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Non-Euclidean Property of Blind Walking

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In the present study, the geometrical property of blind walking was studied. The subject was asked to make a circle of radius 2.3 m by blind walking. First, the blindfolded subject stood at the starting point O . Second, he walked 2.3 m subjectively and stopped (point A). Third, from point A , he drew a circle of radius \overline{OA} by walking. He was asked to put a small object for the record on the floor at the location of a third (point B), two third (point C) of the circumference and the final location (point D) of the circumference. Eight subjects attended the experiment and the experiment consisted of eight trials (four clockwise directions and four counter-clockwise). If the geometrical property of blind walking is Euclidean, points B , C , D should be on the same circumference as point A . However, the result showed that they were not on the same circumference and the average radius of \overline{OB} , \overline{OC} , \overline{OD} was significantly smaller than the radius \overline{OA} ($t=2.45$, $df=2$, $p < 0.05$). If we draw a circle of radius r on the surface of a globe, its circumference is smaller than $6.28r$. That is, the result implies that the geometrical property of blind walking should be elliptic.