

Human comfort responses in winter environments

Introduction

Every year the winter season seizes us into a whirlpool of rapidly changing events. We brace ourselves for the cold winds stabbing us and daylight clocking out early. In protest we resort to elaborate rituals: reaching out for a warm bowl of soup, taking steaming hot showers, and cocooning ourselves in a blanket so heavy it could definitely pass as our emotional support boulder. These instincts, however, aren't just us conforming into the 'winter aesthetic' but rather psycho-physiological reflexes hardwired into our system by evolution, neurobiology and the sheer human need to not feel like a popsicle with responsibilities. In other words, these comfort-seeking behaviors that we rely on aren't arbitrary but rather rooted in mechanisms to maintain both physical and psychological stability.

Cognitive and physical effects

Winters can take a toll on both physical and psychological health. Reduced sunlight during winter causes an imbalance between neurotransmitters serotonin (commonly associated with mood regulation) and melatonin (which governs the sleep-wake cycle), both of which help maintain the body's circadian rhythms. This neurochemical imbalance can disrupt the quality of sleep and mood, subtly impairing cognitive sharpness. Moreover, cold exposure also contributes to worsening mood, irritability, fatigue and dwindling motivation. This might explain the grogginess you feel when you drag yourself up for an 8 am class on a foggy November morning.

Naturally, our body rises to defend itself and starts working overtime to maintain a constant environment. To preserve core temperature, the body increases metabolic activity through shivering and heat production. This extra effort leads to increased energy expenditure, causing fatigue and reduced endurance thus impacting the body's overall performance. Taken together, winter conditions impose both cognitive and physical strain, subtly reminding us that the season's chill extends beyond the ambient air.

Warm drinks to the rescue- liquid bandages

To combat the negative psycho-physiological effects of winter, we instinctively lean into comfort-seeking mechanisms. And because our bodies are burning extra energy just to stay functional, we instinctively reach for the simplest, warmest coping mechanism: grabbing a warm cup of coffee or a steaming soup bowl. Humans have been using warm drinks as emotional first aid for a really long time. Letting a mug hold your hand for a bit isn't just a physically warming experience but it also engages your body's thermoregulatory pathways and improves your mood.

Studies suggest that drinking warm beverages can have a significant influence on the nervous system; warmth can be linked to the release of oxytocin, the happiness hormone, bettering low mood and making you feel sharper and more alert, combating cognitive sluggishness. Similar findings suggest that warm drinks stimulate soothing responses that regulate the nervous system and promote calmness.

Moreover, warm beverages reduce physiological strain due to cold stress. Hence, the first 'aah' feeling after taking a sip might actually be your overstimulated nervous system blowing off some steam. During winter, when the cold fuels your stress and dulls your mind, these microdoses of warmth hit even harder.

Taking warm showers- evening reset button

During winters it's a very natural tendency to want to end your day with a hot, steamy shower. Beyond comfort, this ritual has a significant impact on the body's nervous system, particularly the sympathetic nervous system which is the 'fight or flight' response. Studies show that repeated warm showers, a winter favorite, lower sympathetic activation and promote feelings of calmness and relaxation.

Physiologically, warm water exposure suppresses sympathetic activation facilitating a shift towards relaxation. Meta-analyses further demonstrate that warm baths or showers taken a few hours before sleep improve the onset and quality of sleep.

Using heavy blankets to sleep- weighted comfort

Another comfort strategy in our routines is wearing warm blankets to bed. Experiments have revealed that the part of our brain called *insula*, responsible for detecting physical warmth, is

also responsible for detecting social warmth. This explains why wearing a heavy blanket to bed is a physically and emotionally comforting experience.

Heavy blankets evoke a deep-pressure stimulus and lower cortisol levels, a key stress hormone. This soothes the nervous system by inducing calmness, reducing irritability and improving sleep architecture. These warmth signals are processed by the *insula*, which immediately connects them to feelings of social connection. Hence, snuggling up in your favorite cozy blanket can potentially reduce feelings of loneliness and clear cognitive fog while improving emotional stability by making you sleep better.

Conclusion

Winter might dim the sunlight, slow our thoughts, and drain our energy, but humans have always met the cold with warmth, seeking comfort in the little things. Our rituals serve as a reminder that we're made to protect ourselves and how the brain and body function effortlessly in sync. At its core, these rituals serve us by regulating our internal temperature and soothing the nervous system which in turn stabilizes mood, enhances energy levels and cognition during environmental stress. So the next time you're snuggling up in your cozy blanket with a cup of warm cocoa in your palms make sure to thank your body for choosing warmth, comfort and balance.

Citations

- Palinkas, L. A. (2001). Mental and Cognitive Performance in the Cold. *International Journal of Circumpolar Health*, 60(3), 430–439.
<https://doi.org/10.1080/22423982.2001.12113048>
- Falla, M.; Micarelli, A.; Hüfner, K.; Strapazzon, G. The Effect of Cold Exposure on Cognitive Performance in Healthy Adults: A Systematic Review. *Int. J. Environ. Res. Public Health* **2021**, 18, 9725. <https://doi.org/10.3390/ijerph18189725>
- Sun, Boyang & Wu, Jiansong & Hu, Zhuqiang & Ruotong, Wang & Gao, Fei & Hu, Xiaofeng. (2022). Human mood and cognitive function after different extreme cold exposure. *International Journal of Industrial Ergonomics*. 91. 103336. 10.1016/j.ergon.2022.103336.
- Danilenko KV, Putilov AA, Russkikh GS, Duffy LK, Ebbesson SO. Diurnal and seasonal variations of melatonin and serotonin in women with seasonal affective disorder. *Arctic Med Res*. 1994 Jul;53(3):137-45. PMID: 7986318.
- Romu T, Vavruch C, Dahlqvist-Leinhard O, Tallberg J, Dahlström N, Persson A, Heglind M, Lidell ME, Enerbäck S, Borga M, Nystrom FH. A randomized trial of cold-exposure on energy expenditure and supraclavicular brown adipose tissue volume in humans. *Metabolism*. 2016 Jun;65(6):926-34. doi: 10.1016/j.metabol.2016.03.012. Epub 2016 Apr 1. PMID: 27173471.
- Wu T, Ramesh N, Doyle C, Hsu FC. Cold and hot consumption and health outcomes among US Asian and White populations. *Br J Nutr*. 2025 Sep 18:1-15. doi: 10.1017/S000711452510514X. Epub ahead of print. PMID: 40964923; PMCID: PMC12507458.
- Inagaki TK, Eisenberger NI. Shared neural mechanisms underlying social warmth and physical warmth. *Psychol Sci*. 2013 Nov 1;24(11):2272-80. doi: 10.1177/0956797613492773. Epub 2013 Sep 18. PMID: 24048423.
- Repanshek, R. (2023, October 11). [Why warm beverages are comforting, according to science](#). MUD\WTR.

· Cui, J., Gao, Z., Leuenberger, U. A., Blaha, C., Luck, J. C., Herr, M. D., & Sinoway, L. I. (2022). Repeated warm water baths decrease sympathetic activity in humans. *Journal of Applied Physiology*, 133(1), 234. <https://doi.org/10.1152/jappphysiol.00684.2021>

· Yu J, Yang Z, Sun S, et al. The effect of weighted blankets on sleep and related disorders: a brief review. *Front Psychiatry*. 2024;15:1333015. Published 2024 Apr 15.
doi:10.3389/fpsy.2024.1333015