

## Psychological impact of social isolation: does an evolutionary viewpoint make a better sense?

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### ABSTRACT

Socially disconnected humans are known to function poorly. Social isolation often results in debilitating mental and physical ailments, and increased risk of death. With the COVID-19 pandemic forcing a breakdown of social activities, across the world there is an increased report of people suffering from psychological ailments. India is no exception. Typically, these ailments are considered illnesses and therefore, treated with medicines and/or counselling therapies. However, much of these ailments are incidental by-products of a mismatch between the long-term evolutionary ecology and what is currently prevailing. Here, I argue that the psychological ailments are better understood from an Evolutionary viewpoint. I point out the lack of data and a need for a fresh approach by practicing psychologists and psychiatrists.

**Keywords:** *Social isolation, cultural evolution, human psychology.*

Humans form large groups or organizations like many other social animals. The ability to form such organisations in humans evolved during the course of human evolution (Klüver 2008). Ancestral hominids are thought to be group-living - living, hunting, foraging together, and also defending themselves together from their common natural enemies (J. Michael Plavcan 2012). Such organization or group-living lifestyle affected, and was also an effect of the behavioural, neural, morphological and physiological evolution, eventually allowing them to protect themselves against external odds (J. Michael Plavcan 2012). Supported by their societies, humans survived and reproduced, and also cared for their offspring sufficiently long, such that they too reproduced, thereby transmitting their genetic legacy. This paradigm represents the vast majority of human existence on earth. With passing time, though, the dynamics of human society has changed. In the last hundred years - which is a mere tiny fraction of the human evolutionary history, we have rapidly shifted the social dynamics (Ramos et al. 2019). However, humans are still intricately social at a very fundamental level.

Now we are facing a global pandemic of COVID-19 which has affected each and every segment of the human population. Ironically, the spread of the virus depends on human-to-

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human contact and proximity (WHO 2019), the very reason for the success of humans as a species on earth. As a protective measure, governments across the world imposed a series of lockdown events and billions of people were quarantined in their homes. *Social distancing* became the most effective measure to stop the spread of infection. Now, how will a species which thrived due to its ability to form societies do when they are forced to break down their social contacts? Many parts of the world, including in India, this social disruption has gone on for nearly five months - a long enough time to cause detrimental effects on mental and eventually, physical well-being (Stickley & Koyanagi 2016). Added to this is the uncertainty of the future. With no clear end in view, the social disruption is leading people to anxiety and depression.

Silently the mental health status of populations across the world is slowly approaching a state of emergency, and there is a serious dearth in measures to tackle the situation. This is particularly true in a country such as India where mental health is yet to receive its due importance. However, mental health is as important as physical health - it affects how we think, feel, and act. It may also affect how we handle stress, relate with others, and make choices, which is especially important during an emergency situation. The feedback between mind and body is also fairly well documented (Telles et al. 2015). Thus, it is a good time to understand why humans are so dependent on their societies and what could be the consequence of any level of social isolation.

In this article, I will argue that just like the public (physical) health emergency, we are also facing a public (mental) health emergency. I will discuss the deep-rooted social nature of humans and the consequence of a sudden alteration of lifestyle, driven by the current pandemic.

### ***Human as social being***

Evolution of humans started 6-7 million years ago when the common ancestors of humans and chimpanzees gave rise to proto-humans (Langergraber et al. 2012). Presumably these primates lived in loosely formed societies just like the chimpanzees and pygmy chimpanzees. In the subsequent more than 5 million years the proto-human lineage gave rise to numerous species of proto-humans and eventually humans (Yamakoshi 2008). The modern humans, *Homo sapiens* however is the only surviving descendant of this lineage. Naturally, the obvious question is - what is so special about this particular species of primates?

Anthropologists and Evolutionary biologists agree that the success of modern humans in surviving through the evolutionary time and also driving sister species of hominids to extinction was largely due to the ability of modern humans to form large coordinated societies (Klüver 2008). From the beginning of human evolution, superior social skills presumably always have been selectively advantageous. Individuals with poor social skills may have survived less and left behind fewer progeny. Larger and more coordinated clans survived better than smaller and less coordinated. It has been argued that biological properties, including relevant neural and cognitive skills, were subjected to selection. Thus, biological evolution working on the heritable tendencies to show different social skills was presumably one of the most important aspects of early human evolution (Klüver 2008). Over the course of human evolution, social skills have become increasingly more sophisticated. With ever increasing reliance of individual humans to its society for survival and reproduction, there was positive feedback that drove further elaboration of social and cognitive evolution in humans (Adolphs 2003). The various attributes of modern humans

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including behaviour, psychology and physiology are the products of such complex evolution. They are not only interdependent but also intertwined biologically as well as culturally.

