



Performing under Pressure; on the Biology, Psychology and Sociology of stress in high-performance professions

IV - ON THE SOCIAL PSYCHOLOGY OF STRESS

Social stress and the problem of inbreeding



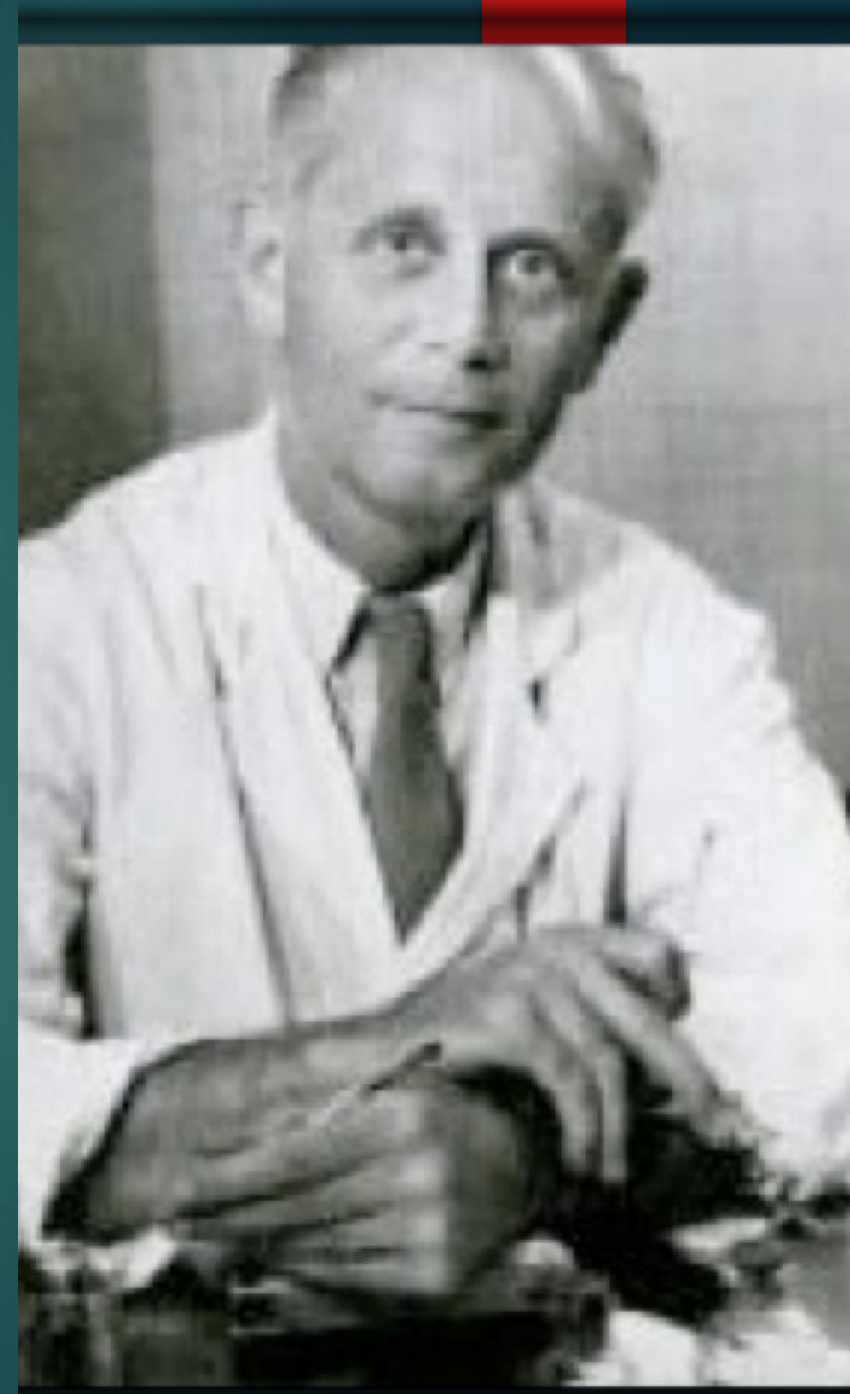
Who leaves the troop?



Hans Selye – The Granddaddy of stress science

- ▶ Stress as a physiological reaction to general unpleasantness.
- ▶ Selye assumed that the negative effects of stress are the result of stress hormones running out. This is not the case. Rather, at a certain point we invest so much in the stress response that other processes become neglected.

Selye, H. (1936). A Syndrome Produced by Diverse Nocuous agents. *Nature*.
Szabo, S. (2017). "Stress" is 80 Years Old: From Hans Selye Original Paper in 1936 to Recent Advances in GI Ulceration. (December). <https://doi.org/10.2174/1381612823666170622110046>



Do you have an outlet?

