





Abstract

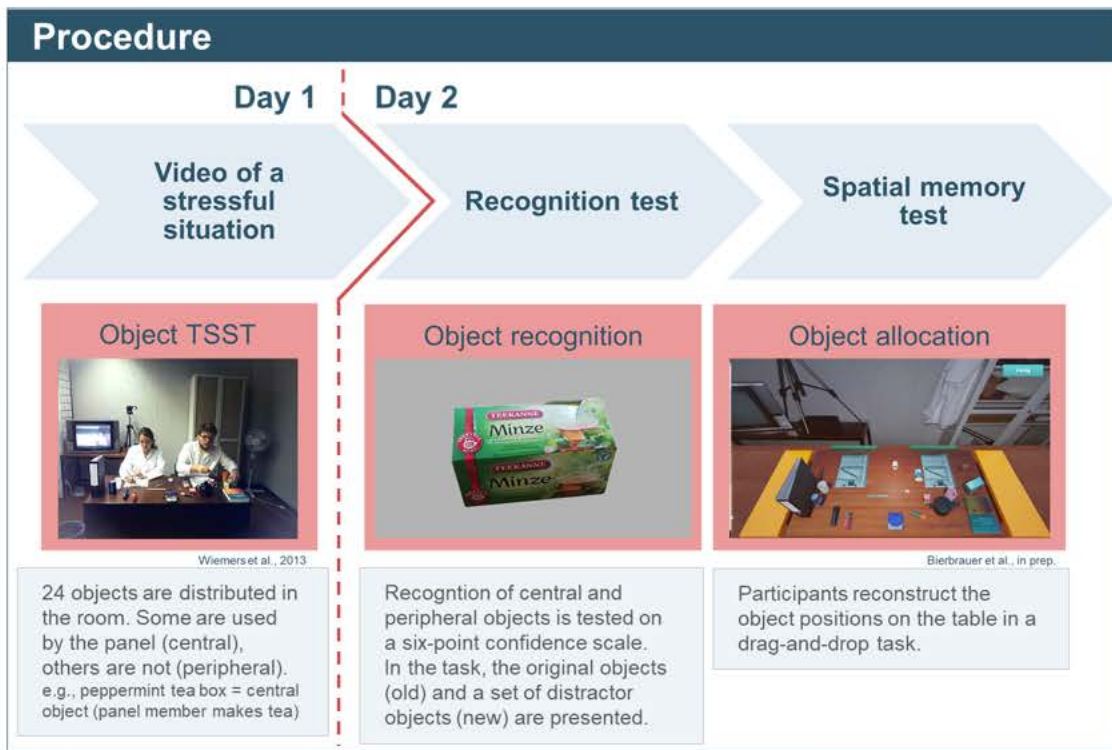
The interplay of subjective stress and semantic relatedness modulated olfactory cueing of a stressful episode: Participants watched a video of a stressful episode and recalled aspects of it 24h later. Ambient during encoding and recall was an odor related to the episode, an unrelated odor, Hedione or no odor. The more stressful the episode was perceived, the narrower was recognition memory - but only if a semantically related odor was ambient. Higher subjective stress predicted enhanced spatial memory – but not in the presence of an olfactory context cue.

Related publications:

- Pützer, A., Wolf, O.T. (in prep). Odors as Context Cues of Emotional Memories – the Role of Semantic Relatedness.

Techniques & Methods

Participants	
Control group → no odor Valence of ambient odor: M=6.5 SD=2.2	(n=31)  Ø Age: 23.5y (SD=3.9)
Peppermint group → semantically related Valence of ambient odor: M=6.3 SD=2.5	(n=29)  Ø Age: 24.7y (SD=3.9)
Cherry group → semantically unrelated Valence of ambient odor: M=6.6 SD=2.4	(n=30)  Ø Age: 23.0y (SD=3.6)
Hedione group → Hedione Valence of ambient odor: M=6.2 SD=2.2	(n=30)  Ø Age: 23.6y (SD=4.3)