### ***Human societal structure***

Social structure is the distinctive and stable arrangement of institutions where humans in a society interact with each other and live together. The term structure has been applied to human societies since the 19th century. The concept of social structure assumes that human social relationships are not arbitrary. Rather, it follows certain patterns that can be identified. In humans, societal structure generally involves individuals living as a family with their parents and offspring, and sometimes with broader family members, for example, near relatives.

According to the most accepted view of human evolution, group dynamics of the ancestral humans went through a dramatic diversification and gave rise to various types of social structures. Similar diversity of social structure can be seen in the extant species of primates where both *within* and *across* species diversity is remarkable (Malone et al. 2012). Several authors have argued that group size and dynamics were important for hunting, gathering and defending in the early *Homo sapiens* (King et al. 1975). There is no doubt that human social structure is much more diverse than the rest of the primates combined (Henrich and McElreath 2007). This has a profound implication in shaping of biology and psychology of *Homo sapiens* (Henrich 2011). The elaboration of social structure gave rise to social norms and eventually, culture in ancient humans. It is difficult to put an exact time when this happened. Importantly, even extant primates show culture and cultural transmission. The advent of cultural transmission brought an added dimension to human evolution - cultural evolution (Creanza et al. 2017). While genetic evolution progressed through various evolutionary forces, such as, natural and sexual selection, genetic drift, gene flow etc., cultural evolution added another layer of traits that deeply interacted with the aforementioned forces of biological evolution (Creanza et al. 2017). Such interaction, often referred to as Genetic and cultural co-evolution in humans, allowed rapid evolution of humans and helped them dominate the earth as (arguably) the most superior species on earth (Henrich 2011).

Thus, the connection between social structure, psychology and physiology in humans is much more deep rooted and is a product of evolution for several millennia. However, much of the social dynamics has undergone a rapid shift in many directions over the last hundred years. Especially, the last fifty years have seen a growing disparity between urban and non-urban lifestyles. While humans have adapted to all the changes in their ecology in the course of their evolution, most of these changes have been relatively slower compared to this dramatic shift in human life and ecology. The question, therefore, is - are we going to adapt to this as well? This is clearly a much broader question and the answer needs to come from different domains of investigations. The purpose here is to discuss the implication of the enormous mismatch between the social ecology of humans during a major part of their evolution and what is prevailing for the last few decades, especially in the context of psychological consequences of social isolation.

### ***The concept of Social isolation and loneliness***

When a person lives alone and has very less or no connection with the family members, neighbours and colleagues, the person is said to be socially isolated. This can be a forced situation, for example, due to the death of a spouse or parents, remote housing, friends and

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family moving somewhere else, impaired mobility etc. (Singer 2018), and also under home confinement due to a raging pandemic. People in such conditions may perceive Isolation - a subjective experience of lack of companionship and support. Loneliness may be a part of Perceived isolation. In some cases, people choose to stay isolated and disconnected from others. In these cases, people are socially isolated but might not experience loneliness as they choose isolation as a lifestyle, and may not cause depression and other psychological effects and in turn have less impact on health (Cornwell and Waite 2009). However, enforced social isolation in general can have a huge effect on mortality risk by increasing smoking, obesity, sedentary lifestyle and high blood pressure driven by depression and stress (Cacioppo et al. 2011).

### ***Health and fitness impact of Social isolation***

Sociality is an important attribute of human existence and also plays an important role in evolutionary fitness (Hawkley and Capitanio 2015). Several studies showed that lack of social connectedness can have adverse health effects in humans and thereby affect their evolutionary fitness. Apart from stress, depression and insomnia, it can also lead to impaired cognitive functions, poor cardiovascular functions, impaired immunity, inflammatory conditions, adrenocortical activity and early mortality. Strength of social connectedness usually plays a very crucial role in successful survival and reproduction. Lack of or poor social relationships give us an opportunity to understand the importance of sociality.

