

Fast News Digest

Analysis of news from diverse international, political, business sources

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Intuition can be trained

[New York Times](#)

Commentary

Ernst Rommel was said to have had a sixth sense when it comes to physical danger while in battle. The war against Improvised Explosive Devices in Iraq and Afghanistan is now pushing scientists to study the phenomenon and coming up with sensible conclusions. Both the ability to perceive the environment and being aware of it clearly, and the ability to override natural stress response of "fight or flight" help create a clear head to be in touch with the barely conscious signals that the brain gives off.

Excerpts

The sight was not that unusual, at least not for Mosul, Iraq, on a summer morning: a car parked on the sidewalk, facing opposite traffic, its windows rolled up tight. Two young boys stared out the back window, kindergarten age maybe, their faces leaning together as if to share a whisper.

For all that scientists have studied it, the brain remains the most complex and mysterious human organ — and, now, the focus of billions of dollars' worth of research to penetrate its secrets.

Jennifer Murphy, a psychologist at the Army Research Institute, demonstrated a test used to determine the characteristics of service members who might have exceptional abilities at detecting roadside bombs.

The soldier patrolling closest to the car stopped. It had to be hot in there; it was 120 degrees outside. "Permission to approach, sir, to give them some water," the soldier said to Sgt. First Class Edward Tierney, who led the nine-man patrol that morning.

"I said no — no," Sergeant Tierney said in a telephone interview from Afghanistan. He said he had an urge to move back before he knew why: "My body suddenly got cooler; you know, that danger feeling."

The United States military has spent billions on hardware, like signal jamming technology, to detect and destroy what the military calls improvised explosive devices, or I.E.D.'s, the roadside bombs that have proved to be the greatest threat in Iraq and now in Afghanistan, where Sergeant Tierney is training soldiers to foil bomb attacks.

Still, high-tech gear, while helping to reduce casualties, remains a mere supplement to the most sensitive detection system of all — the human brain. Troops on the ground, using only their senses and experience, are responsible for foiling many I.E.D. attacks, and, like Sergeant Tierney, they often cite a gut feeling or a hunch as their first clue.

Everyone has hunches — about friends’ motives, about the stock market, about when to fold a hand of poker and when to hold it. But United States troops are now at the center of a large effort to understand how it is that in a life-or-death situation, some people’s brains can sense danger and act on it well before others’ do.

Experience matters, of course: if you have seen something before, you are more likely to anticipate it the next time. And yet, recent research suggests that something else is at work, too.

Small differences in how the brain processes images, how well it reads emotions and how it manages surges in stress hormones help explain why some people sense imminent danger before most others do.

Studies of members of the Army Green Berets and Navy Seals, for example, have found that in threatening situations they experience about the same rush of the stress hormone cortisol as any other soldier does. But their levels typically drop off faster than less well-trained troops, much faster in some cases.

In the past two years, an Army researcher, Steven Burnett, has overseen a study into human perception and bomb detection involving about 800 military men and women. Researchers have conducted exhaustive interviews with experienced fighters. They have administered personality tests and measured depth perception, vigilance and related abilities. The troops have competed to find bombs in photographs, videos, virtual reality simulations and on the ground in mock exercises.

The study complements a growing body of work suggesting that the speed with which the brain reads and interprets sensations like the feelings in one’s own body and emotions in the body language of others is central to avoiding imminent threats.

“Not long ago people thought of emotions as old stuff, as just feelings — feelings that had little to do with rational decision making, or that got in the way of it,” said Dr. Antonio Damasio, director of the Brain and Creativity Institute at the University of Southern California. “Now that position has reversed. We understand emotions as practical action programs that work to solve a problem, often before we’re conscious of it. These processes are at work continually, in pilots, leaders of expeditions, parents, all of us.”

Seeing What Others Miss

The patrol through Mosul’s main marketplace never became routine, not once, not after the 10th time or the 40th. A divot in the gravel, a slight shadow in a ditch, a pile of discarded cans; any one could be deadly; every one raised the same question: Is there something — anything — out of place here?

Clearing a road of bombs is one of the least glamorous and most dangerous jobs on the planet. It is also one of the most important. In May, coalition forces found 465 of them in Afghanistan and 333 in Iraq. The troops foiled more than half the traps over all — but about 10 percent of the bombs killed or maimed a soldier or a Marine.

“We had indicators we’d look for, but you’d really have to be aware of everything, every detail,” said Sergeant Tierney, whose unit was working with the Iraqi police in that summer of 2004.

In recent years, the bombs have become more powerful, the hiding places ever more devious. Bombs in fake rocks. Bombs in poured concrete, built into curbs. Bombs triggered by decoy

bombs.

“On one route sweep mission, there was a noticeable I.E.D. in the middle of the road, but it was a decoy,” said Lt. Donovan Campbell, who in 2004 led a Marine platoon for seven months of heavy fighting in Ramadi and wrote a vivid book, “Joker One,” about the experience. “The real bomb was encased in concrete, a hundred meters away, in the midst of rubble. One of my Marines spotted it. He said, ‘That block looks too symmetrical, too perfect.’ ”

Lieutenant Campbell had the area cleared and the bomb destroyed.

“Unless you know what rubble in that part of Iraq looks like, there’s no way you’d see that,” he said. “I had two guys, one we called Hound Dog, who were really good at spotting things that didn’t fit.”

The men and women who performed best in the Army’s I.E.D. detection study had the sort of knowledge gained through experience, according to a preliminary analysis of the results; but many also had superb depth perception and a keen ability to sustain intense focus for long periods. The ability to pick odd shapes masked in complex backgrounds — a “Where’s Waldo” type of skill that some call anomaly detection — also predicted performance on some of the roadside bomb simulations.

