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Discuss to what extent mental factors impact ageing.

In the words of Cindy McDonal, “Ageing is not an option, not for anyone. It is how gracefully we handle the process and how lucky we are, as the process handles us.”[1]

From fuelling today’s stringent beauty standards, to preying on our physiological functions, no one is astonished by ageing’s reputation of dread and condemnation. Inevitable by nature, it continuously proves itself a conspicuous culprit of inducing biological decline. If that doesn’t tarnish the phenomenon’s name enough, it also encumbers our abilities to adapt to metabolic stress. Countless cultures fear-monger about the ramifications and physical manifestations of gerontology, yet will science ever successfully excavate the full picture of the process? Properly examine the long-obfuscated underdog of influences at play - mental factors? Ranging from hormonal imbalances to social attributes, much of the research available pines after the extrinsics, postulating that ageing is predominantly driven by deterministic, tangible factors. Contrastingly, investigations conducted delving into the effect of mental factors on ageing remain substantially subverted. Psychology surmises otherwise; mental factors impact ageing to at least some extent, from mental illnesses, stress, and possessing a pessimistic outlook on life, to the role which daydreaming plays. It seems as though the explanations offered by biology and physiology hardly scratch the surface.

Hormonal imbalances are corporeal instances which accelerate ageing through promoting the loss of sex hormones.[2] Sex hormones such as testosterone, integrally maintains and furthers muscle growth.[3] Through provoking muscle loss and decrepitude, an individual’s overall

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[1] “10 Quotes About the Beauty of Aging.” *Home Instead*, 14 January 2022, https://www.homeinstead.com/location/529/news-and-media/10-quotes-about-the-beauty-of-aging/. Accessed 24 December 2023.

[2] “The Role of Androgens and Estrogens on Healthy Aging and Longevity.” *NCBI*, 26 March 2012, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3636678/. Accessed 24 December 2023.

[3] “The Role of Androgens and Estrogens on Healthy Aging and Longevity.” *NCBI*, 26 March 2012, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3636678/. Accessed 24 December 2023.

functional performance is set to dwindle from hormonal imbalances, thereby diminishing their lifespan.[4] Correspondingly, stress is a relevant mental factor. By exerting emotional strain on the body, it elicits fluctuations in the serum level of synonymous hormones; according to the National Library of Medicine, "psychological stress may aggravate natural falls in oestrogen."[5]An individual who wrangles with chronic stress is also more likely to settle into a sedentary or malnourished lifestyle.[6] In 2018, an online poll was sent out by the Mental health Foundation which accumulated 4,619 responses, measuring stress levels in the UK.[7] 46% of the respondents reported that they "ate too much or ate unhealthily" due to stress, 29% reported that they "started drinking or increased their drinking," and 16% reported that they "started smoking or increased their smoking." Chronic stress invites additional health implications into the body, including obesity, diabetes, various cardiovascular diseases and high blood pressure - another probabilistic liability for the lifespan to bear.[8] For this reason, mental factors like stress can be caused by hormonal imbalances, and in turn indirectly accelerate ageing by promoting an unhealthy lifestyle.

An explanation on a cellular level has also surfaced involving the use of telomere length as a primary biomarker of ageing. A telomere is a repetitive chain of DNA repeats located on the ends of our chromosomes.[9] Telomeres serve as protective "caps" on the ends of DNA chromosomes and with time, decompose.[10] Researchers unveiled that this process may

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[4] "The Role of Androgens and Estrogens on Healthy Aging and Longevity." *NCBI*, 26 March 2012, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3636678/. Accessed 24 December 2023.

[5] Ghazanfar, Haider. "Role of Sex Hormone Levels and Psychological Stress in the Pathogenesis of Autoimmune Diseases." *NCBI*, 5 June 2017, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5498122/. Accessed 24 December 2023.

[6] "The Role of Androgens and Estrogens on Healthy Aging and Longevity." *NCBI*, 26 March 2012, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3636678/. Accessed 24 December 2023.

