Why Biologists Feel Older Than They Are

David Morrison

Introduction

The analysis presented in this paper was prompted by recent casual remarks from a number of the biological colleagues of my own cohort. The model derived by this analysis is definitely biological, and the results of analysing it are of general scientific applicability, so I thought that I should make these results generally available to biologists. Equally importantly, the conclusions are of vital concern to all administrators running scientific organisations and university departments; as, indeed, are the extremely interesting results presented by Eversham (1963).

The problem that has been concerning the colleagues of my immediate generation is that of their apparently fast-disappearing lives. Specifically, having reached the age of thirty-something, they are beginning to feel old. Their bones are creaking, their hair is going grey or falling out, their dermal layer is wrinkling, and their adipose tissue is sagging. And all this has happened quite suddenly in the not-too-distant past.

I have tried pointing out to them that, since people in Australia have an average life expectancy of about 75 years (72 for males, 78 for females; Hoffman 1990), they are rapidly approaching middle age (in a strict interpretation of the expression, since the median age is 33 years). Their general physical deterioration since turning 30 is therefore to be expected as simply the beginning of the inevitable downward tenor of the rest of their lives. Alternatively, one could take the view of Pivnick (1985) that, since our early ancestors probably only had a life span of 30 years, anyone over 30 has their physiological and psychological processes careening out of control because natural selection has had no refining influence on this part of their lives. My colleagues have apparently not found either of these analyses to be a great comfort.

However, these same colleagues do often seem to find comfort in cliches such as 'life begins at forty', presumably because this gives them something to look forward to during these troubled years. Unfortunately, this aphorism seems to be derived from the lives of people who are not professional white-collar workers. In particular, if people have their children when they (the parents) are 20-25 years old, then the children will be finally leaving home when the parents are about 40. So, the restrictive tyranny of bringing up children is over, and the parents can get on with their own lives at last. However, professionals (including biologists) usually delay their child-rearing, for one reason or another, until they are in their early 30s; and so, for them, life will not begin until 50. This is apparently even more depressing for those who are wondering why life doesn't appear to have even started yet.

What we obviously need is a general scientific analysis of perceived age, as opposed to actual age. There is another old cliche that says 'you are only as old as you feel'. We need to understand why we feel as old as we do, if we are to understand the psychology of those people who are rapidly approaching middle age. I provide the detailed analysis of a suitable model here.

Analysis

The analysis is based on a quite common idea, that the older we are the quicker time seems
to pass. So, apparent time and actual time are not the same thing at all. Weber (1983) defines a unit of time as perceived by our central nervous system as the Head Time ($T_H$), and notes that our brains do not handle time in a purely linear fashion. In fact $T_H$ is constructed by comparing the span of time in question to the total time of our existence. That is, perception of apparent time by a person is inversely related to his or her actual age, as shown in Figure 1. A year is 50% of your life when you are two years old, but only 2% of your life when you are 50, so a 50-year-old perceives a year to pass more quickly than does a 2-year-old.

This idea is often presented to new parents for them to understand the behaviour of their young child. The model suggests that asking a 5-year-old to wait 30 minutes for an ice cream is exactly equivalent (in terms of perceived time) to asking a 30-year-old to wait 180 minutes (three hours) for a cup of tea. This conclusion explains simply and explicitly why the request is treated with such outrage by the child.

This model of time perception explains many other commonly observed phenomena, from why old people seem to take forever to do even the simplest things, to why children live in mortal fear of missing trains. Unfortunately, there are many unrecognised consequences of this model. Some of these were first analysed by Freeman (1982). However, I disagree with some of the data on which his analysis was based, so I am presenting my own version of the analysis here.

Freeman points out that a person's effective (perceived) age and the actual age of that person are also not linearly related. As noted above, the perception model posits that the apparent length of a year in a person's life is inversely proportional to the person's age. The constant of proportionality is simply the age at which a year really seems to last a year. This age is taken empirically to be 15 years old. Therefore

\[
\text{Apparent year length} = \frac{15}{\text{age}}
\]

Measurements are taken to the end of the year in question, for computational simplicity.

Freeman then defines an individual's Effective Age as the sum of the apparent year lengths experienced in that person's life. This is then a measure of the apparent passage of time in a person's life. The relationship between effective age and actual age is shown in Table 1 and Figure 2. Figure 3 shows that effective age is always greater than actual age from the moment a person is born until age 73 (the average life span), when the two converge again.

