

THE INFLUENCE OF INTERVAL VS. CONTINUOUS EXERCISE ON
THERMOREGULATION, TORSO HEMODYNAMICS, AND FINGER DEXTERITY IN THE
COLD (5°C) (98 pp.)

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PURPOSE: The purpose of this study was to evaluate how interval (INT) and continuous (CONT) exercise alter body temperatures and manual dexterity in the cold. Since athletes, construction workers, and military personnel perform fine motor tasks with bare hands in a cold environment, we sought to determine if one mode of exercise was more efficient at restoring manual performance after a period of immobility. **METHOD:** Fourteen apparently healthy, fit, young men underwent two three-hour trials in 5 ± 1 °C air, separated by one week. All trials included a 90-minute period of acute cold exposure (ACE), 30 minutes of exercise (INT or CONT) and a 60-minute recovery period (REC). Participants donned approximately 1 clo but the hands remained bare for the duration of testing so that a steep decline in dexterity performance occurred prior to the initiation of exercise. INT and CONT were isoenergetic, reflecting $50 \pm 1\%$ of each individual's VO_2 max. Core and skin temperatures were monitored continuously and dexterity testing was conducted at ten time points throughout each 3-hour trial. In addition, oxygen consumption and torso hemodynamics were assessed via indirect calorimetry and impedance cardiography, respectively. **RESULTS:** As expected, finger temperature declined rapidly during ACE and caused a 32% reduction in dexterity performance, relative to thermoneutral conditions. Both modes of exercise increased finger temperature and manual performance, relative to ACE. However, CONT was significantly more effective than INT at increasing finger temperature, which resulted in significantly better dexterity scores during REC. Core temperature was not different between trials, which was expected. However, a significant

increase in stroke index was found following CONT. **CONCLUSIONS:** It is suggested that a greater volume of warm blood in the torso facilitates finger rewarming (and thus dexterity performance) in the cold. The cascade of events from exercise mode to finger dexterity performance seems to be mediated in large part by the cardiovascular system.