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Teaching Time; Disrupting Common Sense

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Acknowledgments: I thank my students for bringing my time course to life and making each iteration of it a new adventure in learning for me. I am also grateful to Keri Facer for her comments.

Biography: Kevin K. Birth is a professor of anthropology at Queens College CUNY and also serves on the graduate anthropology faculty of the CUNY Graduate Center. He is the author of four books: *Any Time is Trinidad Time* (University Press of Florida), *Bacchanalian Sentiments* (Duke University Press), *Objects of Time* (Palgrave), and *Time Blind* (Palgrave), as well as many articles on the topic of time.

Abstract

In my course “Time” I set out to disrupt the connection between cognitive tools used to represent time (clocks and calendars) and experiences of time. This article documents some of the topics and pedagogical methods I use: using unusual due dates for assignments, making the clock look strange, disrupting the idea of “now,” showing how clocks cultivate gullibility, exploring the different hour systems of the past, criticizing clock-based logics used in primatological research, explaining the theory of special relativity, and exploring the political and economic consequences of sleep loss.

I have been teaching an interdisciplinary course on time for the last dozen years. It was originally developed as a senior-level synthesis/capstone course, but then the university ended that requirement. Yet, despite being an elective, the course has continued to get overflowing enrollments for a senior-level seminar, so my department has encouraged me to keep offering it on an annual basis.

When students see the title in the course offerings, they sometimes approach me and ask, “How much can there be to devote an entire course to time?” I smile and begin listing some of the topics covered by the course. I hope that by randomly mentioning subjects, I shall mention one that piques the student’s interests. The topics include: global time policies, the theory of relativity, the use of time in narratives (literature and film), time perception, time and biology, the history of timekeeping, different cultural practices of telling time, time and law, time and politics.

The agenda of the course is twofold. First, it is designed to challenge commonsense ideas about time. The primary pedagogical approach is to push, prod, and explore the tension between standardized representations of time, like the clock and calendar, and the experience of time. Such an approach addresses the goal of criticizing the dominant notions of time in higher education that then have implications for knowledge production outside of the university setting (Shahjahan 2018, 1). This being an anthropology course, much of what happens is asking the students to turn themselves into research subjects to reflect on their and their peers’ ideas of time. As I have argued elsewhere, clocks and calendars are cognitive tools that shape and even limit how people think about time (Birth 2012, 2017), and I seek to have students actively reflect on this.

The second goal is to encourage students to think creatively about time. With the exception of Michel Alhadeff-Jones' book *Time and the Rhythms of Emancipatory Education* (2017), much of the literature on time in higher education is critical of the dominant temporalities but offers little in the way of alternatives. I seek to address this challenge by having every student work on a semester-long paper project on a topic of their choosing. They are required to consult with me about their topic and reference list, give a class presentation, and turn in two drafts for my comments before turning in the final version. I encourage them first to think of something that interests them and only after that, think about how to approach the topic through the lens of time. Since the only limit is that the topic must be about time, this assignment generates a huge variety of projects. To give some examples, I have had papers on the following topics: the concepts of time associated with childhood cognitive development and how this affects the education of students with disabilities, the changes that have occurred in how time is represented in role-playing video games, ideas of seasonality among foragers, and the coordination of restaurant staff during dinner service to both deliver the food in a timely fashion and manipulate customers' experience of time. When encouraged to explore their interests through the lens of time, rather than making the starting point of their projects literature about time, most students find emancipatory ways to think about a wide range of topics outside of the university and often related to their career aspirations or personal experiences.

To cover everything I do in the course is not feasible here, in part because the course is fluid in response to students' interests. But there are certain exercises and topics that I cover that have become standard parts of the course. I shall focus on topics meant to disrupt

students' "commonsense" ideas about time. These ideas reflect a European cultural heritage that has naturalized the clock and the Gregorian calendar. This heritage is pervasive in our educational systems, and because of European colonialism, it has spread throughout the world.

Common sense is cultural hegemony. The clock is so ingrained into how many people approach the topic of time that they have trouble thinking about time except by means of thinking about clocks.

My attack on time-keeping tools begins with the syllabus itself. One of the first things students notice is the header in which I give a variety of dates. Here is the header from the Spring 2022 semester:

Spring 230, 1443, 5782, 2022, Tiger

Queens College has a very diverse student population, so I often have Jewish, Muslim, and Chinese students in my class, so four of the year dates are often quickly identified. Once the students have done that, I point out that the date of 230 refers to the year according to the French Republican Calendar developed during the French Revolution.

After the header, the students quickly notice the odd due dates for written assignments. When I teach the course in the spring semester, these are when assignments are due:

Paper 1: Topic—What is time to you? Due two weeks from now.

