

Taming Time

Daoist Ways of Working

with

Multiple Temporalities

by

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The Prize

Imagine that you have won the following prize in a contest: each morning the bank deposits \$86,400.00 in your private account for your use. However, this prize has rules.

1. Everything that you don't spend in any given day is taken away.
2. You cannot save or transfer the money into some other account.
3. You may only spend it.
4. Each morning, the bank opens your account with another \$86,400.00 for that day.
5. The bank can end the game and close the account for good without warning.

What would you do?

You would buy anything and everything you wanted, right? Not only for yourself, but for all people you love. Even for people you don't know, because you couldn't possibly spend it all on yourself. You would try to spend every cent, and use it all.

Actually, this game is real! Each of us is already a winner of this prize. The prize is *time*. Each and every morning, we wake up to receive 86,400 seconds as a gift of life. When we go to sleep at night, any remaining time is not credited to us and cannot be saved. What we haven't lived up that day is forever lost. Yesterday is forever gone, but the next morning the account is refilled. Still, the process can stop at any moment without warning!

So, what will you do with your 86,400 seconds? Those seconds are worth so much more than the same amount in dollars. Think about that, and always think of this: Enjoy every second of your life, because time races by so much quicker than you think. Take care of yourself, be happy, love deeply, and enjoy life! Start spending!

Introduction

The Nature of Time

A present that is common throughout the whole universe does not exist. Events are not ordered in pasts, presents, or futures; they are only “partially” ordered. There is a present that is near to us, but nothing that is “present” in a far-off galaxy. The present is a localized rather than a global phenomenon.

The difference between past and future does not exist in the elementary equations that govern events in the world. It issues only from the fact that, in the past, the world found itself subject to a state that, with a blurred take on things, appears particular to us.

Locally, time passes at different speeds according to where we are and at what speed we ourselves are moving. The closer we are to a mass or the faster we move, the more time slows down: there is no single duration between two events; there are many possible ones.

The rhythms at which time flows are determined by the gravitational field, a real entity with its own dynamic that is described in the equations of Einstein. If we overlook quantum effects, time and space are aspects of a great jelly in which we are immersed.

In the elementary grammar of the world, there is neither space nor time—only processes that transform physical quantities from one to another, from which it is possible to calculate probabilities and relations.

—Carlo Rovelli, *The Order of Time* (2019, 194)

Time flies. Time waits for no man. Time is of the essence. Time is everywhere and in everything. We are in time, with time, of time (Peters 2015, 175). Time is a river, a thief, and a bestower of gifts. It is a god, a revealer of secrets, and a burier of secrets. It runs or flows for the most part, but sometimes it also stops or drags (Lawrence 1986, 25; Alverson 1996, 111).

Time surrounds us, flows through us, and determines us (Griffith 2002, 1). We never see it, but we see, feel, and experience events (Mak 2006, 157; Grosz 1999, 2). “It permeates simple everyday experience no less than the most abstrusely theoretical speculation” (Bender and Wellbery 1991, 1). “Time is the strangest thing that does nor does not exist, as every becoming is also the negation of what once was. It is the element most resistant to materialization, although mathematics has been its most faithful medium and translator” (Peters 2015, 167).

Time has classically, notably by the ancient Greeks, be defined as motion and is intricately linked with space.¹ A cluster of concepts, events, and rhythms covering a wide range of phenomena (Hall 1983, 13), it has been classified variously, most prominently divided into personal and social dimensions, and analyzed according to its physical and metaphysical, biological and psychological, sacred and profane, cosmic and historical manifestations (Hall 1983; Harris 1988; Ornstein 1977).

What they all have in common is that time in its essence, sometimes also called “meta time” (Hall 1983, 25), can be defined as the interval that elapses when an object, however massive or subtle, moves from one place to another (1981, 27). Much of the universe is in a state of space, which is “the organizing principle of the natural world, the glue that binds the universe together.” Time, in contrast, is secondary, “not the reason but the consequence of order, derived from the sequence of cause and effect” (Musser 2015, 171-72). In existence as we know it, time and space cannot exist one without the other but form an intricate network where any spatial localization is also temporal, a phenomenon physicists and philosophers describe as spacetime.²

Spacetime is clearly perceptible in the night sky. Looking at stars a plethora of light years away, one sees things happening millions of years ago (Gott 2001, 77). Spacetime never ceases, but is dynamic change and ongoing transformation, shaping a universe made up of mass-energy, which can be neither created nor destroyed and remains constant in its totality (Benjamin 1981, 7; Rovelli 2019, 97). But constant does not mean static—any stability or rest are merely apparent, essentially states of dynamic balance—and there is nothing really still.

