

COVID-19 Restrictions-Related Mental Health Challenges and Associated Public Health Preventive Strategies Via a Critical Evolutionary Mismatch Perspective



Jiaqing O¹ and Lei Chang²

¹Department of Psychology, Aberystwyth University, Aberystwyth, UK

²Department of Psychology, University of Macau, Macau, China

Keywords

COVID-19 · Movement restrictions · Mental health · Public health strategies · Evolutionary mismatch

Definition

The disturbingly extensive spread of the coronavirus disease 2019 (COVID-19) is currently a grave cause for global concern. (Re-)enforcing/advocating social and movement restrictions are part of the core repertoire of tactics numerous countries have adopted in dealing with this pandemic. While arguably essential courses of action, prolonged restriction measures could nevertheless cause individuals to be excessively exposed to a host of evolutionarily unnatural conditions that

might render them more susceptible to experiencing psychological problems. A selection of key public health preventive strategies, founded on the framework of evolutionary mismatch (which can be arguably regarded as a form of critical approach as well), including (1) the facilitation of technology use to maintain social contact with kin and close friends; (2) encouraging the enhancement of natural stimuli in people's homes; (3) curtailing individuals' exposure to overwhelming amount of COVID-19 information; and (4) educating on and supporting the beneficial engagement with evolutionarily familiar stress coping methods, is proposed to be effective in counteracting mental health challenges among individuals in such circumstances.

First detected in Wuhan, China, in late 2019, the coronavirus disease 2019 (COVID-19) has swiftly transformed into an alarming threat of global proportions in a matter of weeks (Shereen et al. 2020). As of the 4th of April 2021, more than 130 million people around the world were determined to have been afflicted with the condition, with over 2.8 million of them having already succumbed to it (World Health Organization 2021). Numerous nations have elected to (re-)enforce/advocate drastic movement restrictions (of varying intensity for parts of the country at a minimum) in a bid to tackle this ongoing health crisis (Hale et al. 2021). These strategies, while radical, are valuable tactics in dealing with a virus outbreak of such a scale especially when utilized as part of a multipronged approach (World Health

Organization 2020). Nonetheless, severe social and movement restrictions could pose serious mental health challenges in the longer term if they were to persist for an extended period of time (Brooks et al. 2020), and public health strategies will need to take these into account.

From an evolutionary mismatch viewpoint (see Giphart and van Vugt 2018, for an extensive discussion of this), adverse outcomes, including the development of (mental) health issues, could materialize when environmental conditions deviate too drastically from what is evolutionarily familiar for modern humans to adapt adequately to. As a species, humans require numerous generations to gradually evolve psychological and biological mechanisms that are suitable for different environmental contexts so as to enhance survival (and therefore reproductive) chances. This rate of change is believed to be generally sufficient if environmental transformations are similarly gradual, but problems might arise when our surroundings change too rapidly for humans to evolve in order to adjust accordingly and those previously adaptive mechanisms could then be rendered less useful in such situations (e.g., they could possibly influence health outcomes negatively). Take the emergence of jet lag experiences for example. Humans' evolved psychological and biological mechanisms are adapted to gradual changes in sunrise/sunset timings over the course of evolutionary history but the widespread utilization of air travel in the modern world has provided an evolutionarily novel experience of encountering two (potentially very different) time zones within a relatively short span of time which would in turn put one at risk of developing signs of jet lag because our evolved mechanisms are not yet redesigned, evolutionarily speaking, to take such experiences into account. Similar evolutionary mismatch-related explanations have also been adopted to elucidate a wide array of mental health issues that has ranged from specific phobias (O 2018) to depression (Hidaka 2012). Besides the usefulness of this perspective in offering a parsimonious and coherent account of mental health issues, it also provides a more humanizing explanation of why mental health issues might develop (and ways to reduce that likelihood).