Term paper topic: Due the first class after the feast day of St. Mathias which, this year [2022], is not a bissextile day. [Note: in leap years, this is a bissextile day, and this gives me the opportunity to discuss leap years and what a bissextile day is.]

Paper 2: Due first class after the spring equinox or after the crocuses start to bloom—whichever comes first. Use Bakhtin's idea of chronotope to discuss how space and time are represented in a poem, short story, or song.

Term paper draft #1: Due before April Fool's Day.

Paper 3: Topic—What are the social (NOT PERSONAL!!!) functions of a deadline?

Describe ways in which deadlines are linked to social rhythms and influence social rhythms. How do deadlines affect you? Due whenever (Don't procrastinate!!!!).

Term Paper Draft #2: You must turn in a draft of your term paper. Due 10 days before our last class meeting.

The term paper is then due during the week of final examinations. The students get particularly concerned about identifying crocuses—a plant that usually blooms around the spring equinox in the northeastern United States.

In addition to the syllabus and written assignments, what follows below are eight topics discussed in my class with details on how I approach these topics pedagogically.

1. The Clock as a Frankenstein Monster

During the first class meeting, I ask the students to describe the clock on the classroom wall. In their descriptions, they mention the numbers, the hands, and the shape. After that, the work begins:

What are the reasons for there being 12 numbers?

What are the reasons for the dial being divided into 60 parts?

Why is clockwise clockwise?

If the dial is divided into 12 hours, and each hour into 60 minutes, and each minute into 60 seconds, why do we divide seconds into tenths?

Does this make any rational sense?

Such questions turn clocks into enigmatic representations. My answers to these questions begin to tell the story of such strange devices.

I tell them that what they are taking for granted is a horological Frankenstein monster—a representation of stitched-together time ideas from dead empires. The 12 numbers are dividing the day into two equal parts—an inheritance of the ancient Egyptian idea that the day was 24 hours long. The division of hours and minutes into 60 are an inheritance from the Babylonians. The division of seconds into tenths was an idea derived from the French Revolution's experiment with decimalizing time. Thus, these units reflect a multicultural heritage (or an appropriation, if one prefers that term) from past time-keeping ideas cobbled together in a single representation.

But why clockwise? That mimics the movement of a shadow on a sundial in the northern hemisphere. This allows me to bring up two interesting points. First, if clocks were based on southern hemisphere sundials, then clockwise would be what we call "counterclockwise." Clocks represent a de facto dominance of peoples in the northern hemisphere over representing time. Second, by mimicking the movement of the shadow, a clock represents the movement of the Sun. The problem is that it is not the Sun that is moving, but Earth that is rotating. A factual representation of time would, in fact, have the dial rotating and the hands remaining stationary.

I then ask the students the following: “If ‘octo,’ the root of October, means ‘eight,’ why is October the tenth month of the year?” This allows me to introduce how political clocks and calendars can be, because my answer is “Because Caesar decreed it.”

2. What is Now?

A great deal of philosophy of time is based on a distinction between before and after, and some of it focuses on a division between past, present, and future. In such thinking, the concept of “now” is extremely important. Common sense indicates that “now” implies simultaneity. That everything we perceive in a given now is occurring at the same time, but, in fact, it is not.

Everything we see travels to us at the speed of light. Everything we hear, taste, smell, or touch comes to us at a rate more slowly than light. I vex my students with the question: “If you hear thunder after lightning, are they happening at the same time or not?”

Thinking of the speed of light, the farther away we look, the further into the past we look.

That light impulse slows down to travel from our retina through our optic nerve, to our brain, to weave through a web of neural connections that somehow form our memories, our perspective, and our senses.

Despite our only seeing the past, it is the present—our now. In fact, multiple pasts make up our present. Look at the stars at night. The most distant star we can see with our naked eye is V762Cas in the constellation Cassiopeia. This star is over 16,000 light years away.

So if one looks at that star at night, one's "present" is constituted by over 16,000 years of the past.

In a way, indigenous Australians have a better way of viewing "now" than those who see "now" as a point in time. They say that we are walking backwards on a road into the future. Their rationale is that we cannot see the future, but we can see the past. For them, moving through time involves looking back on the road already traversed (see Stanner 1979).