- ▶ Sports
- ▶ Social interaction
- ▶ Social care



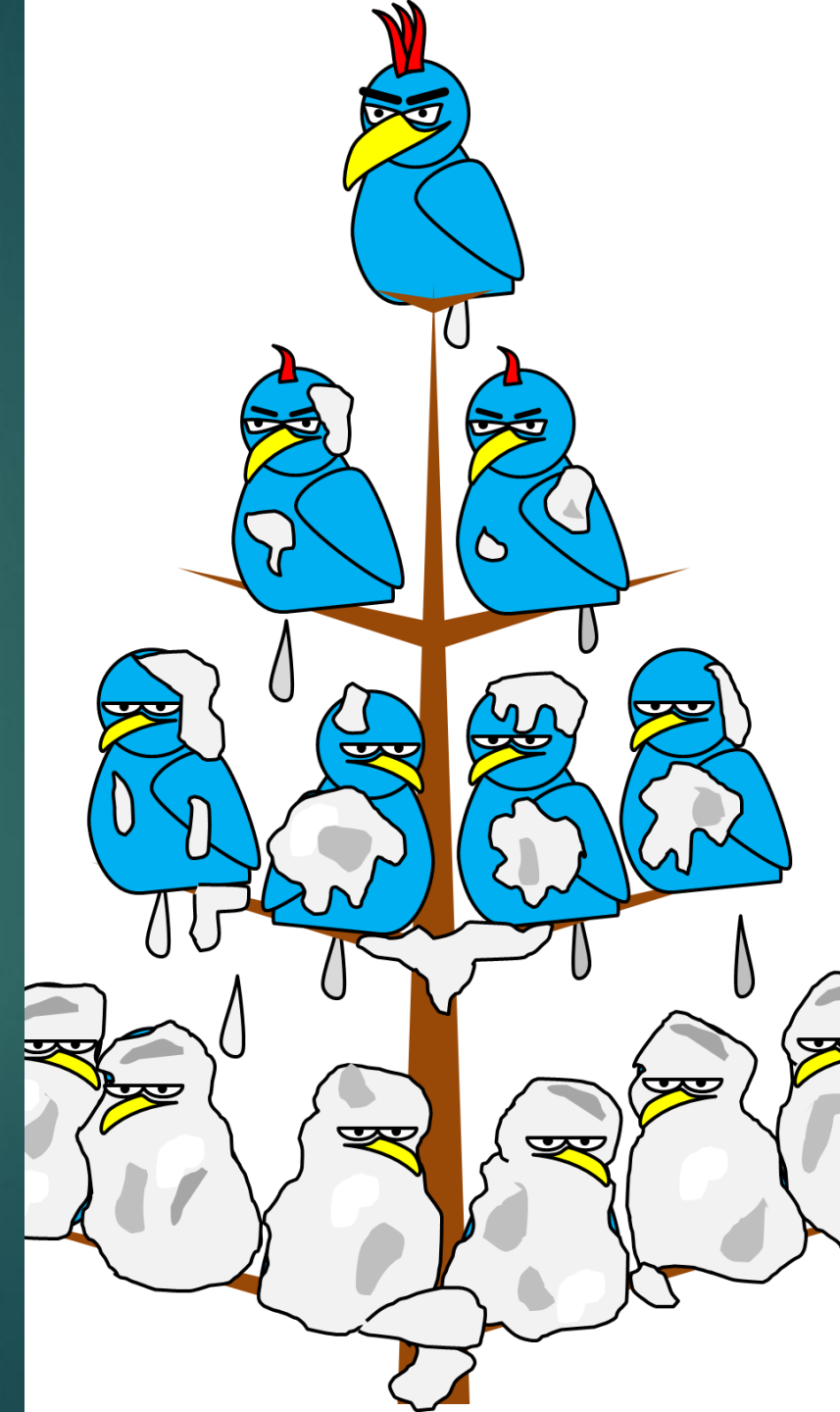
A photograph of a man and a woman in a heated argument. The man on the left has a pained or angry expression, while the woman on the right is shouting with her mouth wide open. The image is overlaid with a semi-transparent teal filter. A red graphic element is visible in the top right corner.

