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Perceived relation between odors and a negative event determines learning of symptoms in response to chemicals

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Abstract *Background:* We investigated the effects of worrying information about chemical pollution on subjective symptoms in response to an odor that was previously associated with symptom episodes. *Methods:* Ammonia and butyric acid in harmless concentrations were used as odor cues, and 10% CO₂-enriched air was used to induce symptoms. One of two odors was consistently mixed with CO₂-enriched air while the other odor was presented in room air during 80 s breathing trials (three trials of each). Next, information framing the experiment in the context of possible health-damaging effects of chemical pollution of our environment was presented to half the participants, whereas no information was given to the other half. Finally, both odor cues were presented with room air. Symptom scores were used as the dependent variable. *Results:* Unexpectedly, participants reported more symptoms in response to the odor previously presented with air than to the odor previously presented with CO₂-enriched air. Post-hoc analyses suggested a crucial role for perceived rather than actual contingencies between odor and symptom episodes. Information manipulation had no effect. *Conclusions:* Believing that a specific odor cue was associated with a symptom episode was more important than the actual association in order to provoke symptoms in response to harmless odor cues.

Keywords Subjective symptoms · Odor · Multiple chemical sensitivity · CO₂

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