

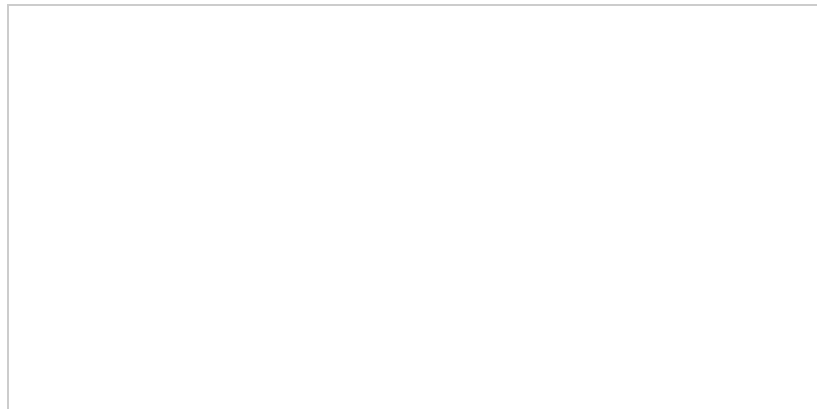
WEDNESDAY, JUNE 24, 2009

FOLLOWERS

The Case Against Margolis & Liebowitz

The Defendants

I type a lot. In 2002, plagued by hand and wrist pain and fearful of developing a repetitive stress injury, I decided to switch to the Dvorak keyboard layout. Dvorak is an alternative to the traditional QWERTY keyboard. It is named after its creator, August Dvorak, who designed it for maximum efficiency. The QWERTY layout, meanwhile, had originally been designed to keep early typewriter keys from jamming. Unlearning QWERTY and learning Dvorak was very difficult (I'd tried to convert years before and had failed), but since I successfully made the switch I've never suffered hand and wrist pain again.



Naturally, I'd like to encourage others to adopt this layout, and I take up that challenge in another blog post. I know from experience that Dvorak is more efficient than QWERTY, and that its benefits justify its learning curve, but I don't expect to be taken as much of an authority. So, I did a little web research looking for studies of its efficiency. In doing so, I kept coming across an aggressively negative article about Dvorak by a pair of economists.

Right away I was nonplussed: what were economists doing studying typing efficiency in the first place? The answer is, these two take an interest in Dvorak because it is the poster child for an economic theory they refer to as "lock-in," which is the (alleged) ability of inferior products to command inappropriate market share. The "lock-in" debate concerns the extent to which factors other than a product's performance, such as an early foothold in the market or strong-arm market practices, can largely shape the competitive landscape.

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Other classic examples of this economic theory are gradually losing their punch. For example, the Apple vs. Microsoft case study has become less relevant, as the obvious inferiority of MS-DOS to the Mac OS has given way to the arguable similarity of features between Mac and Windows. Or take the case of Betamax vs. VHS: once the source of lively debate, both video formats have become historical footnotes given the rise of the DVD. In contrast, the durable near-ubiquity of the QWERTY layout remains, justifiably, the perfect example of how performance and inefficiency can continue to take a backseat to sheer societal inertia.

The evil of two lessers

For philosophical, intellectual, and political reasons, Liebowitz and Margolis don't like to accept that lock-in is a legitimate economic theory. I suppose they prefer to believe that the free market can solve all problems; in any case, it is essential to their position that Dvorak be discredited. So, despite the fact that they dwell in the abstract realm of economic theory instead of the literally hands-on physical realm of human/machine interfaces, they position themselves as authorities and assail the Dvorak layout with gusto in their article "The Fable of the Keys" in the *Journal of Law & Economics*, and (in shortened form) in their article "Typing Errors" in the June 1996 edition of *Reason* magazine.

"Typing Errors" article is pretty well written. It's glib and polished, and the uncritical lay reader can be forgiven for being swayed by it. Even the normally unflappable Cecil Adams of *The Straight Dope*, after initially decrying the inefficiency of QWERTY, was taken in by "The Fable of the Keys", falling on his sword and disavowing the entire content of his original article.

On closer inspection, however, Margolis and Liebowitz's paper turns out to be poorly researched, and its arguments weakly constructed. The article has two fundamental problems. For one thing, the authors' critique is targeted mainly at existing efficiency studies of the keyboard, rather than at the keyboard itself. Bad studies don't mean a bad keyboard! Meanwhile, their article is far too focused on the feasibility of retraining QWERTY typists on Dvorak, not the ongoing benefits of the Dvorak layout once it's been learned. The difficulty of retraining is beside the point: we don't need today's typists to unlearn QWERTY and learn Dvorak—we need tomorrow's typists to learn Dvorak to begin with.

