

Getting Lost via GPS

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“Wait... no... TURN HERE!” I spun the wheel of my red SUV-sized Jeep across three lanes of traffic and onto the exit ramp, narrowly missing... well, everything. We careened down the exit ramp and I hit the brakes to come to a full stop. Heart beating and adrenaline pumping, I looked over at the source of the yelled directions that very nearly ruined us. Molly, my best friend and navigator on our old-fashioned road trip across costal Maine, opened her clenched eyes and uncurled her hand from the ‘oh, shit’ handle above her window. She looked at me, not comprehending how we managed to survive -- a look I’m sure I echoed. But, after a beat or two, we started to laugh. We kept laughing, fueled by the pulsing adrenaline, and pulled off the ramp into a gas station to gather our remaining wits and reexamine the map.

I still attest that our near-death experience was not my fault, but it wasn’t Molly’s either. Earlier that morning I sat at the breakfast table of Molly’s grandparent’s lake house with my atlas and planned our route home. My parents had drilled into me the absolute necessity of having an atlas and its well-worn pages were my constant travel companion. Molly, on the other hand, hadn’t been her family’s self-assigned navigator, so when we finally clambered into my Jeep to head home, I carefully explained the route and handed my well-worn travel buddy over to her. The drive was smooth until late afternoon when I mistakenly got on the wrong highway. The rest, you know, is history. To save our friendship (and probably our lives), we used a GPS for the rest of the trip.

Molly and I almost died not only because of my bad driving, but also because of a fairly common occurrence in our generation: map illiteracy. People who grew up with GPS technology never gained the ability to read maps or even navigate, and thus are dependent on technology until a dead battery or lack of data renders it useless. Then, users are on their own and, without map skills, out of luck. Users’ inabilities with maps are partially because of the disuse of maps and partially a direct symptom of GPS use. A GPS acts as a crutch for its users; users have no need to pay attention to their routes or what they are doing because a

GPS takes care of it for them. While a GPS does show a map of the immediate area around travelers, travelers do not watch the map as they drive; all they need to do is listen to the narrated directions and mindlessly follow. Thus, they do not get the practice of map reading, nor do they build mental maps that are necessary to navigation by remembering streets, turns, and landmarks.

One traveler guilty of this, Leon Neyfakh, explained his GPS dependence for the *Boston Globe*. In his article, "Do Our Brains Pay a Price of GPS?" he examines his own experiences of being unable to navigate to work without his 'crutch.' Neyfakh explained that although he had been following GPS directions to his new workplace for a few days, when he tried to get home without any help he got lost immediately and resorted back to his GPS. Neyfakh is an example of travelers not paying attention when using a GPS and thus not building a mental map. Once Neyfakh sat down and studied his route on a map, he was able to picture it and could do it without guidance: he created a mental map of his commute. Now, if need be, Neyfakh would do just fine without the crutch of technology. In Neyfakh's case, his GPS dependence ending up harming him more than it helped him as his obliviousness to his environment and dependence on GPS directions didn't help him learn anything about his route. In fact, by not paying attention and creating mental maps, it is possible to lose the ability to navigate at all.

Monika Bachmann, for *Papers in Applied Geography*, has examined this phenomenon by studying community college students. Her paper, "Exploring and Addressing Functional Map Illiteracy in Community College Students," states that GPS users lose the ability to form cognitive maps. Cognitive maps are mental maps of physical places; if you close your eyes and picture the layout of your bedroom, you are picturing a cognitive map of this area. What you see in your mind's eye is the spatial relationships between your bed, dresser, and walls. Cognitive maps are essential to navigation because they help us recognize where we are in relation to everything else. Without them, we could lose the ability of identifying spatial relationships -- a crucial qualification to map literacy and independence from technology.

Although I wouldn't learn the term "cognitive map" for many years, I began developing navigational skills as a little kid. I was an only child with a huge imagination and spent much of my childhood staring out of windows. I watched playgrounds from classrooms, clouds from my bedroom, and roads from the passenger seat. I took the

navigator's seat every chance I got and soon took the responsibility of navigator as well. The driver, my father and personal chauffer, would get so absorbed into his own thoughts that he would forget to turn, and that's where I came in. By age ten, I had a fully developed cognitive map of my town and surrounding area. I flaunted this skill every chance I got, recommending shortcuts and back roads. My aunt loves to tell the story of her little navigator, age seven, telling her that she was taking the long route and shouldn't she take the next left? This talent, while only mental at the time, was crucial to developing my map literacy. As I became intimately familiar with the layout of my town, my spatial awareness grew. All my practice and backseat driving paid off the first time I was handed a map and asked to navigate; it clicked instantly and I became a navigator for life.