[7] "Stress: statistics." *Mental Health Foundation*, https://www.mentalhealth.org.uk/explore-mental-health/statistics/stress-statistics. Accessed 30 December 2023.

[8] "The Role of Androgens and Estrogens on Healthy Aging and Longevity." *NCBI*, 26 March 2012, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3636678/. Accessed 24 December 2023.

[9] McSwine, Damien. *YouTube*, 7 November 2023, https://journals.physiology.org/doi/full/10.1152/physrev.00026.2007. Accessed 24 December 2023.

[10] Bailey, Susan M., and M. Azzalin. "Mechanisms of telomere loss and their consequences for chromosome instability." *NCBI*, https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3463808/. Accessed 24 December 2023.

become expedited when the body experiences stress.[11] Once telomeres become inadequately short, the cells are rendered bereft of protection.[12] Since the progressive shortening of telomeres leads to cellular senescence or cell death (apoptosis), telomere length can, over time, impact the ageing process of an individual.[13] For example, Epel et al aided in divulging this association between stress and accelerated telomere shortening in 2004, and dissected the repercussions of psychological stress endured by pre-menopausal women.[14] Hence, stress is a byproduct of hormonal imbalance - a mental factor within a larger cause. However, Epel's study has been criticised for being too small to lay the groundwork for future analyses, with its limited sample size of 34. Nonetheless, it has high internal validity because of its the sample of pre-menopausal women in particular - disentangling the effects of regular psychological stress from that of post-menstrual syndrome on telomere length is rendered unnecessary, as most of the women involved have likely reached the end of their periods for good. Therefore, making research into the role of stress in ageing be seen as more credible.

Mental disorders have also promisingly proven to contribute to accelerated ageing. Studies led by researchers at the University of Michigan found that those plagued with mental disorders during adolescence were more liable to accelerated ageing in mid-life.[15] By the same token, researchers from Stanford University and The Chinese University of Hong Kong presented an 'ageing clock' they constructed based on data collated from 4,846 adults in 2015.[16] The study assessed ageing using 16 blood biomarkers, including cholesterol and

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[11] "How Stress Accelerates the Aging Process." *Orlando Clinical Research Center*, 16 September 2021, https://ocrc.net/how-stress-accelerates-the-aging-process/. Accessed 24 December 2023.
[12] "How Stress Accelerates the Aging Process." *Orlando Clinical Research Center*, 16 September 2021, https://ocrc.net/how-stress-accelerates-the-aging-process/. Accessed 24 December 2023.
[13] "How Stress Accelerates the Aging Process." *Orlando Clinical Research Center*, 16 September 2021, https://ocrc.net/how-stress-accelerates-the-aging-process/. Accessed 24 December 2023.
[14] "How Stress Accelerates the Aging Process." *Orlando Clinical Research Center*, 16 September 2021, https://ocrc.net/how-stress-accelerates-the-aging-process/. Accessed 24 December 2023.

[15] Spranklen, Annabelle. "How Mental Health Can Impact How Quickly You Age." *Glamour UK*, 27 September 2022, https://www.glamourmagazine.co.uk/article/mental-health-impact-on-ageing. Accessed 24 December 2023.
[16] Spranklen, Annabelle. "How Mental Health Can Impact How Quickly You Age." *Glamour UK*, 27 September 2022, https://www.glamourmagazine.co.uk/article/mental-health-impact-on-ageing. Accessed 24 December 2023.

glucose levels, participants' sex and information like their blood pressure and BMI. Galkin, a leading researcher of the study, reveals that "psychological factors, such as feeling unhappy or being lonely, add up to 1.65 years to one's age."[17] This aggregate effect also excludes those of biological sex, lodgings, marital status and smoking status,[18] which exhausts the findings of confounding variables, therefore improving the internal validity of the results.