According to the evolutionary mismatch formulation, biological and psychological mechanisms are conceptualized not as problems or deficiencies that are influential in the emergence of mental health issues like what traditional biological/medical theories would suggest but as evolved mechanisms that were and are still useful in the relevant environmental contexts and are only rendered less useful if environmental conditions change too rapidly – in this regard, affected individuals are given a sense of agency that they modify their environments, both social and physical ones, to improve their mental well-being, and are not perceived as “mentally sick” or “diseased” passive sufferers who are solely dependent on healthcare professionals and treatments for help. This is the approach this entry will adopt to understand the impact of COVID-19 related restrictions on mental health challenges and associated strategies that can be utilized to reduce the likelihood of such issues from occurring.

To this end, strict (but important) COVID-19 measures that generally confine individuals to their homes, except for a limited number of non-residential activities, could heighten mental health risks considerably, by increasing their exposure to a range of evolutionarily unnatural circumstances. In this regard, public health regulations/guidelines should also incorporate strategies that are informed by evolutionary mismatch theory (e.g., which arguably could provide a unique, parsimonious explanation for the underlying functions of these proposed strategies) that can adequately prevent or mitigate some of the unintended impact the pandemic-related restrictions can have on individuals' psychological well-being. In this entry, we discuss four major possible mental health challenges that could disproportionately affect individuals and their proposed remedies below, one at a time (e.g., each challenge will first be presented together with its proposed remedies, before the discussion of the next challenge).

Restrictions-Related Mental Health Challenges (and Their Proposed Remedies)

Due to Lesser Interactions with Kin and Friends

Restrictions on movements outside of people's homes could severely undermine their ability to preserve important connections with their relatives and close friends (if they are living alone/separately from them). Throughout human evolutionary history, *Homo sapiens* likely have survived longer with the help of their relatives (who would conceivably share resources with them and protect them emotionally and physically from harm), as the welfare of each member within a kinship group could have important well-being implications for the group's offspring (Hughes 1988). A similar argument could be put forth for support from close friends, who would have been more likely to assist one during difficult times in the ancestral context as the latter would expectedly have done likewise in analogous circumstances (Trivers 1971).

Hence, for those people who do not reside together with their kin (or close friends) and having the option of these individuals visiting them regularly to provide (emotional) support (or vice versa) rendered largely unfeasible due to a quarantine/lockdown (depending on the severity of the country's restrictions), the risk of developing mental health issues is potentially substantial (e.g., Brik et al. 2021; Ye et al. 2020). Indeed, empirical evidence has shown that an inadequate amount of support from one's kin or friends was linked to a greater probability of experiencing psychopathological problems among physically isolated individuals (Chou et al. 2000; Palinkas and Browner 1995). Such a risk is likely to be especially more severe among those who might be less socioeconomically privileged, as they are more likely to have a smaller group of individuals in their lives whom they can depend on in the first place (Weyers et al. 2008).

Proposed Public Health Strategies

One approach to overcoming this obstacle is to promote, through the mass media, the engagement in regular video calls with kin and close friends who are not residing with us. Public policymakers and local agencies should also plan to provide monetary and/or technological support specifically for socioeconomically disadvantaged individuals who do not yet have the means to partake in such regular virtual interactions. Humans are believed to react (e.g., emotionally) to stimuli in the cyberspace, including the real-time virtual representations of our relatives and friends via a video chat, as if they are indeed physically with us because cognitive mechanisms have not yet evolved to distinguish them from looking at actual people in front of us on an emotional and physiological level (although we know the difference intellectually) as the viewing of these representations of others using technological means is such a recent (and hence novel) evolutionary phenomenon (Kanazawa 2002). Because of that, having regular contact with physically distant relatives and close friends via video chats (but perhaps somewhat less so with audio-only chats as they do not provide a visual representations of the other party) would predictably minimize the impact quarantine measures could have on one's ability to cope psychologically with life stressors during the pandemic.

