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# The Effect of Direction Type and Environmental Scale 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? Previous findings indicate that men navigate more efficiently when following cardinal directions, whereas women navigate more efficiently when following landmark directions (Saucier et al., 2002). One goal of this investigation was to specify whether people are faster and more accurate when wayfinding based on directions that contain left and right turns or cardinal descriptors.

A second goal was to compare wayfinding processes across two environmental scales: a large-scale environment (the basement of a university building) and a similar small-scale environment (a model of the basement). Despite general theoretical agreement that environmental scale is important (Montello, 1993), there is little consensus regarding similarities and differences in processing across environmental scales. Further complications arise because most previous research has focused on only one scale or has used diverse tasks across scales (Saucier et al., 2002). The present investigation used comparable large- and small-scale environments and tasks to directly compare wayfinding processes. Although speculative, we predicted that wayfinding processes would be similar across both environmental scales.

## Method

Sixty-four undergraduate students (32 men, 32 women) participated for extra credit in psychology courses.

The basement of a complex, 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 followed three sets of cardinal directions and three sets of left/right directions in the large-scale environment and three sets of directions of each type in the small-scale environment. Routes included four turns and ended at a landmark. The assignment of routes to direction type and environmental scale and the ordering of wayfinding trials were counterbalanced across participants.

The experimenter first pointed out the four cardinal directions. On each trial, the experimenter noted the starting location. Participants read the sets of directions one at a time and walked through the hallways or moved the toy person in the model to follow the directions from the starting location to a destination. Mean wayfinding time and number of

errors were recorded. Participants also completed self-report questionnaires designed to assess familiarity with the university building, spatial anxiety, and wayfinding strategies (Lawton, 1994; Lawton & Kallai, 2002).

## Results and Discussion

Participants made significantly fewer errors when using left/right directions than when using cardinal directions. Moreover, they were significantly faster when wayfinding using left/right directions than when using cardinal directions in the small-scale environment. Unexpectedly, there was no significant difference across direction types in the large-scale environment, nor were there any significant gender differences in wayfinding performance. Interestingly, participants made significantly fewer errors and were significantly faster when wayfinding in the small-scale environment than in the large-scale environment.

As familiarity with the university building increased, wayfinding time and errors for trials using cardinal directions in the large-scale environment decreased significantly. Although wayfinding strategies were not related to wayfinding performance, strategies differed across gender such that men preferred global, survey strategies and women preferred route strategies. Similarly, women reported higher spatial anxiety than did men. These findings generally are consistent with previous results. Together, the present findings provide valuable information about the (similar) processes by which people find their way from place to place in large- and small-scale environments.

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