“Some of these things cannot be trained, obviously,” said Jennifer Murphy, a psychologist at the Army Research Institute and the principal author of the I.E.D. study. “But some may be; these are fighters who become very sensitive to small changes in the environment. They’ll clear the same road every day and notice ridiculously subtle things: this rock was not here yesterday.”

In a study that appeared last month, neuroscientists at Princeton University demonstrated just how sensitive this visual ability is — and how a gut feeling may arise before a person becomes conscious of what the brain has registered.

They had students try to pick out figures — people or cars — in a series of photos that flashed by on a computer screen. The pictures flashed by four at a time, and the participants were told to scan only two of them, either those above and below the center point, or those to the left and right. Eye-tracking confirmed that they did just that.

But brain scans showed that the students’ brains registered the presence of people or cars even when the figures appeared in photos that they were not paying attention to. They got better at it, too, with training.

Some people’s brains were almost twice as fast at detecting the figures as others’. “It appears that the brain primes the whole visual system to be strongly sensitive to categories of visual input,” kinds of things to look for, said Marius V. Peelen, a neuroscientist at Princeton and a co-author of the study with Li Fei-Fei and Sabine Kastner. “And apparently some people’s visual system processes things much faster than others’.”

Something in the Air

A soldier or Marine could have X-ray vision and never see most I.E.D.’s, however. Veterans say that those who are most sensitive to the presence of the bombs not only pick up small details but also have the ability to step back and observe the bigger picture: extra tension in the air, unusual rhythms in Iraqi daily life, oddities in behavior.

“One afternoon I remember turning down a road in Baghdad we were very familiar with, and there’s no one out — very creepy for that time of day,” said Sgt. Don Gomez, a spokesman for the Iraq and Afghanistan Veterans of America, who took part in the invasion and later, in 2005, drove a general in and around Baghdad.

Trash was heaped in a spot along the street where Sergeant Gomez and other drivers in the convoy had not seen it before, so they gave it a wide berth.

“We later called it in to an explosives team and, sure enough, they found one and detonated it — the thing left a huge crater,” he said.

As the brain tallies cues, big and small, consciously and not, it may send out an alarm before a person fully understands why.

In a landmark experiment in 1997, researchers at the University of Iowa had people gamble on a simple card game. Each participant was spotted \$2,000 and had to choose cards from any of four decks. The cards offered immediate rewards, of \$50 or \$100, and the occasional card carried a penalty. But the game was rigged: the penalties in two of the decks were modest and in the other two decks were large.

The pattern was unpredictable, but on average the players reported “liking” some decks better than others by the 50th card to the 80th card drawn before they could fully explain why. Their bodies usually tensed up — subtly, but significantly, according to careful measures of sweat — in a few people as early as about the 10th card drawn, according to the authors, Dr. Damasio; his wife, Dr. Hanna Damasio; Dr. Antoine Bechara; and Dr. Daniel Tranel.

In a study published in May, researchers at King’s College in London did brain scans of people playing the gambling game used in the University of Iowa study. Several brain regions were particularly active, including the orbitofrontal cortex, which is involved in decision making, and the insula, where the brain is thought to register the diverse sensations coming from around the body and interpret them as a cohesive feeling — that cooling sensation of danger. In some brains, the alarm appears to sound earlier, and perhaps more intensely, than average.

Gut feelings about potential threats or opportunities are not always correct, and neuroscientists debate the conditions under which the feeling precedes the conscious awareness of the clues themselves. But the system evolved for survival, and, in some people, is apparently exquisitely sensitive, the findings suggest.

Mastering the Fear

One thing did not quite fit on the morning of Sergeant Tierney’s patrol in Mosul. The nine soldiers left the police station around 9 a.m., but they did not get their usual greeting. No one shot at them or fired a rocket-propelled grenade. Minutes passed, and nothing.

The soldiers walked the road in an odd silence, scanning the landscape for evidence of I.E.D.’s and trying to stay alert for an attack from insurgents. In war, anxiety can run as high as the Iraqi heat, and neuroscientists say that the most perceptive, observant brain on earth will not pick up subtle clues if it is overwhelmed by stress.

In the Army study of I.E.D. detection, researchers found that troops who were good at spotting bombs in simulations tended to think of themselves as predators, not prey. That frame of mind by itself may work to reduce anxiety, experts say.

The brains of elite troops also appear to register perceived threats in a different way from the average enlistee, said Dr. Martin P. Paulus, a psychiatrist at the University of California, San Diego, and the V.A. San Diego Healthcare System. At the sight of angry faces, members of the Navy Seals show significantly higher activation in the insula than regular soldiers, according to a just-completed study.

“The big question is whether these differences perceiving threat are natural, or due to training,” Dr. Paulus said.

That morning in Mosul, Sergeant Tierney gave the command to fall back. The soldier who had asked to approach the car had just time enough to turn before the bomb exploded. Shrapnel clawed the side of his face; the shock wave threw the others to the ground. The two young boys were gone: killed in the blast, almost certainly, he said.

Since then, Sergeant Tierney has often run back the tape in his head, looking for the detail that tipped him off. Maybe it was the angle of the car, or the location; maybe the absence of an attack, the sleepiness in the market: perhaps the sum of all of the above.

“I can’t point to one thing,” he said. “I just had that feeling you have when you walk out of the house and know you forgot something — you got your keys, it’s not that — and need a few moments to figure out what it is.”

He added, “I feel very fortunate none of my men were killed or badly wounded.”

Posted by [Andrew](#) at [11:44 PM](#) 