

Chapter 9

Age and Happiness



Abstract Contrary to the common belief that the age-happiness relationship is mountain shape (the middle aged being happier than children and the aged), it is really largely U shape, with the middle aged (at around mid 30's or 40's) least happy. The increase from around 60 to 70's is particularly clear. However, happiness becomes lower over the last few years of illness before passing away. The decline in happiness from around 12 years old and the trough in happiness level around middle ages may partly be explained by the delay in sleep–wake cycles of teenagers, causing conflict with their mostly middle-aged parents. Recognizing the evolutionary ultimate explanation for this delay advanced here, the society should delay start hours for high schools to fit in with the delayed biological clock of teenagers.

9.1 The U-shape Relation of Age and Happiness

What is the relationship of age and happiness? Many if not most people (myself included before I looked at the evidence) believe that happiness should first mostly with age up to around the middle age, and then decline with age; the relationship is that of an inverted U shape, or mountain shape. This is thought to be so because children do not have independence, have the pressure of passing exam, and are not capable of enjoying life much; in contrast, the elderly have health problems and likely have lower incomes as well.

Actually, many studies in different countries discover that the situation is actually the opposite. Young children are fairly happy, and happiness starts to decline from around 11–12 years old (González-Carrasco et al. 2017). Happiness reaches a low at around mid-thirties to fifty something; then it increases (Gerdham and Johannesson 2001; Mroczek and Spiro 2005; Deaton 2008; Blanchflower and Oswald 2008; 2017; Cheng et al. 2017; Graham and Pozuelo 2017; Beja 2018; Laaksonen 2018; Butkovic et al. 2020), but decreases over the last few years (Fukuda 2013; Burns et al. 2014), typically with serious illness that ends their lives. A study on China shows the lowest point at around 34 years old (Graham et al. 2017).

Knowing this somewhat counter-intuitive evidence is very important. When you are very unhappy at say around early thirties, you may think that, I am young and

healthy, but I am already so unhappy; won't it be horrible when I become old and unhealthy? Perhaps I should end this miserable life! Now, having known that the age-happiness relationship is largely U shape instead of mountain shape, when you are at your low, you will know that this is only the low point in life, and the future will be much better. Just this knowledge will reduce your unhappiness then and help you endure over that, instead of ending your life unwisely. This knowledge may thus save your life and increase your happiness. This is certainly worth many thousands of times the costs of reading this book.

Is the U shape relationship of age and happiness non-controversial? There were some controversies. Earlier, happiness researchers believed that there is no regular relationship between age and happiness; the happiness levels of individuals in different age groups are largely the same; on average, a person over different ages also has largely similar happiness levels. Differences and fluctuations are not mainly age-related, with no definite tendencies or patterns. They believed in this probably because there are many factors affecting happiness, with large interpersonal differences. In the absence of a large amount of data, it is very difficult to see any tendency or pattern. In later studies, with much more data, more reliable conclusions could be reached. For example, Blanchflower and Oswald (2017), using seven data sets from 51 countries covering 1.3 million randomly selected individuals from 20 to 90 years old, reaching the reliable conclusion that the age-happiness relationship is largely U shape.

I have read many papers on this issue and may safely conclude that, if we exclude the last few years of illness before death, in most cases, we do have the largely U shape age-happiness relationship. There are also some double U or W shape relationships. For example, a recent U.K. primary data set shows a low at around age 20, recovering to about 34 years old, and then declining to another low around 46; after 50, happiness recovers strongly until 70's. The U.S. data are similar, especially the jump in happiness from 60 to the 70's is very clear. Confucius said, 'I started to devote myself to study at the age of 15; became independent at 30; had no more illusions at 40; knew the mandate of Heaven at 50; could accept different opinions calmly at 60; could do whatever I want without overstepping any bounds at 70' (my translation). It was likely that his happiness also increased in the later few decades of his life.

An evidence strongly supporting that (net) happiness is U shape in age is that negative feelings and behavior like pressures, psychological problems, depressions, suicide rates, etc. are strongly mountain shape in age. These data are more objective and reliable. As these factors are strongly negatively related to happiness, this mountain shape supports the U shape age-happiness relationship. The Graham et al. (2017) study on China that reaches the lowest happiness level at around 34 years old, also shows a peak in these negative factors at around 33 years old.

Yet another interesting supporting evidence is from apes (including chimpanzees and orangutangs). Those feeding these apes can tell whether they are happy or unhappy from their appearance and behavior. Their happiness indices so judged are also U shape, with a low in middle age (Weiss et al. 2012).

Why does our happiness initially fall with age to a trough at middle age and recover after that?

