

Motor Skill Consolidation and Transfer Differences in Older Adults With and Without Amnestic Mild Cognitive Impairment

Tomlin, K.^{1,2} & Westlake, K. P.¹

- 1. University of Maryland, School of Medicine, Dept. of Physical Therapy and Rehabilitation Science
- 2. Arizona State University, School of Biological and Health Systems Engineering

Background

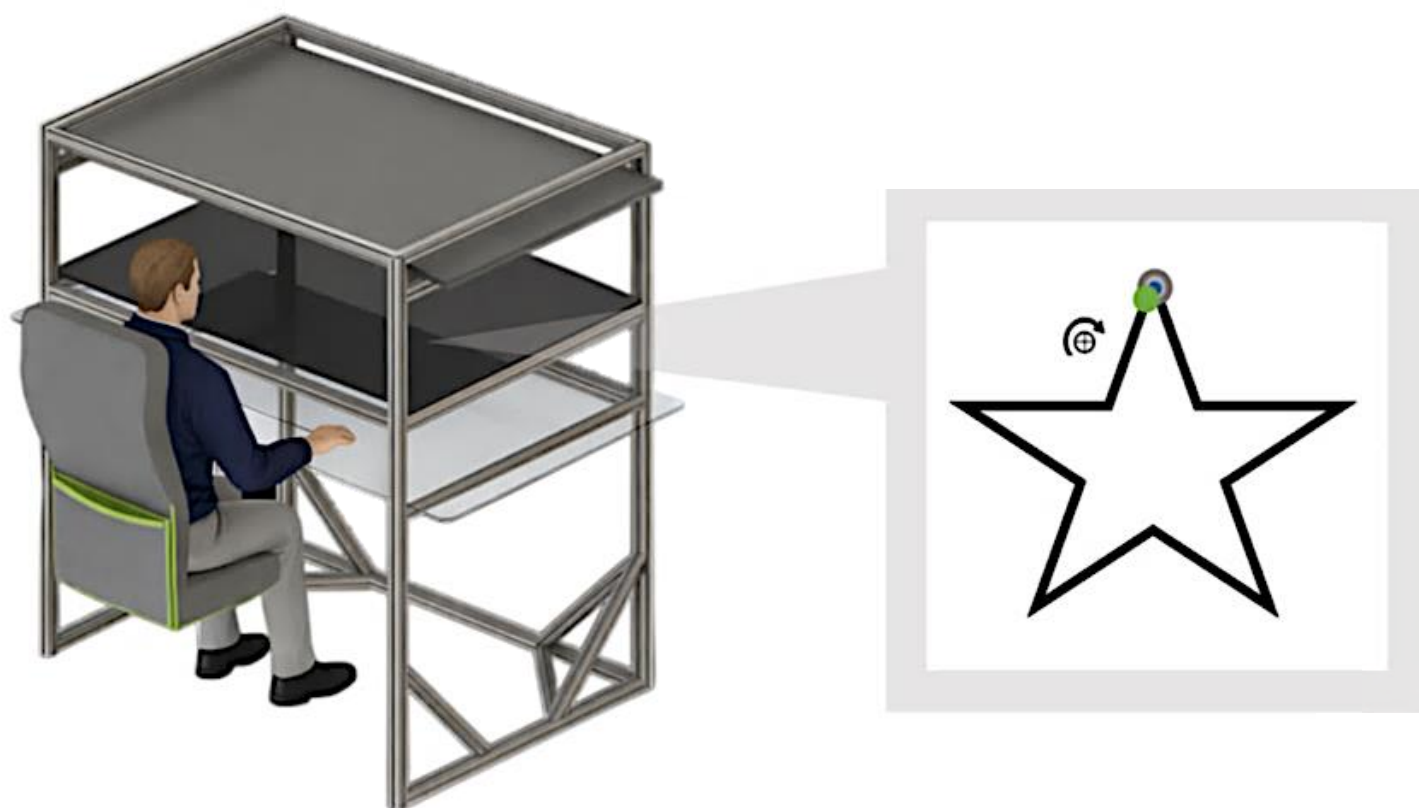
Motor behaviors may serve as meaningful preclinical indicators of dementia.

Motor learning may offer insight into cognitive aging, beyond motor performance alone.