Due to Lesser Exposure to Nature

Mental health issues could subsequently also arise because some stay-at-home guidelines have curtailed individuals' daily nature exposure. This is especially more likely to be apparent among highly urbanized, socioeconomically less privileged people who might already be less able to encounter nature regularly given that natural spaces are typically more accessible/widespread in socioeconomically more privileged communities (e.g., Astell-Burt et al. 2014). From an evolutionary mismatch angle, individuals are believed to be more susceptible toward developing mental health issues when they are devoid of peaceful natural surroundings, which were ubiquitous for much of human evolutionary past and are places that humans have evolved to utilize for deep

contemplation about valuable ways to tackle existential challenges (O et al. 2019). Consistent with these lines of reasoning, the lack of nature exposure has been demonstrated to be related to poorer psychological well-being (Tillmann et al. 2018), and this is conceivably more apparent among socioeconomically disadvantaged individuals who might actually benefit more from such reflection-conducive exposure (Garrett et al. 2019).

Proposed Public Health Strategies

Considering the demonstrated benefits of nature exposure due to its evolutionary significance (and the possible psychological harms from its deprivation), public health guidelines should especially encourage individuals, including those from more socioeconomically disadvantaged groups, to profit from continuing their contact with/physical activities in a natural environment near their home *if* it is still safe to do so. For those who might now find such outdoor activities unfeasible, but have visual access to natural surroundings (e.g., the sea or a woodland) via their domicile's windows, public health agencies should specifically encourage them to spend more time observing such environments from their dwelling while going about their indoor tasks (Kaplan 2001). In light of the possibility (as indicated above) that some of these individuals might not have the privilege to be close to such spaces in their neighborhood nonetheless, public health messages could alternatively suggest that they curtail their chances of experiencing adverse mental well-being outcomes (that might stem from prolonged stay-at-home regulations) via the introduction of houseplants and pictures depicting natural landscapes into their homes (the cost of which could ideally be reimbursed via a special governmental grant for those within certain socioeconomic levels), while spending time (exercising if possible) under daylight that have shone through opened windows (Largo-Wight 2011). Combining these with taped audio and visual stimuli of the natural world via online videos playing in the background (or by looking at them) on occasion (with the cost of obtaining an electronic device and/or reasonable internet access similarly reimbursed, to a

certain extent at least, by a special governmental grant for those who have not yet acquired them) are further empirically supported ideas that could be incorporated in governmental messages aimed at encouraging individuals to reap the protective benefits of (artificial) nature exposure (Largo-Wight 2011).

Due to Excessive Exposure to COVID-19 Information

Furthermore, these restrictions might likewise provide plenty of opportunities for primarily housebound individuals to engage excessively with COVID-19-related information in the mass media. Given that individuals (especially younger ones) would already allocate close to 4 hours daily to the cyberspace and television programs in general before the pandemic (Thomas et al. 2019), it is very probable most people are going to spend even more time consuming content (specifically COVID-19 news/stories due to the ubiquitous nature of their availability) on the mass media during a lockdown/quarantine. Excessive exposure to innumerable information about a virus outbreak is predictably going to lead to significant psychological distress because it is not something humans would have adapted to handle throughout the majority of our evolutionary existence, as access to such knowledge through the mass media is a viable option only in the modern world. Indeed, empirical evidence has suggested that this is veritably the case (e.g., Riehm et al. 2020; Wang et al. 2020).

Proposed Public Health Strategies

Public health preventive strategies should primarily be geared toward reducing the magnitude of exposure to news and stories about the pandemic to a level that is more similar to what humans would generally have been confronted with during a virus outbreak in the evolutionary past (e.g., our ancestors would only have had access to locally relevant information communicated through the grapevine – the precursor of modern-day media). Specifically, public health organizations should work closely with policymakers and media outlets in limiting people's exposure to evolutionarily unfamiliar

information in the media by (1) minimizing the reporting of daily COVID-19 statistics around the world; (2) decreasing the extent (predicted) worldwide economic impacts of the pandemic are being reported; (3) curtailing the amount of stories/reports about the unfortunate suffering of victims across the globe; and (4) aiming to report, where appropriate, only locally relevant COVID-19 news and safety guidelines in the main. It is very important for the messages to highlight that many news reports and stories are truly meaningful especially with regard to remembering the numerous unfortunate victims of the health crisis around the world – constant exposure to them might nevertheless heighten one’s already enormous level of psychological distress.

