Article

Time Is Dual: Reconciling Absolute & Relative Time

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Abstract

Modern interpretations of time, influenced by Einstein's theory of relativity, often depict time as a flexible entity that bends, stretches, pauses, or reverses depending on velocity or gravity. This paper challenges that notion by asserting that time is fundamentally absolute within each individual system. Apparent variations across observers arise not from time itself, but from differences in reference frames. Slower ticking clocks under motion or gravity are mechanical responses to external forces, not evidence of altered time. Misinterpreting these effects is akin to blaming a crooked ruler for a curved line. We present a framework in which proper time is internal and unchanging, while reference time is a comparative label tied to frame-dependent coordinates. Time dilation is redefined as a device-level phenomenon, and the idea of time travel is identified as a conceptual error rooted in instrumental misinterpretation. Logical analysis, physical examples, and philosophical reasoning support the conclusion that proper time flows is continuously, irreversibly, and absolutely, regardless of external conditions.

Keywords: Absolute time, reference frame, time dilation myth, proper time, time travel critique, relativity revisited, clock fallacy, philosophical time.

1. Introduction

Time is often treated as a fixed scientific parameter, a number ticking forward, a coordinate on a continuum. In classical Newtonian physics, it was considered absolute: flowing uniformly and independently of any observer [1]. This understanding remained largely unchallenged for centuries until the advent of Einstein's theory of relativity. According to relativity, time became elastic, appearing to bend, stretch, or pause depending on one's velocity or proximity to gravitational masses. A clock on a mountain ticks faster than one at sea level; a satellite's onboard clock must be corrected to stay synchronized with Earth-based systems [2]. But should we then conclude that time itself changes, or is it merely the devices that are affected?

This paper argues that time is dual in nature: absolute within each physical system, and relative only in comparison across frames. Proper time, the internal, lived experience of duration, is untouched by external factors. Coordinate time, however, is frame-dependent and subject to mechanical or observational distortions. That is all relativity reveals: variance in clocks, not

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variance in time. A teacher in Pakistan conducting a real-time class with students in both Australia (UTC+10) and the United States (UTC−7) appears to transcend time zones, but in reality, he and his students each experience uninterrupted local time. They are not time traveling; they are navigating labeled frames. Relativistic experiments, such as Hafele and Keating's atomic clock flights around the world, demonstrated deviations in timekeeping but not in human biological time or experience [3]. This paper reasserts the distinction between instrumental deviation and temporal reality, formalizes the Time Duality Hypothesis, and aims to refute popular and academic misconceptions about time dilation and time travel.

2. Classical Time vs Modern Confusion

2.1 Newton's Absolute Time: The Golden Simplicity

Sir Isaac Newton defined time as "absolute, true, and mathematical time," a steady flow independent of any object or event. In his worldview, time existed universally and uniformly, like an invisible river coursing through the cosmos. It did not need validation through instruments; rather, instruments were judged by how well they kept up with time. When clocks failed to align, we corrected the clocks, not the time itself. This view underpinned centuries of reliable physics and human understanding. It matched everyday intuition: time moves forward, equally and unceasingly, for everyone, everywhere [4].

2.2 The Rise of Relativity: A New Way to Label Clocks

Einstein's theories of relativity, both special and general, challenged Newton's absolutes by introducing frame-dependence. According to relativity, a moving clock or one near a massive object ticks slower compared to one at rest or in weaker gravity. This revolutionized modern physics, yet it also sowed deep confusion. The equations show that clocks behave differently under different conditions, but they do not claim that time itself bends or slows. Unfortunately, the subtlety was lost in translation: clock variance came to be seen as time distortion, giving rise to imaginative but misleading interpretations of "slower time" [5].

2.3 Clock ≠ Time: The Root of the Confusion

The central misconception lies in equating time with its measurement. Modern science often conflates time with atomic clocks, GPS systems, or synchronization algorithms, interpreting any irregularity in ticking as proof of time variation. But this is flawed logic. Just as a shadow changing with sunlight does not imply a change in physical form, a clock ticking slower under strain does not mean the person wearing it is aging slower. Human biological experience, including thoughts, heartbeats, and metabolism, continues at the same internal rate regardless of gravitational or inertial effects. The deviation lies in the device, not in time itself [6].

2.4 From Universal Time to Personal Clocks: Where Physics Slipped

Relativistic thinking gradually shifted from Newton's universal model to a scattered perspective where "time" depends on the clock, leading to some bizarre conclusions. We are told that sitting in a plane alters aging rates, or that cities at lower altitudes experience slower time. More dramatically, popular science often teases the idea of entering the future or past simply by accelerating fast enough. These ideas are not grounded in physical reality but are speculative tales dressed in mathematical language. They mistake coordinate shifts for temporal events, which continues to mislead both laypeople and academics alike.