As we sit quietly in an armchair, peaceful and relaxed, we appear to be motionless. Yet in fact, we move with the earth as it rotates on its axis at 1,000 miles per hour (mph) and revolves around the sun at 66,000 mph. More than that, we speed along with the sun on its way toward Lambda Herculis at 45,000 mph. As part of the solar system, we spin around the Milky Way at 483,000 mph; and as part of the Milky Way galaxy, we hurl through space in the ever expanding universe at 1.3 million mph.

Far from being solid and stable, we are in constant motion at speeds much too fast for our sensory perception and limited imagina-

¹ Benjamin 1981, 13; Hammond 2012, 122. This also holds true for China (Chang 2009, 218).

² For more on spacetime, see Carroll 2019, 271; Coveney and Highfield 1990, 82; Douglas 1995, 173; Galison 2003; Greene 2004, 130; Halpern 1990, 13; Mainzer 2000, 44; Muller 2016, 79; Newton-Smith 1986, 32-33; Rovelli 2019, 74-76; Savitt 1995, 10; Shallis 1986, 68; Stamp 1995, 110; Unruh 1995, 57; Weinert 2010, 112.

tion (www.astrosociety.org/uitc; Muller 2016, 27). In sum, we ourselves as much as all particles, molecules, entities, objects, and living organisms keep on moving and transforming, changing differently according to varying constitutions, densities, and situations (Carroll 2012).

Time is not uniform or universal. Rather, it moves at different speeds, “travels at diverse paces with diverse persons” (Fraser 1987, 183). We know this from everyday experience. “A watched pot never boils,” expresses it poignantly – when we wait for something to happen time slows down. By the same token, time flies when we are having fun – summer vacations passing much too quickly (Muller 2016, 26) – and any many older people say with Zhuangzi, “Man’s life between heaven and earth is like the passing of a white colt glimpsed through a crack in the wall – whoosh! – and that’s the end” (ch. 22). The famous dictum of Albert Einstein summarizes it well: “When you sit with a nice girl for two hours you think it’s only a minute, but when you sit on a hot stove for a minute you think it’s all of two hours” (Muller 2016, 27).

What most people do not realize is that this is not just perception but reflects physical reality. The universe being ultimately “a patchwork of an infinite number of clocks that are running at different rates, none of them measure its proper time” (Halpern 1990, 94). Rather, clock time is an artificial construct, a synchronizing structure to correlate and coordinate different events based on various mechanical means that move in a steady rhythm – the shadow of the gnomon, the large hand on the dial, the atomic counter (Carroll 2012).

All things in the world are connected with one another and depend on one another. . . . Time is an abstraction, at which we arrive by means of the changes of things; made because we are not restricted to any one definite measure, all being interconnected. (Mach 1919, 223-24)

Relationally defined by a specific phenomenon, measured time is neither external to phenomena nor a universal quantity (Uzan 2004, 207). As a result, in actual reality “the time when an event takes place depends on the reference frame” (Muller 2016, 29). That is to say, depending on the speed at which an object moves, its time slows down or speeds up – the faster the motion, the slower the time. For example,

If an astronaut were to travel near the speed of light, it might take him, say, one minute to reach the nearest stars. Four years would have elapsed on earth, but for him only one minute would have passed, because time would have slowed down inside the rocket ship. Hence he would have traveled four years into the future, as experienced here on earth. (Kaku 2008, 219)

The same holds also true on a more mundane level.

Our biological clocks are affected by changes in the flow of time. Consider a pair of twins. Suppose that one twin goes to live on the top of a mountain while the other stays at sea level. The first twin would age faster than the second. Thus, if they met again, one would be older than the other.

In this case, the difference in ages would be very small, but it would be much larger if one of the twins went for a long trip in a spaceship, in which he accelerated to nearly the speed of light. When he returned, he would be much younger than the one who stayed on earth.

