

Frequently Asked Questions on Longevity and Rejuvenation

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Does not aging also have its good sides?

Chronological aging, i.e., the increase in the amount of time one has already spent in the world, is accompanied by many other processes that we find desirable - the accumulation of experience, knowledge, wisdom, skills, and achievements. However, these processes are not necessarily associated with another process that chronological aging has so far entailed - biological aging, which includes declining health, suffering, disability, and death.,

The benefits mentioned above of chronological and psychological or sociological aging (others call it "development") increase more rapidly when young or middle-aged, as one is not yet too constrained by biological aging. Untreated biological aging slows the accumulation of these benefits and eventually reverses the process for many people, robbing them of their knowledge, wisdom, and abilities (see Alzheimer's disease as a simple example).

Rejuvenation therapies only treat biological aging and would positively influence the desirable processes mentioned because a biologically young brain can absorb and process new information much more quickly than a biologically old one.

Would extending longevity make human life meaningless?

Arguably no, as life may carry its meaning independent of death. It is difficult or even impossible to place a temporal limit on life's meaning, love, and enjoyment. Humans are entitled to choose a prolonged existence; that choice and pursuit alone may give their life meaning.

What does "pro-aging trance" mean?

Why do so many vehemently defend aging and death and radically oppose developing therapies to combat it?

A plausible explanatory model for this is the pro-aging trance⁶⁴: according to this, many people gloss over aging to come to terms with it cognitively. This is not surprising because, after all, the thought of the incessant decay of one's own body is something so stressful that, from a psychological point of view, it seems to make the most sense to persuade oneself that aging is not so bad until there is a realistic chance of defeating it.⁶⁵ However, this makes many people who are otherwise open to discussion unwilling to take a closer and more differentiated look at this issue, lest they be reminded of they secretly feared future events. Thus they are usually stuck in their opinions, so it is difficult, if not impossible, to convince them argumentatively that aging is one of the biggest problems facing humanity from a social point of view and should be fought.

Those affected by this phenomenon talk themselves out of aging is so strikingly irrational that it is reminiscent of hypnotized people whose subconscious, in a trance state, prefers to resort to illogical explanations rather than abandon a firm conviction.⁶⁶ Frequently occurring statements are that "aging has always existed," that "it is a completely neutral and natural process" that must be "accepted by all people," and that "life is precious in the first place," the combating of which is "probably impossible anyway" because "it was dreamed of thousands of years ago," which is why "it is good and right" that we all age and die. However, in treating age-related diseases, for which these points also apply, the same people usually argue altogether differently. They would immediately favor curing cancer, Alzheimer's, or diabetes, if possible.

This behavior is sometimes compared to Stockholm syndrome ⁶⁷ : Like hostages sympathize with their captor after a specific time, people eventually become friends with the idea that they will age and die.

A video by the well-known YouTuber "CGP Grey" ⁶⁸ clearly explains this connection. The Wikipedia article on the pro-aging trance⁶⁴ provides further explanations for this phenomenon.

However, the coping strategy mentioned becomes a problem when we reach a point where aging is no longer inevitable, and we can develop effective therapies against it. We have been at this point for several years, according to the consensus of many researchers. However, the development of these therapies will only be completed if there is political and public acceptance, interest, and support for them. The fact that a future without aging is almost always portrayed dystopically in fiction does not necessarily help - at the end of this article, we look at a few famous films and books about this in a little more detail.

Only sensational advances in rejuvenation medicine (first and foremost, "robust mouse rejuvenation," see the corresponding question), as well as more public communication and discussion of the topic, can remedy this.

Don't we want to die at some point?

Many older people wish to die as soon and painlessly as possible. Given this fact, younger people often assume that everyone, and thus they too, will eventually tire of life. However, a closer look reveals another possible and even more probable cause besides simple "life oversaturation": the physical and mental deterioration that comes with aging. Many older people are in pain and can no longer get around independently. Everyone knows that there is no long-term prospect of

improvement. Given this, it is understandable that older adults usually no longer make big plans and want to die soon. If we can successfully bring aging under medical control and thus keep people healthy, fit and fit, this could, at least in the vast majority of cases, also remove the desire to die. (For the concern that a significant prolongation of life could lead to massive boredom, we refer to the corresponding question below: "Doesn't such a long life lead to boredom?").