Due to Excessive Exposure to Other Evolutionarily Unfamiliar Media Stimuli

In a similar vein, individuals are also likely to spend much more time consuming other evolutionarily novel content (e.g., movies and videos depicting attractive celebrities who might not be representative of the average person, among others) in the media in an attempt to deal with their discomfort given the extended amount of time that will be spent at home or in a quarantine facility. These experiences could render them (particularly those who are already struggling with body image issues to start with) more vulnerable to develop psychiatric problems (especially those encompassing appearance concerns) (Harrison and Cantor 1997). Furthermore, individuals might also be faced with other mental health issues (such as the presence of some indications of depression) following prolonged engagement with social media as a result of upward social comparison, because the content on such platforms would usually be made up primarily of certain (e.g., self-promoting) pictures and videos from others that might only provide a very limited (or false) rosy view of their lives (Tandoc Jr et al. 2015).

One possible explanation is afforded by Kanazawa’s (2002) abovementioned theory about how we might react (e.g., emotionally) to virtual representations of others (and these include those depicted in the media) as if they are

individuals who are indeed present at that very point in time in our surroundings, due to evolutionary mismatch. Recurrent exposure to these virtual representations (e.g., of celebrities) might thus provide individuals with an inaccurate sense of the types of physical appearance the average person might have in their community (Kanazawa 2002). Similar cognitive bias downplaying the quality of one’s own life could also occur with regular exposure to positively skewed images/information of others’ lives on social media (e.g., reading social media posts about peers apparently “loving every minute” of their stay-at-home period). To this end, excessive consumption of digitally enhanced media content such as movies that generally only showcase celebrities who are on the extreme end of the attractiveness spectrum might cause individuals to make misguided negative judgments about themselves, as would an immoderate usage of social media consisting largely of embellished presentations of other people’s lives; and such experiences could subsequently induce psychopathological affective and behavioral responses in the long run.

Proposed Public Health Preventive Strategies

These evolutionary mismatch-focused arguments would suggest that public health recommendations should be geared toward educating individuals about the importance of moderating their consumption of celebrities-oriented media content and their usage of social media especially during this period of movement restrictions. Public health messages should also advise people to consider other healthier stress-relieving strategies that do encompass more evolutionarily familiar stimuli, including (as indicated above) increasing one’s engagement with the natural world to buffer against the psychological impact of movement restrictions/quarantine (Largo-Wight 2011), and embarking on more virtual interactions with their kin and friends whenever possible; ideally supported by some forms of governmental financial support that might be needed by some to obtain reasonable access to these experiences.

Other potentially useful, evolutionarily more familiar alternatives that could be suggested in these public health messages (and technological

access to these opportunities could similarly be facilitated by the abovementioned grant from the government if possible) include spending more time listening to calming music, something that humans were contended to have benefitted psychologically from (via biological reactions) over the course of evolution (Snowdon et al. 2015); and partaking in online strain-alleviating religious activities (for those who are religious and are missing out on attending such engagements in person due to the pandemic) (Nooney 2005). Religious activities were believed to have served an adaptive function in engendering a sense of emotional connection with other like-minded members since prehistory (Dunbar 2020), and such bonds could confer members an enhanced sense of psychological hardiness in the face of an ongoing pandemic (Townshend et al. 2015). Public health agencies should therefore encourage religious groups to provide more online meetings/sessions and to work with governmental organizations in extending financial and training support for groups, especially those in more socioeconomically deprived areas, that might encounter more difficulties in setting up an online presence. Similar forms of assistance should also be extended to establishing online community support groups especially (but not exclusively) for nonreligious individuals, which could mimic the beneficial evolutionary function of religious groups (Slavich 2020).

