Negligence

Nature abhors a vacuum. And so do we.
— Oliver Sacks in Everything in its Place

I first met S. while she was recovering from a stroke. She was in her mid-twenties, healthy (stroke aside), and without prior medical history; the stroke had defied all odds and known risk factors to hit her out of nowhere. Some people are just unlucky, I thought to myself as I went through her file in preparation for our first appointment. S. had suffered an ischemic stroke due to a blood clot in the middle cerebral artery, affecting the right parietal lobe. The stroke had been mild, and most symptoms had cleared up quickly. But she had remained clumsy in a way that her file described as “odd, without her seeming to be fully aware of it.”

When S. entered my office, she was accompanied by her sister. She told me that, for the first few days after the stroke, she had felt weak and confused. And she had been terribly afraid that she would remain disabled for the rest of her life. But the worst of the symptoms had subsided, and now she felt good again; in some ways she even felt better than ever, because she had a renewed appreciation for life. But, she said, she still experienced occasional difficulties. Before the stroke, she had gone running several times a week. But now she couldn’t anymore, because she tended to bump into things. And she sometimes failed to notice oncoming traffic, which had already resulted in a few close calls. She had coped with these difficulties by going swimming instead, which was safer, because in a swimming pool there was no traffic and there were fewer things to bump into.

On my desk I kept a tablet computer for quick diagnostic tests. I started a so-called cancellation test, which consisted of a few dozen empty checkboxes that were laid out in a random pattern. The goal was to check each box by tapping on it. I gave the tablet to S. and explained the procedure. She tapped the screen intently for a minute or so, and then handed the tablet back to me. She said that it was a deceivingly difficult task, but that now she really couldn't find any unchecked boxes anymore. I looked at the tablet. S. had checked all of the boxes on the right side of the screen, but only some of the boxes on the left.

I explained to S. that she suffered from a condition called hemispatial neglect, and that this was common after the kind of stroke she had suffered.

Neglect is a strange condition. Even after having seen it so many times, I struggle to understand it, let alone explain it. The main symptom is—for want of a better description—an extreme lack of curiosity for things that are on the left. Vision as such is not impaired, or at least not in the sense of blindness: S. had perfect vision and still suffered from neglect. Rather than suffer from a loss of vision, people with neglect fail to direct their attention towards things and people on their left, and as a result often bump into them.

Fortunately, I emphasized, given how quickly S. had recovered after the stroke, it was likely that the lingering symptoms of neglect would also clear up after a few weeks. We agreed that we would give it some time, and that for now she would follow the regular revalidation program. If the symptoms still persisted after a month, we would schedule a new appointment.

I did not see S. again until about a year later.

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Some brain areas are much more likely to be affected by stroke than others. This is because the brain's blood supply comes from several cerebral arteries, some of which are more vulnerable than others. The second time that I met S., she was again recovering from a stroke, but this time it had affected an unusual part of her brain. The damage seemed to be limited to a small region of white matter, which is the tissue that connects different brain areas. The affected region was slightly dorsal to the medial temporal lobe. Her file was unclear about the exact symptoms that S. suffered from. But the pattern did not strike me as consistent with classic hemispatial neglect.

When S. entered my office, again accompanied by her sister, she walked with a slight limp. I initially interpreted this as some residual paralysis, which is common after stroke. But then I noticed bandages on her foot and arm.

S. told me that she had lost consciousness as a result of the stroke. When she had come to, she had felt more or less the same as after the first stroke: confused, weak, and afraid. But as the symptoms cleared up, she had started to feel better. When I asked what kinds of problems she still experienced, she seemed to struggle to understand the question. Her sister intervened and told me that S. sometimes behaved strangely; but she too was unable to formulate clearly what exactly it was about S.'s behavior that made it strange. When I asked about the bandage, her sister explained that S. had gone for a run in the park (she had picked up this habit again), and that she had been bitten in the leg by a dog. The strange thing was, her sister said, that she knew this only from bystanders who had seen the attack happen. S. herself seemed not to have registered the dog, nor the bite. On another occasion, S. had burnt herself badly on the fire of a gas stove. While cooking, she had simply reached into the flames, apparently unaware of their danger.

I was puzzled by the unfamiliar pattern of symptoms. I told S. and her sister that I needed some time to think about it, and that I would contact them again soon to schedule another appointment. I encouraged them to be careful. The strange behavior of S. worried me.

♈

That evening at home, I sat down on the sofa in the living room and opened my laptop. I logged into the hospital server and viewed an anatomical scan of S.'s brain. I referenced it against a standardized brain atlas to get a more detailed picture of the extent of the damage. I was struck by how focal the damage was; a stroke is usually diffuse, affecting large parts of the brain. But in this case the damage was limited to a small white-matter tract that connects the amygdala to the posterior parietal lobe.

