



# Electromyographically Controlled Prosthetic Wrist Improves Dexterity and Reduces Compensatory Movements

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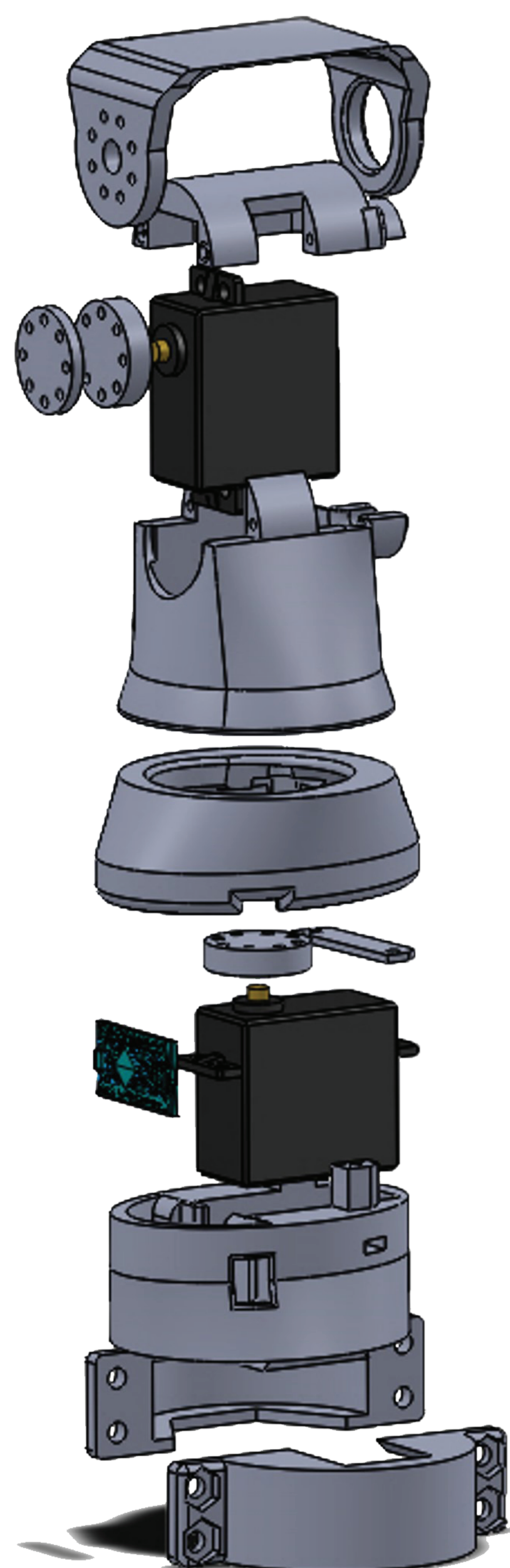
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## Background

Upper-limb amputees must perform unnatural body movements to compensate for the lack of a functional wrist. This can lead to musculoskeletal damage over long periods.

We designed and built a low-cost, adaptable wrist to decrease compensatory movements without increased cognitive load.

