



THE FARMERS' MARKET

What are the roles of motor error and hypervigilance in unintended acceleration accidents?

Santa Monica is located in west Los Angeles, along the strip of land that borders the Pacific Ocean. It is home to movie stars, sports heroes, and many wonderful entertainment and shopping venues. One day each week a multiblock section of Santa Monica is barricaded from traffic and hosts an open-air farmers' market, where vendors from near and far come to sell food, clothing, jewelry, and other goods to the many thousands who gather in the area. On July 16, 2003, 86-year-old George Russell Weller drove his Buick LeSabre through the crowds of people who were shopping at the farmers' market, killing 10 and injuring 63. This story concerns why it happened.

The prosecution, at Weller's trial several years later, claimed it was no accident—that Weller deliberately drove his car through the crowded market. The reason, they said, was that Weller had been involved in a minor fender bender just moments before he entered the farmers' market. His response to the fender bender was to flee the scene of the accident. Witnesses for the prosecution painted Weller as a cold-blooded killer, commenting on the determined look on his face during the ordeal and his relatively calm demeanor afterward. It probably also didn't help his case when he emerged from the car immediately afterward and wondered aloud why the people he had hit had not jumped out of his way. Adding his age into the mix, Weller's actions were painted as rather pathetic.

Richard Schmidt, a renowned motor control scholar and human factors expert, testified on behalf of the defense team and argued that the facts of the case shared many similarities to accidents caused by errors of pedal misapplication, or unintended acceleration. Accidents of this type, which, thankfully, are quite rare, occur when the driver intends to apply pressure to the brake pedal, but misses the brake and pushes down on the accelerator instead.

Unintended acceleration accidents had been investigated for many years prior to the Weller case. These accidents were more common when the driver first got into the car, started the engine, and engaged the automatic transmission from the Park position into either Drive or Reverse. Indeed, such frequent episodes of “runaway cars” were the primary reason auto manufacturers added the brake–transmission shift interlock system in the 1980s so that an automatic transmission lever could not be moved from the Park position until the car sensed that a certain amount of pressure had been

applied to the brake. However, the brake lock system only prevented this particular type of pedal misapplication; moving the foot to the accelerator instead of the brake would not be prevented once the transmission was successfully engaged out of Park and the car was in motion.

It is important to note that reaching for the brake requires that we steer the foot from a comfortable seated position to a target (the brake) in the absence of any visual guidance. We do this all the time without making any errors. We know where the brake is located from experience, and we also know that the brake feels different underfoot than does the accelerator. So then why would we suddenly miss the brake, push down on the accelerator instead, and then keep the foot there?

Schmidt (1989) presented evidence that unintended acceleration cases frequently involved accidents in which the driver had less experience than usual with that particular vehicle. Therefore, in some of these cases, the exact location and feel of the brake might not have been as familiar to the driver as normally could have been expected. These accidents also occurred more frequently on start-up, compared to later in the driving cycle, perhaps due to temporary factors associated with preparing an action (see “Shooting Two From the Line” in chapter 11). Driver inattention has also been linked with these cases, so it may not come as a surprise that drivers would not immediately notice the difference between the brake and gas pedal if engaged in a distracting activity at the same time (see “Gumbo” in chapter 6).

But for Weller, none of the common profiles for these accidents fit the case: he had already been driving before the supposed pedal misapplication error, so it was not a matter of missing the brake on initial start-up. Weller was quite familiar with his own vehicle, an 11-year-old Buick LeSabre. And he was not talking on a cell phone. Instead, Schmidt argued that Weller’s pedal misapplication error was likely triggered by a catastrophic case of panic, termed hypervigilance, which could have been initiated when Weller had been involved in the fender bender just prior to the episode.

But one last issue seemed particularly problematic, according to the prosecution. Once the pedal misapplication error had occurred and the car started to accelerate wildly out of control, why didn’t Weller simply remove his foot from the pedal or turn off the engine—actions that would have brought the car quickly to a stop? Again, failure to carry out corrective actions is typical of unintended acceleration cases, and some reasonable accounts have been offered to explain why drivers do not perform them. First, the driver probably does not realize that the foot is on the accelerator rather than the brake. The intention was to press the brake, and the fact that the pedal has gone all the way to the floor could reasonably be interpreted as brake failure rather than human error. And second, once the driver enters into this catastrophic state of panic, all normal modes of thinking cease. Reasoning and problem solving, the kinds of activities that are easy to do when unflustered, become unlikely, if not impossible, to carry out when in this state of hypervigilance.

Thomas Shelton, a member of the California Highway Patrol, testified at Weller's trial that he once investigated an unintended acceleration case in which an elderly woman ended up driving her car onto the top of another vehicle. The woman was in such a panicked state that when Shelton arrived at the accident scene, he had to climb up into the car to shut off the racing engine, at which time he noticed that the woman was still seated, very much alive, staring straight ahead with a death grip on the steering wheel, and with her foot still pushing the accelerator all the way to the floor.

Unfortunately, all of these arguments can only be used to speculate about what may have occurred in George Russell Weller's Buick LeSabre on that fateful day. On October 20, 2006, the jury convicted him of vehicular manslaughter in the 10 deaths resulting from the Santa Monica farmers' market crash. Nobody will ever know whether the verdict was the right one.

SELF-DIRECTED LEARNING ACTIVITIES

1. In your own words describe the phenomenon known as unintended acceleration.
2. Describe a situation in which you made an action error that you were able to correct. How did you know that you had made the error, and what did you do to correct it?
3. Using our feet to manipulate car pedals involves aiming without visual feedback. What factors influence our ability to make these aiming movements accurately?
4. Propose a research methodology that examines one's ability to (a) move to a target without visual feedback and (b) estimate the accuracy of those aimed movements (again, without vision).

NOTES

- Evidence from George Weller's trial during September and October of 2006 was summarized in the *Santa Monica Daily Press*, which can be accessed through its archives:
www.tinyurl.com/wellertrial
- Not all cases of unintended acceleration are generally agreed to be the result of a pedal misapplication. A segment of the television show *60 Minutes*, hosted by Ed Bradley and which aired November 22, 1986, claimed that accidents of similar etiology involving the Audi 5000 were the result of a faulty idle stabilizer, which caused the car to accelerate wildly out of control when put into gear. An investigation by the U.S. NHTSA (National Highway Traffic Safety Administration) failed to support *60 Minutes'* claim.

- More recently, runaway Toyotas have been a topic of concern. Once again, a government investigation failed to support a claim that these cases of unintended acceleration were due to an electronic fault in the engine. Again, this leaves open the very real possibility that driver error is to blame, as suggested by Richard Schmidt in the New York Times:

www.tinyurl.com/schmidtnyt

SUGGESTED READINGS

- Castelli, J., Nash, C., Ditlow, C., & Pecht, M. (2003). *Sudden acceleration: The myth of driver error*. University of Maryland: CALCE EPSC Press.
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- Schmidt, R.A. (1989). Unintended acceleration: A review of human factors contributions. *Human Factors*, 31, 345-364.
- Schmidt, R.A. (1993). Unintended acceleration: Human performance considerations. In B. Peacock & W. Karwowski (Eds.), *Automotive ergonomics* (pp. 431-451). London: Taylor & Francis.
- Schmidt, R.A., & Lee, T.D. (2011). Central contributions to motor control. In *Motor control and learning: A behavioral emphasis* (5th ed., pp. 177-222) Champaign, IL: Human Kinetics.