A brief examination of these two fundamental flaws ought to be enough to thoroughly discredit the Margolis/Liebowitz thesis. But I won't stop there. Because these hotshot economists have published a crappy article in a highly regarded journal, and because their quest to make an arcane point about economics has added to the inertia that prevents widespread adoption of a useful innovation, I aim to systematically dismember their argument to expose the full range of its flaws. Yes, your unsung blogger will take on the fancy eggheads using nothing more than logic and first-hand experience.

Red Herrings

The Margolis/Liebowitz argument begins with a section called "Tainted evidence for Dvorak." They argue that Dvorak's own study wasn't subject to

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ABOUT ME



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sufficient controls; they describe, for example, how Dvorak “compared students of different ages and abilities (for example, students learning Dvorak in grades 7 and 8 at the University of Chicago Lab School were compared with students learning QWERTY in conventional high schools).” After dispatching the large body of August Dvorak’s work in a few paragraphs, they proceed to a Navy study about the Dvorak layout. They find flaws with the Navy study as well: for example, “The participants’ IQs and dexterity skills are not reported for the QWERTY retraining group.” They cite differences in the study’s methods of measuring performance between the two layouts. They point out that August Dvorak, a Navy man, was the top expert in the Navy study. Margolis and Liebowitz present this last bit like it’s some sort of a conspiracy, and decry the fact of August Dvorak’s financial stake in the design.

Most of these grievances seem pretty nit-picky to me. The quality of the schools in the study wouldn’t seem to be a big deal, since plenty of people learn to type using simple software. (I learned Dvorak using a very basic website.) The lack of IQ benchmark strikes me as laughable; after all, Stephen Hawking, one of the foremost minds of our time, can’t type for beans. (Note to Margolis and Liebowitz: if you’re reading this, which I truly hope you are, please don’t build your rebuttal around that statement—it was a *joke*.) The financial interest Dvorak had is a bit more troubling, but don’t companies routinely fund their own performance studies? This is called marketing. (“Your mileage may vary.”)

But fine, let’s give these two the benefit of the doubt. Let’s assume that both the Dvorak study and the Navy study were complete frauds, conducted by deranged, dog-kicking sociopaths whacked out on coke and smack. Does that mean the Dvorak design isn’t more efficient? Of course not. Osama bin Laden could publish a pack of lies about the Dvorak design tomorrow, and it’s not going to make me type any slower.

Narrow interpretation

The next section of the Margolis/Liebowitz article is called “Evidence Against Dvorak,” and focuses on a government General Services Administration study. Margolis and Liebowitz describe the study as “a carefully controlled experiment designed to examine the costs and benefits of switching to Dvorak.” The ten subjects of the study took “well over 25 days” (whatever that means) to catch up to their old QWERTY speeds, after which their progress slowed. Meanwhile, a control group of QWERTY typists showed greater ongoing gains in speed than the Dvorak group. Based on these results, the director of the study concluded that “Dvorak training would never be able to amortize its costs.”

Is this really evidence against Dvorak? Note that the goal of the study wasn’t to assess the actual efficiency of Dvorak compared to QWERTY, but rather the merit of retraining QWERTY typists at government expense. The conclusions of the study itself, meanwhile, beg a lot of questions:

- Is twenty-five days really an unreasonable amount of time to unlearn an automatic, unconscious skill and learn a new one? In other words,

is it not possible that the study was ended too soon? (My own speed continued to increase for *years* after I learned Dvorak.)

- Is speed the only measure of the validity of a keyboard design? Did anybody bother to ask the participants which keyboard was easier on their hands and wrists? Were the long-term costs of repetitive stress injuries even considered?
- Is ten typists a large enough sample?

Margolis and Liebowitz go on to narrowly interpret the results of other studies. They cite a 1973 study of six typists that found that after 104 hours of Dvorak training, typists saw a 2.6% increase in speed. I take this as evidence *for*, not against, Dvorak given that, by my own rough calculations, I will spend around 45,000 more hours typing by the age of seventy. A mere 104 hours of training, after which my hands and wrists stop hurting, seems like a good investment to me. This 1973 study is only “evidence against Dvorak” because Margolis and Liebowitz label it as such.

Meanwhile, a fundamental difference between Dvorak’s own study and these others is that Dvorak assessed the ease with which *children* learn the Dvorak layout, and the children's ultimate results thereafter. He was looking to a future generation unhindered by the need to unlearn an obsolete keyboard layout. The “Typing Errors” authors don’t seem to appreciate this difference in approach, framing the debate only in terms of the difficulty of retraining.

More red herrings

From here, the Margolis and Liebowitz spend one brief paragraph referring in the most general terms to other works denying the validity of Dvorak. They cite “other studies” without naming them, and conclude “The consistent finding in ergonomic studies is that the results imply no clear advantage for Dvorak.” What ergonomic studies? Whose findings?