One of the primary functions of social interactions in early life in humans is to foster the learning of trust. A study conducted on 296 British children suggested that persistent loneliness in early childhood led to an increased occurrence of depressive symptoms at the adolescent ages (Qualter et al. 2009). During adolescence, executive function training was more effective when it was accompanied with opportunities for social interactions compared to when it was implemented alone, i.e., without social interactions (Qualter et al. 2009). Thus, it can be argued that development of cognitive and motor skills (and perhaps, brain development as well) are simultaneously dependent on social contacts. Social connectedness and social acceptance during adolescence usually result in successful relationships at a later stage and are therefore, very important determinants of reproductive success. Social acceptance and a strong peer support also set the stage for a better mental health, including a reduced likelihood of depression. Several research findings suggest that there is potential risk of morbidity due chronic loneliness. Loneliness can induce inflammatory symptoms which is also associated with several physiological indicators such as high blood pressure, obesity, high cholesterol and impaired immunity. A study conducted by Goosby et al. (2013) showed that loneliness during adolescence had an increased risk of high blood pressure, high cholesterol and obesity. Another study by Gow et al. (2013) showed that chronic loneliness can lead to cognitive decline and dementia in older people.

An individual's health status contributes to his/her ability to have strong social connectedness. For example, persons with impaired mobility or with any other chronic health complication sometimes are unable to connect with the social circle regularly. Such disconnectedness makes that person more isolated from the society, thus acting like a positive feedback. Perceived isolation can either be transient or chronic. Transient or mild isolation (e.g., minutes, hours or for a few days) can have negative consequences (e.g., anxiety, sadness), but these feelings tend to be adaptive and easily go away with a sense of social connectedness. Situation driven transient loneliness can also have brief physiological stress (see cortisol response, Adam et al. 2006), which may resolve with social reconnections. However, chronic feelings of loneliness are more intense and are thought to

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be toxic players in persistent psychosocial problems leading to clinical manifestations, disabilities and, in extreme cases mortality (Hawkley and Capitano 2015). In a four-year long investigation on 32,624 US men, the level of social connectedness was found to have a significant association with risk of mortality. The results showed that socially isolated men had a 90% increased risk of cardiovascular death and a double risk of mortality from an accident or suicide compared to men who were socially more connected. They also reported two-fold risk of non-fatal stroke (Kwachi et al. 1996). Another study revealed that chronic loneliness in women leads to coronary heart diseases (Thurston and Kubzansky 2009). Several studies also showed a strong connection between insomnia and loneliness. Duration and quality of sleep tend to be lower in lonely individuals (Hawkley et al. 2010). Chronic sleep deprivation leads to fatigue, irritability and other stress symptoms (Thurston and Kubzansky 2009).

Thus, health involvement due to direct or indirect effect of social isolation is to be expected. Notwithstanding the dynamics of the modern societies, this issue is bound to be many fold exaggerated at the time of a global pandemic as the current one, where social disconnects seems to be the only way to control the spread of a highly contagious virus. However, does such social disconnect, or as it is more commonly termed - *Social distancing*, really saves lives?

### ***Social Isolation and COVID-19 Pandemic***

The pandemic has resulted in a massive increase in various psychological distresses, resulting in another pandemic itself. Arguably the direct cause of the psychological pandemic is no less important than COVID-19 pandemic. Rather, the effect of the psychological pandemic is long lasting and there can be no vaccination or targeted therapy for the same. Hence, it is of paramount importance that the root cause of the psychological distress be identified, which in turn will direct us to proper management and/or therapy. It can be argued that the root cause can either be a direct or indirect effect of the measures implemented by the government agencies to control the spread of the virus (such as, the economic fallout, career and health uncertainties etc.). Alternatively, it can be a direct effect of the breakdown of the social structure that has resulted from *social distancing*. Here, the term *Social distancing* will refer to a broad spectrum of social measures adopted to prevent the spread of the disease and includes, home isolation, avoidance of social gathering and social visits, home and institutional quarantine, work from home, avoidance of proximity to others etc. For the purpose of this article, only the latter is relevant. However, this is not to undervalue the significance of the former.

Social distancing has the opposite effect of social integration, viz., a lack of social interaction, such as, having fewer friends or closely related persons or none at all, and hence, leads to social isolation. Social isolation may lead to loneliness. Loneliness as distinguished from isolation does not mean being alone and isolated, but more precisely *feeling* lonely, lack of care and support system and socially disconnected (Singer 2018). Social isolation and loneliness are not the same, in fact some people feel lonely even when they are surrounded by family and friends, whereas some socially isolated people do not feel lonely and prefer their alone time more than surrounded by lots of people. Therefore, loneliness is not always associated with social isolation. However, different people have different tendencies to feel lonely when subjected to social isolation. Therefore, people also vary in the susceptibility to suffer from the different mental and physical health problems due to social distancing. Research in this domain has identified well-documented risk factors for poor health, health complications and increased morbidity. One of the main aims of this

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article is to draw a connection between social structure, as discussed above with the prevalence of the variety of psychological distress caused by the ongoing COVID-19 pandemic, especially in Indian context.