2.5 Clarifying the Foundation

To restore clarity, we must separate the tools of timekeeping from time itself. Time is the internal, irreversible progression experienced by a system; this is proper time. Clocks, in contrast, are mechanical or atomic devices whose performance is susceptible to external interference. Coordinate time is not time itself but merely a label assigned to align frames. Relativity rightly shows how instruments diverge under motion or gravity, not how time itself distorts. Time dilation, therefore, is more accurately understood as clock deviation, not an invitation to bend the arrow of time or escape causality.

3. Time Is Absolute – No Matter What the Clock Says

3.1 Clocks Misbehave – Time Does Not

A fast-moving atomic clock can lose or gain nanoseconds, just as a cheap wristwatch may drift seconds per day, yet in both cases the defect lies in the mechanism rather than in the passage of time itself. Treating such instrumental error as evidence of a temporal "warp" is like blaming a crooked ruler for the curvature of space; the measurement tool falters while the underlying dimension remains unchanged and uninterrupted.

3.2 The Logical Barrier to "Going Back"

For any traveler to revisit a personal yesterday, the universe would need simultaneously to undo every thermodynamic change, restore every microscopic quantum configuration, and erase the traveler's present memories while somehow preserving awareness of success. This is an obvious contradiction. Because entropy cannot spontaneously reverse and macroscopic order cannot be reconstructed at will, the concept violates the second law of thermodynamics [7].

3.3 A Note on Resurrection and Metaphysics

Religious traditions that speak of resurrection or final re-creation do not imply a rewinding of cosmic history; rather, they posit a new instantiation of life brought forth by divine command. The timeline, therefore, still advances unidirectionally. The resurrected state is a forward event,

not a retrograde splice. Even sacred narratives, then, tacitly respect the one-way arrow of proper time.

3.4 Formal Statement of Absoluteness

Let τ denote proper time along any world-line. For every physical process

$$\frac{d\tau}{dt} > 0 \; and \;\; \tau(t_2) > \tau(t_1) \;\;\; \forall \, t_2 > t_1$$

No valid coordinate transformation $(t, x, y, z) \mapsto (t', x', y', z')$ can produce $\tau' < \tau$. Clock (C) may exhibit $\frac{dC}{dt} \neq 1$ under stress , yet $\frac{d\tau}{dt} = 1$ by the definition of proper time [8].

4. Frame-Switching, Not Time Travel – Practical Relativity Explained

4.1 The Great Teaching Experiment

Imagine a teacher in Pakistan delivering a live lecture at 12:00 noon. One of his students joins from Australia at 6:00 PM (six hours ahead), while another connects from the United States at 2:00 AM (ten hours behind). From a superficial perspective, it may seem as though the teacher is interacting with the future and the past, "reaching forward" to tomorrow and "speaking back" to yesterday. However, in reality, nothing extraordinary has occurred. The teacher's proper time flows continuously and undisturbed. What differ are the students' local clock settings, which reflect distinct reference frames. These are time zones, not temporal warps. This is not time travel; it is frame-switching in action, a globally synchronized illusion rooted in relative coordinate labeling.

4.2 What Time Zones Really Mean

Time zones are cultural conveniences, not physical transformations. When someone says "New York is 12 hours behind Tokyo," they are not suggesting that people in Tokyo are aging faster or exist in the future, only that each region aligns its daily clock with the position of the Sun overhead. Identical twins living in different time zones do not live in different eras; they live the same moment, differently labeled. This is the essence of relativistic observation: differences in labels do not mean differences in reality. Time remains consistent; only the coordinate framing changes. Clocks may disagree, but time does not.

4.3 GPS: A Clock-Tuning System, Not a Time-Warp

The Global Positioning System is often cited as proof of time dilation because its satellite clocks require tiny relativistic adjustments due to both speed and altitude. But this does not mean that satellites experience different flows of time. Their onboard clocks simply tick at slightly different rates due to mechanical influences, and Earth-based systems adjust these discrepancies to maintain accuracy [9]. If left uncorrected, the positional error could lead your smartphone to

report that you are miles away. However, that would not mean reality has shifted; it would only indicate that the satellite clock became misaligned due to its orbit. This is clock tuning, not temporal bending.

4.4 The Illusion of "Forward Travel"

Returning to the teaching example: when the instructor sees that it is 6:00 PM on his Australian student's screen, it might feel as though he is glimpsing the future. However, his own biological time, including breathing, metabolism, and mental awareness, remains locked at 12:00 noon. The student's timestamp is a function of longitudinal position, not a temporal head start. Flying east or west simply means resetting your watch, not propelling yourself along a time axis. The illusion of future or past interaction arises from clock offsets, not from any rupture in time's continuity.

