

HOW ACCURATE ARE FITNESS PRODUCTS?

Aim

The aim of this experiment was to determine which fitness product is the most accurate. They have been tested on their ability to calculate the total steps walked, how far the user has walked and how far the user has run. The overall intention of this experiment was to rank which fitness product is the most effective in measuring the extent of the user's activity.



Graphs Explained

Each of the graphs displays data that was collected during our experiment from each fitness product. For each product, there is a bar showing the results from each of the three tests, and a fourth bar displaying the average of the fitness products over the three tests.

The first graph shows the results from the step tracking experiment, with the actual steps taken being 500 steps. One of the products we tested was the Garmin Vivofit. From viewing the graph, we can see that it gave an average of 504 steps from the three tests, which is only a minuscule difference between the actual average of 500 steps.

Our second graph displays the results of our experiment testing the accuracy of distance measured while walking from each fitness products. If we look at the results from the Fitbit Alta, we can see that from the three tests, it displays an average of 267m. This is not very far from the actual average of 300m, making it mildly accurate.

Our final graph displays the results from the experiment testing the accuracy of distance measured while running from each of the fitness products, with the actual distance being 100m. The results from the iPhone SE give us an average of exactly 100m. This shows how it managed to succeed all other fitness products in this experiment.

Hypothesis

The fitness product that was released most recently will have the better technology, and from this we can determine that the most accurate fitness product will be either the Fitbit Alta, which was released in 2016, or the Fitbit Blaze, which was also released in 2016. This is because out of all of the products that we are testing these two fitness products were released the most recently.

Results

As the above table shows, we found that the surprising overall winner was, by a wide margin the iPhone SE Health app. On the other hand, the least accurate was the Fossil Q Smart Watch - also by a significant amount. Apart from these, ranked in most accurate to least accurate was the Garmin Vivofit, then the Fitbit Alta, then the Fitbit Blaze and finally the Fitbit Charge HR.

Method

01.

Have one person put on all of the fitness products and walk 500 steps, whilst a second person counts the first persons steps to ensure accuracy using the tally counter

Repeat step 1 three times.

02.

03.

Have 1 person put on all of the fitness products and walk 300m. Record distance results from each of the different products.

Repeat step 3 three times.