The Indian population and their normal societal integrity was shaken after the declaration of lockdown by the Government on 24th March, 2020, and is still continuing to varied degrees across the country even in the mid-August. The World Health Organization (WHO) had pointed out the need for special attention and necessary precautions to tackle the impact of the COVID-19 pandemic on the psychological health of common people (Yao et al. 2020). There is little systematic data from Indian population, but several investigators across the world have attempted to put together some analysis. A survey was performed with 56,679 individuals across all 34 province regions in China. The result showed 27.9% of participants had symptoms of depression, 31.6% had symptoms of anxiety, 29.2% had symptoms of insomnia, and 24.4% had symptoms of acute stress during the outbreak of Covid-19 pandemic (Shi et al. 2020). Another survey conducted in China (1210 individuals responded from 194 cities) during the early stage of the COVID-19 pandemic reported that 53.8% of the population is facing mild to severe psychosocial impact. 16.5% individuals had reported moderate to chronic symptoms of depression, 28.8% had reported moderate to severe anxiety symptoms and 8.1% had reported moderate to severe levels of symptoms associated with stress (Wang, Pan et al. 2020). Another survey-based study which assessed the mental health status of 994 medical and nursing staff working in Wuhan, China (the epicentre of the pandemic, Kang, MA et al. 2020) showed that 36.9% of the health workers had reported psychological disturbances at subthreshold level, 34.4% had reported mild disturbances, 22.4% had reported moderate disturbances and 6.2% had reported severe mental disturbances. However, how much of these results can be attributed to the effect of social distancing is hard to comment on. Researchers from different countries had revealed that COVID-19 pandemic driven social distancing and a sudden major change in people's lifestyles has a profound psychological impact. A survey-based study by Ho, Chee et al. 2020 revealed that individuals with pre-existing mental conditions reported more adverse psychological conditions and were more likely to report about their physical health, insomnia, anger, impulsivity, and suicidal thoughts. Another survey-based study by American Psychiatric Association showed that American people are going through high levels of anxieties and other associated health impacts due to this pandemic. 19% People reported trouble sleeping, 8% people have been consuming more alcohol and other drugs, and 12% have been facing household fights with their family members as they are stuck at home. About 24% people have reported trouble concentrating on things as reported in a survey by the American Psychiatric Association (Glenn O'Neal 2020). Ozamiz-Etxebarria et al. (2020) investigated the same issue on 1,933 people in Spain, indicated that 27.5% participants experienced depression symptoms, 26.9% had faced anxiety symptoms and about 26.5% had experienced symptoms of stress during the lockdown period. The data also indicated that men had higher levels of depression, anxiety symptoms than women (Ozamiz-Etxebarria et al. 2020). As indicated by 100 million google searches about mental health during the lockdown period, it appears that people are also increasingly worried about mental health implications of social distancing (Jacobson et al. 2020). Therefore, the mental health implication of the social distancing is undeniable. The Indian scenario is, however, less clear as there is little data on public domain. Surprisingly, until April there was only a single article discussing the issue in an Indian context (Banerjee 2020). This article discussed the general importance of psychology in different contexts of pandemic management in India.

## CONCLUSION

The feeling of loneliness and associated anxiety rather than being a disease state, is perhaps an adaptation that has evolved during the course of human evolution. Given that humans are *by-nature* social and the *feeling* of loneliness is hardwired in the human brain and physiology, it is quite obvious that breaking the social structure will have considerable implications. The COVID-19 pandemic has revealed the magnitude of importance of this attribute of our species. It is, therefore, a high time that we understand the true nature of the problem and address it with special measures and not by prescribing pills which can only be transient solutions. However, the first step in that direction is to document the magnitude of the problem in a population. Indian societies have been more cohesive in nature for a bulk part of the twenty-first century, especially compared to the western world. It is possible that this has resisted the epidemic of psychological diseases in the country, unlike the west. However, the pandemic has changed the social norms dramatically. While it is too early to assume that to be transient, it is quite likely to have long lasting consequences even after the pandemic is over.

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