I walked to the kitchen. I took a can of sardines from a cupboard and a can of beer from the fridge, and sat down at the kitchen table to have dinner. This used to be the place and time to tell my wife about what had happened at work that day. I would tell her about my patients, and about how they struggled and coped with their conditions in as many different ways as there were people; about strange symptoms; about unusual types of brain damage; about ideas that I had. I used to tell her everything. And I still did, sometimes. And as I was talking to her, structuring my thoughts, eating sardines and drinking beer, a possible explanation for S.'s symptoms began to form in my mind.

I walked back to the living room, picked up my laptop, and started to work on a variation of the checkbox test, in which I replaced the checkboxes by small photos. Happy photos, disgusting photos, neutral photos, scary photos—I needed a wide variety of emotions. When I was done, I looked up and momentarily made eye contact with my wife, who looked at me through a photo on the wall in front of me. I quickly averted my gaze.

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The third time that I met S. was about a week later. She had bruises on her face. She was again escorted into my office by her sister. I asked how things were going, and S. replied that, even though she still experienced moments of confusion, things were going very well overall. She said that she felt happy, and two lively eyes sparkled at me from between the bruises on her face. But her sister did not share this positive outlook. She told me that S. continued to behave recklessly, as though she had no regard for her own safety. She began to list all the precarious situations that S. had gotten herself into: she had been hit by a car while crossing the street, and it was pure luck that she hadn't been hurt more badly; she had fallen into the freezing water of a pond in the park; and worst of all, she had started seeing a man with a drinking habit, and the bruises on her face testified to this man's lack of self-control. While her sister was telling all of this, S. simply sat there, listening, or perhaps not, with a content expression on her face.

I asked S. if she remembered the checkbox test from the previous time, and she said that she did. I explained that I had a test that was similar yet slightly different. Instead of checkboxes, there were photos, and the task was to make all photos disappear by tapping on them. To demonstrate this, I tapped on a photo of a hammer, which disappeared as soon as I touched it. I gave the tablet to S., and she started to tap on the photos, making them disappear one at a time. When about two-thirds of the photos were gone, she gave me back the tablet, saying that she was done.

I looked at the tablet. The remaining photos included a dead body, a gun, an explosion, a tarantula, a crying face, a starving child, and a growling rottweiler. The cute puppies were all gone. The neutral photos of houses and kitchen utensils were all gone. Only danger and sadness remained. I turned the tablet around so that the remaining photos were clearly visible to S. I asked her if she was sure that she was done; she told me that, yes, she was absolutely sure.

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That evening at home, I explained to my wife what I had explained to S. and her sister earlier that day, after I had seen my hypothesis confirmed by the photo-tapping test. I was now convinced that S. suffered from a rare and hitherto unknown type of neglect: a failure to attend to sad and dangerous things. I called it affective neglect.

Threatening things trigger a strong response in a part of the brain that is called the amygdala. The amygdala then sends a signal to the parietal cortex, which in turn triggers a shift of attention towards the source of the danger. Or at least that's how things work in a healthy brain. In the brain of S., the white-matter tract that connects the amygdala to the parietal cortex was damaged. As a result, the amygala could no longer inform the parietal cortex of the presence of danger, and dangerous things therefore no longer grabbed attention. Whether it be a vicious dog, a burning flame, or an abusive boyfriend—in all of these situations, S. was incapable of recognizing danger.

I was satisfied with my medical detective work. I imagined that my wife would be proud. And so would our daughter, proud of her daddy, the clever doctor, and she would understand why he has to work so much. Perhaps I could visit her school sometime and talk about brains. Kids like that.

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The fourth time that I saw S., she was covered in wounds and bruises. But she looked as cheerful as ever. Her sister, on the other hand, looked desperate. But her desperation was mixed with a glimmer of hope, because I had told her on the phone about a new, experimental treatment that might be able to help S.

The treatment consisted of bypassing the damaged white matter with two wirelessly connected chips. One chip would be surgically implanted on one side of the damaged white matter; the other chip would be implanted on the other side. The chips would register incoming neural impulses, digitize them, and then transmit them wirelessly to the other chip, where the digital signal would be converted back into neural impulses. In the case of S., this would allow neural impulses to once again flow from the amygdala to the parietal cortex.

I enrolled S. into a small-scale clinical trial so that she would be among the first patients to benefit from this experimental treatment.

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That evening at home, I looked through my collection of wine bottles. I felt that S. now had a good chance of full recovery, and that this was an occasion to celebrate. I prefer red, but my wife prefers white, and so I settled for an expensive bottle of pinot gris. I poured myself a glass, put on some music (Satie's Gnossienne No. 2), and sat down on the sofa.

I looked at the photo on the wall in front of me. I had never taken it down, because taking it down seemed as obscene as leaving it up, and so I had fallen back to the default of doing nothing. The photo had been taken on a holiday some years ago. It showed my wife, my daughter, and myself. We smiled, even though that day had been tense; the air had been filled with the kind of resentment that is not named but affects every word that is spoken, every little gesture that is made, and every brief moment of eye contact. I thought about how photos can convey so many different emotions at the same time. I felt happiness when looking at the smiling face of my daughter, and fear and anger and also happiness when looking at my wife. And I felt disgust when looking at myself. These primary emotions mixed into a rich blend of secondary emotions: guilt, shame, love, jealousy, and the emotion of missing someone. And I thought about how strange it is that there is no word for the emotion of missing someone, even though it is such a powerful emotion. And then I thought how fitting it is that such a word should be missing from our vocabulary.

