

Competition increases risk when exercising in heat

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Credit: University of Portsmouth

The dangers of exercising in hot conditions can increase when people compete against each other, according to a new study.

The research shows that compared to solo exercise, individuals can perform faster in head-to-head [competition](#) in a hot environment, but this increases metabolic [heat](#) production and puts the body under greater strain. The study demonstrates that exercising in a competitive situation can alter the way individuals perceive their body temperature so they become unaware of physical changes to their bodies which might lead them to ignore important warning signs. High body temperatures can result in heat-illness, which can be serious and even lead to death in exceptional circumstances.

Individuals more inclined to take risks may be even more susceptible which may help to explain how risk-takers are able to push themselves to the point of collapse. The research is published today in *Sports Medicine*.

The researchers, at the University of Portsmouth, said that the results could better inform guidelines about competitions and other events taking place in extreme temperatures. Dr Jo Corbett who led the study said that sporting competitions are not the only events where participants push themselves to succeed despite challenging heat.

Dr Corbett said: "Organisations that use physical selection exercises for recruitment, promotion or training should be aware that individuals may push themselves beyond their normal limits when in highly competitive situations and when there is a lot at stake."

The study involved 18 individuals cycling solo over 20 kilometres in cool conditions as quickly as they could and again in the heat. They also undertook a simulated head to head competition over the same distance in hot conditions, but in fact, they were competing against their own original performance in the cool environment.

When riding alone in the heat participants cycled more slowly, but during the simulated head-to-head competition they increased their pace

and even matched their own original performance in the cool conditions. The data revealed that the participants were hotter, yet reported feeling no different. Dr Corbett said that in the head to head competition the participants would have been under increased thermo physiological strain but their perceived effort and sensation of how hot they were was the same as during the slower solo exercise in the heat.

"We found that participants ignore the signals they would usually notice because they are motivated to compete and to win. It appears that competing changes the relationship between an individual's perceived and actual effort levels. During competition it may be that their focus is changed and rather than paying attention to how they feel, they might focus instead on beating their competitor. Their performance is enhanced but it might put some people into the danger zone."

The study also found that a person's attitude to risk-taking behaviour can affect their performance. All participants undertook a questionnaire before their trials that identified where they were on a scale of behaviour associated with taking risks. Those more inclined to take risks became hotter in the head-to-head competition, in some instances becoming dangerously hot.

Psychological resilience also predicted [performance](#) times in the head-to-head competition and resilient [participants](#) performed better than those with low resilience scores.

The University's Dr Chris Wagstaff, who lead the psychological testing, said: "Psychological testing may identify [individuals](#) who are resilient and likely to better perform, and those who are more susceptible to increased risk of heat-related illness."

More information: Jo Corbett et al. The Effect of Head-to-Head Competition on Behavioural Thermoregulation, Thermophysiological

Strain and Performance During Exercise in the Heat, *Sports Medicine* (2017). [DOI: 10.1007/s40279-017-0816-x](https://doi.org/10.1007/s40279-017-0816-x)

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