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The Mental Representation of Distances
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Knowledge about distances between objects in our environment enables us to remember routes and to decide which path to take to a given goal. The question of how this information is stored in memory is addressed by a number of models. The objective of this work was to test these models against each other experimentally.
Participants learned routes by navigating through virtual environments which were presented on a computer monitor. Subsequently they were asked to estimate distances between objects in the environment from memory. The time needed for these estimates was used to deduce properties of the underlying spatial representation.
The first part of this work focused on the question of how distances along routes are represented. The results are in line with the notion that these estimates result from mental scanning of a map-like representation.
The second part addressed the representational format that enables people to judge straight line distances between locations. Reaction times indicate that these distances are not reconstructed from route segments during the estimation process. Instead they support the notion that they also are estimated by scanning map-like representations.
In sum, the results are in contrast with the theory that spatial relations are reproduced by integrating explicitly encoded relations that are perceptually accessable while learning. Rather, it is proposed that spatial information is integrated to a high degree while it is encoded.