The decline in happiness from about age 12 is probably associated with puberty. Children at such ages start to have their own views which may be different from the parents. For example, some want to dye their hair into different colors and may have strong disputes with parents. They start to be interested in the opposite sex, but have little experience in relationship. Who they are interested in may not reciprocate. The pressure of study is also increasing.

The unhappiness at around 30's or 40's may be associated with financial pressures such as paying back housing loans, higher family responsibilities and expenses. It may also be the time pressure, with the need to take care of both the parents and children, at a time when working is important. Alternatively, it may also be due to being newly wed, still lacking experience in handling the relationship well; or first having a child, with no experience in caring for it. On the other hand, the higher happiness of the old may be due to the higher wisdom, and like Confucius, being able to do as one wishes without overstepping bounds.¹ However, for my case, though I have long known the mandate of Heaven (well, well over 50), I still have illusions. If I do as I want, I will certainly be put into prison. Nevertheless, my own happiness levels also conform to the general pattern, being U shape with age. My least happy period was also in my early thirties. Since then, my happiness increased every decade, with the peak at the current decade in my 70's.

I have an observation that may partly explain the decrease in and the low happiness level of teenagers and those in their middle ages simultaneously, as well as a simple way to increase their happiness. This is related to the delay in the sleep/wake cycle of teenagers, as discussed below.

9.2 The Delay in Sleep/wake Cycles of Teenagers: Ultimate Reason and Implications

We are all familiar with the sleep/wake cycle. This basic circadian rhythms of day-night wake-sleep cycles are observed from fruit fly to human (Dunlap 1999). Though the reasons for sleeping may not yet been settled, given the need for sleeping, the reason for the circadian rhythms is fairly obvious, being dictated by the 24 h day-night cycle. Here we are concerned with why this rhythm is delayed for teenagers upon the onset of puberty. This delay is well-known by all parents with teenage children. It is very difficult to get adolescents to observe 'early to bed and early to rise'. It has also been clearly confirmed by scientific research, 'Our results indicate that pubertal maturation at this transitional phase (age 11–12 years) has a significant influence upon phase preference [i.e. delay in the circadian sleep cycle] and that psychosocial factors are less influential than anticipated' (Carskadon et al. 1993, p. 261; see also

¹ On the contribution of wisdom to the old, see Cheung and Chow (2020).

Gradisar et al. 2013). Thus, your teenage children's late sleeping habit is not mainly influenced by bad friends, but has a biological basis.

Why do teenagers sleep late? In biological research, there is a distinction between proximate versus ultimate reasons (Mayr 1961). The physiological mechanisms influencing the circadian rhythms and the differences of these factors for teenagers have been explored. A proximate reason for sleeping delay of teenagers is the delay in the secretion of melatonin in the body since puberty (Hagenauer et al. 2009; Troxel and Wolfson 2017). (Melatonin is related to sleeping. Thus, when one has jet lags, taking melatonin about 45 min before sleeping may help.) But why does this delay take place and at puberty? This more ultimate reason for this teenage delay in the rhythm has not, to my knowledge, been discussed. Here, I wish to advance a likely ultimate explanation.

The fact that the onset of the phase delay occurs at puberty suggests that it is related to mating. A person becomes potentially sexually active after puberty. Mating is directly related to the passing on of one's genes and hence takes priority over many other things (with the possible exception of survival). Thus, after puberty, allowing the individual to have high chance of mating becomes a high priority. Why is this related to the circadian phase delay?

The answer is hinted at in an ancient Chinese poem from the Song Dynasty: 'The moon rising up the top of the willow tree; people dating after nightfall' (Ouyang Xiu 欧阳修). Mating is more appropriate or common after nightfall. This is so both for privacy and safety, as one is more vulnerable to attack while mating. Thus, to have more opportunities for mating (and the pre-mating courting), adolescents have to delay sleeping time until well after nightfall. Given that it is probably easier and less harmful to delay than to shorten the sleeping time, the teenage circadian delay then emerged from mutation and got selected. This is our mating-facilitating explanation for the delay.

This delay helps partly explain the low happiness levels for both the teenagers and the middle aged. The belief in the desirability of 'early to bed and early to rise makes a person healthy, wealthy, and wise' is very deep-seated. Many schedules, including school and office hours observe this rule. When teenagers start to sleep and wake up late, they unavoidably get into conflict with their (mostly middle-aged) parents. This is likely one of the reasons accounting for the low happiness levels of these two groups.

