

The Effects of Training Experience and Sense of Direction on Wayfinding Efficiency

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Introduction

Finding our way from place to place is essential to everyday functioning. Often, we rely on directions from others to find unfamiliar destinations, such as tourist sites. These directions might include a variety of cues, including cardinal descriptors (e.g. north, east) and left and right turns. How efficiently can people follow directions containing these cues? Moreover, is this ability related to one's overall sense of direction (Kozlowski & Bryant, 1977). People's self-ratings of sense of direction are highly accurate and reliable predictors of wayfinding performance (Prestopnik & Roskos-Ewoldsen, 2000; Sholl et al, 2000). One goal of this investigation was to further specify the relation between sense of direction and wayfinding efficiency.

A second goal was to examine how training experience with maps or models might facilitate wayfinding in large-scale environments. Kozlowski and Bryant (1977) investigated the impact of training experience and sense of direction by asking participants with good and poor senses of direction to walk through underground tunnels during four trials. After each trial, participants were asked to indicate the direction of the endpoint. Participants with a good sense of direction showed significant improvement over the four trials, indicating a learning effect that depended on sense of direction (see also Gillner & Mallot, 1998). In the present investigation, we sought to further specify the relation between sense of direction, training experience, and wayfinding efficiency by examining the effect of experience in a small-scale environment on later wayfinding in a larger environment.

Method

Seventy-two undergraduate students (36 men, 36 women) participated for extra credit in psychology courses.

The basement of a university building served as the large-scale environment. A 77.5 in. x 44 in. model of the basement served as the small-scale environment. Bound sets of note cards contained written directions for wayfinding.

Participants were randomly assigned to one of three training conditions: left-right, cardinal, or control. Participants in the left-right training condition followed sets of directions containing left-right descriptors, and participants in the cardinal training condition followed sets of directions containing north-south-east-west descriptors. On each of 6 trials, participants moved a toy person to follow the directions to a destination. Participants in the control condition completed a personality questionnaire.

After training, all participants followed 12 sets of directions (half containing left-right turns, half containing cardinal directions) by walking through the hallways of the basement. Wayfinding time errors were recorded.

Participants also completed self-report questionnaires assessing wayfinding strategies and sense of direction (Kozlowski & Bryant, 1977; Lawton & Kallai, 2002), as well as an orientation task in which they indicated the angular locations of five landmarks within the university building and five campus landmarks.

Results and Discussion

During the test phase, participants were significantly faster when following routes containing left-right directions ($M = 66.52$ s, $SE = 2.16$) than when following routes containing cardinal directions ($M = 77.37$ s, $SE = 2.35$). Similarly, participants exhibited significantly fewer errors when following routes containing left-right directions ($M = 1.32$, $SE = .42$) than when following routes containing cardinal directions ($M = 6.83$, $SE = .77$). As expected, participants in the cardinal training condition ($M = 70.18$ s, $SE = 3.78$) and left-right training condition ($M = 69.88$ s, $SE = 3.03$) were significantly faster than were participants in the control condition. Moreover, participants in the cardinal training condition ($M = 3.88$, $SE = .90$) exhibited significantly fewer wayfinding errors than did participants in the control condition ($M = 4.89$, $SE = .66$).

As sense of direction increased, preference for route wayfinding strategies decreased, and preference for orientation wayfinding strategies increased. As total direction-pointing error increased, wayfinding time and errors for routes containing cardinal descriptors also increased. These results indicate that sense of direction is related to wayfinding efficiency, thereby providing valuable information about the processes by which people find their way from place to place.

References

- Gillner, S., & Mallot, H. A. (1998). Navigation and acquisition of spatial knowledge in a virtual maze. *Journal of Cognitive Neuroscience*, 10, 445-463.
- Kozlowski, L. T., & Bryant, K. J. (1977). Sense of direction, spatial orientation, and cognitive maps. *Journal of Experimental Psychology: Human Perception and Performance*, 3, 590-598.
- Lawton, C. A., & Kallai, J. (2002). Gender differences in wayfinding strategies and anxiety about wayfinding: A cross-cultural comparison. *Sex Roles*, 47, 389-401.
- Prestopnik, J. L., & Roskos-Ewoldsen, B. (2000). The relations among wayfinding strategy use, sense of direction, sex, familiarity, and wayfinding ability. *Journal of Environmental Psychology*, 20, 177-191.
- Sholl, M. J., Acacio, J. C., Makar, R. O., & Leon, C. (2000). The relation of sex and sense of direction to spatial orientation in an unfamiliar environment. *Journal of Environmental Psychology*, 20, 17-28.