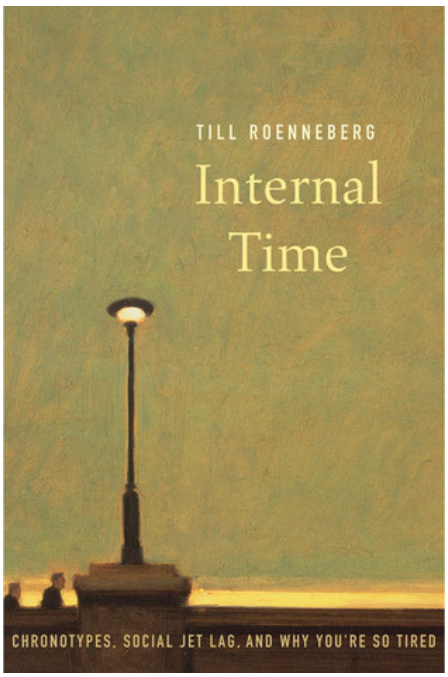

Internal Time: Chronotypes, Social Jet Lag, and Why You're So Tired

Till Roenneberg

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Early birds and night owls are born, not made. Sleep patterns may be the most obvious manifestation of the highly individualized biological clocks we inherit, but these clocks also regulate bodily functions from digestion to hormone levels to cognition. Living at odds with our internal timepieces, Till Roenneberg shows, can make us chronically sleep deprived and more likely to smoke, gain weight, feel depressed, fall ill, and fail geometry. By understanding and respecting our internal time, we can live better.

Internal Time combines storytelling with accessible science tutorials to explain how our internal clocks work—for example, why morning classes are so unpopular and why “lazy” adolescents are wise to avoid them. We learn why the constant twilight of our largely indoor lives makes us dependent on alarm clocks and tired, and why social demands and work schedules lead to a social jet lag that compromises our daily functioning.

Many of the factors that make us early or late “chronotypes” are beyond our control, but that doesn’t make us powerless. Roenneberg recommends that the best way to sync our internal time with our external environment and feel better is to get more sunlight. Such simple steps as cycling to work and eating breakfast outside may be the tickets to a good night’s sleep, better overall health, and less grouchiness in the morning.

[Description taken from publisher's web site.]

Internal Time: Chronotypes, Social Jet Lag, and Why You're So Tired Details

Date	:	Published April 2012 by Harvard University Press (first published February 18th 2010)
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From Reader Review Internal Time: Chronotypes, Social Jet Lag, and Why You're So Tired for online ebook

Jo says

The question "Why I am I so tired" was a major one for me at the time of reading this book. It's not a self help book but just reading his research on sleep really helped me put my own situation in perspective. As a late chronotype myself, I particularly enjoyed how he defended us, by demonstrating that the old adage "the early bird gets the worm" might well have applied to a traditional agrarian community but it is not necessarily true for modern city dwellers.

My rating is based on the comprehensive range of topics that he covered and the way he challenged many conventional ideas about sleep. Overall I liked the format of introducing each chapter with a fictional situation that he then explained with his research but at times I did wish that would hurry up and make his point as I found myself getting lost in the detail - someone more used to reading academic writing would likely find this less of an issue than I did. But it was compelling research and worth persevering with. I will certainly return to some of the chapters to try and deepen my understanding of a fascinating subject that is highly relevant in today's hectic world.

Lois Bujold says

I could hardly write a better review than this one, which sent me to Amazon Kindle to buy a copy:

http://www.brainpickings.org/index.ph...

24 chapters of the latest news from sleep studies. Good and useful information for Owls like me, and the Larks who have to live/deal with them.

The one item I was hoping for, and did not find in the read, was anything on studies of sleep disruption in women enduring menopause. It seems to me this would be a perfect natural laboratory to study endogenous sleep regulation brain and body chemistry, since (for example in my case), one is waked up every 90 minutes just like one of those political prisoners undergoing systematic torture. Alas, not one word on this topic.

(For one thing, I have noticed that it is not the so-called hot flashes that woke me up; I came awake at least a full minute before those somatic sensations occurred. I asked another woman about this, and she reported it as well. This says to me it's brain sleep chemistry being directly affected. But what *exactly* is happening?)

I suppose it must wait on 1) the existence of female sleep researchers who 2) hit menopause. Male sleep researchers merely seem to tend to mumble, "Hormones," as if that explained anything, and wander off, completely oblivious to what a gold mine of data they might tap.

Other than that, good book.

