

Tongue-in-cheek award with cult status for cinema air study

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The Ig Nobel Prizes honor scientific achievements that "should first make people laugh and then make them think". The spoof prizes, first awarded by the US journal *Annals of Improbable Research* in 1991,

have long since acquired cult status among scientists. This year's chemistry award recognizes a study that proves the connection between the air in cinemas and different age ratings. The study was carried out in cooperation between the Max Planck the connection between the air in cinemas and the age rating. The study was carried out in cooperation between the Max Planck Institute for Chemistry and the University of Mainz.

In their work, the teams led by Jonathan Williams from the Max Planck Institute for Chemistry (MPIC) and Stefan Kramer, professor at the Institute for Computer Science at the University of Mainz, demonstrated the connection between the concentration of isoprene in the air of cinema and the FSK age rating (Germany's motion picture rating organization). Isoprene is stored in muscle tissue but escapes through our breath during movement. With the systematic data collected and evaluated by Kramer's team, the [smell of fear](#) could be visualized in concrete numbers.

Evidence of creativity

"Through the joint project, we have created a great link between the Atmospheric Chemistry Department at the Max Planck Institute for Chemistry and the Data Mining group at the University of Mainz, which helps us analyze atmospheric data", explains Williams. The scientist, who was born in England - where self-deprecation tends to be used as an art form - is delighted about winning the spoof award. "The prize is a testament to our creativity as scientists and our willingness to see the bigger picture. We like to do experiments that may seem idiosyncratic at first but which end up revealing new phenomena. This is part of the basic research that is the defining element of the Max Planck Society. Our work on measurable fear in cinema air has already set many new studies in motion", says Williams. "In our many years of cooperation with Jonathan Williams from the MPIC, we have always found

extraordinary questions for the application and further development of machine learning methods" adds Kramer

The Ig Nobel Prizes are presented each year two weeks before the announcement of the real Nobel Prizes at the Sanders Theatre of Harvard University in Cambridge, Massachusetts. Due to the coronavirus pandemic, this year the award took place digitally on 9 September.

Through their collaboration, the researchers have opened the door to an interdisciplinary research direction that combines expertise from the fields of atmospheric chemistry, breath analysis, emotional response analysis, and data mining. Nevertheless, Williams found the nomination for the iconic research award rather surprising. After all, this study represents only a fraction of his actual research work. His main research focus is outdoor atmospheric chemistry.

The study entitled "Proof of concept study: Testing human volatile organic compounds as tools for age classification of films" was published in the Open Access journal *PLOS ONE* in September 2018. As Williams recalls, the cinema study was met with a great response in the media at the time. Many people love the cinema, which means the topic is of interest to the general population. Whether *Psycho*, *Silence of the Lambs*, or *Saw*: many thrillers have burned themselves into society's film memory with their shock moments. "Whether we are scared or laughing, our emotions are in the air", says Williams. This gave him the idea of examining the air as a measurable indicator for age ratings of films. Kramer added to the idea by investigating whether the smells produced by viewers reliably reflect the level of violence, sex, anti-social behavior, drug use, and cursing in the film being shown.

Innovative film assessment: Air measurement in the cinema

The researchers connected a mass spectrometer to the ventilation system of a cinema auditorium. During 135 film screenings, the researchers measured and analyzed how the composition of the cinema air changes every 30 seconds. They discovered a relationship between the isoprene concentration in the air and the age rating of the film. "Apparently, we involuntarily move back and forth in our seats or tense our muscles when we are nervous and excited. This also causes us to exhale more isoprene", explains Williams. How tense the audience is when watching a film provides a good indication of how stressful the film is for children and adolescents.

A continuation of the cinema study is being planned. Williams would now like to investigate whether people leave a chemical fingerprint in the air, not only of their tension but also of other emotional states.

More information: C. Stöner et al, Proof of concept study: Testing human volatile organic compounds as tools for age classification of films, *PLOS ONE* (2018). [DOI: 10.1371/journal.pone.0203044](https://doi.org/10.1371/journal.pone.0203044)

Jörg Wicker et al, Cinema Data Mining, *Proceedings of the 21th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining* (2015). [DOI: 10.1145/2783258.2783404](https://doi.org/10.1145/2783258.2783404)

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