ESTIMATE OF DISTANCE COVERED IN THE TREKKING WITHOUT VISION

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Abstract

The objective of this paper was to investigate the course estimate using the trekking with controlled hearing and smell indications. For that, an experiment was applied that sought to investigate the course estimate with 10 participants with vision, that accomplished Trekking in a trail of 800 meters. Those people walked blindfolded, and they were instructed to locate the landmarks and to tell the walked course estimate in meters. All of the verbal information was logged and analyzed reaching the conclusion that the estimate of distance covered without vision doesn't possess a satisfactory accuracy due to estimate variability among the subjects and accentuated course underestimate.

In Brazil, the Trekking without vision is an emergent activity mainly with blind people, carried through with the conduction of another person with vision. This, in a certain way, takes off the autonomy in the activity and mainly diminishes the pleasing aspect of the adventure, which is perhaps the main sensation sought in the segment of the adventure sports, of which the Trekking is part.

This situation occurs because of the fear of loss of route in the tracks in the independent Trekking without vision. However, a factor that is not considered, is that according to (BLOUIN et ali., 2002) the cognitive representation of the space allows the individual to determine his/her localization and orientation in the space, thus as to establish relations between the position of the environmental elements and their bodies.

This way, the navigation in Trekking could be based on landmarks, consisting of auditory, smell and tactile information, therefore according to (LOOMIS; KLATZKY; GOLLEDGE, 2001), the patch integration constitutes of an efficient way that allows the individual to venture in the environment, integrating the fragmented information of exterior landmarks to a coherent representation of the environment. According to these authors, the navigation uses two methods, which are the patch integration, that it uses the relative information of speed and acceleration of the individual, and the pilot, where the external references locate the person in the navigation. These methods interact supplying a satisfactory accuracy in the navigation. In this perspective, this article aimed to investigate the course estimate using trekking with controlled auditory and smell indications, searching to answer the following question: Do the estimate of covered distance, localization of landmarks, and spatial orientation in trekking without vision possess a satisfactory accuracy?

Method

Participants: 10 university students (5M and 5F) of the course of under graduation in Tourism of the Campus of UNESP in Rosana, with ages varying between 17 and 28 years old. All were voluntary and declared to possess good vision with or without correction, and they did not know the intentions of the experiment.

Researchers: This work was performed by the researcher, with the help of 2 academic students of the Tourism course. These monitors assisted in the viability of the activities, with relation to the conduction of the subjects in trekking.
Materials and equipment: For execution of the work the following equipment was used: Computer Pentium 4; Laser Printer HP Jet 4100 PCL6; Multi-functional Lexmark X1185; Word Program; Digital photographic machine; 2 whistles with sound of animals, 2 sprays disinfecting floral and eucalyptus.
Place of the experiment: a natural track of 800 meters with few relief oscillations (plain), with 2 trunks of fallen trees and alterations of height (natural obstacles).

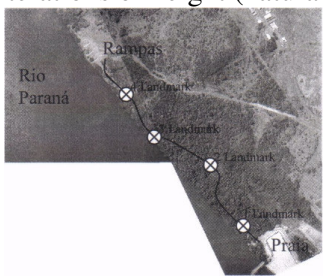

Figure 1 - Aerial photo of the track with coordinates and landmarks

Procedures: In this experiment, the participants carried through the modality of Trekking without vision blindfolded and guided by monitors, in an unknown track, guaranteeing the conditions of security with clothes and footwear adjusted for trekking practice.
The participants received the instructions, in a base located next to the beginning of the track, and were led to the place of the experiment only at the moment of the activity. The experiment was carried through in the period of the afternoon, with climatic conditions favorable to the event. The subjects were instructed to tell the information verbally, therefore they had been written down by the researcher that followed them with an individual form attached to a plane table. Four landmarks were adapted to the track signaled through auditory or smell tips produced artificially for the event as a way to control the variations for the course estimate. These landmarks were located to 200, 400, 600, 800 meters respectively to the initial point of the track, being that the first and third points had auditory tracks provoked by 2 different whistles with sound of birds that had been set by a student according to the proximity of the participant. In the points 2 and 4 the tracks were smell through sprays disinfecting in the aromas floral and eucalyptus and had been respectively set in identical form as the auditory tracks. The participants had been instructed to locate landmarks and to carry through verbally the course estimate covered in meters having as reference the initial point of the track. After the experiment the participants waited for the end of the activities in a base located next to the end to the track that contained restrooms. For documentation and illustration of the activities some moments had been photographed.