I asked how our daughter was doing, how things were at school, and if our daughter had enough friends to play with, and if she and M. were taking good care of her while I was not there. I noticed that the music had stopped, and that my voice was the only sound in the room. I picked up my glass and the empty bottle, and brought them to the kitchen. I put the glass into the dishwasher. Then I took a sleeping pill and went to bed.

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The fifth time that I saw S., I visited her in the hospital. The white-matter-bypass surgery had been successful, and now the question was whether her affective-neglect symptoms would be reduced as well. When I asked her how she felt, she said that she felt ok, but that she was very tired and mostly wanted to sleep. I assured her that I would be on my way again quickly, but that, if she felt up to it, I had brought the picture-tapping test with me to see if her condition had improved. She agreed to do the test, took the tablet from me, and listlessly tapped on all the pictures, including the nasty ones, until none were left; there was no longer any sign of affective neglect. I expressed my amazement about her instantaneous recovery. S. gave me a faint smile, but it appeared to be mostly for my benefit. Then she turned around and went back to sleep.

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The sixth time that I saw S., she came to my office alone and unannounced while I was working late. Physically, she looked as healthy as I had ever seen her. But her expression was emotionless and flat. Before I had even had the opportunity to ask how she was doing, she told me that the period after the surgery had been horrible. Everywhere she looked, she saw danger. She saw people who might hurt her, traffic that might hit her, food that might poison her, flames that might burn her, a boyfriend who might beat her. I pointed out that the world was, in many ways, a dangerous place, and I suggested that her renewed attention to danger might just be a proportional response to things that were in fact dangerous. She replied that, while this might be so, she could no longer stand a life that was dominated by fear. Her condition had allowed her to experience for the first time what it was like to be carefree and unafraid. It had been the happiest time of her life. No, she corrected herself, it had been the *only* truly happy time of her life. I pointed out that she had also been severely hurt on many occasions, as a result of her condition. She said that she didn't care. I want it back, she said.

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That evening at home, I opened my laptop and started working on a new surgical protocol. I entered the talairach coordinates of the white-matter tract that had been damaged by S.'s stroke. Based on this, the computer determined the best path of entry into the brain. This consisted of entering the skull from the top, and then lowering a needle mostly through the interhemispheric fissure until it reached the target area. The surgery was not complicated, and the operating computer would be able to perform it on its own.

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The seventh time that I saw S., she visited my office, again in the company of her sister. There was an emptiness in her expression that reminded me of chronic depression. I want it back, she said again, using the same intonation and the same phrasing that she had used the previous time. Her sister and I looked at each other. I explained to S. that she had the right to refuse treatment, but that it was my medical opinion that it was unwise and dangerous to disable the white-matter bypass. I explained that was she was feeling now was a generalized anxiety disorder, which could be treated with a combination of psychotherapy and medication. I offered to prescribe oxazepam to reduce the acute feeling of anxiety, and to schedule an appointment with a psychotherapist. Then her sister pleaded with S., recalling all the times that S. had gotten badly hurt as a result of her condition, and asking her to please, *please* not deactivate the white-matter bypass. But there was no pleading with S. She just repeated: I want it back.

And so I took my tablet and logged into the chips that had been implanted into S.'s brain. And I deactivated them. This was the last time that I saw S. A few weeks later she would be hit by a car while running in the park. She would die on impact.

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Later that day I went into one of the operating rooms of the hospital. I loaded my surgical protocol into the computer, and activated the voice-control system. I prepared a surgical needle with ibotenic acid, a neurotoxin that causes permanent brain damage. I put the photo of my wife, my daughter, and myself in front of the surgical chair. Then I climbed into the chair. I ordered the computer to restrain my head. The computer lowered an iron cap onto my head, and a dozen-or-so steel pens emerged from it, pressing against my skull to keep my head firmly in place. Then I ordered the computer to start the surgery. I felt a sting as a local anesthetic was injected into the skin at the top of my head. The computer waited for a few minutes for the anesthetic to take effect. I forced myself to look at the photo. That day hadn't been all bad, I remembered. We had gone for a walk in the morning, and it had been warm and sunny, and our daughter had wanted ice cream, and my wife had said no because we would have lunch soon, but I had said yes because lunch could wait. Then the computer used a small drill to pierce my skull and the dura mater beneath it. Slowly, one millimeter at a time, the needle was lowered into my brain. I still looked at the photo. I let a bitter-sweet cocktail of emotions wash over me one last time. My wife told me that it was her medical opinion that I was making the wrong choice, that I was about to lose so much, and that fear and pain and the feeling of missing someone are part of life. But I said to her that I didn't care. I don't want it anymore, I said. Then the computer released the ibotenic acid.

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