Joy says

Interesting and thoughtful, but ultimately disappointing and not particularly recommendable. There are 24 chapters, and each one has a case study about a different aspect of our internal time clocks, and then a detailed discussion about that aspect and the scientific evidence to date about it. The presentation is somewhat unique in that way, and the author clearly had fun writing this. (It’s also very clear that he’s European—that tone and style comes through, even in the translation.)

What was disappointing is that there is no conclusion and there are almost no take-always that can be applied in daily life. So in many ways, this is a data dump of the science known to date on internal clocks. Some of the chapters end with whole lists of questions for further research. I had hoped for something that I might be able to apply and use in my daily schedule, and this is not that! The text literally stops cold at the end of chapter 24.

One interesting contention at various points is that “decision makers” (people who establish processes or programs that society must follow) tend to be early risers with a need for less sleep than the average person. His contention was that many of our processes and programs assume or benefit early risers and people who need less sleep. I’m not positive he backed that up perfectly with research each time he suggested it, but it was still interesting that he kept pointing to that hypothesis at various places along the way.

Angie says

Upside: This book confirmed my hatred of mornings is genetic and therefore really not my fault. Downside: I will peel myself off the mattress until I die.

Brooks says

The subject was interesting, and there was some good information here, but the book as a whole I didn't enjoy. The anecdotes to start each chapter ranged from average to excruciating, and did little to move the book forward.

Glad to be done with this.

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mlady_rebecca says

Great article on the book: http://www.brainpickings.org/index.ph...

*****

By the way, this is another "heavy on the details" style review. If you just want the thumbs up/ thumbs down on content, writing style, and scientific accessibility, scroll to the end of the review.

*****

This is the book for all you night owls that are always fighting the "early to bed, early to rise" philosophy.

1) "Early to bed, early to rise" is a remnant of agrarian society when you needed to get outside work done while the sun is up. It is not as applicable in a 24/7 industrialized society.

2) Having a later biological clock is something you were born with. You can entrain to some extent to an earlier schedule by getting more direct sunlight exposure, but failing to entrain is not due to laziness or lack of willpower.

*****

I've read two great books on introversion over the last year. Add this to that collection and I've found two biologically based personality traits that I've been punished for all my life.

America is an extroverted nation, and yet there are statistically more introverts than extroverts. America is an "early to rise" nation, and yet there are more Americans with late chronotypes than with early ones. Talk about invisible discrimination.

*****

First off having a late or early chronotype, which defines when you prefer to sleep, is a distinct feature from whether you are a short sleeper or a long sleeper, which defines whether you need more or less than 8 hours sleep to function properly. Both are biologically driven.

And for those who criticize long sleepers, Einstein was known to need 10 hours of sleep per night.

While social time cranks out endless perfect 24 hour days, most of us don't have an internal biological clock that matches that 24 hours perfectly. A perfectly tuned biological clock was never of Darwinian advantage, because most of us live in regions of the world where the length of the day and night vary throughout the year.

Those of us with internal clocks longer than 24 hours need to constantly compress time, which ends up making us into late chronotypes or "night owls". Those of you with internal clocks shorter than 24 hours need to constantly expand time, which ends up making you into early chronotypes or "larks".

Being able to fall asleep is a combination of the sleep pressure you've accumulated (how tired you are) and where you are with respect to your own biological clock. I won't rattle off statistics, but the book gave me the impression that I'm an extreme late chronotype.

In addition to waking and sleeping, our biological clock determines a whole host of internal settings, like hormone levels and metabolism. Our body temperature hits a daily low around the mid-point of our sleep cycle. It hits a second low in the middle of the day, the time most appropriate for a nap.

It is interesting to note, we can't initially fall asleep at the time we get the best sleep of the night.

In bunker experiments where a subject was cut off from sunlight (and social cues) for a period of time, the subject stopped following social time and started following their own internal time - leading to longer or shorter days. In addition, when left to follow their own biological clock, the subject tended to fall asleep at the point where their body temperature hit a daily low.

I've always said I like to sleep in a cooler room - the best sleeping weather.

By the way, it is thought that yawning cools the brain.

The part of the brain that includes the biological clock is affected by sunlight. The more sunlight we are exposed to, the earlier our natural chronotype shifts.

The author gave a story showing how identical twins, who started out with identical chronotypes, drifted apart when one choose to become a farmer and the other a factory worker. The factory worker's chronotype shifted later than his twin, who continued to get lots of sun exposure.

Additionally, individuals who are blind tend to have later chronotypes, because their eyes don't get exposed to sunlight. The light receptors aren't the rods or cones, but a third type of photoreceptor called melanopsin.