3. Clocks and Watches Cultivate Gullibility.

To demonstrate this, I do my time travel trick. I take out my pocket watch and tell the students that I shall teach them how to do time travel. I then say, "here we go," and let my watch tick off ten seconds. After that I remark, "We have now traveled forward 10 seconds in time." As the students groan, I ask them if they want to go the other way. I show my watch to several students for them to record the time. I then utter some nonsensical pseudo-magical phrase in Latin (like "Tempus retro fugit"). As I do this, I use the stem on the watch to turn back the time. I then show the astounded students the watch with the time from about 40 minutes before (that's what one good turn of the stem normally produces). One of the reasons I wear a pocket watch and not a wristwatch is that it is far easier to accomplish this trick with a pocket watch.

Of course, they don't really believe they have traveled backwards in time, but they are curious about what happened. I then tell the story of my friend in Trinidad who used to work as a foreman for the Department of Public Works in the 1950s. As foreman, he was responsible for making sure his workers began finished work on time. Every morning, he would set his

watch to that of the chief engineer, and then he would take his workers out to their assigned project. Occasionally, he would end the work day early. Once, when this happened, the engineer showed up shortly after and accused him of having let the workers go home too early. But my friend had learned the trick to adjust the stem of his pocket watch quickly and while the watch was still in his pocket, so by the time he pulled his watch out of its pocket, he had adjusted it to show that the time on his watch was after quitting time. As he showed the engineer the watch he remarked “this is the time I work by.” There was nothing the engineer could do.

We give credence to clocks, but do not consider that they are devices that can be adjusted and manipulated. I conclude by asking the students if they know who controls the time on their devices. With this I can talk about the institutions that manage Coordinated Universal Time and eventually segue into the topic of time and law.

4. Asynchronous Hours of the Past.

I use the example of hour systems different from the modern one to emphasize that our representation of time is not dictated by nature. In the Renaissance and early modern Europe there were many different ways of telling the hour of the day, and in some cities different bell towers struck different hours. The most common systems were canonical hours and small hours. Canonical hours divided the daylight hours into 12 equal segments. Consequently, they varied depending on the time of year and the amount of daylight. Small hours are the system we use today. There were also Italian hours (1-24 starting after sundown), and Nuremberg hours (different counts of hours for daylight and nighttime hours). I show several examples of

how to convert between these hours that can be found in broadsheets or on early modern clocks, but then I focus on one particular broadsheet published in Nuremberg in 1564 (R.F. 1564). On this are canonical hours, Nuremberg hours, and our modern hours. Nuremberg hours involved different counts of hours for the day and night. The hour after sunrise was 1 o'clock in the day, and the hour after sunset was 1 o'clock in the night. At the winter solstice, 8 o'clock in the day would be followed by 1 o'clock at night. Not content with an academic discussion of these systems, I have created the world's worst drum solo to represent their relationship:

Kick drum = 15 minute intervals in our system

High hat = 5 minute intervals in our system

Floor tom = striking the hours in our system. One o'clock results in one strike on the floor tom.

Mounted tom = striking the Nuremberg hours. So 15 o'clock at night results in the mounted tom being struck 15 times.

Snare = striking the canonical hours

While this produces one of the most unappealing drum solos ever, it gives an idea of the asynchrony of bells in Nuremberg in 1564. It is so horrid I don't make it publicly available on the internet, but I share it with my class and have posted it on my website at

http://qcpages.qc.cuny.edu/ANTHRO/Web_Pages/birth/Kevin%20Birth,%20QC%20Anthropology.html

6. Do Baboons Really Work from 9 to 5?

Here I first refer to an article by Henzi et al. (1992), which suggests that “on average” baboons are active from 0900 hours to 1700 hours, in other words, from 9 to 5. I ask the students what they think of that statement. We then discuss all the environmental cues that might affect baboons’ actual behavior. Here I am usually blessed by having several students who have taken courses from my colleague Larissa Swedell, who is a field primatologist who studies baboons.

I then ask the students to produce metaphors associated with time. To some extent, this replicates the chapter on this topic in Lakoff and Johnson’s *Metaphors We Live By* (1980).

The typical metaphors I get are:

Save time

Spend time

Budget time

Time management

Wasting time

Time is money

It is not much of a leap to view these as capitalist metaphors for time. I then ask the students to search such terms as well as the term “commodity” in the article “Time as an Ecological Constraint” (Dunbar et al. 2009). This is an important methodological article in the field of primatology. Students are surprised at the extent to which the article uses the “time as commodity” metaphor to discuss time as if it were something that non-human primates managed and budgeted.

After a little work, I encourage the students to discuss whether or not they think that non-human primates really think and act as if time was a commodity. They generally conclude that it is a bit silly to model monkey and ape behavior on the basis of capitalist time logics.