However, even older adults all too often want to live longer, provided they are reasonably well. As this article 699 argues at length, "Do you want to live forever?" is the wrong question. The right question is, "Do you want to die in the foreseeable future?". One could also be more specific: "Do you want to die tomorrow? Do you think that when you are 100 and enjoying the best health, you will want to die the next day?". There will be no miracle pill that makes one immortal after taking it once, but medicine that one can take if they want to stay healthy and live for a while - and then again if they want to for a while. And again. Dying sometime in the distant future feels suitable to many people - except we do not live in the future, we live in the here and now. That is why we always die in the here and now, and immediate death, unlike death in the future, is unwelcome to almost everyone. It is not in the case of an extension of the healthy life span that anything changes in what is normal for us (life); it is in the opposite case that something changes because, in that case, we become ill and eventually cease to exist. So life extension only means that this does not happen. Both our everyday behavior (that we do not cross the road at red lights) and the use of technologies that make our lives safer (see, for example, bicycle helmets, disinfectants and filtration for water purification) show that we do care about preventing this opposite case for as long as possible.

Moreover, since rejuvenation therapies cannot stop aging but only reverse it and must be used regularly, anyone who no longer wishes to live could forego the treatment the next time. However, the person would still have to age for several decades before dying, at least according to the current status. It is conceivable that this will be considered inhumane and that active euthanasia will be introduced - with appropriate safeguards. Probably all people would prefer to decide for themselves when they want to pass away rather than being forced to do so at a particular time by a process that has so far been unavoidable.

Isn't that just unnatural?

Many people are, therefore, very opposed to combatting the aging process as such, as they believe humans should not interfere too much with natural processes. Instead, as already touched on in the point of the "pro-aging trance," they advocate not even trying to treat aging in any way but to understand it as an expression of the becoming and dying of every living being that has existed up to now and to accept it as a process given by nature that is part of life and makes room for new life.

Apart from the fact that it is not a programmed and universal law that living beings age (hydra, for example, do not age and only die of causes unrelated to age^{70, 71}) and that death does not belong to life but is its absence, the same could be said about diseases that can already be treated or eradicated, such as smallpox. Hardly anyone would think of claiming that the eradication of smallpox was not something desirable and meaningful or that we should even bring back this

plague, just as no one would be against curing Alzheimer's or cardiovascular diseases - although these are just as natural as aging. The fact that aging is inevitable for most and dying for all living beings so far is not an argument for leaving it at that and certainly does not mean that this fact is good. On the contrary, the fact that aging affects everyone worsens it, and the moral need for action to develop anti-aging medicine is even more urgent. To say that it is okay or even a good thing that old creatures die and thereby make room for new ones is to make the value or *raison d'être* of living beings dependent on the time they have spent in the world, which seems highly dubious from an ethical and moral point of view.

If one continues the logic that one should not interfere with nature, one would have to reject all medicines and most of the widespread technologies used today as unnatural interventions. Conditions that cause suffering should be corrected according to commonly accepted social standards. Why aging should be an exception to this needs to be clarified from a rational point of view.

It is like human beings to overcome the limitations of the environment using technologies they have created. For example, how natural is it that you read this text on an internet-enabled digital device? It would be unnatural for humans to leave nature as it is and not change it in their favor. It is precisely the endeavor to manipulate nature and to expand our initially limited abilities with the help of scientific knowledge that has enabled us to master fire, build houses, stop being eaten by predators, invent the wheel, develop vaccines, split the atom, to fly to the moon and to turn the primitive dry-nosed monkey in the African savannah into the advanced species we are today.

Doesn't that contradict religious values?

The alleviation of suffering is an obligatory practice in many belief systems, from the Bible to the Koran. Human aging causes extraordinary suffering. Accordingly, it would be a sin not to work to abolish it.

Moreover, in almost every moral code, religious or secular, the right to life is the most fundamental. The issue differs from how long life should last, but its end should not be hastened by action or inaction. It is precisely this hastening through inaction that we are already circumventing by administering drugs against inflammation, operating on tumors, and protecting people from natural disasters as best we can. From an ethical point of view, the abolition of aging is merely an extension of this exercise of duty, and the difference from what we already do today is not one of principle but of degree.

Some would object that today's tumor operations save lives, whereas the abolition of aging would "artificially prolong" life. However, "saving a life" and "prolonging life" is purely linguistic: in both cases, we give people a chance to live more and do so through active action.

Aren't there more pressing problems?

Aging and its associated diseases cost over 100,000 lives daily and cause indescribable suffering. We are not saying that other problems are not also significant, only that the rapid development of

effective rejuvenation therapies should be high on our list of priorities. After all, nothing costs nearly as many lives as aging. Besides, we have enough resources to tackle several problems at once. So there is no reason to let children in developing countries starve while we deal with pollution, and there is no reason to shy away from tackling again. At the same time, we research how to manage malaria medically (and vice versa).

Moreover, as explained above, eliminating aging would free up resources that currently go into (health) care for the elderly. These resources could be freed up and used for "more pressing problems" once aging is cured. Therefore, fighting aging seems to be a good investment - even with these "more pressing problems" in mind.