Apart from having conflict with their parents, the delay in the sleep-wake cycles of teenagers also make them not having enough sleep, especially as the schooling hours have not been changed to fit their new biological clock (Carskadon et al. 2004). For the U.S., only about 7% of high-school students have enough sleep of 9 h a day needed for their ages (Basch et al. 2014). Evidence suggests no improvement in this and even some deterioration (Troxel and Wolfson 2017, p. 419).

One obvious social measure to tackle problems created by the delay in the teenagers' circadian cycle is to delay schooling hours for high schools. Why has this not been done. One reason is the inadequate recognition of this delay being biological rather than the influence of bad friends. Not realizing that this delay is natural

tendency difficult to fight against makes people wanting the teenagers themselves to adjust to the social schedules.

Another reason against delaying hours for high schools is that this will increase transportation costs. Even if this is true, the benefits would likely be many times the costs. In fact, even if we confine only to the more easily measurable economic factors, the benefits are 9 times the costs (Jacob and Rockoff 2011). Even purely for productivity considerations, delaying high-school hours is highly desirable (Hafner et al. 2017).

Another reason against the delay in schooling hours for teenagers (high schools) is the argument that this delay will only delay further their hours of going to bed, not increasing the amount of their sleep. This is contradicted by a study showing that a delay of school hours by 50 min increases students' sleeping time by more than half an hour and reduces fatigue in day time (Owens et al. 2017). Some study concludes that delaying school start hours does not delay bedtime, but increases the amount of sleep, reduces daytime sleepiness, promote a better mood, and reduces coffee drinking (Boergers et al. 2014).

From many studies and experiments, it may be concluded that delaying schooling hours for teenagers not only increases their health, function, and safety, but also benefits the economy (Troxel and Wolfson 2017, p. 420). On the other hand, 'there was no evidence suggesting potential harmful outcomes associated with later start times for adolescents' (Troxel and Wolfson 2017, p. 421). Rather, inadequate sleep is obviously harmful, including affecting safety, as it will increase traffic accidents (Danner and Phillips 2008).

In April 2016, some southern districts of Maine in U.S. voted to delay secondary and high schools starting hours to no earlier than 8.30 (Collins et al. 2017). (Before this change, many schools started at around 7.30.) This decision affected 6,500 students. The delay in school starting hours produced positive effects, with no increase in transportation costs as afraid. People are now accustomed to the new hours. One personnel said, 'If you told our kids we'd be going back to the old system we'd have a revolt' (Collins et al. 2017, p. 482).

It seems clear that delaying starting hours for high schools is a simple way to increase sleeping time, health, and happiness for teenagers and their parents.

9.3 Chapter Appendix. Methodology

There are two different methods in analyzing the age-happiness relationship. The first is to directly look at the primary data, comparing the average happiness levels of individuals with different ages. This was used by early researchers, mainly psychologists. Within this method, there are also two different ways of analysis. The first is to compare the happiness levels of people of different age groups in any one time, i.e. taking a cross-section of people in the society at the same time/period. Another is to follow a group of people through their life or as they age. This is the time-series data (with the panel data on a specific group one being more reliable), in contrast to

the cross-section data. This second way takes a long time to complete the study and hence is more costly and less frequently used.

In contrast to just looking at the primary data, another method is to do multiple regression on the primary data, either the cross-section or the panel one. Apart from separating people into different ages, we add other possible variables like sex, jobs, incomes, health conditions, etc. to get the relationships of age itself with happiness. The need for doing this multiple regression is based on the following rationale. For simplicity, suppose (not really true) that female (or the blue-collar workers) age-happiness relationship is mountain shape, while the male (white-collar workers) one is U shape. Then, if we do not distinguish the two groups and put them together, we may get the result that the age-happiness curve is horizontal, i.e. no relationship. But this hides the opposite and hence offsetting relationships of the two groups. Also, the middle age may be happier due to their higher incomes; if the income factor is deducted, there may be no difference. Similarly, the aged may be less happy because of lower health; excluding the health factor, happiness may be unchanged.

However, it may also be argued that, the middle aged have higher incomes precisely because of their higher age (compared to the younger groups) that increases their experience and hence their incomes. So, this should not be deducted. Similarly, the aged may be less healthy precisely because of being older. So, this factor should also not be deducted. Thus, both the method using just primary data and the method using multiple regression have some advantages and some inadequacies. We may use both methods and compare the results. In recent years, researchers used both methods and still obtained the result that the age-happiness relationship is largely U shape. For example, Blanchflower and Oswald (2017) show that, out of seven data sets, if we just look at the primary data, we have the U shape relationship for 5 sets out of 7. Using multiple regression, we have the U shape result for all the 7 sets. Moreover, the U shape relationship is very large.

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