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Spontaneous Synchrony in Friends Dyads: The Role of Social Settings and Ambient Odors

Interpersonal synchrony, defined as the temporal coordination of movements between individuals, plays a central role in social bonding, cooperation, and trust. While the influence of social context on synchrony has been well documented, little is known about how sensory environments—particularly ambient odors—may modulate this coordination. This study investigated whether a pleasant ambient odor could influence movement synchrony between individuals during social interactions. Twenty-five same-sex friend dyads participated in three interaction tasks designed to elicit distinct social atmospheres: fun, cooperative, and competitive. These tasks were performed under two conditions: with the diffusion of a pleasant, stimulating peppermint odor, or without any odor (control). Interpersonal synchrony was quantified using motion energy analysis and windowed cross-correlation of video recordings. As expected, synchrony levels were significantly higher in the fun condition compared to cooperative and competitive contexts, replicating prior findings on the impact of affective atmosphere. However, no significant effect of ambient odor was found on in-phase synchrony across conditions. These results suggest that while social context robustly shapes interpersonal coordination, ambient olfactory stimulation—at least when task-irrelevant—may not significantly influence motor synchrony between individuals. Ongoing analyses using functional near-infrared spectroscopy (fNIRS) aim to explore inter-brain synchrony during these interactions. Preliminary neurophysiological results will be presented, offering further insight into how shared brain activity may or may not be modulated by ambient olfactory cues.

Keywords: Behavioral synchrony, Olfactive stimuli, In-phase synchrony, Anti-phase synchrony, Cooperation, Competition

Biography

I am a PhD candidate at SCALab UMR 9193, University of Lille, under the supervision of Prof. Yvonne Delevoye-Turrell, in collaboration with the neurotech start-up Seenel Imaging. My thesis, funded by the Hauts-de-France Region, the University of Lille, and Seenel Imaging, focuses on how olfactory stimuli modulate cognitive effort and affective states, using combined EEG-fNIRS technology in ecologically valid settings. Passionate about affective and cognitive sciences, I explore the role of scent in shaping perception and brain dynamics. I also teach cognitive science and engage in public outreach, especially through Xperium, to make research more accessible.

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