Being forced to constantly work during hours your body expects to sleep creates social jet lag, a chronic version of the jet lag you experience when flying through multiple time zones. Social jet lag can lead to a weakened immune system, which contributes to a whole host of issues including sleep problems, depression, cardiovascular pathologies, digestive track issues, diabetes and other metabolic diseases, and obesity. (I have way too many check marks in that list.) It is even a potential cause of cancer.

Those fighting social jet lag are also more likely to be smokers. (A bullet I thankfully dodged.)

Speaking of traditional jet lag, east to west travel is easier to adjust to for everyone except extremely early chronotypes. Traveling west tends to make us slightly earlier chronotypes; traveling east tends to make us slightly later chronotypes.

As for Daylight savings time ... evil. For late chronotypes especially, it can take weeks to adjust. In the spring your body is slowly attuning itself to earlier sunrise, so that you wake before the sun, then with the sun, then after the sun comes up. Daylight savings time kicks you out of that pattern, throwing you back approximately 3 weeks so that you once more rise before the sun. In fall, the reverse happens.

Two last tidbits.

1. Late chronotypes tend to be able to stay up longer and "catch up" on sleep later easier than early chronotypes.

2. Teenagers are naturally later chronotypes. And as we age we tend to become earlier chronotypes. (I haven't noticed it yet, and I'm 41.)

*****

Fascinating book. I really enjoyed learning all about chronotypes.

Content: 5 stars.

I personally found the format and writing style a bit awkward. Each of the 24 chapters starts with a story and ends with details about chronotypes you can learn from that story. That tended to make the information jump around, rather than flow smoothly from point to point.

There were also a lot of diagrams, many of which I found not at all helpful.

Format and writing style: 3 stars.

I still don't quite understand how a 25 hour day is compressed or a 23 hour day is expanded to match the social 24 hour day. I think that was the main scientific detail I walked away not understanding fully.

Scientific accessibility: 4 stars.

Overall: 4 stars.

Steve Bradshaw says

Fascinating content but awfully written.

Simple concepts are explained in such convoluted complex ways that I had to reread a few sections to make sure I hadn't missed the point. The author has no ability to simplify the research into a clear narrative. The fictional chapter intros made me throw up a little in my mouth each time.

I gave it one star since zero doesn't seem to be an option. Malcolm Gladwell, please will you help rewrite this book!

Stefan Kanev says

This is a very interesting book about sleep.

It's not a self-help book. There are no advices on how to approach sleep, nor recipes to improve it. It just tells a lot of interesting things about how we sleep, how our body keep track of time and what happens when it looses synchrony with the external world. The book is written in a nice style, where each of the 24 chapters starts with a fictional story illustrating a point about the ideas ahead, then followed by a detailed discussion. It's pleasantly written, although the German heritage of the author occasionally shows through his English.

Here's a small sample of things covered in the book:

* Chronotypes - people have different sleep needs. Some work better when they raise early and some work better when they raise late (larks and owls).
* Interestingly enough, a big part of the reason is that our "internal day" is usually more or less than 24 hours - people with shorter days become early risers and people with longer days become late risers.
* Chronotypes change over the lifetime – teenagers usually become very late chronotypes and that visibly affects their performance in school.
* Interesting things happen when people are removed from all ques about the day/night cycle (isolated rooms with no clocks and a constant amount of light).
* Social jet lag – having a chronotype that doesn't fit the modern 9-5 workday and how we use the weekend to compensate.

Seriously, it's full of interesting stuff.

Jean says

A scholarly discussion of the study of the human body's internal clock, and the significant aspects of the field of sleep research. Although Roenneberg clearly strives to make his points accessible by including an illustrative story (in conversational tone) at the onset of each chapter, the concepts can get a bit heady. He divides the book into 12 chapters of two parts each, to mimic the night/day rhythms of our lives and our planet, and fitting as this is to the theme of the book, it seals it as a scholarly work and not an easy useable resource for diagnosing or curing an off-kilter internal clock. Still, it's quite fascinating.

~?~Autumn♥♥ says

Fascinating new information such as that some people make their melatonin in the day time and so should sleep in the day time which is NOT accepted by our society overall. Larks think everyone should be larks. Owls are more extroverted which sure surprised me. They are also more innovative.

Children born with Smith-Magenis syndrome are very crabby from being expected to be awake during the day when they are producing melatonin. They can be helped by a beta-blocker in the morning and supplemental melatonin in the evening.

Brett says

Are you a lark, or an owl? Do you bound out of bed 15 minutes before your alarm sounds, or are you continually hitting the snooze button ‘just one last time’? The culprit is your internal clock, a biological device found even in creatures as lowly as bread mould, which is used to synchronise our waking activities to the sun.