Acting out

Social hierarchy and the dynamics of acting out

- ▶ We mainly act out down the social hierarchy
- ▶ In a stable social hierarchy, stress and its negative health outcomes accumulate at the bottom.
- ▶ In an unstable social hierarchy, stress effects most members equally
- ▶ Poverty, social strata and the meritocracy
- ▶ Testosterone, competition and your place on the hierarchy

Sherman, G. D., & Mehta, P. H. (2020). Stress , cortisol , and social hierarchy. *Current Opinion in Psychology*, 33, 227–232. <https://doi.org/10.1016/j.copsyc.2019.09.013>
Bernal, D. R., Ho, K., Johanna, M., & Niki, A. (2022). Second - class citizens ? Subjective social status , acculturative stress , and immigrant well - being. *SN Social Sciences*, 2(7), 1–18. <https://doi.org/10.1007/s43545-022-00371-2>



Ideal human group size and its effects on performance: Dunbar's number

- ▶ The human frontal cortex can comfortably retain information on +/- 150 individuals.
 - ▶ Over a 150 individuals the group has to either
 - ▶ Split in two
 - ▶ Develop solutions to the emerging lack of social cohesion
 - ▶ Money
 - ▶ Formal power structures
 - ▶ Steps up from 2-5, 9-12, +/- 45, +/- 150.
 - ▶ Sports teams
 - ▶ Military company

Your position in society and stress levels

- ▶ Village elder
 - ▶ Age and authority
- ▶ Power and wealth as a buffer against stress
- ▶ Testosterone and position
 - ▶ The lower down the social ladder, the more suppressed your testosterone levels will be.

Social connection & stress modulation

- ▶ Social connection has a strong effect on stress appraisal
 - ▶ B-endorphin
 - ▶ Oxytocin



β-endorphin

- ▶ μ-Opioid agonist
 - ▶ Opiate drugs act upon this receptor
 - ▶ Trauma in heroin addicts
 - ▶ Opiate abuse among PTSD sufferers
 - ▶ Morphine & PTSD susceptibility
 - ▶ Social connection as a treatment option for PTSD
 - ▶ μ-Opioid receptor / Galanin 1 receptor heteromers in the tail of the ventral tegmental area.
 - ▶ Analgesia
 - ▶ Passive coping

Serafini, R. A., & Zachariou, V. (2019). Opioid-galanin receptor heteromers differentiate the dopaminergic effects of morphine and methadone. *Journal of Clinical Investigation*, 129(7), 2653–2654. <https://doi.org/10.1172/JCI128987>

Ullrich, D., & Mac Gillavry, D. W. (2021). Mini-review : A possible role for galanin in post-traumatic stress disorder. *Neuroscience Letters*, 756(May), 135980. <https://doi.org/10.1016/j.neulet.2021.135980>

How to increase β -endorphin

- ▶ Collective exercise and hardship
 - ▶ Sports
 - ▶ Struggle
- ▶ Collective rituals
 - ▶ Uniforms & behaviours
 - ▶ Religious ritual
 - ▶ Unity with God
- ▶ Pain

Harber, V. J., & Sutton, J. R. (1984). Endorphins and Exercise. *Sports Medicine: An International Journal of Applied Medicine and Science in Sport and Exercise*, 1(2), 154–171. <https://doi.org/10.2165/00007256-198401020-00004>

Lang, M., Bahna, V., Shaver, J. H., Reddish, P., & Xygalatas, D. (2017). Sync to link: Endorphin-mediated synchrony effects on cooperation. *Biological Psychology*, 127(June), 191–197. <https://doi.org/10.1016/j.biopsycho.2017.06.001>

Corder, G., Castro, D. C., Bruchas, M. R., & Scherrer, G. (2018). Endogenous and Exogenous Opioids in Pain. *Annual Review of Neuroscience*, 41(1), 453–473. <https://doi.org/10.1146/annurev-neuro-080317-061522>

Oxytocin

- ▶ Modulates PTSD susceptibility and symptom severity
- ▶ Enhances ethnocentric/in-group sentiment
- ▶ Proactive coping

De Dreu, C. K. W., Greer, L. L., Van Kleef, G. A., Shalvi, S., & Handgraaf, M. J. J. (2011). Oxytocin promotes human ethnocentrism. *Proceedings of the National Academy of Sciences*, 108(4), 1262–1266. <https://doi.org/10.1073/pnas.1015316108>

van Zuiden, M., Frijling, J. L., Nawijn, L., Koch, S. B. J., Goslings, J. C., Luitse, J. S., ... Olff, M. (2017). Intranasal Oxytocin to Prevent Posttraumatic Stress Disorder Symptoms: A Randomized Controlled Trial in Emergency Department Patients. *Biological Psychiatry*, 81(12), 1030–1040. <https://doi.org/10.1016/j.biopsych.2016.11.012>

What does this mean for peak performance?

- ▶ In-group cohesion
 - ▶ Endorphin & oxytocin
- ▶ Analgesia and resilience
- ▶ Competition vs teamwork

