

# Human Spatial Awareness: Trained and Untrained Individuals, Measuring Margin of Error and Time.

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## Introduction

Spatial awareness and proprioception are key in everyday living -- i.e. humans constantly perceiving their personal space when walking through crowds or even running through mental maps when traversing their homes late at night. [2]The purpose of this experiment is to compare spatial awareness accuracies of athletes and untrained individual’s over varying movement patterns instead of standard forward and backward walking. Based on pre-experimental research and literature, hypotheses can be formed that trained athletes will have a margin of increased accuracy compared to untrained individuals over varying movement patterns.[1]

### Female Results



Trained Females vs. Untrained Females  
Forward Walking Test –17.6 in. > 9.8 in.  
Backward Walking Test –18.2 in. < 25.8 in.

Time to Perceived Completion –  
Forwards: 6.60 seconds < 6.78 seconds  
Backwards: 6.74 seconds < 6.85 seconds  
[1],[2]

## Methods

This experiment was performed by having the two groups view a basketball placed 20 feet in front from them on a running track. Without being told the actual distance, the participants were blindfolded and instructed to walk forward, at a normal pace and in a straight line (to the best of their ability), to the basketball. This process was repeated again, with the subject walking backwards.[1]

### Measurements taken

Time it takes the subject to walk the perceived distance.  
Total distance walked by the subject.  
Distance error will be calculated, using the actual distance of 20 feet and the distance walked by the subject.

## Conclusions

The overall data agreed with our initial hypothesis that, trained individuals would have higher spatial awareness than untrained individuals.

## References

- 1.Bredin, J, Israel, I, Kerlizin, Y. Path integration: is there a difference between athletes and non-athletes? Experimental Brain Research.167:670-674, 2005.
- 2.Hutton, R, Atwater, S, Acute and Chronic Adaptations of Muscle Proprioceptors in Response to Increased Use Journal of Sports Medicine.1179-2035, 1992
- 3.M.L., Mittelstaedt H., Idiothetic Navigation in Humans: Estimation of Path Length Experimental Brain Research 139:318–332, 2001.

### Male Results



Trained Males vs. Untrained Males  
Forward Walking Test – 13.8 in. < 15.0 in.  
Backward Walking Test – 24.2 in. < 25.0 in.

Time to Perceived Completion  
Forwards: 5.55 seconds < 7.21 seconds  
Backwards: 6.81 seconds > 6.59 seconds