



THE FOOTWEAR INDUSTRY MUST TAKE URGENT ACTION TO ELIMINATE THE DANGEROUS DEFECT NOW OBVIOUS IN SOLES

SHOE INSTABILITY HAS BEEN OVERLOOKED IN FORMAL RESEARCH

Unfortunately, there is no settled science on extreme lateral instability in footwear soles, especially the extreme outward tilting typical of lateral ankle sprains – despite being by far the most common injury requiring medical care. No peer-reviewed studies have ever been done by footwear companies or by scientific and medical researchers in biomechanics or orthopedics that investigate the true role of unstable footwear soles in the ankle spraining mechanism.

Instead, the human ankle alone has always been blamed by all for human instability. The fundamental defect in existing footwear soles has been entirely overlooked, however obvious it is now in light of the easily demonstrated safe natural stability of the barefoot ankle.

This costly oversight should not be a surprise. It is likely the direct consequence of the footwear industry spending very little on R&D, only about 1/10th as much as the average of all U.S. companies. Moreover, almost all of that footwear R&D funding goes into product development, not research, and definitely not into the kind of truly basic research shown here.

Moreover, all industry product development focuses narrowly on the existing cobbler-based paradigm of shoe sole structure that has existed unchallenged for 2,000 years. The footwear industry's "high tech" is limited to fancy new materials and construction in the ancient sole structure, perversely providing a glitzy veneer that covers up its extremely unsafe instability.

FORMAL FOOTWEAR STUDIES IGNORE CRITICAL SCIENTIFIC STANDARDS

So, without effective research, the entire footwear industry has been in essence flying blind, despite millions of deadly crashes resulting from defective sole wearers falling all over the world, every year, year after year. Worse, the formal footwear research that does exist only meets a single of the well-established standards of valid modern scientific research, peer-review. But peer-review alone ensures only groupthink among the established experts who control research, all of whom have a vested interest in the status quo, not new ideas that challenge it.

Footwear research studies ignore more important research standards like random sampling and valid control groups. Nor do they use double-blinding to prevent the obvious likelihood of serious placebo effects. So most footwear studies are false and misleading*.

As a result of that vacuum in reliable formal footwear science, do footwear companies currently lack sufficient trustworthy information to solve its extreme instability problem safely? Unfortunately, the knee-jerk reaction of major global companies facing serious industry-wide problems caused by defects or pollution is often to say that many more research studies are needed before any major corrective action is even contemplated, much less taken.

A reasonable case can be made that scientific researchers with ties to the footwear industry have taken that position in the past relative to studies showing that barefoot populations have far fewer injuries than modern shod populations. Future studies with much more rigorous scientific methodology were said to be required before any industry action, but the industry never funded any such studies.

Finally, even if the demanded formal footwear science were ever properly done, would modern shoe wearers then be trapped in the same situation that existed during the recent COVID

pandemic. The problem then was that much of the “settled science” was far too complex for non-experts to understand in any meaningful way. To that inherent complexity was added unusually divided views between disagreeing experts that further confused the issue of what might be the best choices for treatment and prevention. Unfortunately, most were left to trust the experts of their choice with no reliable basis upon which to base that trust, other than blind faith.

THE BASIC SCIENCE HERE IS SO SIMPLE THAT IT IS INDISPUTABLE

Fortunately, the evidence here is undeniable, because the relevant science at issue is so remarkably simple that it is indisputable. The science actually could not be more basic! The evidence already shown proves beyond reasonable scientific doubt that existing footwear is artificially unstable and therefore defective. Far more formal future research can and definitely should be done, but will only confirm more formally the obvious facts already in plain view.

In unambiguous fact, science never gets any simpler than the surprising result already shown. **The human ankle is naturally stable in the extreme sideways motion that occurs in ankle sprains and falls, unless it is artificially destabilized by defective footwear soles.**

Existing footwear soles are based on the standing footprint of a wearer used by cobblers for several thousand years, maybe far longer. Unfortunately, the standing footprint is simply too narrow to provide stable support to the naturally wider barefoot sole that provides structural support during the extreme sideways foot motion. That sideways motion naturally occurs often, particularly during lateral sports, but even during running and walking, or just standing.

Natural sideways motion is typically up to 20° of outward rolling supination and up to 10° of inward rolling pronation. Both sideways motions are provided by the **subtalar joint**, which is located directly under the ankle joint, between the ankle bone and the heel bone.

THE SCIENCE IS EVEN SO SIMPLE, ANYONE CAN PROVE IT FOR THEMSELVES

In formal modern science, researchers usually have to try hard to find meaningful and statistically relevant results, and often fail to do so. But even when successful in doing so, their test results are almost never repeated by others to verify their validity.

It is therefore all the more surprising that the hidden stability difference is so great – absolutely unprecedented in modern science – that anyone who can stand safely can prove it for themselves in the simplest way without any equipment other than one of their ordinary shoes, **but only with support from a safety spotter**. No experts are required. It’s not rocket science.