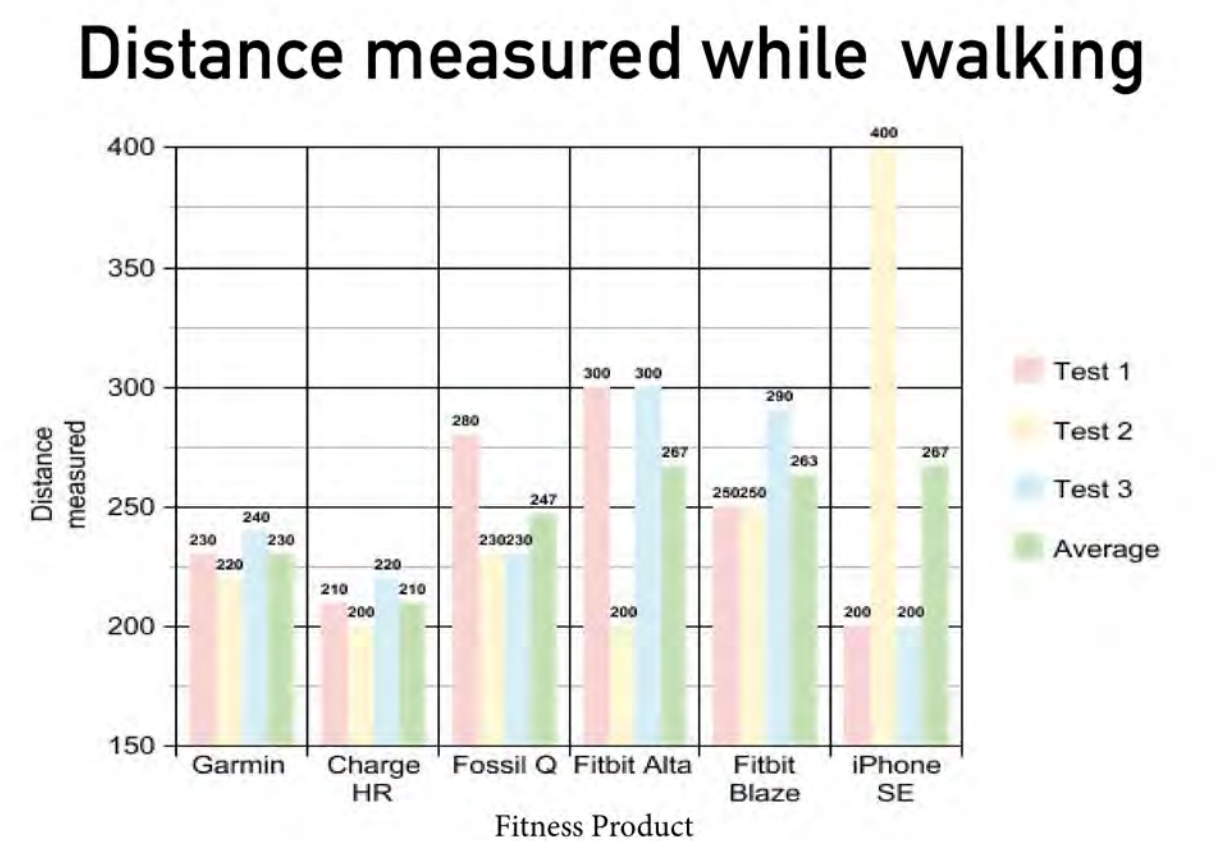
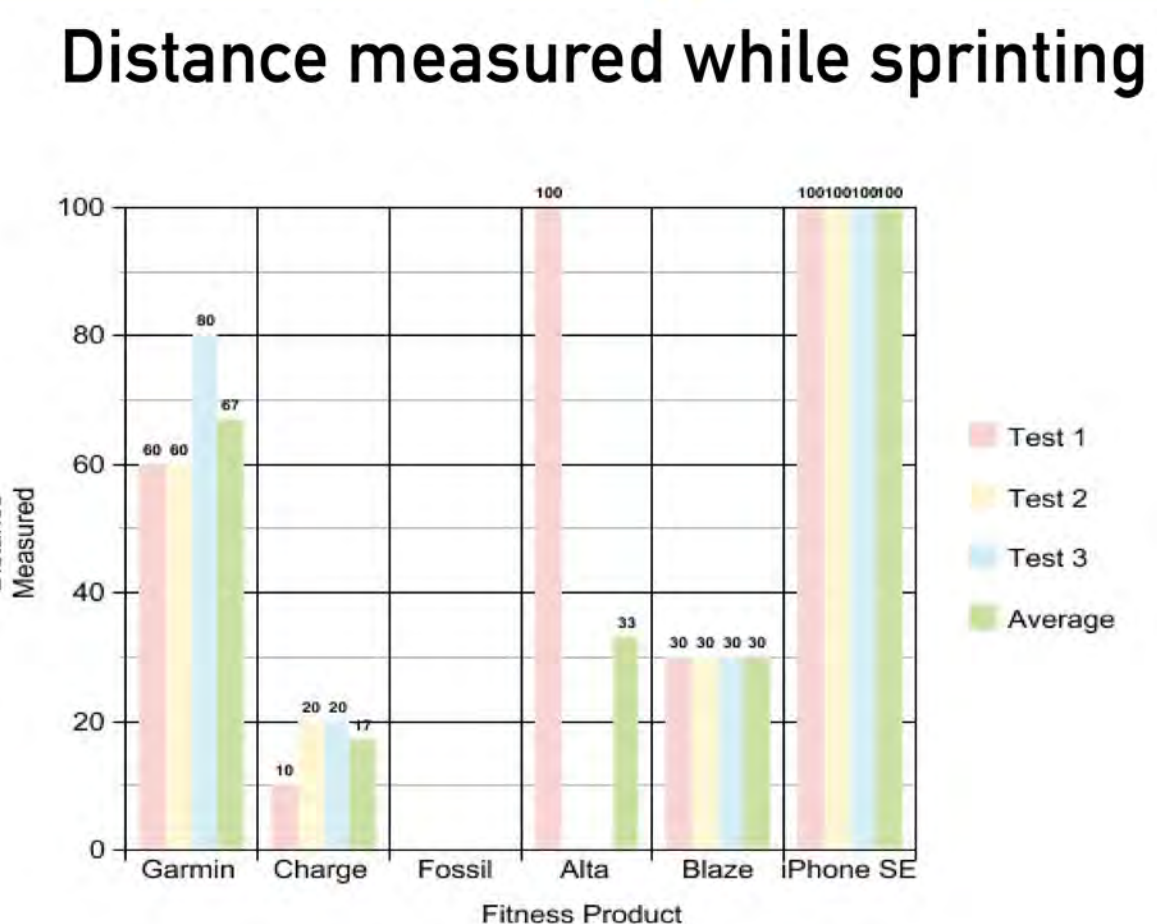
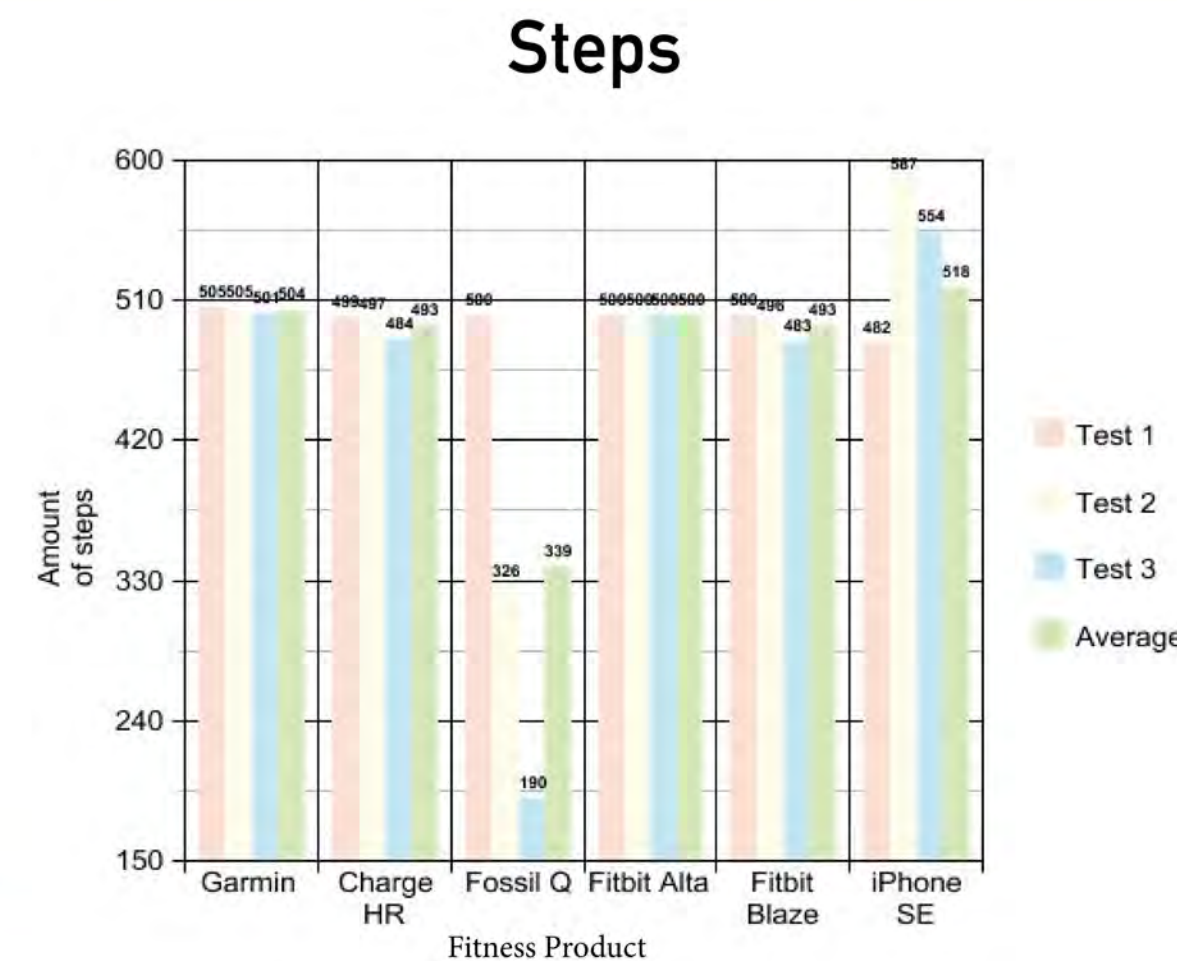
04.

