why the older structures of the brain identify the prospect of prolonged isolation as truly dreadful. [Humans](#) started as “interdependent, bonded and unequal” and “our bodies and minds are not designed for life in the absence of others.” Moral sensitivities developed in the context of social evolution and were influenced by the emotional part of our brains. Several parts of the brain developed to respond to others, and as a result of our engagement with the world. [Mirror neurons](#), discovered in the early 1990s, have provided additional insights into how we generate our actions, as

well as how “we monitor and interpret the actions of others.” These neurons were first discovered in the rostral division of the ventral premotor cortex of the macaque brain, and subsequently in other regions. Research over the years has shown that there are no specific *mirror neuron regions*, but rather that they exist in many brain regions.

Drawing on insights from neuroscience, I have previously described human nature as [emotional, amoral and egoistic](#). We are far more *emotional* than rational, and evidence suggests that what we think of as *rationality* is hardly as pervasive as we would like to believe. In fact, emotional processing in the brain plays a critical role in cognitive functions, memory formation and decision-making—the idea of [dual systems](#) of *emotion* and *reason* is not supported by neuroscience. We are also *amoral* in the sense that we are not born with a predefined notion of good or bad. Our moral compass will develop and fluctuate depending on circumstances in our environment. We are hardwired, however, in a deep sense to pursue survival, which is a basic form of *egoism*. These egoistic features (which can be heightened in a period of social isolation) can prompt us to “[fear-induced pre-emptive aggression](#),” which is a defense mechanism that occurs when individuals anticipate danger and act to protect themselves, including through violence.

Going Forward

In addition to the obvious dread of boredom and monotony, social distancing, isolation and imposed quarantine activate deeper ancestral fears and cause us to feel threats that persist even in this technologically connected global society.

Philosophers have often praised the virtues of solitude and the bouts of productivity and artistic creativity that can be fostered in moments of serene isolation. The example of [Newton](#) has resurfaced in recent weeks, as a reminder that great scientific achievements can be accomplished in isolation. During the Great Plague, Newton, along with all students at Cambridge University, was sent home, where he continued his studies and produced some of his most important work. While such episodes may be welcome at various points throughout existence, social isolation is a distressing experience when it is externally imposed. We would never have thrived in social isolation: neither intellectually, physically, or morally.

As hundreds of millions of people around the world have been asked to practice social distancing, we are faced with a difficult challenge going forward. While digital connectivity will help us navigate this period, and salvage to some extent the sense of connection with others, this is also a time to go back to the ancient philosophy of [Seneca](#), who teaches us that we tend to suffer more in our imaginations than in reality. In the face of this uncertainty, we must strive at all costs to overcome extreme fears and avoid any form of *pre-emptive aggression*. For this, in addition to community support, the role of [governments](#), how they communicate and reassure the population, will be critical in the coming months.

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