## Wrist Design



Adaptable to multiple hands

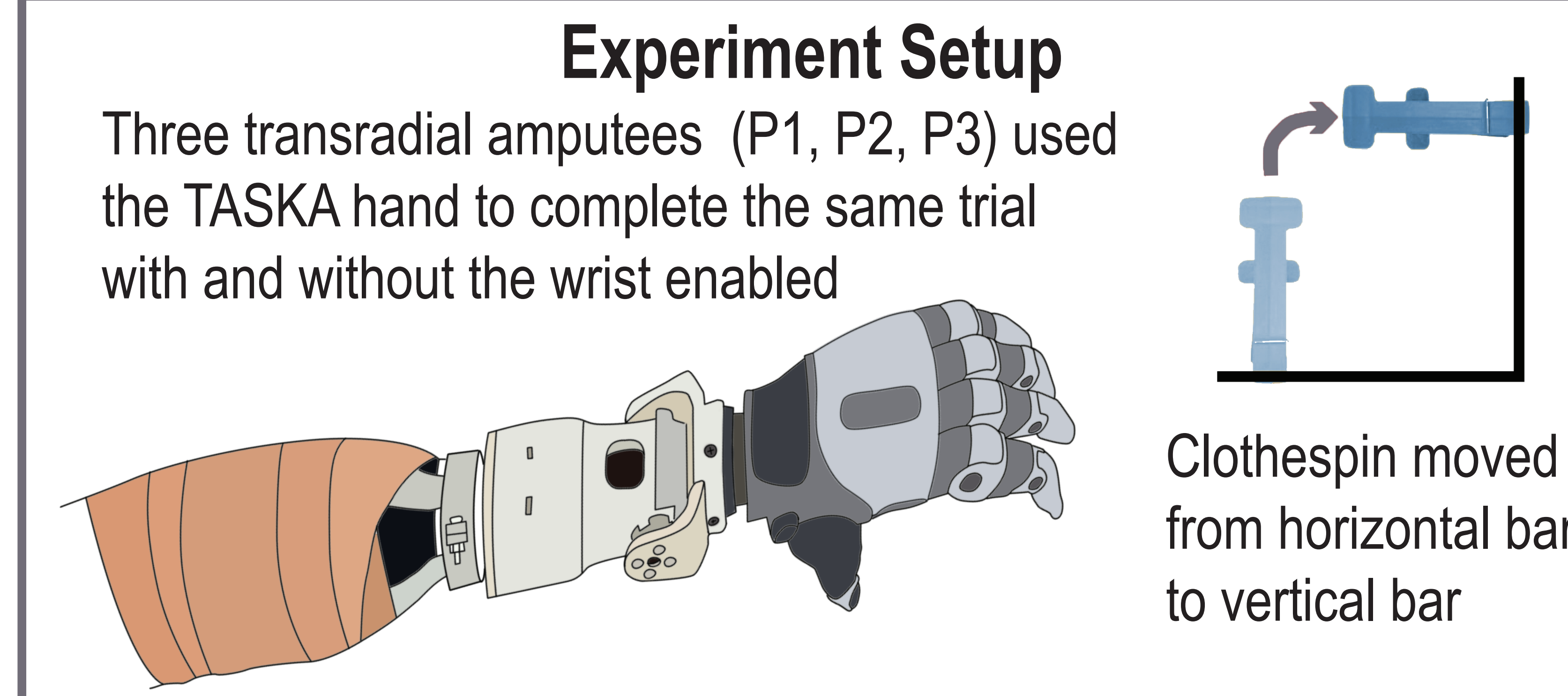
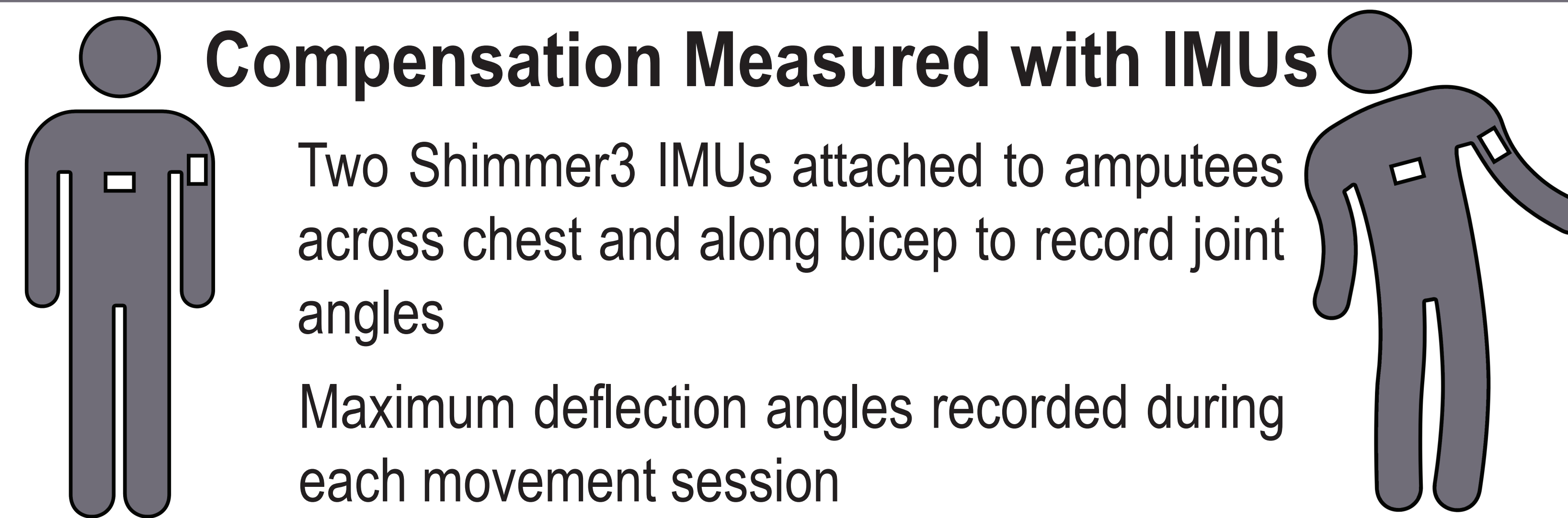
4.3 Nm of torque

