



Electronic white cane versus scotopic vision for obstacles avoidance

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Abstract

In this experiment, we studied the ability of blind people to avoid obstacles using an Electronic Travel Aid. We used the "Tom Pouce 3" which is a white cane equipped with laser and infrared detection giving a tactile feedback. For that, we used a 25 meters path and randomly placed on it eight obstacles. We measured the number of collisions and the speed while passing between the obstacles. Then we compared the results we had in this experiment with others obtained with sighted persons in situation of scotopic vision. The first group is made of blind people using the "Tom Pouce 3" in their daily life for at least one year.

The second group is made of sighted people that do not suffer from any ocular pathology. They used glasses with optical densities adjusted to reproduce different nocturnal light conditions. Each person had to cross a 25-meter long and 2.2-meter wide corridor.

The number of obstacles on the path at each attempt increases gradually. For example, in the first attempt there was only one obstacle, if the person crossed the path without any collision, one more obstacle was added in next attempt. If there was a collision the number of obstacles remained the same, and the attempt had to be repeated. After five collisions in total, the experience is finished. If a person succeed to pass the eight obstacles on the path, then

The new challenge is to crossed in the shorted time possible. In each attempt, the positions of the obstacles were changed. Blind people in the first group were blindfolded to avoid the effect of an eventual small residual sight.

In this study, some blind people succeeded to cross the eight obstacles at in average speed exceeding 6 km/h. The performance of blind people did not depend on the color of obstacles. However, for scotopic conditions their performances depended a lot on the contrast that had to be taken into consideration for the comparison. Their performances are not reproducible

Biography

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[World Congress On Ophthalmology & Optometry](#) August 24-25 2020, Webinar

Abstract Citation:

Dr.Aya Dermayka **Electron white can versus scotopic vision for Obstacles.**World congress on ophthalmology & optometry 2020, 34th Global Ophthalmologists Annual meeting, 15th International Conference on Ophthalmology & VisionScience–**August24-25,2020**