This is known as the twin paradox, but it is a paradox only if you have the idea of absolute time at the back of your mind. In the theory of relativity there is no unique absolute time; instead, each individual has his own personal measure of time that depends on where he is and how he is moving. (Hawking and Mlodinow 2005, 48)³

This phenomenon of moving at different speeds through time is known as time dilation.⁴ It matters little in ordinary life but makes a big difference in more cosmic settings. Thus, GPS satellites, which orbit at 2.4 miles per second (8,750 mph), run slower than time on earth by 7,200 nanoseconds, causing an error in location of 1.4 miles per day if left uncorrected (Muller 2016, 33). Similarly, if we could speed ourselves up to the level of light, we would not age at all – time would change pace and we would move with it. Stories such as the Rip van Winkle tale about stepping into an alternative universe, spending a week, and returning home to find hundreds of years have passed express the same idea.

Multiple Temporalities

While Einstein discovered the relativity of time and opened the door to much of modern physics and technology, it was the genius of Julius T. Fraser to identify six central reference frames of time that are all present within each of us, moving at different speeds and creating both progress and conflict. Constituting “the most comprehensive theory on this subject” (Steineck 2010, 350), they signal different chronotypes, i. e., “models or patterns through which time assumes practical or conceptual sig-

³ For other discussions of the twin paradox, see Burdick 2017, 65; Canales 2016, 53; Coveney and Highfield 1990, 81; Davies 1995, 59-63; Fraser 1987, 237-39; Gott 2001, 66; Muller 2016, 54; Rovelli 2019, 10, 38; Sciama 1986, 9-10; Weinert 2013, 143; Zohar 1983, 131-33.

⁴ On time dilation, see Buonomano 2017, 58; Coveney and Highfield 1990, 94; Davies 1995, 35; 2001, 10; Hall 1983, 121; Hammond 2012, 24; Halpern 1990, 92; Mellor 2002, 46; Musser 2015, 81; Noreika et al. 2014, 536; Rovelli 2019, 10; Sciama 1986, 7; Weinert 2010, 113.

nificance” (Bender and Wellbery 1991, 4; Buonomano 2017, 50). Fraser further links them to the image of the “arrow of time,” developed by Sir Arthur Eddington in connection with his studies of entropy (Muller 2016, 97). The six modes or levels of time are:⁵

Name	Frame	Characteristic	Image
atemporal	universe	timeless	no arrow
prototemporal	particles	simultaneous	shaft fragments
eotemporal	stars	longterm	straight shaft
biotemporal	body	rhythmical	vague head and tail
noötemporal	mind	symbolic	whole arrow
sociotemporal	society	scheduled, historical	quiver in flight

These six, “the canonical forms of time” (Fraser 1999, 38), working from empiricist, relativist, conventionalist, scientific, and evolutionist standpoints (Steineck 2010, 352), match the overall evolution of the universe, which increased in complexity and energy rate density with every major step. Thus, from galaxies to human societies, energy rate density changes exponentially. If we assign the number one to early cosmic galaxies, the stars would be at two, planets at 75, plants at 900, animals at 20,000, brains at 150,000, and human societies at half a million (Chaisson 2001, 139; Christian 2004, 81).

The number one, then, marks the instant of the big bang about fifteen billion years ago, when the primeval universe consisted of “pure chaos or pure becoming” and “formed the foundation of the world, constituting nature’s first stable integrative level” (Fraser 1999, 27). Nothing but electromagnetic radiation, it was without time and had “no lawful physical processes” (1982, 50), a world without any form of causation—defined as “constraints that govern the manner in which events may be connected” (2010, 19; Rovelli 2019, 166). A state of elementary unfolding, it was cosmic chaos, a word that originally means “abyss”: the primeval emptiness or dark gorge of the universe (Fraser 1999, 60; 2010, 20).