Roenneberg argues that your ‘chronotype’* – whether you are an early bird or a night owl – can impact several things in your daily life. Covered are topics like why teenagers sleep all day, why people living in the country go to sleep earlier than their counterparts in cities, and why couples tend to have different bedtimes. Each chapter begins with a fictional account that is intended to draw out the main premise of the chapter. Following the story, the science is explained in detail.

Internal Time covers a wide range: from experiments on humans kept in underground bunkers sealed from the outside world, to molecular biology identifying the genes that control our internal clock. The breadth of content is a weakness at times, as the complexity of the concepts presented varies significantly from chapter to chapter – some chapters are an intense read.

Overall, this is a fascinating account of the biology that controls our waking lives, whether we realise it or not.

**You can find out your chronotype by completing a short survey at http://www.thewep.org (‘Chronotype study’ link).*

Charlene says

I became familiar with Roenneberg's work while taking a chronobiology course that mentioned him and the

subject matter in this book. The writing style is a bit like a textbook. I listened to an audio version of this book and found myself zoning out. About a 1/4 through the book, I had to start over and make myself pay attention. Once I did, I loved this book.

While taking chronobiology, I learned about the various chronotypes in humans and how this would affect travel to Mars. I had never thought about how some individuals would be successful in training their biorhythms to match a Mar's day, while others would simply die trying. Since then, I have been looking for a book that focuses on biorhythms and discusses travel to Mars. Roenneberg's coverage of chronotypes in relation to Mars travel, as well as in relation to many other aspects of life, were extremely satisfying.

I did feel as if he really missed an opportunity in this book by not discussing the creation of Earth and the moon and how that event resulted in the dependency of the living organisms that live upon Earth to be synced with specific biorhythms. From there he could have talked at length about animal behavior and not simply human behavior. For this reason I was left wanting for another book about chronobiology that provided a greater depth and breadth of the subject. I might look online for open courses because it really is one of the most interesting subjects I can think of to keep learning about.

Throughout the book Roenneberg provided odd and quirky stories about fictional subjects. These, imo, were the best part of the book. I loved them! When he first wrote that he would be including fictional scenarios along with solid scientific findings, I was a bit skeptical he could pull it off. But he did indeed. I had to stop the audiobook at times because I found myself daydreaming about his fictional characters:)

Fiona Leonard says

There are some books that immerse you in a topic and you come away feeling wiser and inspired. Then there are other books that lead you to the edge of learning, throw you a few tasty morsels and then turn off the lights and send you away. For me, Internal Time: Chronotypes, Social Jet Lag and Why You're So Tired, sits squarely in the latter category.

This is a book about the science of sleep. According to the science, sleep is not something that is governed entirely by choice. Instead, it is something deeply rooted at our cellular level. While we have control over when we want to wake and sleep, at our core there is a mechanism that has preset when we should wake and sleep. Not only does this impact on how we feel, but also how we digest, think and function. This sleep preset is, however, not fixed, rather it follows a natural pattern over the course of our lives - varying with age. There is also a divergence between male and female sleeping patterns.

As the book clearly sets out, how we should sleep is profoundly affected by our need to conform to social expectations, whether those are preconceived notions of effectiveness ("the early bird catches the worm") or simply by the fact that we are required to be at work or school at a proscribed time.

The book is set out in 24 chapters (yes because there are 24 hours in a day) and each one begins with a case study/story and then goes on to explain the science behind it. The chapters makes for fascinating reading and there were plenty of sections that I found enlightening and highlighted to come back to. I read this book quite quickly because I was looking forward to getting to the advice section - "Here's how to manage sleep/jet lag/chronotypes etc" - except that part never comes. You get the science and then you're on your own.

If nothing else I feel like this book is a step forward in addressing the social stigma that surrounds sleep - that the less you sleep the better you are. It's good food for thought. What you do with that information is up to you.

Keriann says

Many of the negative reviews of this book are from people who were expecting self-help literature for sleeping disorders, or who get bored easily when things get sciencey. That being said, some of the "stories" are a bit cringeworthy, but I'm willing to forgive the author for that. Overall, I enjoyed this book quite a lot, but my opinions are biased because I'm a) extremely interested in circadian cycles, and b) a late chronotype. I wouldn't necessarily recommend that everyone read this book, but I DO recommend that everyone learn a bit about chronotypes and how they're biological rather than a lifestyle choice.

Suzanne says

Not what I was looking for. Gave up early.