**Discussion**

This analysis demonstrates that, throughout a normal life span, you will always feel older than you are. For example, life appears to be half over when you are six years old, three-quarters over at age 22, and nine-tenths over at 47 (assuming you live to be 73, of course). Only if you live for longer than average will you finally know what it's like to feel younger than you are. This may be one of the few compensations of very old age (although I'm not quite sure what the advantages are of feeling only 78 when you're actually 100).

This makes it obvious why at thirty-something your body goes to rack and ruin: your perception is that you are over 60 years old, and your life is now at least 80% over. Thirty years is actually a turning point in apparent time, as perception of time changes very little once you are 30 years old (Figure 1). The maximum discrepancy between actual and effective age is at 15 years old (Figure 3), when a year really is a year long. From 30 years of age onwards, there is an almost linear approach of effective age to actual age. This means, in reality, that you can sit back and relax, knowing that from here on things can't feel any worse. You haven't felt this close to your actual age since you were five years old.

Furthermore, this analysis makes it clear that if life really does begin at 40, then we are in big trouble, because when we get there we will feel like we are at retirement age, and effectively have only 14% of our lives left to enjoy. It is obviously far better to live your own life while you are young and can enjoy it, and only then have kids when it is 80% over (at age 30). This also has the advantage of being ecologically more responsible, since delayed age of first reproduction will also slow world population growth.

As pointed out by Freeman (1982), there are many other of life's mysteries that are explained by this perceptual model. For example, it explains why you thought you knew everything as a teenager, and why you thought...
you would live forever when you were in your 20s. It explains why the generation gap gets narrower as parents and children grow older, and it explains why your birthday rolls around faster every year. It even explains why children won't go to sleep as early in the evening as you want them to. It won't, however, explain why time flies when you're having fun (unless fun increases with age). It does, nevertheless, suggest that being vain about giving your age is really rather ridiculous, since everyone knows that you actually feel even older than you will admit.

More importantly, the model explains such phenomena as why very early influences are vital in determining personality traits, (e.g. Freud 1953-74). A 1-year-old baby effectively has the accumulated experience and knowledge of an actual 15-year-old. You are therefore whoever you are at a much younger age than has been previously suspected. Since you have experienced a half of your life at age six, your personality is pretty well set by then.

Equally importantly, the results of this analysis have enormous consequences for our social planning. At the moment, our kindergartens are being attended by effective 34-year olds, and our universities by people who feel they are in their 50s. This is ridiculous. Moreover, if students stay at university to do a postgraduate degree, then they will not graduate and enter the workforce until they feel like they are at least 57. For administrators, this is obviously unacceptable, as these people will spend their entire working careers feeling elderly, and could, in fact, want to take early retirement immediately upon entering employment. Under these circumstances, it is rather difficult to develop an effective management plan for an institution, as well as work out a good personal superannuation scheme.

Straub (1986) has pointed out that instead of just being related to the person's current age, an interval of perceived time might also be related to the total time of that person's existence. If this were true, then two people of the same age would perceive time slightly differently. For example, a 50-year-old with a life expectancy of 80 years would perceive a year as being much shorter than would a 50-year-old with a life expectancy of only 51 years. This result might have a significant effect on time perception after the magical age of 30, and would therefore be a very powerful tool in the hands of (for example) personnel selection committees. A person's life expectancy could be predicted from that person's own perception of the duration of any one period of time, and the more long-lived person could be given the job. Thus, anyone complaining about the shortness of a year could be assumed to have a long life expectancy, while someone who has all the time in the world is likely to pass away before realising just how long a year of their life has been.

So, accelerated ageing by biologists is not necessarily just the result of overwork caused by rabid Dickensian employers. It is a general human malaise caused by our central nervous system's non-linear interpretation of the basic unit of time. There is probably very little we can do about it, except to reminisce about the good old days, when a year seemed to last forever. As it turns out, things really were different when I was a lad.

Acknowledgements

Thanks to Tony Auld, David Bedford, Ross Bradstock, Mike Crisp, Joy Everett, Ken Hill, David Keith, Louisa Murray, Peter Weston, and Barbara Wieck for providing the initial impetus for this analysis.

References


Pivnick, K. 1985, 'Why it's not quite as late as you didn't think it was' Journal of Irreproducible Results, 30(2):6.


Table 1. Effective age as a summation of apparent years in a person's life.

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*Assuming a life expectancy of 73 years

Figure 1. Relationship of apparent year length to actual age.

Figure 2. Relationship of effective age to actual age.

Figure 3. Discrepancy between effective age and actual age.