Summary

While not intended to be exhaustive, this work has provided a succinct, empirically supported discussion of selected mental health-related perils, that could arise from drastic (but essential) COVID-19 social and movement restrictions enacted around the world (and their proposed public health solutions). While others (e.g., Brooks et al. 2020) have elucidated this topic in the past, the current work has presented a unique perspective (based on evolutionary mismatch theory as a critical psychological formulation) on the evolutionary underpinnings of the significance of these restrictions and why a focus on enhancing evolutionarily

familiar experiences is contended to be indispensable in combating the associated psychological challenges during the pandemic.

Cross-References

► [Neoliberalism](#)

References

- Astell-Burt, T., Feng, X., Mavoa, S., Badland, H. M., & Giles-Corti, B. (2014). Do low-income neighbourhoods have the least green space? A cross-sectional study of Australia's most populous cities. *BMC Public Health, 14*(1), 1–11.
- Brik, M., Sandonis, M. A., Fernández, S., Suy, A., Parramon-Puig, G., Maiz, N., . . . Carreras, E. (2021). Psychological impact and social support in pregnant women during lockdown due to SARS-CoV2 pandemic: A cohort study. *Acta Obstetrica et Gynecologica Scandinavica, 100*(6), 1026–1033.
- Brooks, S. K., Webster, R. K., Smith, L. E., Woodland, L., Wessely, S., Greenberg, N., & Rubin, G. J. (2020). The psychological impact of quarantine and how to reduce it: Rapid review of the evidence. *The Lancet, 395* (10227), 912–920.
- Chou, K. L., Chi, I., & Boey, K. W. (2000). Determinants of depressive symptoms among elderly Chinese living alone. *Clinical Gerontologist, 20*(4), 15–27.
- Dunbar, R. I. M. (2020). Religion, the social brain and the mystical stance. *Archive for the Psychology of Religion, 42*(1), 46–62.
- Garrett, J. K., Clitherow, T. J., White, M. P., Wheeler, B. W., & Fleming, L. E. (2019). Coastal proximity and mental health among urban adults in England: The moderating effect of household income. *Health & Place, 59*, 102200.
- Giphart, R., & van Vugt, M. (2018). *Mismatch: How our stone age brain deceives us every day (and what we can do about it)*. London: Hachette.
- Hale, T., Webster, S., Petherick, A., Phillips, T., & Kira, B. (2021). *Stay-at-home requirements during the COVID-19 pandemic, Apr 12, 2021*. Global Change Data Lab. <https://ourworldindata.org/grapher/stay-at-home-covid>.
- Harrison, K., & Cantor, J. (1997). The relationship between media consumption and eating disorders. *Journal of Communication, 47*(1), 40–67.
- Hidaka, B. H. (2012). Depression as a disease of modernity: Explanations for increasing prevalence. *Journal of Affective Disorders, 140*(3), 205–214.
- Hughes, A. L. (1988). *Evolution and human kinship*. New York: Oxford University Press.
- Kanazawa, S. (2002). Bowling with our imaginary friends. *Evolution and Human Behavior, 23*(3), 167–171.