5. Why Time Machines Don't Exist And Never Will

5.1 The Dream That Never Had Physics

From the early imagination of H.G. Wells to modern Hollywood epics, time machines have captivated public fascination. They present an alluring concept in which one could leap into the past or glimpse the distant future at the push of a button. However, beneath the storytelling lies a glaring void: no law of nature supports it. Physics offers no field, equation, or mechanism that allows any system to reverse its proper time. Causality, once disrupted, collapses, and without it, the foundation of physical law erodes. Therefore, despite its cultural appeal, the time machine has no footing in logic, physics, or empirical science.

5.2 Proper Time Is One-Way

Proper time is not an external label; it is the internal progression of a system, such as heartbeats, memory formation, thermodynamic changes, and biological aging. All of these move forward irreversibly. Even Einstein's theory of relativity, which revolutionized our understanding of space and time, permits only the re-coordination of frames, not causal reversal. The critical distinction is this: relativity reshapes coordinate systems, not the unfolding of internal events. Mistaking coordinate adjustments for temporal reversal is the fundamental misunderstanding behind many time travel myths.

5.3 Time Travel Paradoxes: Entertaining, But Invalid

The classic Grandfather Paradox posits that if someone travels back in time to kill their grandfather, they would prevent their own birth, creating a logical contradiction. However, this is not just a curiosity; it is a categorical invalidation of the premise. The paradox demonstrates that time travel to the past is inherently self-contradictory. Proposed "solutions," such as multiple timelines, block universe models, or quantum branching, remain untestable, speculative, and

philosophically unresolved. They may entertain fiction and theoretical discussions, but they provide no practical path toward reality..

5.4 Clock Confusion ≠ Time Reversal

Cited examples like the Hafele and Keating experiment or satellite-based GPS clock corrections are often misunderstood as evidence for time travel. However, these examples only show that clocks under different gravitational or inertial conditions tick at slightly different rates, not that time itself changes. A wristwatch losing two seconds during a flight does not mean the traveler has become two seconds younger; it simply means the device deviated from the reference standard. A drifting clock does not imply a drifting timeline [10].

5.5 Religious and Metaphysical Distinctions

Theological ideas such as resurrection or divine judgment are frequently misrepresented as temporal reversals. In reality, they refer to re-creation or new beginnings, not to the rewinding of cosmic time. Faith traditions envision renewal, not reversal; the individual is reborn or raised again in a new form or realm. Even divine narratives respect the irreversible nature of time's arrow. No sacred scripture asserts that time itself flows backward. Rather, it affirms divine power to create again, not to undo time.

6. Broader Implications of Time Duality — From Consciousness to Cosmology

6.1 Neuroscience & Conscious Experience

Neuroscientific research demonstrates that what we perceive as the present moment is actually composed of neural events distributed across roughly 300 milliseconds [11]. Despite this spread, we experience a seamless "now," uninterrupted and fluid. This phenomenon supports the dual-time framework: proper time acts as the brain's intrinsic clock, independent of external fluctuations. Whether satellite clocks shift by nanoseconds or a phone auto-adjusts for daylight savings, the internal perception of time in human consciousness remains unaffected. Claims that astronauts might think slower due to relativistic time dilation confuse mechanical clocks with cognitive flow and represent a fundamental category error.

6.2 Thermodynamics & the Arrow of Time

Entropy, the measure of disorder, defines the arrow of time, and its growth within a system is the hallmark of irreversibility. Dual-time grounds this behavior in proper time, anchoring entropy's progression to the internal evolution of each system. Frame-to-frame comparisons, such as those between satellites and ground stations, may show differing timestamps, but they do not affect the microstate bookkeeping that underpins the second law of thermodynamics. Thus, entropy always increases locally and irreversibly, exactly as the dual-time framework predicts.

6.3 Cosmology: A Single Cosmic Clock

In cosmology, time is often benchmarked by the cosmic microwave background, yielding a type of conformal time that functions as the universe's master clock. This acts as a practical version of absolute proper time at a cosmic scale. Local effects such as gravitational lensing or redshift introduce distortions, but these are superficial and coordinate-dependent rather than fundamental. The dual-time theory fits naturally within the ΛCDM framework, making sense of large-scale structure without invoking speculative constructs like multiverses or recursive timelines.

