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Life, the Universe, and Numeracy: Review of *A Numerate Life* by John Allen Paulos (2015)

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Abstract

John Allen Paulos. *A Numerate Life: A Mathematician Explores the Vagaries of Life, His Own and Probably Yours* (Buffalo, NY: Prometheus Books) 200 pp. ISBN: 978-1633881181

John Allen Paulos, author of *Innumeracy* and many other books addressing quantitative literacy and numeracy in society, tackles autobiography in this quirky "anti-memoir."

Keywords

Numeracy, Biography, John Allen Paulos, Innumeracy

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Cover Page Footnote

Kira Hamann teaches mathematics at Pennsylvania State University, Mont Alto. A logician by training, she has a longstanding interest in numeracy. Her current work focuses on the intersections between mathematics, quantitative literacy, and social justice.

I read John Allen Paulos's *Innumeracy* as a new faculty member. Although the book had been published some 15 years earlier, it was still going strong, and for good reason: its simultaneously serious and entertaining articulation of the problem of quantitative illiteracy brought into sharp focus an issue that had been in the peripheral vision of the mathematics community for decades. It was galvanizing for many mathematicians and mathematics educators, myself included. It is not an overstatement to say that it influenced the direction of my career.

Not long after reading *Innumeracy*, I discovered *A Mathematician Reads the Newspaper*, a hilariously curmudgeonly takedown of innumeracy in the media. I still use this as the primary text for one of my quantitative literacy classes today, and students love it. They perceive Paulos as a kind of cranky but benevolent mathematical grandpa, grumbling about “these kids today” before slipping them a little pocket money on the sly. This is, as it turns out, not an entirely inaccurate perception. In any case, it works for them, and they get a lot out of the book.

Paulos's most recent work is an autobiographical project. He seems to embark on this with some misgivings, expressing skepticism of the “biographical endeavor, my own included” and telling us that he has written “an anti-memoir.” He proposes to “convey some of the concerns and questions most of us don't, but arguably should, have when reading biographies and memoirs.” However, by the last page of the introduction he warns us that the book may at times be “cloyingly self-indulgent,” and the reader could be forgiven for becoming a bit nervous.

Happily, Paulos's version of self-indulgence does not include the name-dropping that so often plagues memoir. Or, perhaps more accurately, the names he drops are not of famous people with whom he has rubbed elbows (at least, not often) but of information and ideas with which he is familiar. Readers of Paulos's previous work know that he is well-versed in history and culture in addition to mathematics, and this intellectual virtuosity is part of the reason he has been able to communicate so effectively with a wide audience. If the effect here can be dizzying at times – ranging from Bayesian statistics to *Breaking Bad* to David Hume to pornhub.com to multi-dimensional hypercubes over the course of just a few pages – it can also be charming.

Take, for example, Chapter 3: *Ambition vs. Nihilism*. Here, Paulos prefaces a discussion of infinite cardinalities by a “migraine warning” which made this set theorist smile. He then delves into a nuanced but approachable discourse that includes Cantor's diagonalization, the Continuum Hypothesis, Hilbert's Hotel (arguably the most intuitive way to grasp the topic), and Zeno's Paradox. In classic Paulos fashion, he links all of this to immortality, throwing Tristram Shandy, Friedrich Nietzsche, and Henri Poincaré into the mix for good measure. His position on the question implied by the chapter's title remains unclear, but after a romp like that, who cares?

Of course, even the broadest possible definition of numeracy probably does not include facility with infinite numbers, and thus the infinite (fascinating though it may be) is unlikely to be of much relevance for most readers of *Numeracy*. Let us jump ahead, then, to Chapter 8: *Chances Are That Chances Are*, which contains a section called *Innumeracy, A Mathematician Reads the Newspaper, and Their Aftermath*. Readers who recall the beginning of this review will not be surprised to learn that I found this a most interesting chapter. Here we get the backstory to Paulos's seminal works, presented with touching sincerity. He speaks fondly but despairingly of the nursing students in a class he taught early in his career, people who he says "seemed temperamentally suited to the profession, appearing to be compassionate, empathetic, and caring. Unfortunately most of them were quite innumerate." He goes on to add that "many never managed to distinguish 2 percent from 0.02 percent nor could they, despite my pleading, believe it was even very important to do so."

This experience will likely resonate with many readers of *Numeracy*. In Paulos's case, it was combined with a dismissive attitude from the institution's administration (literally dismissive – in Paulos's telling he was fired for pointing out the innumeracy of these nursing students), and this prompted him to write the article that he later expanded to become *Innumeracy*.

We should pause here to acknowledge that this illustrates a major shift in society's understanding of innumeracy, a shift that is due in no small part to Paulos's work. It is impossible to imagine a college administrator today responding to a charge of student innumeracy with surprise, much less with anger or retaliatory action. While we may not have fixed innumeracy, at this point we have certainly acknowledged it. For that we owe Paulos, among others, a debt of gratitude.

The story of the nursing students and the genesis of *Innumeracy* brings up the question of the intended audience for *A Numerate Life*. Indeed, it brings up a larger question that frequently confronts the numeracy movement: how do we convince the general population of the value of numeracy, and of their own capacity to achieve it, while still calling out innumeracy and its enablers?¹ In earlier works, Paulos sought to endow non-mathematical readers with the confidence that quantitative understanding was within their reach. The reader, even the innumerate reader, was presumed to be part of the club. *A Numerate Life*, by contrast, has a perplexing tone that seems almost to run counter to that democratizing mission. With in-jokes that only mathematicians and Neil DeGrasse Tyson (who wrote the cover blurb) are likely to get, one wonders if Paulos has grown tired of accommodating the very innumerate reader he initially sought to engage.

Paulos has by now perfected the grumpy-hip voice beloved of Bernie Sanders supporters, and while in this volume it may sometimes stray across an admittedly

¹ Thanks to Mike Catalano for raising, and articulating, this point.

fuzzy line, it is nevertheless fun to read. His mathematics is clever and entertaining, his instinct for mathematical trouble spots is undiminished, and his observations of human nature are often arrestingly accurate. I suppose, toward the end of a long career aimed at bringing quantitative literacy to the masses, a person might become a bit frustrated by the slow pace of progress. Perhaps this book is in some sense an expression of that frustration. The level of numeracy in the general population today is not measurably improved from 1988, when *Innumeracy* was first published. However, the change in awareness of numeracy as a concern in our society is marked, and the resulting changes in curriculum are significant. Paulos's work has been instrumental in bringing about those changes, and his idiosyncratic "anti-memoir" is an appropriate epilogue to that work.