It is unclear how the ability to learn and retain motor skills is affected in early cognitive decline, such as mild cognitive impairment.

Aim: Compare acquisition, consolidation, retention, and interlimb transfer of a motor skill in older adults with and without amnestic mild cognitive impairment (aMCI).

Methods



Older adults (n = 30; 15 aMCI) used a 180° rotated cursor to trace a star, completing 30 dominant (right) limb trials at Visits 1 and 2 (24 hours apart) and trials with each limb at Visit 3 (1 week later), scored using a combined measure of speed and accuracy.

Findings

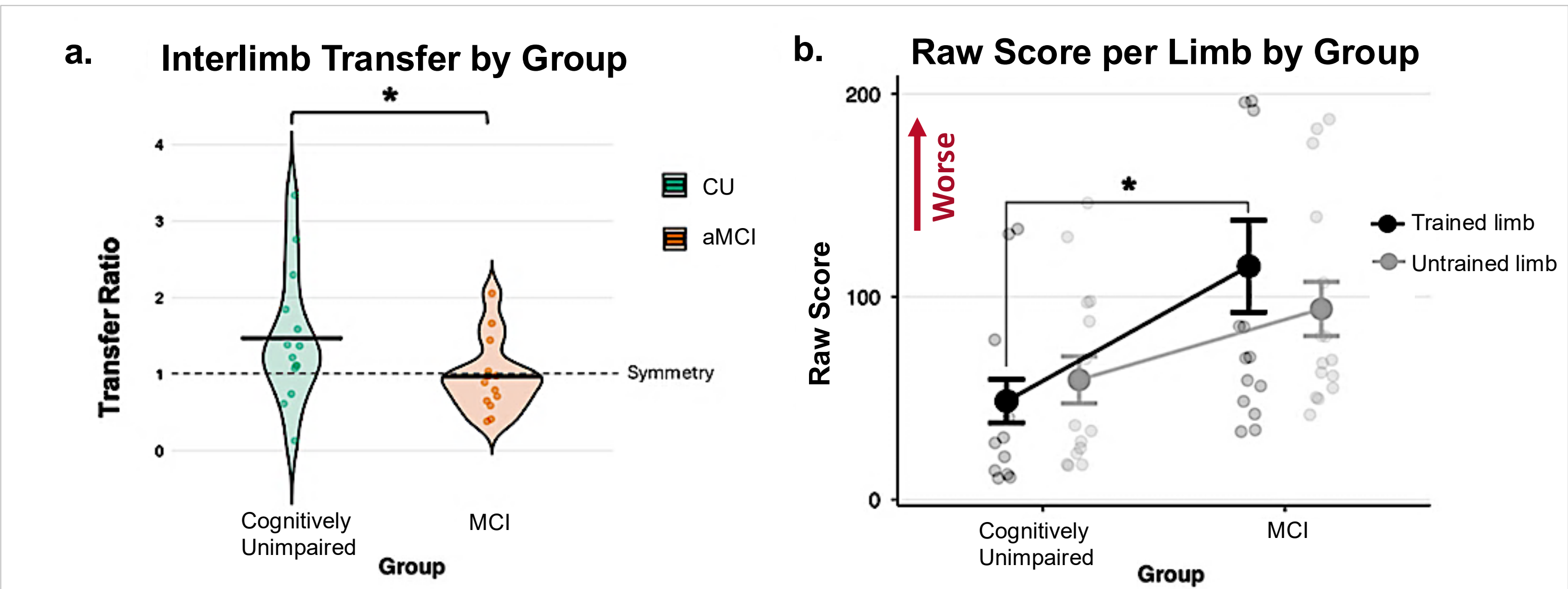
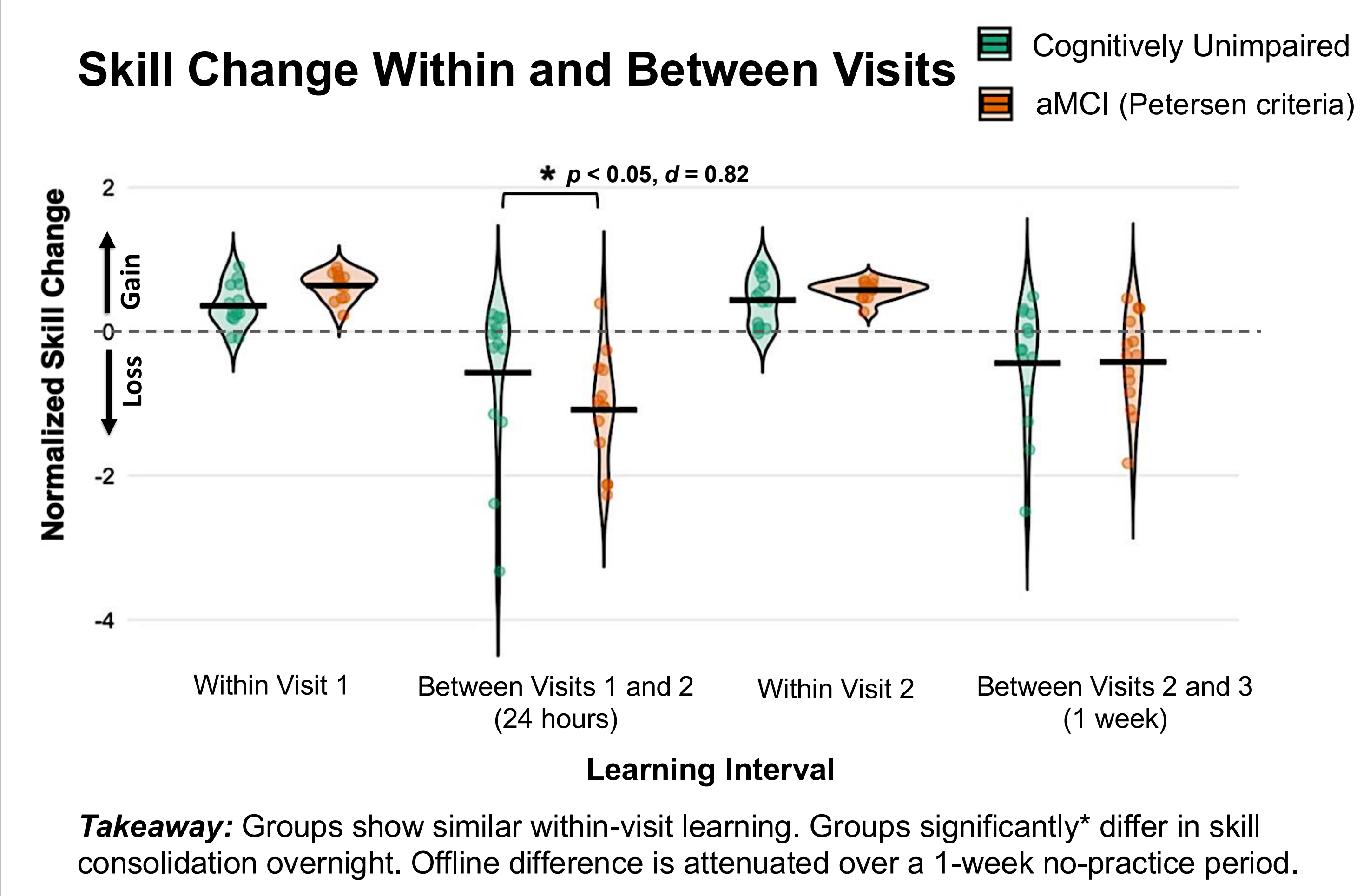


Figure a) Ratio of skill on untrained ÷ trained limb; b) Skill on Visit 3, lower values reflect more skill.

Summary

The aMCI and cognitively unimpaired groups showed similar within-session skill learning.

The aMCI group lost more skill overnight, consistent with reduced skill consolidation.

Both groups retained a similar amount of skill over a one-week period of non-practice, possibly suggesting delayed timelines of motor memory consolidation in aMCI.

The aMCI group showed reduced asymmetry of performance across trained and untrained limbs, consistent with early-stage learning or diffuse neural activation.

Implications

Motor learning processes may be altered in early stages of age-related cognitive decline.

Motor learning behaviors may be useful indicators of cognitive trajectory in aging.

Additional Information

Contact: Kylie.Tomlin@asu.edu

Funding: NIH T32 AG000262 (KT); University of MD Claude D. Pepper Older Americans Independence Center (KW)