

# Can smells improve your athletic performance?

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Did you know that the scent of peppermint can make you run faster? That a whiff of ammonia will make you do a few more push-ups than usual? Or that the fragrance of jasmine can improve your bowling score?

Those and other findings were made by Mathieu Cournoyer, a master's student in UdeM's School of Kinesiology and Human Kinetics, who

reviewed 19 studies on the effect of olfactory stimulation on [physical activity](#).

His research was [published](#) in the January issue of *Physiology and Behavior*.

## **Speed, endurance and precision**

Under the supervision of Professor Marie-Eve Mathieu, Cournoyer compiled studies on the effect of odors on speed, endurance and precision in various physical activities.

Many studies have looked at the positive effect of physical activity on the [sense of smell](#), including the ability to recover the sense of smell after an accident or infection, and some have investigated hormonal or nervous responses to the inhalation of specific odors.

But Cournoyer's research project is the first to survey studies that examine whether certain odors promote or inhibit actions related to physical activity.

Cournoyer surveyed 19 studies with different—and even divergent—methodologies.

"We defined physical activity very broadly," Cournoyer explained. "Since this is a new field, we couldn't focus on one specific type of activity. What we found is that there are a wide variety of olfactory stimulation protocols in the literature."

The number of participants in the studies ranged from 10 to 104 (most were in their 20s and physically fit); the duration of odor exposure varied from a few seconds to five minutes; and the methods of exposure included under-the-nose strips, absorbent cotton, masks, essential oil

diffusers and more.

The studies were conducted in the U.S., U.K, the Philippines, Iran, South Korea, Japan, Palestine's West Bank, and Taiwan. There were no comparative studies.

## Classified by type and odor

Cournoyer classified the 19 studies by type of physical activity analyzed—strength, cardiovascular, precision, and balance—and by odor tested—peppermint, citrus, lavender, ammonia, jasmine, woody scent, and mixed essential oils.

Despite the variety of methodologies, some notable findings emerged.

For example, the five studies of strength-related activities showed that:

- ammonia increases [heart rate](#), alertness, and perception of performance;
- some odors can reduce [diastolic blood pressure](#) by 7 mmHg;
- peppermint added two push-ups at maximum effort;
- lavender can reduce attention span.

"Two extra push-ups may not seem like much, but bear in mind that we're talking about fit young people for whom [performance improvement](#) is harder to achieve," Cournoyer pointed out.

The five studies of cardiovascular function found, among other things, that:

- peppermint shaved 2.94 seconds off a 400-meter run and 53 seconds off a 1.5K run, increased cardiovascular capacity and lung function, and reduced feelings of fatigue;

- lemon and orange produced a sense of well-being during physical activity.

Two studies showed positive effects on precision. In one, jasmine improved their bowling scores by 26.5 percent. In the other, peppermint made dart players more consistent. One study even found that lavender improved balance.

"We were somewhat surprised by these results," said Mathieu, Cournoyer's supervisor. "Some of the performance results are not negligible, particularly for improved cardiovascular response, although these are small studies and the results are crude."

## **Significant risk of bias**

Mathieu also noted the risk of bias in this type of study.

"You can't hide from people that they're going to smell an odor, or give them a placebo odor, so a psychological effect could be a factor in the performance improvement," she said.

But she does consider it interesting that certain aromas seem to have a positive effect on performance and may even reduce perceived effort.

"The important point is that it's possible that a scent you find pleasant can make you feel better during physical activity—looking at the big picture and the role of pleasure in training, this is meaningful," she said.

"Overall, this literature review shows that smelling odors before or during exercise either has no effect or improves responses. Further research is needed to determine whether certain aromas can contribute to the practice of a sport on a more regular basis."

**More information:** Mathieu Cournoyer et al, Effect of odor stimulations on physical activity: A systematic review, *Physiology & Behavior* (2023). [DOI: 10.1016/j.physbeh.2023.114408](https://doi.org/10.1016/j.physbeh.2023.114408)

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