

# Is magnetoreception experience-dependent in humans?

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## Abstract

Some humans, like other animals, may sense magnetic fields: Gurindji people from Australia can locate a hidden magnet solely based on magnetoreception, but an American control group cannot (Meakins, 2022). Why can only some humans use magnetoreception? One possibility is that human magnetoreception is experience-dependent: the fundamental capability may be universal, but the Gurindji learn to use it reliably because, unlike Americans, their language and culture promotes paying constant attention to cardinal directions and thinking about space using a geocentric cognitive map, which sensing the Earth's magnetic field would help with. If so, we might expect other cultures using geocentric thinking, such as the Hai//om people from Namibia, to have also learned to use magnetoreception. We tested this and found that, unlike Gurindji, Hai//om people could not locate a hidden magnet at above chance levels, suggesting that learning to think geocentrically may not be sufficient to acquire magnetoreception.