Would extending longevity not lead to a shortage of resources for society or "overpopulation"?

As this question is probably the most frequent one, we give you a few links in the notes⁷², which explain the points raised here in more detail and provide examples.

First, the problem we currently have is not too little space on Earth or too many people but the inefficiency of our methods for extracting and using resources (fossil fuels, for example). As the famous blogger Tim Urban shows very vividly in his articles, there would still be enough space for a much larger population than ours.⁷³

Based on the available evidence and trends of development, scarcity of resources should not be anticipated as a result of increasing longevity.

It was already calculated in the 1960s by the Agricultural Economics Research Institute, Oxford, that the agricultural productivity, even at that time, would be more than sufficient to feed 45 billion people globally.⁷⁴ You can read more about the assumptions of this calculation in the notes.⁷⁵ Since that time the agricultural capabilities in developed countries have increased dramatically, way ahead of life expectancy or population increases.⁷⁶ The technological capabilities are here to feed the world. Then, why are there still famines? It often happens because of mismanagement or the right technologies are not applied.⁷⁷ But technologies generally, or life-extending technologies in particular, should not be considered a cause of overpopulation or shortage of resources. On the contrary, in wealthy, technologically advanced countries, with high life expectancy, there are hardly any signs of "overpopulation" or shortage of resources. "Overpopulation" is often the problem of poorer, "developing" countries that overcompensate for high mortality (low life expectancy) with high birth rates and that have limited access to medical and technological means to provide for the population increase. Hence, in those countries, the way to combat overpopulation may be by increasing life expectancy and the concomitant quality of life, medical and technological capabilities, not by decreasing them. Indeed, longevity (life expectancy) is an indispensable part of the Human Development Index, and it correlates with and synergistically reinforces its other parts, such as education and quality of life.⁷⁸

Prolonging human life may be valuable and desirable even with diminishing resources. However, the most likely concomitant of extended longevity is abundance and not scarcity, as the same

types of technologies that improve agricultural, technological, and medical capabilities are also instrumental in increasing the lifespan and health span.

Do we even want to live to see the future if everything keeps getting worse?

By most objective measures, the world is not getting worse but better. For example, today we have, on average, higher literacy rates worldwide,⁷⁹ higher life expectancy,⁸⁰ lower infant mortality,⁸¹ less hunger,⁸² less poverty,⁸³ more species conservation and nature reserves,⁸⁴ less child and forced labor,⁸⁵ more leisure time,⁸⁶ more people with access to clean drinking water,⁸⁷ more democracies,⁸⁸ fewer war deaths⁸⁹ and fewer deaths from natural disasters⁹⁰ than ever before in human history.

In addition, due to effective rejuvenation medicine, scientists, engineers, activists, and other people would have much more time and other resources available to achieve something positive for humanity. At the moment, biological aging prevents many bright minds from developing brilliant ideas and implementing them successfully because they fall ill and die after only a few decades. Of course, new bright minds are also born, but they have so far met the same fate. With a significantly or even endlessly extended lifespan, they could educate themselves much more comprehensively and profoundly, tackle unimaginable projects, and witness their completion.

Either way, each person should have their vision of the future and be allowed to decide whether to take up this medicine. To deprive someone of a longer life based on negative expectations of others is immoral.

Should we interfere with evolution?

This is a question we should have asked ourselves several hundred years ago. In the meantime, we have already intervened in natural selection processes in many ways: through modern medicine, how we organize our lives, by creating new means of transmitting information, and so on. Moreover, with the age of gene therapy, we are also getting into a situation where people can change their genomes while still alive. The original path of natural selection, for which we must die, is finally becoming obsolete.

This does not mean our further development will stop, but we will no longer develop according to Darwinian principles. Instead, our progress will be socially, culturally, scientifically, and technologically shaped - as it is today.

Will this make us more susceptible to parasites because we will no longer be able to adapt appropriately genetically due to the few deaths and births?

No, that will not be the case.

Humans have not been exposed to natural selection by parasites to any decisive extent since the early 20th century. The repression of diseases in infants, children, and mothers through sanitation, antibiotics, and vaccination has massively reshaped the process of natural selection in

humans. In this respect, even prolonging our lives after our early reproductive phase will no longer represent a decisive upheaval.

People before the 20th century - and since then, people in developing countries, although fortunately to an increasingly lesser extent - have been much more susceptible to parasites than people in industrialized nations today, and this despite having lived much shorter lives (partly because of parasite infections). Parasites have plagued us for hundreds of thousands of years. We have defeated them in the developed world, not through evolution - evolution has no rid us of a single parasite - but through technology: hygiene and medicines. This is how we will make further progress in the future.⁹¹

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