Data from over 2 million New Zealanders were also interpreted, with participants aged 10 to 60 years old across the subsequent 30 years, or until death.[19] Their longitudinal analysis excavated that individuals who had been admitted to hospitals due to mental health issues (e.g. substance use, psychotic mood, behavioural disorders, etc) also tended to have other health diseases (e.g. cancer, diabetes, cardiovascular diseases, etc) at a relatively younger age.[20] These people were forecasted to die earlier than those without mental health problems early in life, and these trends were observed in both men and women, and across the lifespan.[21] With its ample sample size - this study has good generalisation power, denoting that in the main, mental disorders accelerate ageing regardless of individual differences.

Mental disorders often bring about a strenuous but familiar mentality which also accelerates ageing – pessimism. Found to correlate with leukocyte telomere shortness in post-menopausal women.[22] This possibility was examined by the National Library of Medicine, who investigated how expectations might modify health outcomes by altering the

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[17] Spranklen, Annabelle. "How Mental Health Can Impact How Quickly You Age." *Glamour UK*, 27 September 2022, https://www.glamourmagazine.co.uk/article/mental-health-impact-on-ageing. Accessed 24 December 2023.

[18] "Psychological factors substantially contribute to biological aging: evidence from the aging rate in Chinese older adults." *Aging-US*, 27 September 2022, https://www.aging-us.com/article/204264/pdf. Accessed 24 December 2023.

[19] "Mental illnesses in early life linked to faster aging and worse health in later years." *National Institute on Aging*, 6 May 2021, https://www.nia.nih.gov/news/early-mental-illness-accelerates-aging-process. Accessed 24 December 2023.

[20] "Mental illnesses in early life linked to faster aging and worse health in later years." *National Institute on Aging*, 6 May 2021, https://www.nia.nih.gov/news/early-mental-illness-accelerates-aging-process. Accessed 24 December 2023.

[21] "Mental illnesses in early life linked to faster aging and worse health in later years." *National Institute on Aging*, 6 May 2021, https://www.nia.nih.gov/news/early-mental-illness-accelerates-aging-process. Accessed 24 December 2023.

[22] Epel, ES. "Pessimism correlates with leukocyte telomere shortness and elevated interleukin-6 in post-menopausal women." *PubMed*, https://pubmed.ncbi.nlm.nih.gov/19111922/. Accessed 24 December 2023.

rate of biological ageing.[23] This refers to ageing specifically directed to the immune system, also known as immunosenescence.[24] They tested whether dispositional tendencies towards the dichotomous mentalities of optimism and pessimism were associated with telomere length.[25] A sample of 36 healthy post-menopausal women was used. The procedure consisted of regression analyses where optimism and pessimism were inserted simultaneously, alongside meticulously controlling chronological age and caregiver status.[26] Findings indicated that pessimism shared an independent correlation with shortened telomere length.[27] Optimism on the contrary, failed to strike an independent association with either measure of immunosenescence.[28] Conclusively, the researchers surmised that dispositional pessimism had potential to accelerate the rate of telomere ageing, while its more positive counterpart seems to pose zero effect on the process. However, one might argue that pessimism would be better categorised as a psychological rather than mental factor which affects ageing. Mental health and psychological health should not be mutually interchangeable; mirroring how we regard mental health in relation to cognition, we should associate psychological health with an individual's emotions and behaviours.[29]

Perhaps a far more shocking mental factor which influences ageing is daydreaming; this is defined as the "common mental state whereby task-oriented thoughts are hijacked by internally generated, unrelated or wandering thoughts, usually with little meta-awareness with

