Researchers find variation in foot strike patterns in predominantly barefoot runners

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A recently published paper by two George Washington University researchers shows that the running foot strike patterns vary among habitually barefoot people in Kenya due to speed and other factors such as running habits and the hardness of the ground. These results are counter to the belief that barefoot people prefer one specific style of running.

Kevin Hatala, a Ph.D. student in the Hominid Paleobiology doctoral program at George Washington, is the lead author of the paper that appears in the recent edition of the journal Public Library of Science, or *PLOS ONE*. In their study, Mr. Hatala along with Brian Richmond, associate professor of anthropology within GW's Columbian College of Arts and Sciences, contradict the idea that all habitually barefoot people run by landing on their forefoot first in order to avoid the high impact forces typically associated with a heel strike. This idea has become widely cited in popular running journals and has helped fuel the barefoot running movement now popular among recreational runners. However, previous research supporting this hypothesis was limited to only one population of habitually barefoot people.

Mr. Hatala, Dr. Richmond and their colleagues studied the Daasanach, a modern habitually barefoot population from northwestern Kenya, to support their theory. Data was collected from 38 adults as they ran along a track with a plantar pressure pad placed midway along its length. The subjects ran at self-selected endurance running and sprinting speeds. The collected data supported the theory that a forefoot strike reduces the

magnitude of impact forces on the feet, but the majority of Daasanach subjects opted instead to use a rearfoot strike at endurance speeds.

"The Daasanach people grow up without shoes and continue to spend most of their lives barefoot," said Mr. Hatala. "We were surprised to see that the majority of Daasanach people ran by landing on their heels first and few landed on their forefoot. This contradicts the hypothesis that a forefoot strike characterizes the 'typical' running gait of habitually barefoot people."

Some Daasanach individuals switched to a forefoot strike when running at high speeds but a forefoot strike was not the typical foot strike pattern at any speed.

The analysis of running gaits within the Daasanach is only the second study of its kind and its results differed significantly from those of earlier research, which had suggested that, when running at endurance speeds, habitually barefoot people tend to land on their forefeet instead of their heels. Given that humans were barefoot for millions of years during which our foot evolved its current shape, the research also has implications for hypotheses regarding the running gaits that would have been used by our ancestors.

Mr. Hatala said the results of the study suggest that running speed, alongside other factors such as the firmness of the running surface, may have similarly influenced variation in the running gaits of early man, rather than one gait being preferred in all circumstances.

"The challenge ahead is to identify the most important factors that influence how barefoot people run and the healthiest style for today's runners," said Dr. Richmond, a co-author of the research.