
Research highlights

Exploring the Therapeutic Potential of Human Body Odors in Mindfulness-Based Interventions

Research has shown that body odours (BOs) contain a wealth of biological information, including genetic compatibility, health status, and even emotional states. Like other animals, the human olfactory system is finely tuned to detect and interpret these subtle signals, which can influence our behaviour, emotions, and social interactions.

For example, studies have demonstrated that individuals can discern certain emotions, such as fear or happiness, based on the scent of sweat (Groot et al 2021). This suggests that BOs serve as a form of non-verbal communication, allowing us to subconsciously react to the emotional states of others. These subconscious reactions, both positive and negative emotions, can be quantified through various means, such as monitoring physiological changes (e.g. by changes in heart rate variability (HRV), skin conductance level (SCL) or facial muscles). However, the potential of body odours to benefit individuals with psychiatric disturbances, such as social anxiety or depression has not yet been tested. Therefore, the POTION consortium is investigating the potential benefits of using body odours to enhance mindfulness-based intervention for affective symptoms, as this could have implications for improving existing treatments.

The findings of the study can be found in the [preprint article](#), "Sniffing Out a Solution: Emotional Body Odors Can Improve Mindfulness Therapy for Social Anxiety Symptoms But Not for Depressive Symptoms" (Cecchetto C. et al.).

Briefly, in this study, individuals diagnosed with social anxiety disorder or depression were randomly allocated to be exposed to either happiness BO, fear BO, or clean air while engaging in mindfulness sessions. Throughout the intervention, participants' affective symptoms were measured at the beginning

and end of each day, alongside the recording of physiological indicators such as heart rate variability (HRV) and skin conductance level (SCL).

The results unveiled intriguing insights. For the SAD group, exposure to both happiness and fear BOs led to a significant reduction in anxiety levels compared to the clean air condition. The anxiety reduction with happiness BOs aligns with prior research indicating their positive impact. However, the comparable effect by the fear BOs is surprising as it contradicts the “emotional contagion” hypothesis. This suggests that BOs may primarily serve as social stimuli, conveying the social presence of another individual, rather than eliciting direct emotional responses.

Moreover, HRV analysis revealed that during the fear BO condition, participants exhibited lower HRV compared to the clean air condition, suggesting a physiological response to BO exposure. However, no significant differences were found in SCL. On the contrary, the study found no beneficial effects of BO exposure for the Depression group, indicating that emotional BOs may not directly impact depressive symptoms.

The complexity underscores the need for further research to understand BOs' nuanced influences on subjective experiences and emotional regulation, particularly within mindfulness practice contexts. However, these findings offer promising implications for the integration of BOs into psychological therapy, particularly for individuals with social anxiety. By incorporating BO exposure alongside mindfulness practices, therapists may augment the positive outcomes of interventions, potentially leading to more effective treatment strategies.

Partner meeting: Stockholm, Sweden

The POTION partners had an exciting two days in Stockholm! The tranquil city provided the perfect backdrop for stimulating conversations and fruitful collaborations. It was inspiring to see passionate professionals from diverse backgrounds come together to exchange ideas, share insights, and brainstorm innovative solutions.

A big thank you to Karolinska Institute for organising the meeting at the beautiful retreat Var Gard.



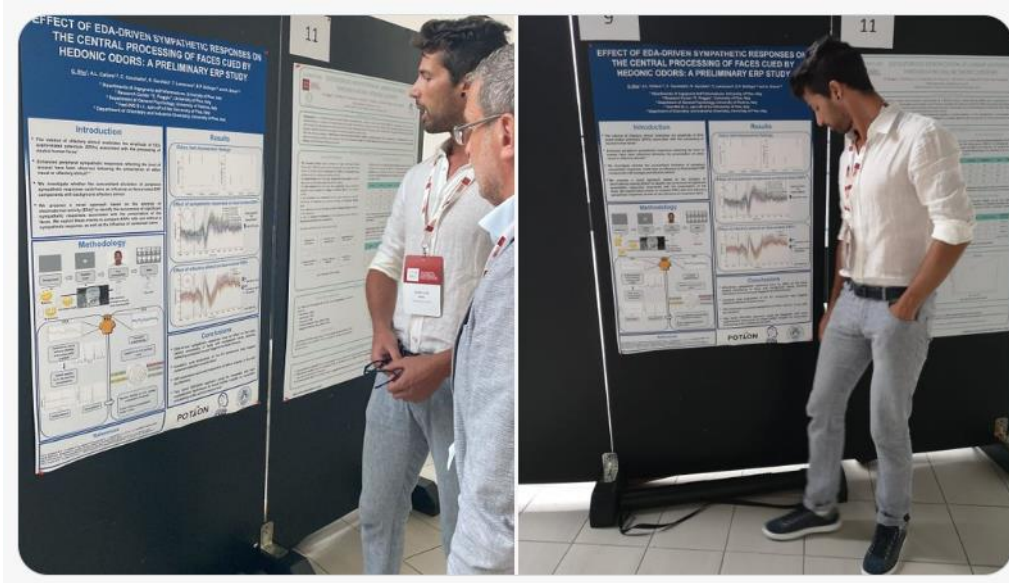
Celebrating Dr. Elisa DalBo's Achievement



Congratulations to [Dr Elisa DalBo](#) for achieving her PhD from the University of Padova! Wishing you continued success and fulfilment in all your future endeavours.

Activity highlights from the POTION Team

- **UNIPI presented at the prestigious GNB 2023 conference in the beautiful city of Padova. GNB, the National Congress of Bioengineering, serves as a focal point where biomedical research and clinical end users come together to discuss recent advances.**



- **Inventya Ventures exhibited at the Medical Technology Ireland on 20-21 September 2023. The exhibition showcased innovative medical devices and engineering.**



- UNIPi attended the Medicon Conference in Sarajevo. POTiON researchers presented advancements in the field of Emotional recognition from physiological signals.



- UPV presented at the In International Conference on Human-Computer Interaction in July 2023 titled “Modulating Virtual Affective Elicitation by Human Body Odors: Advancing Research on Social Signal Processing in Virtual Reality”.

Recent Publications

- Gomes, N., Pause, B. M., Smeets, M. A., & Semin, G. R. (2023). Comparing fear and anxiety chemosignals: Do they modulate facial muscle activity and facilitate identifying facial expressions? *Chemical Senses*, 48. <https://doi.org/10.1093/chemse/bjad016>
- Rho, G., Callara, A. L., Bossi, F., Ognibene, D., Cecchetto, C., Lomonaco, T., ... & Greco, A. (2023). Multimodal Integration of Olfactory and Visual Processing through DCM analysis: Contextual Modulation of Facial Perception. *arXiv – QuanBio – Neurons and Cognition* arXiv:2309.03536. <https://doi.org/10.48550/arXiv.2309.03536>.
- Dal Bò, E., Natali, L., Gentili, C., & Cecchetto, C. (2023). Low odor awareness predicts reduced olfactory abilities in women with depressive symptoms, but not with anxiety symptoms. *Journal of Affective Disorders*, 338, 171-179. <https://doi.org/10.1016/j.jad.2023.06.009>.
- Cecchetto, C., Dal Bò, E., Eliasson, E. T., Vigna, E., Natali, L., Scilingo, E. P., ... & Gentili, C. Sniffing Out a Solution: Emotional Body Odors Can Improve Mindfulness Therapy for Social Anxiety Symptoms But Not for Depressive Symptoms. Preprint. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4591481



About POTION Project...



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