- Kaplan, R. (2001). The nature of the view from home: Psychological benefits. *Environment and Behavior*, 33(4), 507–542.
- Largo-Wight, E. (2011). Cultivating healthy places and communities: Evidenced-based nature contact recommendations. *International Journal of Environmental Health Research*, 21(1), 41–61.
- Nooney, J. G. (2005). Religion, stress, and mental health in adolescence: Findings from add health. *Review of Religious Research*, 46(4), 341–354.
- O, J. (2018). Self-efficacy, animal phobias and evolutionary mismatch. In T. Shackelford & V. Weekes-Shackelford (Eds.), *Encyclopedia of evolutionary psychological science*. Cham: Springer.
- O, J., Kavanagh, P. S., Brüne, M., & Esposito, G. (2019). Testing the unsolved problems hypothesis: The evolutionary life issues-mitigating function of nature exposure and its relationship with human well-being. *Urban Forestry & Urban Greening*, 44, 126396.
- Palinkas, L. A., & Browner, D. (1995). Effects of prolonged isolation in extreme environments on stress, coping, and depression. *Journal of Applied Social Psychology*, 25(7), 557–576.
- Riehm, K. E., Holingue, C., Kalb, L. G., Bennett, D., Kapteyn, A., Jiang, Q., . . . Thrul, J. (2020). Associations between media exposure and mental distress among US adults at the beginning of the COVID-19 pandemic. *American Journal of Preventive Medicine*, 59(5), 630–638.
- Shereen, M. A., Khan, S., Kazmi, A., Bashir, N., & Siddique, R. (2020). COVID-19 infection: Origin, transmission, and characteristics of human coronaviruses. *Journal of Advanced Research*, 24, 91–98.
- Slavich, G. M. (2020). Social safety theory: A biologically based evolutionary perspective on life stress, health, and behavior. *Annual Review of Clinical Psychology*, 16, 265–295.
- Snowdon, C. T., Zimmermann, E., & Altenmüller, E. (2015). Music evolution and neuroscience. In E. Altenmüller, S. Finger, & F. Boller (Eds.), *Progress in brain research* (Vol. 217, pp. 17–34). Chicago: Elsevier.
- Tandoc, E. C., Jr., Ferrucci, P., & Duffy, M. (2015). Facebook use, envy, and depression among college students: Is facebook depressing? *Computers in Human Behavior*, 43, 139–146.
- Thomas, G., Bennie, J. A., De Cocker, K., Castro, O., & Biddle, S. J. (2019). A descriptive epidemiology of screen-based devices by children and adolescents: A scoping review of 130 surveillance studies since 2000. *Child Indicators Research*, 1–16.
- Tillmann, S., Tobin, D., Avison, W., & Gilliland, J. (2018). Mental health benefits of interactions with nature in children and teenagers: A systematic review. *Journal of Epidemiology and Community Health*, 72(10), 958–966.
- Townshend, I., Awosoga, O., Kulig, J., & Fan, H. (2015). Social cohesion and resilience across communities that have experienced a disaster. *Natural Hazards*, 76(2), 913–938.
- Trivers, R. L. (1971). The evolution of reciprocal altruism. *The Quarterly Review of Biology*, 46(1), 35–57.
- Wang, Y., Gao, J. L., Chen, H., Mao, Y. M., Chen, S. H., Dai, J. M., . . . Fu, H. (2020). The relationship between media exposure and mental health problems during COVID-19 outbreak. *Fudan University Journal of Medical Sciences*, 47(2), 173–178.
- Weyers, S., Dragano, N., Möbus, S., Beck, E. M., Stang, A., Möhlenkamp, S., . . . Siegrist, J. (2008). Low socioeconomic position is associated with poor social networks and social support: Results from the Heinz Nixdorf Recall Study. *International Journal for Equity in Health*, 7(1), 1–7.
- World Health Organization. (2020). *Coronavirus disease 2019 (COVID-19) situation report – 77*. World Health Organization. https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200406-sitrep-77-covid-19.pdf?sfvrsn=21d1e632_2.
- World Health Organization. (2021). *Weekly epidemiological update on COVID-19 – 6 April 2021*. World Health Organization. https://www.who.int/docs/default-source/coronaviruse/situation-reports/20210406-weekly-epi-update_34.pdf?sfvrsn=e1ae1be7_10&download=true.
- Ye, Z., Yang, X., Zeng, C., Wang, Y., Shen, Z., Li, X., & Lin, D. (2020). Resilience, social support, and coping as mediators between COVID-19-related stressful experiences and acute stress disorder among college students in China. *Applied Psychology: Health and Well-Being*, 12(4), 1074–1094.