6.4 Technology & Engineering

Modern engineering relies on stable, coordinated time, whether in global financial transactions, internet data protocols, or synchronized energy grids. All of these systems assume that local clock drift can be corrected without redefining the nature of time. Dual-time validates this approach: each system has its own proper time, while coordinate time differences are handled through calibration. Future navigation systems on other planets will follow the same principle. Martian GPS, for example, will operate within Martian proper time, not Earth's.

6.5 Philosophy & Free Will

If time were truly reversible, causality and free will would collapse into contradiction. Dual-time defends the causal structure of each observer's timeline, ensuring that events unfold in one direction. This preserves agency and decision-making. While we may evaluate and influence the future, we cannot alter the past. Proper time within each agent secures the logical foundation for free will, while frame-relative labels allow meaningful comparison without compromising autonomy.

7. Time Suspension – Skipping, Not Rewinding

7.1 Suspending a System: A Realistic Possibility

Although reversing time contradicts fundamental physical laws, it remains scientifically and conceptually feasible to suspend a system entirely. In such a state, the internal dynamics, including metabolism, cognition, and thermodynamics, come to a complete halt, while the external universe continues its normal flow. This results in a time suspension, where proper time within the paused system effectively freezes, creating a clean fold in time. Once reactivated, the system resumes as if no time has passed at all. No memories are lost and no steps are repeated, because internally, time never moved.

7.2 Examples from Science, Nature, and Theology

Cryogenic Survival: Certain microbial organisms recovered from Siberian or Arctic permafrost have survived tens of thousands of years in complete dormancy. Once thawed, they resumed life

processes without biological degradation, suggesting that their proper time had been paused for millennia [12].

Long-Term Sleep (Ashab-e-Kahf): The Qur'anic story of the companions of the cave (Ashab-e-Kahf) narrates how a group of young men slept in isolation for centuries. Upon waking, they estimated having slept only a day or part thereof. Their bodily functions and cognitive timelines remained frozen, highlighting a suspension of internal time rather than passage through external frames.

The Miʿrāj (Ascension): Islamic tradition recounts the ascension of Prophet Muhammad (PBUH) into the heavens and his return in what felt like mere moments on Earth. This event may be interpreted as a divine suspension of external worldly time or an isolation of the Prophet's reference frame, rather than any distortion or reversal of time. It signifies a metaphysical withdrawal from temporal flow, not relativistic dilation.

Deep Anaesthesia / Coma: In modern medicine, patients placed under extended anaesthesia or in a coma often awaken after days or weeks with no felt sense of time having passed. Their proper time halts in experience, though the world continues. This reflects not a reversal but a pause, a temporary suspension of temporal awareness rather than a deviation through time.

7.3 Mathematical Formulation of Time Suspension

To describe time suspension mathematically, let us define two temporal variables:

τ_s: proper time within the suspended system

τ_e: external or coordinate time experienced by the surrounding universe

During a suspension interval, the internal state of the system does not evolve. That is, its proper time remains constant despite the progression of external time. This can be formally expressed as:

$$\frac{d\tau_s}{dt} = 0 \Rightarrow \tau_s(t_1) = \tau_s(t_0)$$

while at the same time:

$$\tau_e(t_1) > \tau_e(t_0)$$

This means that from the universe's perspective, time has moved forward (external clocks have ticked), but from the system's internal viewpoint, time has stood still. When the system resumes, it continues as if no time had passed internally. This model captures cryogenic stasis, deep comas, and metaphysical suspension events as logical folds in time, not reversals.

8. Conclusion

Time has been fundamentally misunderstood not because we lacked precision instruments, but because we confused the instrument with the entity itself. A slowed clock was mistaken for slowed time, and a drifting satellite for a bent universe. This paper establishes a necessary

distinction: proper time is absolute, internal, and unbroken within each physical system, while coordinate time is merely a relative label used for comparison between frames. By restoring this duality, we resolve longstanding misconceptions. Time dilation becomes clock deviation, time travel becomes frame switching, events like the Miʿrāj or biological dormancy become temporal suspension rather than dilation or teleportation, and resurrection is understood as re-creation, not reversal.

The idea of teleporting into one's past or future, or jumping across timelines as portrayed in science fiction, is physically unsupported. It violates causality, thermodynamics, and internal coherence. Proper time cannot reverse, selectively pause, or fast forward under any physical mechanism. No equation in relativity permits it, and no logical framework sustains it. Time, therefore, is absolute in nature, relative in description, irreversible in flow, and never a machine that can be boarded or bent at will under any serious physics. To mistake coordinate shifts for temporal displacements is to confuse the map with the terrain. By reclaiming this clarity, we return dignity to physics, realism to cosmology, grounding to metaphysics, and draw a final boundary between meaningful science and speculative myth.

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