Introductions

• Does the direction of locomotion affect spatial updating?
• Do the biomechanics of locomotion influence the accuracy of spatial updating during open-loop walking?
• Spatial updating, or the process of keeping track of locations of objects relative to one’s spatial position while moving, is critical to a variety of navigation tasks.
• Although updating is likely to occur automatically during sighted walking, walking without vision (blind-walking) requires imagined updating of the spatial relationships that change concurrently with movement.
• Dynamic spatial updating likely underlies accurate performance when blind-walking to previously seen targets, a task commonly-used to assess distance perception (Rieser, Ashmead, Talor, & Youngquist, 1990).
• Studies of imagined walking suggest that the biomechanical information from locomotion influences the accuracy of spatial updating during blind-walking (Kunz, et al., 2009).
• Although less common, backward blind-walking is nearly as accurate as forward blind-walking, (Paquet, Rainville, Lajole, & Tremblay, 2007).
• We investigated the role of biomechanical information in spatial updating by manipulating the biomechanics of locomotion and the direction of spatial updating during 3 blind-walking experiments, extending and replicating previous experiments.

General Method

• View a target, create a mental image of the target in the surrounding environment, and walk forward or backward without vision to the target
• Forward and backward blind-walking to targets on floor
• 9 trials to 3, 4.5 & 6 or 2, 4.5 & 7 meters for each walking direction
• Experiment 1: Walking direction consistent with direction of spatial updating (targets at 3, 4.5, & 6 meters)
• Experiment 2: Decoupling walking direction and direction of spatial updating during backward walking (targets at 3, 4.5, & 6 meters)
• Experiment 3: Decoupling walking direction and direction of spatial updating during backward walking (targets at 2, 4.5, & 7 meters)

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References available upon request.