THE SIMPLE STANDING ANKLE SPRAIN SIMULATION TEST

As previously shown, the extreme rolled outward position of the ankle in a lateral ankle sprain forms an obvious basis for a very simple **Standing Ankle Sprain Simulation Test**. Virtually anyone can perform the test, even the young child shown.

The **SASS Test** clearly shows that the barefoot is stable and the same foot in shoe is not. No need for experts with many years of graduate training or sophisticated labs with special modern equipment or difficult mathematics that might otherwise cause confusion or raise doubts about test results.

But if you try the Test, DO NOT IGNORE THIS SERIOUS WARNING! Never try tilting out your ankle, especially in a shoe, without firm support from a safety spotter to prevent a potentially very dangerous fall that too often results in a broken joint like a hip or a brain concussion, or even death. All



frequently occur from falls in every age group.

And do not try it if your ankle is unstable from previous injury because such injuries are often repetitive and can lead to its permanent and serious ankle weakening that would make the **Standing Ankle Sprain Simulation Test** dangerous. Finally, don't try it if you have any other serious physical impairment.

In the future, no footwear sole design should be considered safe for public use that cannot pass the simple **SASS Test**. It must be the final test – either pass or fail – for any footwear before going into commercial production. No failing footwear should ever be marketed without a prominent warning of its dangerous and avoidable instability defect!

THE FOOTWEAR INDUSTRY MUST TAKE IMMEDIATE ACTION!

In light of the conclusive evidence shown here, it seems extraordinarily difficult if not impossible even to conjecture what could be a rational argument against urgent corrective action by the footwear industry. The only alternative might be a cynical plea to just believe some unintelligibly complicated denial by industry experts, **but definitely not to believe your own lying eyes**. Or more precisely in this case, **not to believe your own lying feet and shoes**.

The only response to that is blunt: you cannot be serious! Some simple facts are just too plain to cover up. The footwear industry must meet the Missouri “**show me**” standard. They must somehow prove, not by telling us, but rather by showing us that existing shoes really are as stable as bare feet in the extreme outward-rolled ankle spraining position. Or by showing us that bare feet are as unstable as shoes in the same extreme position. Good luck with that.

An earlier and incredibly less subtle disaster caused by a technical defect offers guidance here. After the space shuttle Challenger rocket explosion in 1986, Richard Feynman – one of the most renowned scientists of the recent era – made a critical observation during the long and painstaking investigation into the explosion's cause. He said that “**for a successful technology, reality must take precedence over public relations, for Nature cannot be fooled.**” He further concluded that “**science is the belief in the ignorance of experts.**”

So it is here. Simply put, **the irrefutable and easily reproducible evidence of the natural stability of the human ankle when barefoot absolutely proves that the well-known ankle instability in a shoe is completely artificial. That gross instability is due to the previously hidden defect that is universally present in existing shoe soles, but not to human ankles, which with terrible irony are only the direct victims of the shoe defect.**

The gross sole defect can and must be corrected in every type of shoe. And corrected as soon as possible, given its huge and avoidable cost in lives and medical care. **The defect causes many or most of the serious falls that resulted in \$151 billion in medical costs from 1,700,000 hospitalizations, 6,570,000 Emergency Room visits, and 47,000 fall deaths in 2022 in the U.S. alone (CDC data). For context, 41,000 traffic deaths occurred in 2023 in the U.S.**

Consequently, there can be no valid defense of the status quo by the footwear industry. No delay can be justified. The industry must begin working immediately with appropriate urgency to investigate and finally correct the now obvious sole defect, since the offered initial sole solutions are a proven way to start and are available immediately to copy, test, and improve.

*** Page 1 Footnote:** For more on false and misleading formal footwear studies, see the **Appendix** to my book, **UNNATURAL INSTABILITY**. The **Appendix** is an investigation of the surprisingly primitive state of functional design in modern athletic shoes, with many examples. See particularly pages 10-15, which point out a critical failure of formal footwear

research, which consistently fails to account for placebo effects, even when the potential for those effects to be present is extraordinarily high. Double-blinding can eliminate the placebo effect but is not used. In addition, pages 25-27 cover the footwear industries' continued serious failure, maintained for more than three decades, to investigate significant preliminary evidence of excessive injury rates in populations that wear modern shoes compared to barefoot populations.

See also the **Appendix** to the Summary of my second book, **UNNATURAL MISALIGNMENT & DEFORMITY**. This **Appendix** presents what I believe is conclusive evidence that existing biomechanical studies on running are false and misleading because of consistent and fundamental failures to use the critically important methods that are generally considered to be the basic requirements for valid modern scientific research. The principal shortcomings are failure to use random selection of test subjects, valid control groups, and double-blinding, among many others that are inexcusable.