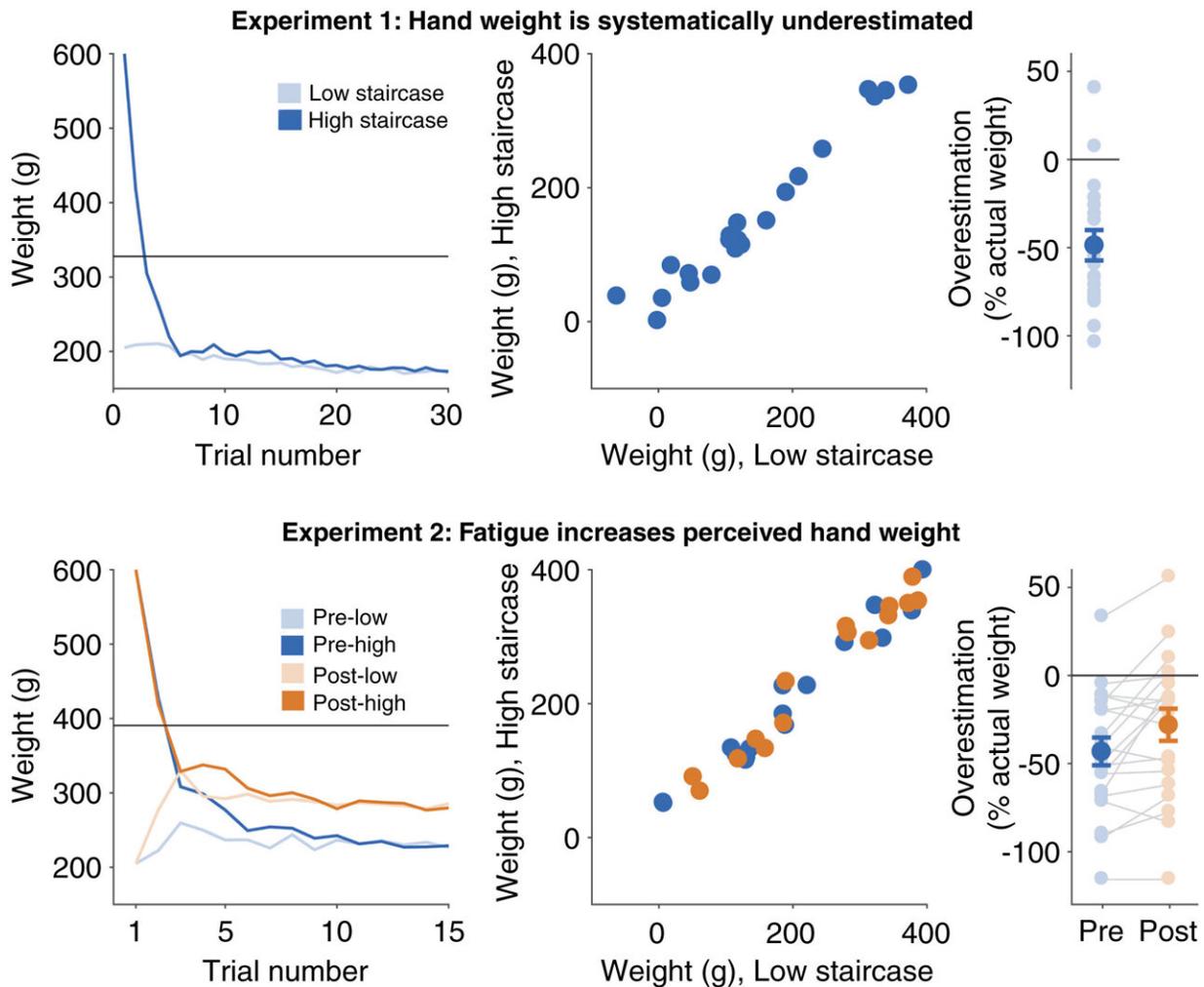


Experiments show people dramatically underestimate how much their hands weigh

July 25 2023, by Bob Yirka



Top row: Results from Experiment 1. Grand average psychophysical staircases starting from low (200 g) and high (600 g) weight initial estimates quickly converged on a common estimate of perceived hand weight (top left). The black horizontal line indicates the mean weight of the actual hand. Across participants,

estimates from the two staircases were strongly correlated, indicating high reliability (top center). Hand weight was systematically underestimated, on average by 49.4% of actual weight (top right). Bottom row: Results from Experiment 2. The low and high staircases again converged on common estimates of hand weight, both before and after fatigue-inducing exercise (bottom left). Estimates of hand weight were strongly correlated between the two staircases (bottom center). There was again clear underestimation of hand weight at both time points. The magnitude of underestimation, however, was reduced following exercise (bottom right). Credit: *Current Biology* (2023). DOI: 10.1016/j.cub.2023.05.041

A team of psychologists at the University of London, has found that people typically greatly underestimate how much their hands weigh. Their study has been published in *Current Biology*.

Prior research has shown that many people fitted with artificial limbs say they feel heavy—this, despite the fact that most such limbs are lighter than natural limbs. In this new effort, the research team sought to learn more about this phenomenon by testing people to see how much they thought their natural hands weighed.

The experiments involved asking 20 adult [volunteers](#) to sit in a chair with pillar-type armrests with fixed screens that prevented the volunteer from seeing their hands. Each was asked to allow their left hand to dangle off the edge of the rest. After a few moments, a weight was attached to the left wrist and the hand was left to dangle again. A researcher then asked the volunteer which was heavier, their hand, or the weight. This [exercise](#) was repeated multiple times with different amounts of weight.

The research team found that on average, the volunteers underestimated the weight of their hands by 49.4%. The human hand weighs on average 400 grams—thus, the volunteers thought they weighed just 200 on

average. The researchers were not able to explain the disparity, but suggest it might have something to do with making movement feel less taxing.

The team repeated the experiment with different volunteers, but this time, each was first asked to flex a dynamometer for 10 minutes, making the hand feel fatigued. After testing for hand weight estimates, they found the volunteers underestimated their hand [weight](#) by just 29%—a finding that suggests a built-in response to fatigue, which encourages resting.

The findings could lead to changes in the design of prosthetics. If people could be convinced that their [artificial limbs](#) are real, the researchers theorize, they may cease feeling them as heavier.

More information: Elisa R. Ferrè et al, Systematic underestimation of human hand weight, *Current Biology* (2023). [DOI: 10.1016/j.cub.2023.05.041](#)

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