# A productivity paradox

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Suppose that the only activity I care about is writing novels, which I intend to do for the rest of my life. All of my novels are guaranteed to be of identical quality, and all I care about is producing as many as I can. In general, as I spend more time writing I'll become a faster writer, so I expect most of my novels to be written late in my career.

Right now I'm just starting out. Before I begin writing, I could spend a year improving my life, which would give me 10% more time/energy/attention each day.

In the real world I face many other important considerations, and I should probably just dive in.

But in this simplified environment I might conclude:

- If I am going to spend more than 10 years writing, then I should clearly spend the year up front to save myself time. After all, that way I end up spending strictly more time writing. So regardless of the relationship between [Time spent writing] and [Productivity as a writer], I'll get more total writing done if I do the preparation.

But as it turns out, each year I spend writing increases my productivity by 15%. So I might conclude:

- Preparing to write is clearly pointless, since actually writing will have a larger impact on my productivity—and will actually produce some output to boot.

Yet this news doesn't affect the original argument at all, which held for any relationship between [Time spent writing] and [Productivity as a writer]. So: what gives?

## Resolution

The original framing was ambiguous: there are two possible interpretations of "increase my productivity by 15%."

After resolving the ambiguity, we are left with a mathematical sleight of hand. When everything is said and done, the time savings seem to win in this simple environment.

## Productivity = [Novels] / [Time]?

Writing has two kinds of output:

1. Novels.

2. Improved writing skills.

In my early years, all that really matters are the skills.

So the question is: when my productivity increases, does that increase both kinds of output, or just my output of novels?

If saving time improves both kinds of productivity but practice only improves the novel output, then it's not a mystery that saving time can be a better deal. After all, saving time accelerates the thing you actually care about, namely the learning process.

But what if both saving time and practice writing improve both kinds of output? In this case, both of my original arguments seem to go through, and we are left with a paradox again.

## The resolution

Suppose instead that practice writing novels improves the rate at which I improve.

So after 12 months, I'm 15% more productive. And 10.5 months later, I'm 15% more productive again. After another 9 months my productivity is up a further 15%. Within 7 years I have written infinitely many novels.

So if my novel writing career is long enough to justify the initial investment in time saving, then my output will be infinite anyway (though it will be infinite *sooner* if I just dive in).

Our paradox is like asking: which is larger, 1+2+3+4+.... or 2+3+4+5+....? You can make superficially strong arguments in both directions, but both of them are wrong.

(In fact, the paradoxical reasoning is a proof that output is infinite.)

## The real resolution

In fact productivity does not tend towards infinity over the course of a career, and there are no task for which practice consistently improves the pace of further practice (it may do so for a while, but eventually the improvement will peter out, and that's enough to make the time-saving intervention look better).

So in the original simple environment, saving time/energy/attention seems to be the right answer, assuming that I wouldn't have discovered the same innovations later and I wanted to write for more than 11 years. Unfortunately, such good opportunities are pretty rare—most improvements don't stick, most improvements are sensitive to our (uncertain) future plans, there are more relevant resources than it appears, and most great improvements we would eventually discover anyway. That said, it seems like people may often underestimate the strength of the a priori case for broad productivity improvements, and this strong a priori case must be weighed against the many unfavorable pragmatic considerations.