I wouldn’t dwell on this vagueness so much if Margolis and Liebowitz didn’t then proceed to blather on for eight long paragraphs, in their section titled “QWERTY’s competition,” about competing early typewriters that lost out to QWERTY in speed tests back in the 19th century, decades before the Dvorak layout came into existence. Margolis and Liebowitz conveniently neglect to mention that the only record that matters—the *current* speed record—was set on a Dvorak keyboard, with a words-per-minute rate of 212, significantly faster than anything anybody has done on a QWERTY. (See for yourself: <http://www.answers.com/topic/typing>; search within the page on the text “Blackburn.”) I find it absurd that these two economists see fit to so smugly discredit the validity of early Dvorak studies when their own research ignores any typing records set after the year 1889.

Hubris

The economists, apparently drunk on their own bathwater, go on to boast that “we published a more detailed version of this material in a Journal of Law and Economics article titled ‘The Fable of the Keys.’ This journal is well known and has published some of the most influential articles in economics. In the six years since we published that article there has been no attempt to refute

any of our factual claims, to discredit the GSA study, or to resurrect the Navy study.”

These guys shouldn't confuse widespread apathy on the part of their readers with tacit agreement. The fact is, their readership is almost entirely comprised of entrenched QWERTY users who aren't in a position to judge Dvorak for themselves. If Margolis and Liebowitz wrote an equally poor paper about, say, childbirth not actually being that painful, you can bet they'd meet with plenty of dissent. (Meanwhile, a month after Margolis and Liebowitz made this boast, *Reason* magazine—the publisher of “Typing Errors”—received, and printed, a scathing rebuttal to the original article.)

Speaking of dissenting opinions, where are the successful Dvorak converts in “Typing Errors”? Did Margolis and Liebowitz's research not manage to find any? It's actually not hard to do. I checked out an opinion piece in the *New York Times* and found fifteen comments (not counting my own) posted by happy Dvorak converts. Okay, not a huge number of people, but it's just one website; besides, the GSA study—Margolis and Liebowitz's centerpiece—had even fewer. And any one of us Dvorak converts has a legitimate real-world perspective on the merit of the Dvorak design, which strikes me as a lot more valid than an argument based solely on the available literature of others. (Would Margolis and Liebowitz refute the benefit of the two-button computer mouse just because reams of scientific performance data aren't available to substantiate its utility?)

Conclusion

“Typing Errors” assumes that the merit of a product design can be creditably evaluated solely on the basis of existing literature. Its authors ignore obvious questions, such as how a layout like QWERTY, designed decades before the advent of touch-typing, could possibly be as efficient as one designed with touch-typing in mind. They apparently fail to notice the obvious failings of QWERTY, such as the scattering of indispensable vowels across the board with the lowly semicolon getting a prime spot on the home row. They're looking at decades-old studies instead of at the keyboard they're typing on.

This article should serve as a cautionary tale about the perils of making up your mind in advance of your research, and tailoring your interpretation to suit your thesis. It's a real pity that the quest of a couple of academics to make an arcane point about economics has managed to mislead the public about something more important. Economic theory aside, Margolis and Liebowitz are hindering the adoption of a technology that can offer tangible benefits.

POSTED BY DANA ALBERT AT 7:25 PM 

LABELS: COMPUTER, DVORAK, ECONOMIST, KEYBOARD, LIEBOWITZ, MARGOLIS, PC, QWERTY, REPETITIVE STRESS INJURY, TECHNOLOGY

5 COMMENTS:

Anonymous said..

Interesting rebuttal... I am considering the switch to Dvorak and appreciate the article!

JUNE 24, 2011 AT 10:58 AM

Anonymous said...

very good article!! I'm doing a project at my school for National History Day and the whole Dvorak keyboard and its story is a good part of it. This was really helpful because i found this right after reading M&L's article, and it argues important points that anti-Dvorak people make. Your argument will be used and cited in my paper, thank you so much! :)

and yes, i typed this using Dvorak layout. best thing to my wrists and hands!! i love it! :D

JANUARY 13, 2012 AT 8:06 AM

Anonymous said...

Hey don't knock the lowly semicolon! As I programmer I use it all the time, so moving it somewhere inconvenient is actually an argument against the dvorak for me.

NOVEMBER 2, 2012 AT 7:54 PM

Dana Albert said...

Regarding the above comment: unless you use the semicolon a whole lot (i.e., more than the letter "s"), I wouldn't say that's a very strong argument against Dvorak!

NOVEMBER 2, 2012 AT 9:08 PM

Anonymous said...

I switched from QWERTY to Dvorak a little over a year ago, and I love it! The main benefit I've noticed is the lack of pain. I can type for a longer amount of time without having to take a break because my hands and wrists don't hurt. I haven't improved much in speed (though I have improved and am continuing to do so). I highly recommend making the change!

JULY 8, 2013 AT 12:00 PM

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