05.

Have 1 person put on all of the fitness products and sprint 100m. Record distance results from each of the different products.

Repeat step 5 three times.

06.



Limitations

Although our experiment covered a large amount of information and testing, there were certain aspects of our testing which limited us to certain results and caused us to not test as many aspects of the fitness products as we originally planned on doing.

One of these aspects were that we were not able to test every single fitness product ever released; only the ones which were available to us. This meant that our product range was limited, so there may be more accurate fitness products available than the one which we tested but we could not access them for our testing.

Another limitation which we faced was that we were not able to compare all of the capabilities that the fitness products possessed. This occurred because either not all of the fitness products had these capabilities and therefore we could not compare it, or there wasn't an available way to test it without using technology of some sort - which would defeat the purpose of testing it at all, as the technology might not be accurate.

The last limitation which we faced was that the fitbit alta didn't give exact measurements on both distance and steps, and rounded to the nearest hundred, which resulted in the steps looking exact in the results but if the test was with a number which wasn't a multiple of a hundred the results wouldn't be exact.



Data Analysis

From this data, we can conclude that the fitbit alta was the most accurate for step counting with an average of a perfect 500 steps, but keeping mind that it was rounded up not including the fitbit alta the most accurate step counter was the garmin vivofit with an average of 504 steps. For distance walking, the most accurate fitness product was tied between the fitbit alta and the iphone health app with an average of 267 m. For distance running, the most accurate fitness product was the iphone health app with a perfect average of 100 m.

Conclusion

The most accurate of the given fitness products was not the most recent but rather one of the earliest, the iPhone SE Health App.

Materials

- Garmin Vivofit
- Charge HR
- Fossil Q
- Fitbit Alta
- Fitbit Blaze
- iPhone SE
- Recording materials
- Tally counter
- Running track (or other place with measurable distances)