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[23] Epel, ES. "Pessimism correlates with leukocyte telomere shortness and elevated interleukin-6 in post-menopausal women." *PubMed*, https://pubmed.ncbi.nlm.nih.gov/19111922/. Accessed 24 December 2023.
[24] Epel, ES. "Pessimism correlates with leukocyte telomere shortness and elevated interleukin-6 in post-menopausal women." *PubMed*, https://pubmed.ncbi.nlm.nih.gov/19111922/. Accessed 24 December 2023.
[25] Epel, ES. "Pessimism correlates with leukocyte telomere shortness and elevated interleukin-6 in post-menopausal women." *PubMed*, https://pubmed.ncbi.nlm.nih.gov/19111922/. Accessed 24 December 2023.
[26] Epel, ES. "Pessimism correlates with leukocyte telomere shortness and elevated interleukin-6 in post-menopausal women." *PubMed*, https://pubmed.ncbi.nlm.nih.gov/19111922/. Accessed 24 December 2023.
[27] Epel, ES. "Pessimism correlates with leukocyte telomere shortness and elevated interleukin-6 in post-menopausal women." *PubMed*, https://pubmed.ncbi.nlm.nih.gov/19111922/. Accessed 24 December 2023.
[28] Epel, ES. "Pessimism correlates with leukocyte telomere shortness and elevated interleukin-6 in post-menopausal women." *PubMed*, https://pubmed.ncbi.nlm.nih.gov/19111922/. Accessed 24 December 2023.
[29] "Mental vs Psychological Health." *The Phoenix Recovery Center*, 12 October 2023, https://www.thephoenixrc.com/understanding-the-differences-between-mental-vs-psychological-health/. Accessed 30 December 2023.

this process."[30] Psychologically, it implies insufficient engagement with your life, and under more relatable circumstances, the mundane chore you initially set out to accomplish.[31] Daydreaming has been dubbed a measure of dissatisfaction linked to shorter telomeres, and even premature ageing.[32] However, research supporting this claim consists of mostly correlational evidence; findings on a causal relationship between daydreaming and accelerated ageing have yet to undergo empirical evaluation. Therefore, several researchers set out to unearth whether a wandering mind is capable of influencing telomere health, with the aid of 239 highly educated women, all over 50, with low stress levels.[33] Following the completion of life satisfaction questionnaires, the women had their telomeres measured.[34] In the main, participants who reported wandering minds possessed shorter telomeres - by about 200 base pairs; this is equivalent to roughly 4 years of additional ageing.[35] Boasting high internal validity, this study ensured all its participational variables were controlled, including the mean IQ levels of all the women involved, their ages, as well as their respective mental states, hence enhancing the viability of the notion that daydreaming accelerated ageing.

In conclusion, psychology reveals how mental factors such as mental disorders, stress, pessimism and even daydreaming are capable of accelerating the seemingly solely biological phenomenon of ageing. Psychologists have posited this on the basis of investigating said mental factors within biological processes and characteristics, from assessing telomere length to glucose level recordings. Thereby, suggesting that mental factors do impact ageing to some

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[30] McSwine, Damien. *YouTube*, 7 November 2023, https://journals.sagepub.com/doi/full/10.1177/2167702612460234. Accessed 24 December 2023.

[31] Oaklander, Mandy. "Daydreaming Linked To Shorter Telomeres." *Prevention*, 21 November 2012, https://www.prevention.com/life/a20437556/daydreaming-linked-to-shorter-telomeres/. Accessed 24 December 2023.

[32] Oaklander, Mandy. "Daydreaming Linked To Shorter Telomeres." *Prevention*, 21 November 2012, https://www.prevention.com/life/a20437556/daydreaming-linked-to-shorter-telomeres/. Accessed 24 December 2023.

[33] Oaklander, Mandy. "Daydreaming Linked To Shorter Telomeres." *Prevention*, 21 November 2012, https://www.prevention.com/life/a20437556/daydreaming-linked-to-shorter-telomeres/. Accessed 24 December 2023.

[34] Oaklander, Mandy. "Daydreaming Linked To Shorter Telomeres." *Prevention*, 21 November 2012, https://www.prevention.com/life/a20437556/daydreaming-linked-to-shorter-telomeres/. Accessed 24 December 2023.

[35] Oaklander, Mandy. "Daydreaming Linked To Shorter Telomeres." *Prevention*, 21 November 2012, https://www.prevention.com/life/a20437556/daydreaming-linked-to-shorter-telomeres/. Accessed 24 December 2023.

extent. However, this is only to a certain extent, as the influence posed by mental factors on ageing is often indirect and nests within a more predominant cause.

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