Only six 3D Printed Parts

.72 lbs and 12 cm

about \$500

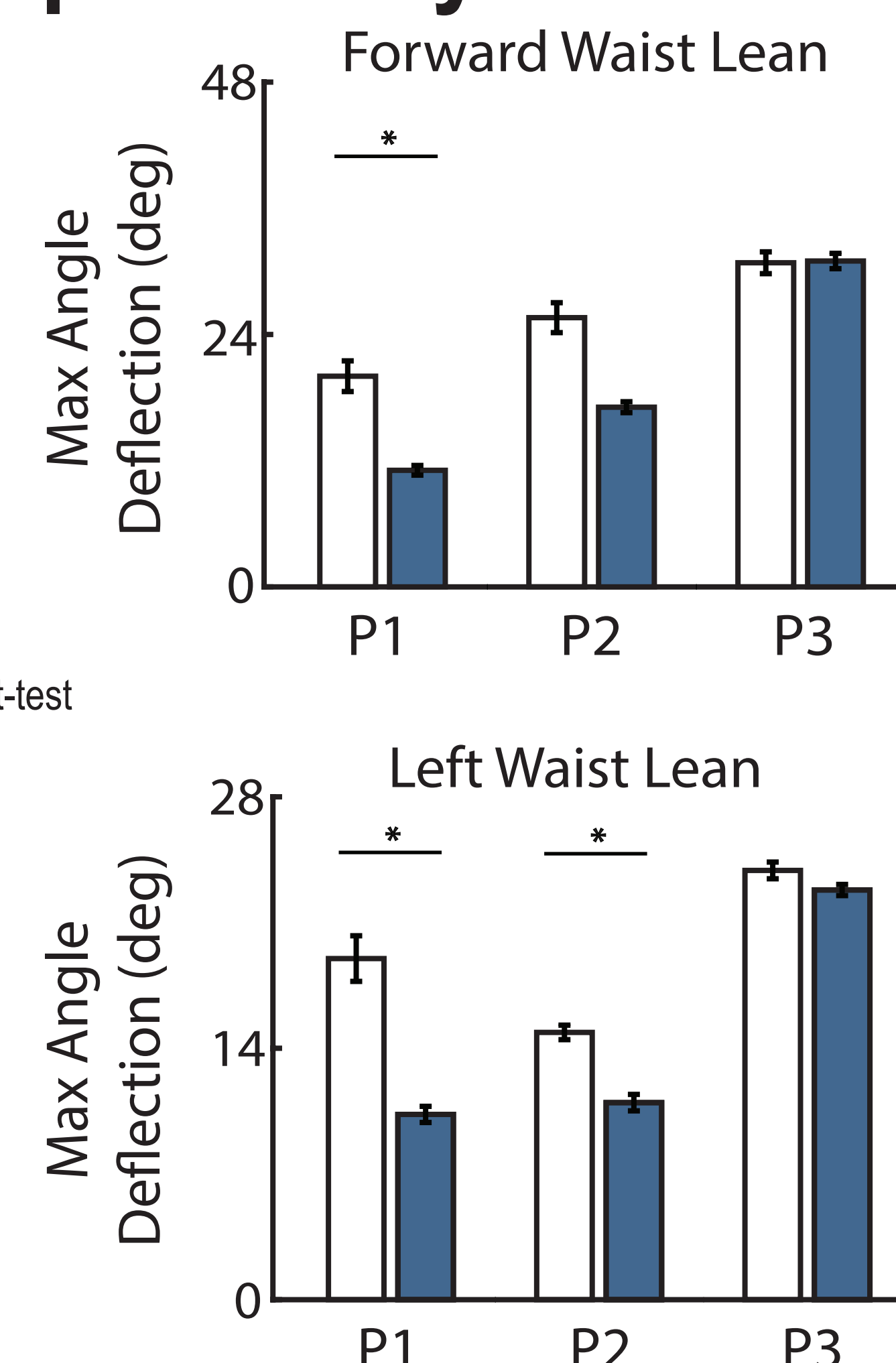
