

# Study of the strength of a muscle during different types of work essay sample

[Business](#), [Work](#)



Introduction: The muscular-skeletal system and the nervous system are responsible for movement in humans. Muscles provide the force needed for muscle contraction. They do this when they contract. In the following experiment we were supposed to investigate the response of muscle during two exercises.

Materials: Dynamometer and timer

Methods: The whole investigation was divided into two parts. In both experiments the group was divided into three, a subject and a two test leader. In experiment 1 the subject was asked to press the dynamometer maximally after every ten seconds (intermittent work) during a time period of one minute while the test leaders noted the value and set the pointer of the dynamometer to zero each time. The experiment was then repeated for the other two members switching roles.

In experiment 2 after giving some rest to the muscle the subject was asked to press the dynamometer again but this time continuously for one minute (continuous work). The test leader reads and notes the value of the mobile pointer of the dynamometer. Experiment 2 was also repeated switching the roles. The values obtained at the end of the exercise were then compared.

Results: Table1 shows the result of experiment 1 " Intermittent work ". The strength of the muscles of three group members measured by the dynamometer every ten seconds during a time period of one minute

Continuous work. Member 1 (best value) the calculation shows the uncertainty of member 1 during continuous work.  $43.50 \pm 5.100 = 43.5 \pm 1\%$

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Member 2(best value) the calculation shows the uncertainty of member 2 during continuous work  $42.00.5 (100) = 42.01\%$

Member 3(best value) the calculation shows the uncertainty of member 3 during continuous work  $240.5 (= 24.02\%$

Graph for table 1

Graph for table 2

Comparison of the two strongest group members with Japanese stud

Average of the strongest grip of the three group members)

Average of the strongest grip using the dynamometer between the age of 17 and 20 years given by the manufacturer.

Conclusion& evaluation by looking at the graph for table one we can see that it is downward sloping for all three group members. The graph is downward sloping because the mass of muscle strength measured by the dynamometer decreases after every ten seconds. This was expected, as mentioned in the introduction muscles provide the force needed for muscle contraction. The more we contract the muscle the sooner will it get tired so because we were measuring the strength of the muscle after every ten second over a time span of one minute we expected the strength of the muscle i. e. mass obtained by the dynamometer to decrease towards the end as the muscle was getting tired.

Table 2 and Graph 2 represent the results for continuous work. However the graph 2 does not give an expected result like graph1. For the second experiment (continuous work) we expected the graph to be downward sloping too, as strong and prolonged contraction of a muscle during continuous exercise would tire the muscle sooner. We see that the graph for group member 2 is downward sloping which was what we expected and the graph for group member 3 varies a little and suggests that group member 3 was exerting almost constant force over the time span of one minute; however the graph for group member 1 or subject 1 is upward sloping. This was not expected, but there are a number of reasons which could explain that shape.

One good reason for the upward sloping graph of subject 1 could be that after the first exercise the muscles for subject1 had warmed up and so he was able to carry out the second experiment in a much better way. This is something sportsmen often do like runners for example before running for the real race they run a few laps to warm their muscles as it helps them in the real race. Another reason for the shape could be the nature of this exercise; the exercise was very intense as we had to press the dynamometer continuously for one minute without letting it go off. So this probably causes us to exert more force, as the more time passes by the more the muscle tires and to avoid letting the grip let loose we exert more force. So these could be a few reasons that can explain the shape of the group member 2 in graph for table two.

I did not calculate the percentage deviation as the value provided by the manufacturer cannot be used as true value. It can only be used to compare our values with theirs. This can be seen in the results above the average (48) of the best value is higher than their best value average (43.5)

There were a few weaknesses and limitations in the experiment that could have affected like the physical state of three members is not mentioned in the results table. Some members might be working out in gym etc which would make it easier for them to do these exercises especially the continuous one. Error from the dynamometer is not likely to affect our reading as the smallest unit on it was 0.5 which is big enough to site and took that as uncertainty to make sure that there is no error in our reading. Human reaction time can be another factor in such experiment as we use the stop watch this is the reason why we took an uncertainty of 1 sec in the table. 1 sec was the smallest unit visible in our stop watch.

The readings for the experiment could have been improved if we had a third trial for both experiments, as the more trials we have the less would be possibility of an error. There is nothing much that could be done about human reaction error apart from taking an uncertainty like we did for this experiment.