

A Science Bag for Putting

Eight on Your Plate, by Geoff Mangum, PuttingZone.com

Contained in this Science Bag are 8 studies concerning putting in golf, chosen as perhaps valuable to players of the game, as opposed to academics. They are:

1. [Grain on the Brain](#), by John Foy: USGA Agronomist points out for golfers how science has practically eliminated “grain” as a significant consideration in golf to the extent that, with only minor exceptions, grain has been a non-factor for over 30 years.
2. [Golfers' perceptions of green speed vary](#)- Over typical Stimpmeter distances, golfers are only guessing when ball-roll differences are less than 6 inches, by Douglas Karcher et al.: Golfers cannot tell which of two green surfaces is faster unless the difference between them in Stimpmeter measurement exceeds one-half a foot.
3. [Putting Green Speeds: Variables and Consequences](#), by Wayne Kussow: Daily speed changes, accelerate starting around 2 pm to lose about 8” 2-6 pm; seasonal: early Fall is faster than Spring or Summer; chronically faster greens have wider daily/weekly variation (about 1') than slower greens (about 8”); greens vary individually, not consistently as a set of 18 greens (some get quicker while other slow down).
4. [The Physics of Putting](#), by Tony Penner: Using standard physics to “model” what happens when a putter sends a ball across a contoured green, Penner examines the relevant considerations affecting the success or failure of putts.
5. [Golfers May Have to Overcome a Persistent Visuospatial Illusion](#), by Alan Johnston et al.: Pointers aiming at targets seen from side-on appear to aim to the inside of the target and have to be rotated clockwise (for right-handers at address) a median error of 1.25 degrees; this perceptual bias does not differ with skill level and does not diminish with aiming practice. [The targeting “look” movements are the problem, not the visual equipment or the brain; the flawed “look” movement confuses the body’s sense of target location by misaiming the action, while the eyes are merely looking at the intended space and are not integrally involved in the action in the way the body is involved.]
6. [Is Your Eye on the Ball?: Eye Tracking Golfers while Putting](#), by Mark Fairchild et al.: advanced-level golfers have a more routinized and effective use of the eyes in putting, from looking mostly at the final segment of the path, to imagining and visualizing a successful putt, to retracing the path back to the ball, and to fixing the gaze directly behind the ball during the stroke. [The question is how do they get that way and why.]
7. [Head-Putter Coordination Patterns in Expert and Less Skilled Golfers](#), Timothy Lee et al.: Contrary to golf lore, all golfers move their heads during the putting stroke -- bad golfers move the head towards the target in the thru-stroke while good golfers move the head away from the target in the thru-stroke.
8. [Cognitive Effort and Motor Learning](#), by Timothy Lee et al.: “Groove the move” teaching does not best promote skill acquisition, which requires the learner attaining “augmented feedback” at a cognitive level of how the skill works, with important consequences for using models and exploration processes and guiding the “know how” acquisition process for effective learning and performance.