Figure 2 - Photographs of the execution of the experiment.

Analysis forms: the verbal information had been transcribed, quantified and formatted in tables and later argued, leading to the final results:

Results

SUBJECT	COURSE ESTIMATE
1	15 meters
2	180 meters
3	22 meters
4	88 meters
5	100 meters
6	200 meters
7	270 meters
8	40 meters
9	300 meters
10	200 meters

Table 1: Results of the course estimate in the landmark 1, located 200 meters from the initial point

The distance estimate covered in landmark 1 located 200 meters from the initial point, were transcribed in Table 1 with the distances in meters. For six participants, the distance covered was underestimated, considering that there was a great variability of estimates. Two other participants had overestimated the distance, having little variability, but a significant difference with the distance covered. Only two participants had made right in meters the distance estimate covered, which demonstrates in this first Landmark, the lack of accuracy in the spatial orientation without vision of the searched subjects.

SUBJECT	COURSE ESTIMATE
1	30 meters
2	300 meters
3	50 meters
4	155 meters
5	220 meters
6	388 meters
7	420 meters
8	90 meters
9	380 meters
10	400 meters

Table 2: Results of the course estimate in the landmark 2, located 400 meters from the initial point.

In landmark 2 located 400 meters from the initial point, the results of the estimate of distance covered in meters were transcribed in Table 2, in which 8 participants underestimated the distance, having great variability of results. One of the participants overestimated the distance and only participant 10 made right the distance of the course estimate. These results show that it had an increase of occurrences of underestimate of course compared with Landmark 1, and with the increase of the covered distance worse accuracy occurs in the spatial orientation without vision of the searched subjects, tending to underestimate.

SUBJECT	COURSE ESTIMATE
1	60 meters
2	500 meters
3	60 meters
4	245 meters
5	420 meters
6	534 meters
7	520 meters
8	140 meters
9	550 meters
10	700 meters

Table 3: Results of the course estimate in the landmark 3, located 600 meters from the initial point.

In landmark 3 located 600 meters from the initial point, as demonstrated in Table 3, the results of the course estimate covered in meters were underestimate by nine participants, having had great variability of results. One of the participants overestimated the distance, and no subject made right in the distance covered without vision. These results show that as in the distance covered increases (comparing with landmarks 1 and 2) the accuracy diminishes in the course estimate, having an increase of underestimate occurrences.

SUBJECT	COURSE ESTIMATIVE
1	100 meters
2	700 meters
3	120 meters
4	450 meters
5	540 meters
6	750 meters
7	620 meters
8	230 meters
9	660 meters
10	1000 meters

Table 4: Results of the course estimate in the landmark 4, located 800 meters from the initial point.

In landmark 4 located in the end of the track 800 meters from the initial point, it shows, as the results in Table 4, that nine subjects underestimated the distance covered also having great variability of results. Participant 10 overestimated the distance, and no subject made right the course estimate. These results show a confirmation of the trend presented in Landmark 3 that points a reduction of the accuracy in the course estimate.

Discussion

This work had its relevance by pointing variables that, in a next work, need to be more controlled, such as the great variability in the course estimates, which had occurred because some subjects did not know correctly how to describe the course estimate in meters. Perhaps in a next work it is necessary to instruct the participants before the experiment in a unit of distance bigger, as for example the Decameter, where the participants would have to memorize the unit through training without vision. The results of this experiment in trekking

without vision confirm the trend already demonstrated in the experiment of (LAWTON, 1996), *Strategies for indoor wayfinding: The hole of orientation*, that investigated the special orientation both in closed and open environments and pointed to an underestimate of covered distance.
In this experiment, according to the results, occurred the same situation, of that as the distance was increasing, occurred a bigger underestimate of the course. These results show that the course estimate based on the Patch Integration, that uses the relative information of speed and acceleration of the individual, does not possess a satisfactory accuracy, tending to a underestimate of distances. This work succeeded to investigate the course estimate in natural tracks with blindfolded subjects with vision, and opens the possibility for new experiments with blind subjects, supplying information for comparison.

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