Maps are reliant on spatial awareness. To use a map you must first recognize where you are in relation to something on the map. Only once you identify your location can you figure out where to go and how to get there. Molly does not have this ability. She could not mentally picture her location on the atlas, and thus could not properly navigate. The default reaction from Molly and GPS users is to simply turn on automated directions and travel passively. This type of travel is blind to spatial relationships. A GPS does not relay any spatial context as its screen only shows the immediate area around a specific route and doesn't give greater context. Thus, GPSs themselves don't relay spatial relationships. Furthermore, travelers following GPSs are not aware of what is around them as they travel and therefore do not build spatial relationships in their mind. Like Neyfakh, travelers are only interested in their destination and don't see anything else, regardless of how many times they travel the route. GPS users are losing their natural ability of spatial recognition in favor of taking the easy way, and, in doing so, are lessening their brainpower.

GPS reliance has been proven to have more serious consequences than just map illiteracy. By relying on automatic navigation tools, travelers have no need to pay attention to their surroundings such as roads, turns, and landmarks. This passivity lessens brain activity and can actually affect brain structure. As described by Julia Frankenstein for the *New York Times*, grey matter in the hippocampus increases with spatial experience. In her article, "Is GPS All in Our Heads?" Frankenstein cites Eleanor A. Maguire's work with London taxi drivers and their hippocampi. Maguire found the taxi drivers' hippocampi to be abnormally large and related this effect back to the intricate streets of London that the

drivers were required to memorize. In an expose by *National Geographic*, Dan Stone examined the mental product of these taxi drivers. In his article "The Bigger Brains of London Taxi Drivers," Stone explains that drivers are required to know every neighborhood and street in London, one of the largest cities in the world. To become qualified, they are tested on the most effective routes and landmarks along the way; this means that cabbies have huge, intricate cognitive maps and exceptional spatial recognition. At the end of their studies their hippocampi will be, on average, larger than all other studied professions. When asked about their mental process during these tests and everyday work, cabbies compared their mental process to an explosion. The second a customer states their destination, cabbies' brains come alive, imagining routes. Taxi drivers are uniquely aware of their cities and benefit in greater brainpower from this; unfortunately, most people do not have this awareness. Many people will never experience this 'explosion' and will always have to rely on technology to navigate.

One person with this lack of 'explosion,' is the aforementioned Leon Neyfakh for *Boston Globe*. In his article, Neyfakh explains his struggles with his own work commute, and examines the work of Veronique Bohbot, a neuroscientist at McGill University. Bohbot has found that people with smaller hippocampi are at a higher risk for psychiatric disorders such as PTSD and dementia. Because relying on a GPS can decrease the size of a hippocampus, people can lessen their risks by enlarging their brain in physical size and in brainpower. However, Bohbot is quick to qualify her prognosis by explaining that map literacy won't directly prevent psychiatric disorders, but by exercising navigational skills people can grow their hippocampi and decrease risks associated with small hippocampi. Fortunately, the risks are small and most people will only see consequences of having a smaller hippocampi and lessened spatial memory in mundane, everyday occurrences such as getting lost on their well-rehearsed commute to work.

Most people who don't exercise their hippocampi will only see their lessened abilities on the road. These people, like Molly, may not be able to read a map or get home from an unfamiliar place without the crutch of technology. This inability, as defined by Bohbot, can also affect other simple everyday aspects of life such as planning for the day or packing for trips. These seemingly simple chores are based off of mental planning -- a talent that mirrors cognitive mapping. To plan a day, or pack for a trip, people must be able to picture where

they will be, what they will be doing and what they will need. In essence, they create a mental map of their day or trip. All of these abilities are linked to spatial memory, so, shouldn't everyone be inherently aware of their disability and want to rid themselves of it? Or is it possible that GPS reliance has so completely taken over our society that we'll be lost when it fails us?

Molly may never learn how to read a map and I may be last annoying seven-year-old navigator; but this doesn't have to be the case. If people start venturing forth without their GPSs, even just in their own neighborhoods, they can start to reverse the damage done from their mindless passivity.

Works Cited

- Bachmann, Monika. "Exploring and Addressing Functional Map Illiteracy in Community College Students." *Papers in Applied Geography* 1.3 (2015): n. pag. *Taylor & Francis*. 24 July 2015. Web. 10 Apr. 2016.
- Frankenstein, Julia. "Is GPS All in Our Heads?" *The New York Times*, *The New York Times*, 04 Feb. 2012. Web. 10 Apr. 2016.
- Neyfakh, Leon. "Do Our Brains Pay a Price for GPS? - The Boston Globe." *Boston Globe*, 8 Aug. 2013. Web. 11 Apr. 2016.
- Stone, Dan. "The Bigger Brains of London Taxi Drivers." *National Geographic Blogs*, *National Geographic*, 29 May 2013. Web. 11 Apr. 2016.