From here, “objects arose that had nonzero rest mass and traveled at speeds less than that of light,” creating the quantum world of particle-waves (1999, 27; 1982, 65). Called prototemporal—using the prefix used to signify “first formed”—this level marks time at its most primitive: instantaneous, synchronous, immediate, nonlocal. Its truth—defined as

⁵ Presented in Fraser 1981, xxx-xv; 1982, 39-31; 1987, chs. 3-4; 1990, 436-40; 1998, 11; 2004, 11-14; 2007, 21-24, 42-47; 2010, 25-27. For more, see Bluedorn 2002, 24; Huisman 2913, 50-53; Michon 1986, 52-59; Ostovich 2013, 170-71; Wood 2015.

the particular knowledge “the organism may successfully employ in the control of its destiny” (1990, 333; Steineck 2010, 353) — is that of probabilities, inherent tendencies mixing and matching every which way, highly unstable in nature yet with permanent underlying laws.⁶

The third temporality developed a billion years later, when “massive matter first froze out and protogalaxies began to form,” floating in “an immensity of almost complete emptiness” (Fraser 1999, 27). The time working in the astronomical universe is called eotemporality, the prefix “eo” indicating the “oldest of developing forms.” Pictured as the shaft of the arrow, it has linearity and structure. “Eotemporal events are countable and orderable” (1999, 36), but notions of passing time or aging do not apply here (1982, 53). Rather, in a basic manner indicating the rhythms of nature as we know them, time here works in a system of “deterministic causation.” It can be measured, sequenced, and expressed in numbers, creating diurnal, seasonal, and long-term cyclical structures (1999, 57; also 1990, 106).

Next, on one small planet—and as far as we know, there may be more—about four billion years ago, life arose, leading to the unfolding of various species, from amoebae through fish, birds, and reptiles to mammals and eventually humans. Their time is biotemporality, the circadian rhythms and life cycles of different species, involving limited temporal horizons and the distinction of different time phases. Life forms built on carbon chemistry absorb and use “matter, energy, and information,” in an ongoing “conflict between growth and decay coordinated in the organic present” (Fraser 1999, 65, 40). “The characteristic connectivity of events” here is biological need plus “organic intentionality directed toward concrete goals,” most notably survival and procreation (1999, 36, 66; 2010, 22).

Moving on, human beings as they arose in biotemporality also developed complex brain structures and mentation, thus evolving into noötemporality or noetic time, “the temporal *umwelt* of the mature human mind in its waking state.” The term *umwelt* here signifies “the circumscribed portion of the environment which is meaningful and effective for a given animal species” (Fraser 2007, 20). Mentation, moreover, involves various features such as perception, memory, mental time travel, and narrative identity creation; it is largely mediated by language—“the architect of time” (1987, 172). Signifying a “world created by the human mind, using its skills for the symbolic transformation of experience and its capacity to appreciate nonpresent objects and events” (1999, 27), the noötemporal framework is determined by the brain in its different dimensions, a uniquely human world (1987, 155; 2010, 23).

⁶ Fraser 1999, 59-60. See also Fraser 1982, 69, 92; 1990, 97-104; 2010, 21.

The most complex of all, finally, is time as determined by society, manifest in organized calendars, systematic scheduling, rites of passage, age-related codes (dress, behavior, remuneration), as well as in the way a given culture places itself in cosmology, history, and eschatology. Sociotemporality—“the socialization and collective evaluation of time” (Fraser 1987, 188) is based on lessons learned from “pasts before birth and visions of futures beyond death” (1999, 68). It works through synchronizing and scheduling different activities as well as by creating and maintaining value systems to guide overall conduct. While these may originate in biological or natural time cycles, they go far beyond and often even ignore or distort them, working largely on a symbolic level (1987, 190).

Since social time, moreover, works closely with mental constructs, “distinguishing it from noetic time is difficult” (1999, 36). Historically, the mental conception of future (tool use) and past (burial rites) precedes complex social structures (Brandon 1981, 140), but then the social phenomenon of literacy laid the foundation for discriminating consciousness, so that the two are intricately intertwined and closely connected. That is to say, sociotemporality is associated with a world of symbolic relations and noetic attributes and identities. Language provides the means to create narrative sequences, defining social similarity or dissimilarity in time as well as history and community dynamics. In other words, language—both a social and noetic phenomenon—is the key to defining social and personal identity as well as temporality (Huisman 2013, 62).