7. Time Dilation and Relativity

Most of my students are from the social sciences and humanities and their eyes glaze over if I go into too much of a mathematical representation of anything, yet they are all familiar with time dilation and are immensely curious about it. After several years of avoiding the topic, I developed a non-mathematical way to approach it. I use the classic Hafele and Keating time dilation experiment conducted in 1971. A summary of this experiment can be found in videos on YouTube. There are many available, and the video I currently use is “The Time Dilation Experiment” at <https://www.youtube.com/watch?v=gdRmCqylsME>.

In the experiment there were two synchronized atomic clocks. One was placed on an airplane, and the other was kept at the airport. When the plane flew eastward, the time difference between the two clocks was 66 ns. When it flew westward, it was at 205 ns.

What this showed is that if the velocity of one clock is greater than that of another clock, then they will indicate that different times have elapsed. This supported Einstein’s claim that time is relative to velocity. The difference between the eastward and westward flying planes allows me to point out to my students that they are not in a stationary frame of reference. Earth moves around the sun at about 30 km/s, which is around 108,000 km/hour. Earth rotates at about 1670 km/h or about 463 meters per second. So, in one second, one travels almost a half a kilometer east and in a curve of Earth’s orbit 30 kilometers long. Since

Earth moves, and the plane moves relative to Earth's moving, the velocity of the plane relative to a position on Earth is greater when the plane flies west as Earth rotates east because the velocity of the airport moving away from the plane gets added to the velocity of the plane moving away from the airport.

8. The Conflict between Capitalism and Circadian cycles

Students often have been lulled into believing that sleep is pathological, and that the less sleep one gets, the more productive one is. So I incorporate a unit on chronobiology. I like to assign the short book *Sleep* by Lockley and Foster (2012). Among other issues this book covers are the symptoms of chronic sleep restriction. Usually, I can tie these symptoms to a current news story. In that regard, President Trump was strangely a pedagogical gift because he is proud of getting only 4 hours of sleep a night.

I ask the students to describe President Trump's behavior and character to me. I do not lead the class in this discussion, but merely write on the board anything they mention. Here's a typical list:

aggressive

arrogant

astute

authoritative

avoids blame

brash

brutal

careless

charismatic

childish

condescending

confident

confrontational

confused

dangerous

deceptive

exaggerated expressions

greedy

has no filter

image-conscious

immature

impulsive

inability to separate truth from fiction

incoherent

insecure

moody

narcissistic

neurotic

poor impulse control

racist

selfish

short attention span

slurred and confused speech

stubborn

untrustworthy

After the class has exhausted itself describing Trump, I have the class turn to the discussion of symptoms of chronic sleep restriction in Lockley's book. We put those symptoms on the board, and I add a few other symptoms based on the recent literature.

Consequences of sleep loss/restriction	Items on class's list of Trump's characteristics
anxiety	X
decreased cognitive performance	X
drop in performance	X
impaired concentration	X
Impaired ability to evaluate risk	X
impaired memory	
increased risk of injury/accidents	
insomnia	(he has this and is proud of it)
irritability	X
mood changes	X
poor decision making	X

I also note that there are symptoms of sleep loss that cannot be verified in Trump:

cancer

decline in reaction time

decreased motor performance

depression

diabetes

gastrointestinal problems

hallucinations

heart disease

hypertension

impaired immune response

microsleep

pressure to sleep

psychosis

weight gain

It is remarkable how much overlap there is between the list of symptoms and Trump's behavior. After allowing the class to discuss the overlap, I then discuss the article "Short Sleep Duration by US Industry and Occupation" by Luckhaupt et al. (2010). We look at the professions that experience the greatest amount of sleep deprivation or restriction: transportation, banking/finance, and medicine. I lead the class in a discussion of what it means for these features of our world to be controlled by people experiencing symptoms of chronic sleep loss.

Obviously, as the memory of President Trump fades, I'll have to find new examples, but there is always something. If all else fails, I can fall back on Karen Ho's ethnography of Wall Street financial firms which describes a typical work week as being over 100 hours (2009).

Conclusion

I view the purpose of my time course as disrupting students' views on time to allow them to think about time in new ways. As I often say, we typically end our education about time in early primary school grades, and never really return to the topic. What this means is that what we learn about time is merely a conventional representation of time that is useful for managing primary school students and future workers. Undo the representation, and one increases the possibilities of thinking about time. I find it also gets students to re-evaluate their relationship with clock and calendar time, and even change some of their habits.

At the end of the course, I ask the students bring their first paper to class—the paper in response to “what is time to you?” I light a King Alfred Candle clock (see Birth 2018) to time the duration of the last class. I ask students to reflect on their first paper to discuss how they think about time after taking the course. From the discussion, it always becomes clear that every student has drawn different insights and that there is no uniformity among them in thinking about time, and, in a sense, that is one of the goals of the course.

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