Plagiarism + Innumeracy

Ethan Bolker

July 18, 2014

Plagiarism is bad enough; seeing it along with innumeracy is doubly painful.

In *The Boston Globe* on July 16, 2014 I read about the Mansfield school superintendent who resigned after she'd been caught borrowing:

> In his speech in May, available on YouTube, [Admiral] McRaven told a University of Texas at Austin audience that "if every one of you changed the lives of just 10 people, and each one of those folks changed the lives of another 10 people, just 10, then in five generations, 125 years, the class of 2014 will have changed the lives of 800 million people."
>
> In her speech, Hodges said that if "every one of you changed the lives of just five people, just five, then in five generations, 125 years, the class of 2014 will have changed the lives of 400 million people." [1]

But halving the growth rate doesn't halve the output! A quick estimate says that the effect at 5 influences per generation is only about 3% of the effect at 10 since $5^5/10^5 = (1/2)^5 = 1/32 \approx 3\%$.

Hodges' error is even worse, because the extent of the influence depends on the size of the graduating class – presumably larger at the University of Texas than at Mansfield's high school.

I was planning a letter to the editor, but read the next day that Scott Damsky beat me to it. He wrote

> SUPERINTENDENT BRENDA Hodges has resigned over allegations she plagiarized a speech by Admiral William McRaven . . . , McRaven had said to the 8,000 members of the graduating class at the University of Texas, "If every one of you changed the lives of 10 people, and each one of those folks changed the lives of just 10, in five generations . . . you would have changed the lives of 800 million people." The admiral's figures were correct.
>
> Whoops. If she had actually done the calculation on the 350 graduates from Mansfield High School, it would have worked out to a little less than 1.1 million changed.
>
> Hodges referred to her firing as a "teachable moment." While she's teaching herself and the students not to copy, she might also want to add a class on math. [2]

Damsky correctly computed

$$8,000 \times 10^5 = 800 \text{ million}$$

and

$$350 \times 5^5 = 1093750 \approx 1.1 \text{ million.}$$

I could nitpick a little with the Admiral since the number of people changed in Texas would really be

$$\begin{aligned} 8,000 \times (1 + 10 + 10^2 + 10^3 + 10^4 + 10^5) &= 8,000 \times \frac{10^6 - 1}{10 - 1} \\ &= 888888000 \\ &\approx 900 \text{ million.} \end{aligned}$$

Either way, the superintendent was off by several orders of magnitude. I will indeed use this in my classes.

---

[1] http://www.bostonglobe.com/metro/2014/07/16/mansfield-school-superintendent-announces-she-will-step-down-amid-plagiarism-MQwQxRSzcsSTbRATQuS4yO/story.html

[2] http://www.bostonglobe.com/opinion/letters/2014/07/17/alas-numbers-weren-copied-mansfield/SFjVFXsR7QL7UAdYCXIV6N/story.html?p1=Article_InThisSection_Bottom