Gender Differences and the Incremental Lifting Machine - A Canadian Appraisal

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ABSTRACT

The Ergonomics Research Group at Queen's University in Kingston, Canada, has conducted a series of studies to examine the use of the Incremental Lifting Machine (ILM) in prediction of task performance. The protocol for date collection in these studies was based on modification of one previously employed by the United States Air Force. Re-analysis of these data permitted the assessment of gender difference in the performance of a pre-employment selection test using the ILM. In particular, analysis of gender difference were undertaken for each of the following: (1) dynamic measures derived for a 1.8m maximum ILM strength test; (2) relationships between ILM test scores and performance of both test and task; ,(3) the impact of anthropometric measures; on performance of both test and task; (4) prediction of actual task performance; and (5) accuracy of the ILM screening test for three different cut-off standards.

Results revealed that females differed significantly from males in their performance of a 1.8m maximum ILM strength test for specific measures of timing, displacement, velocity, acceleration, force and power. Maximum ILM scores attained females were significantly related to body weight, but poorly correlated with maximum box-lifting scores. Also, regression analyses based on ILM scores and associated dynamic parameters accounted for twice as much variance in box-lifting scores for males than for females. Further more, the use of cut-offs standards of 22.7kg and 27.3kg produced a percentage of false negative results for females (12% and 32% respectively) but not for male. Recommendations have been formulated regarding analyses of selection fairness in studies of pre-employment screening tests and devices. Also, issues for future investigation have been proposed.