Inherent Dynamics

Seen as a whole, the six modes of temporality each have their dominant agency, particular form of causation, inherent structure, and relationship to past and future (Fraser 1998, 12; 1999, 67; 2007, 69). More specifically, these are:

Time	Agency	Causation	Structure	Past-Future
atemp	energy	Chaos	potentiality	nonexistent
proto	particles	Probability	nonlocality	coinciding
eo	planets	Determinism	Orbits	geology-ecology
bio	organism	cause & effect	Cycles	birth-aging-death
noö	brain	need & intent	Concepts	memory-expectation
socio	cultures	group dynamics	Measures	history-vision

Their overall dynamic, moreover, is best described by Michael Polanyi:

As the rising levels of existence were created by successive stages of evolution, each new level achieved higher powers entrapped by new possibilities of corruption. The primeval matrix of life was inanimate and deathless—subject to neither failure nor suffering. From it have emerged levels of biotic existence liable to malformation and disease and, at higher stages, prone also to illusion, to error, to neurotic affliction—finally producing in man, in addition to all these liabilities, an ingrained propensity to do evil. (1974, 128-29; cited in Fraser 1999, 43)

Not only do the six temporal frameworks span the evolution of the universe, but “each of the crossings between adjacent temporalities may be described in the language of physics as a phase change in the state of matter and energy,” not unlike the freezing or melting of water (Fraser 1987, 269). Just as water maintains its original nature, they all remain active throughout and together “form a nested hierarchy of presents.”⁷

In other words, the biotemporal, noetic, and social universes we live in “float, metaphorically speaking, in an atemporal sea” and are supported by proto- and eotemporal patterns (1982, 51). We as human beings participate in all six temporalities at all times, so that we are subject as much to the scheduling of the work day as to the rhythms of the planets and the timelessness of original chaos. We also tend to visualize all the different levels in our own terms. “We imagine biotemporal ordering where there can be none,” integrating for example, “atemporal chaos with our understanding of the history of the universe as a universal state of the world that preceded creation” (1992, 66).

Nonetheless, while the levels are integrative and interconnected and in some cases beyond human comprehension, they are also hierarchical, of increasing complexity, and continuously evolving (Nowotny 1998, 98-99). They all work with different inherent dynamics and require different terminologies and modes of thinking, thus leading to a fundamental tension and a continuous state of unresolvable, creative conflict (Fraser 1999, 26; 2010, 29). The various temporalities remain in constant, dynamic flux, so that “all balance is but unperceived conflict,” which may either be maintained for a period, give rise to a new integrative level, or be eliminated by collapse into the level from which it arose (1999, 39).

In other words, while human beings participate in, and have access to, all six temporalities, they do so at their peril. The very multiplicity of

⁷ Fraser 1994, 264; 1999, 35; 2007, 59; 2013, 23. See also Nowotny 1998, 99.

time is not only the root of creativity and ongoing evolution, but also forms the source of deep-seated insecurity and discontent, of an ongoing struggle between the demands of social, biological, natural, and cosmic time patterns.

Daoist Ways

The Daoist enterprise in this context can be seen as a set of unique ways of coming to terms with the six kinds of temporality, describing them in unique terms and working with them to create a different and more cosmic way of life. In many ways, Daoists are not only deeply embedded in, and working with, their own version of social time, but they also strive to reorganize its noetic dimension to recover a greater harmony with biological, natural, and cosmic patterns, to eventually reconnect with the timeless chaos underlying all.

The discussion below follows the different temporalities in inverse order, beginning with the social and ending with the universal or atemporal. Preceding this, it presents issues of language, mainly because, as J. T. Fraser says, it is most fundamentally “the architect of time,” but also because language intricately combines three otherwise separate dimensions, the biological, neurological, and social.

Following this, three chapters present different aspects of sociotemporality—core concepts as defined by Chinese and Western thinkers, the vision of human development in terms of history and its dynamics, as well as ways of measuring time through calendars and clocks that determine how people work with it in their daily lives.

The next three chapters focus on noötemporality, discussing in turn the neurological and conceptual dimensions of present, past, and future. They place particular emphasis on modes of perception, different types of memory and the identities formed on their basis, plus expectations and visions of the future as created through mental travel.

Biotemporality is next, the subject of two chapters. The first centers on genetics and life cycles and discusses circadian rhythms and various other ways time marks biological phenomena. The second focuses particularly on modes of cultivation, that is, on how Daoists work to modify temporal patterns and organic developments such as aging.

The last three chapters of the book discuss one time frame each, moving from timefulness through timeliness to timelessness. They begin with eotemporality or planetary time, then discuss prototemporality or the quantum world of simultaneity, and conclude with atemporality, the overcoming of time in ultimate oneness, a state of emptiness and nonbeing, stillness and nonaction, as well as the transcendence of immortality.