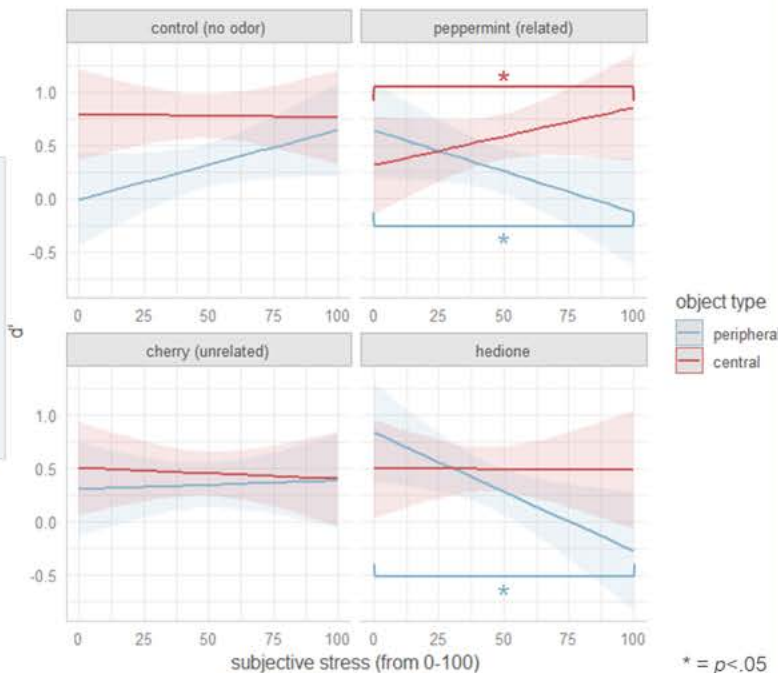
Results

lm(y~centrality*condition*stress)

Recognition memory

d' =discrimination between old and new objects
 $z(\text{False-Alarm-Rate}) - z(\text{Hit-Rate})$

Higher values denote better discrimination between old and new objects.

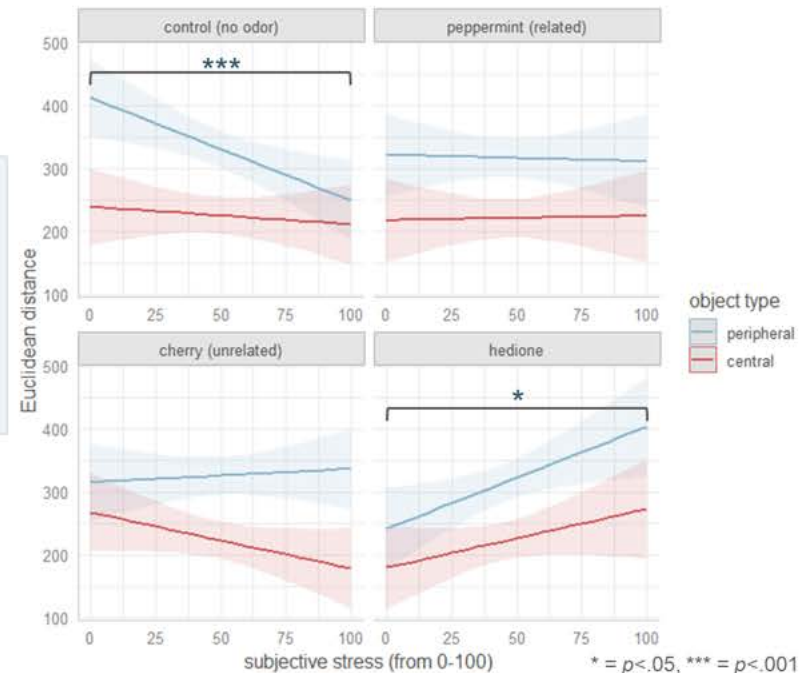


D' did not differ between the groups. D' for **central items** was higher than for **peripheral items** in all groups. In the control group and the cherry group, d' was not predicted by subjective stress. In the peppermint group, higher subjective stress was associated with higher d' for central items and lower d' for peripheral items. When exposed to Hedione, higher subjective stress predicted lower d' for peripheral items.

Spatial memory

Euclidean distance between object position estimated by the participant and actual location.

Higher values denote more deviation from the original position



Euclidean distances did not differ between the groups. For **central items**, they were lower than for **peripheral items** in all groups. In the control group, higher subjective stress predicted decreased Euclidean distances for both item types. In the peppermint and cherry groups, no prediction by subjective stress was found. When exposed to Hedione, higher subjective stress predicted increased Euclidean distances for both item types.

Results / Conclusions

The more stressful an episode was perceived, the narrower was recognition memory - but only in presence of an olfactory context cue that was semantically related to the episode.

Higher subjective stress predicted enhanced spatial memory in the odor-free control group – this was not found in the presence of any olfactory context cue.

When exposed to Hedione, higher subjective stress predicted impaired recognition of peripheral objects and decreased spatial memory performance for both item types.

By shifting the focus to relevant aspects of a subjectively stressful episode, a semantically related odor may aid adaptation to situational demands (i.e. limited processing capacity).

Olfactory context cues might be less prone to convey spatial information of a subjectively stressful episode.

Rather than remembering inanimate objects related to a subjectively stressful episode, the presence of Hedione might spotlight other aspects of the episode (i.e. social interaction).