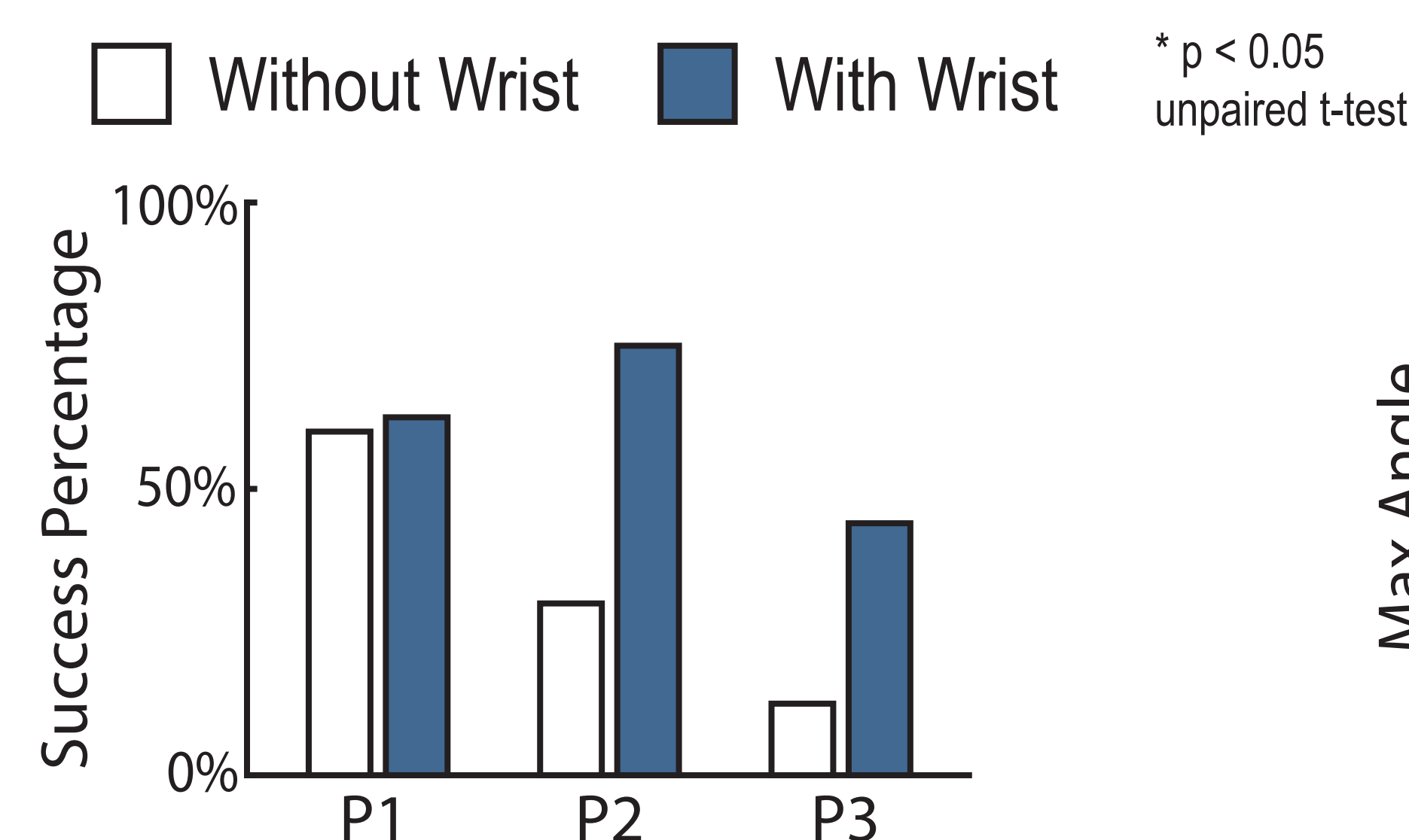
Adaptable to multiple sockets



