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Getting from Here to There: The Effects of Direction Type and Gender on Navigation Efficiency

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Introduction

Finding our way from place to place is essential to everyday functioning. Often, we rely on information from others to help us navigate. For example, people follow directions to get to unfamiliar destinations, such as airports and hospitals. One important goal is to determine the most effective way to give and follow directions.

What types of information are most effective? Previous research has focused on two common direction types: those using landmark descriptors (e.g., go toward the arena on Main St.) and those using cardinal descriptors (e.g., go east on Main St.). In general, landmarks are helpful navigation tools. For instance, routes with landmarks are learned more quickly than routes without landmarks (e.g., Jansen-Osmann, 2002; McFadden, Elias, & Saucier, 2003; Saucier et al., 2002). Many studies have also examined the effects of gender on navigation (e.g., Lawton, 2001; Sholl, Acacio, Makar, & Leon, 2000). Findings have revealed gender differences in navigation tasks, with men often outperforming women.

The present experiment investigated whether landmarks or cardinal directions were more effective as navigation tools and whether there were gender differences in navigation efficiency using these cues. We predicted that people would navigate faster and more accurately when given cardinal directions than when given landmarks and that men might navigate more efficiently than women.

Method

Ninety-two undergraduate students (46 males, 46 females) participated for extra credit in psychology courses.

A fictitious model town (6 ft. 6 in. x 4 ft.) served as the experimental space. The town contained 17 landmarks marked by unique pictures and labels (e.g., hospital). The town also contained 30 streets marked by blue tape and street names (e.g., Memory Lane). Bound sets of note cards contained directions for navigation: one with landmark directions and another with cardinal directions. A toy car was used during navigation.

Participants were randomly assigned to either the landmark condition or the cardinal condition. Participants in the landmark condition received directions involving landmarks (e.g., go toward the arena on Main St.), whereas participants in the cardinal condition received directions involving cardinal descriptors (e.g., go east on Main St.). The routes were identical in both conditions; however, the descriptions differed based on condition. Routes started at a landmark, included four turns, and ended at a destination. The order of routes was counterbalanced across participants.

During the familiarization phase, the experimenter pointed out the four cardinal directions and the 17 landmarks. Then, participants were given 30 seconds to familiarize themselves with the town. On each trial, the experimenter placed the toy car at a starting location and said, "Go." Participants read a set of directions and moved the car so it followed the directions to the destination.

Navigation time was calculated by averaging the time for all 17 trials. The total number of errors was calculated by summing the errors for all 17 trials. Errors included reversing, making a wrong turn, ending at the wrong destination, and not finishing the route.

Results and Discussion

Our main objective was to examine how quickly and accurately men and women navigated based on cardinal and landmark directions. As predicted, participants were significantly faster and more accurate when following cardinal directions than when following landmark directions. In addition, men navigated significantly faster than did women. These findings generally support our predictions, providing valuable information about the processes by which men and women use landmarks and cardinal directions to navigate from here to there.

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References

- Jansen-Osmann, P. (2002). Using desktop virtual environments to investigate the role of landmarks. *Computers in Human Behavior, 18*, 427-436.
- Lawton, C. A. (2001). Gender and regional differences in spatial referents used in direction giving. *Sex Roles, 44*, 321-337.
- MacFadden, A., Elias, L., & Saucier, D. (2003). Males and females scan maps similarly, but give directions differently. *Brain and Cognition, 53*, 297-300.
- Saucier, D. M., Green, S. M., Leason, J. MacFadden, A., Bell, S., Elias, L. J. (2002). Are sex differences in navigation caused by sexually dimorphic strategies or by differences in the ability to use the strategies? *Behavioral Neuroscience, 116*, 403-410.
- Sholl, J. M., 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.