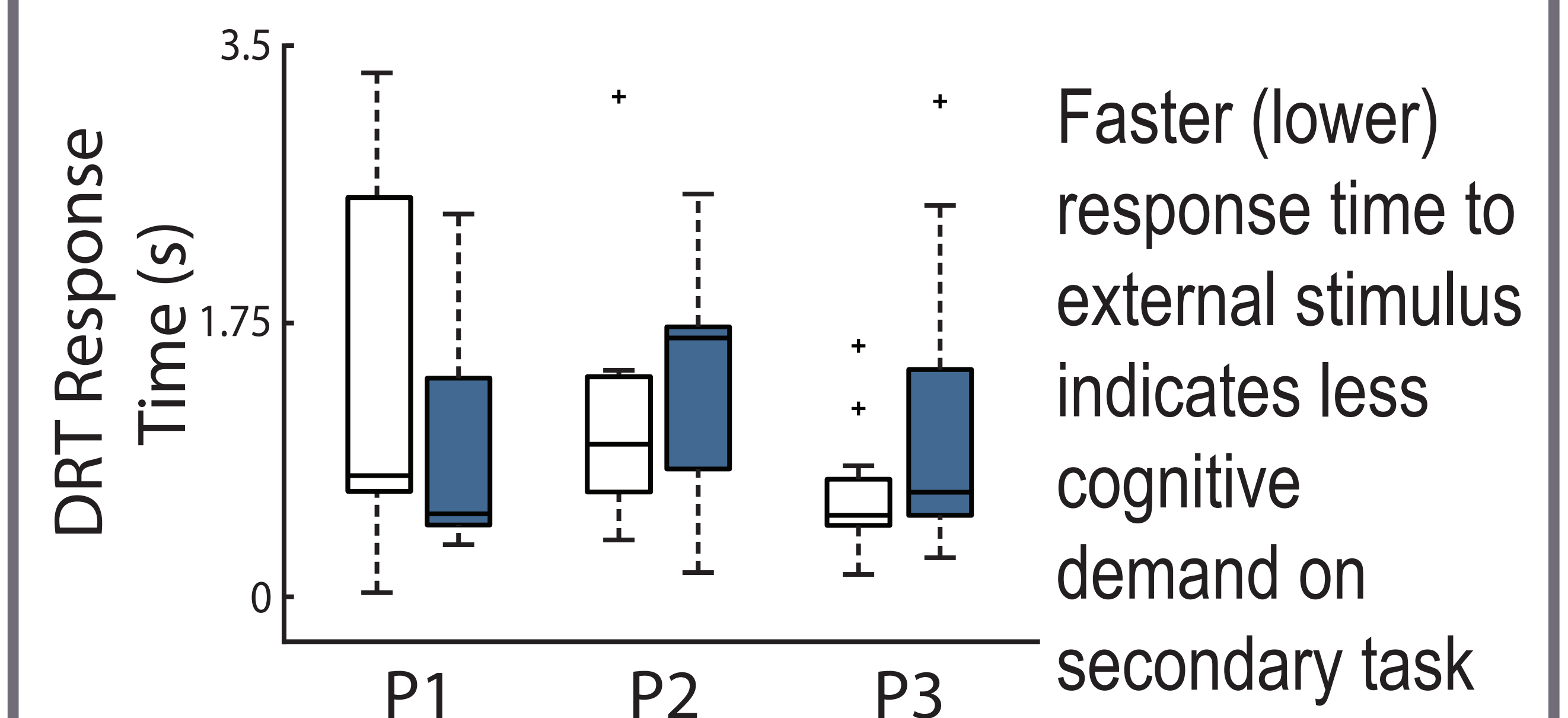
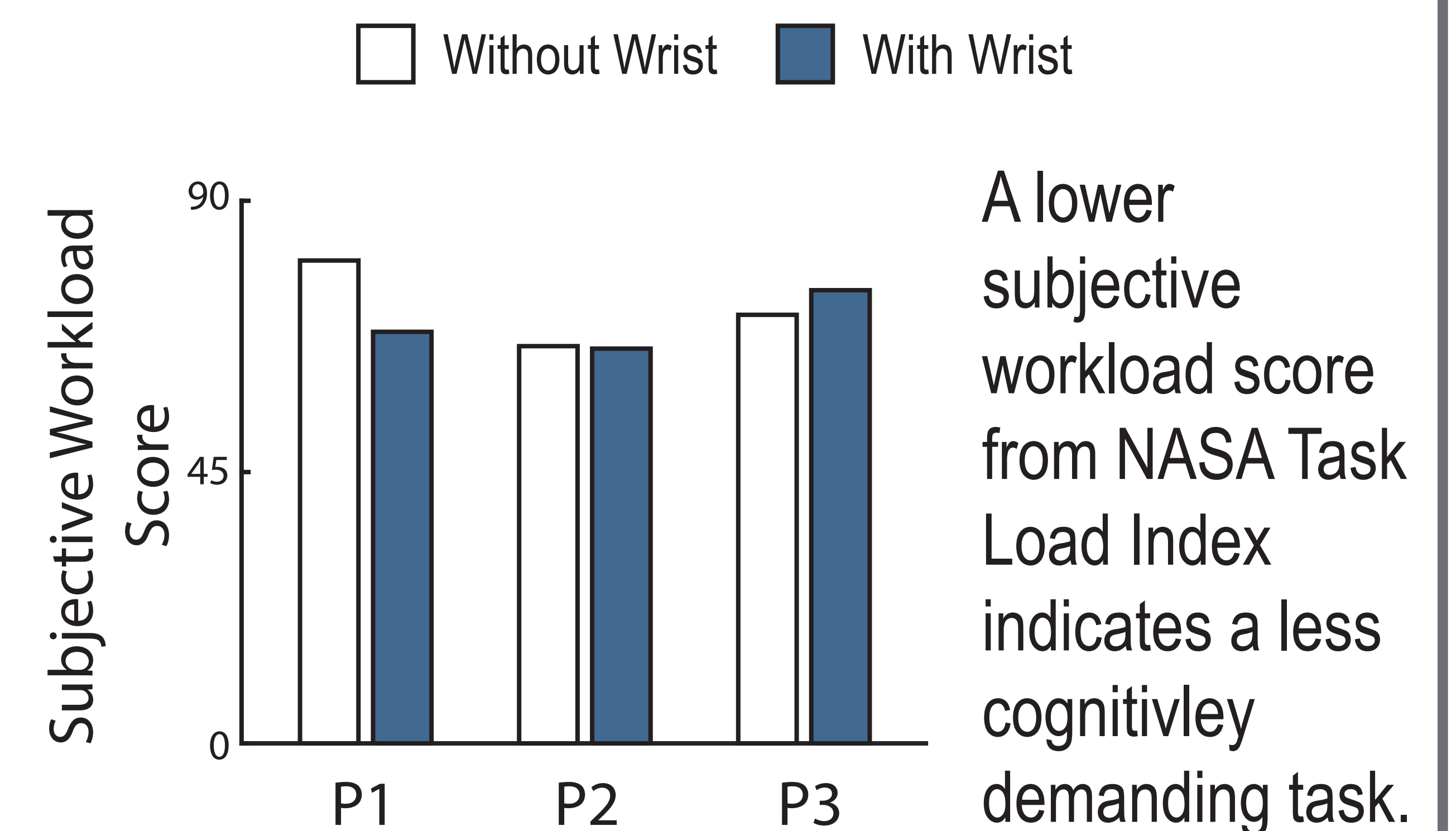
## Using Wrist Decreased Compensatory Movements

Use of wrist led to more natural movements to complete task

Task success increased with use of wrist



## Manipulating Wrist Did Not Increase Cognitive Load



## Future Work

Validation with different prosthetic hands

Additional amputee trials

Repeated trials with ADLs

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## Contact

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