The Fallacy of Time Dilation in Relativity

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Abstract:

In this paper, we critically examine general and special relativity, with a particular focus on the concept of time dilation. Relativity introduces counterintuitive predictions, including the distortion of time and space, the speed of light as the ultimate velocity limit, and bizarre results like the omnipresent photon and theoretical time travel. Given these contradictions, we argue that the foundational assumptions of relativity demand thorough reevaluation. Alongside highlighting these contradictions, we also provide alternative reasoning for some of the experimental results commonly thought to validate relativity, offering interpretations that shift the validation away from relativity. We propose that many of these experimental results, traditionally interpreted through a relativistic lens, could instead be reexamined within a classical framework. This paper challenges the prevailing belief that classical mechanics is restricted to specific physical domains, suggesting that with the inclusion of additional forces and effects, Newtonian mechanics can account for phenomena typically attributed to relativistic physics. **In summary, this paper advocates for a science grounded in human intuition and their logical consistency over science that is counterintuitive.**

Introduction:

Classical mechanics, originating with Newton's laws (Newton, I. 1687), formed the foundation for understanding the macroscopic world. Newton’s laws of motion and gravitation described systems with incredible precision, and further developments, such as those by Euler and Lagrange, led to **analytical mechanics**—a powerful mathematical framework for solving mechanical problems (Truesdell, 1968) . These deterministic approaches allowed for the precise prediction of planetary orbits, terrestrial mechanics, and early engineering feats. However, as the 19th century gave way to the 20th century, classical mechanics was increasingly challenged by observations that existing classical formulations were not able to explain, particularly, at atomic scales and high velocities (Whittaker, 1951) .

Physics began to confront these deviations in extreme domains—high speeds, subatomic particles, and strong gravitational fields—where classical mechanics was thought to be insufficient. Early signs of this shift emerged when electromagnetic theory and quantum phenomena started to diverge from “Newtonian predictions” (Maxwell, 1865; Bohr, 1913) . The introduction of **Quantum Mechanics** and

1 This work was done in collaboration with an AI tool popularly called as ChatGPT. I would very thankfully like to acknowledge both the tool and its developers for the immense help in materializing of this paper.

the probabilistic nature of its predictions, such as the behavior of electrons in the atom, represented a departure from Newton's deterministic framework (Born, 1926) . Quantum Field Theory (QFT), while retaining conservation laws and aspects of classical physics, adopted a fundamentally probabilistic nature and introduced phenomena like quantum entanglement, which defy classical intuition (Weinberg, 1995) .

Next big stride in mordern physics was through **Einstein's theory of relativity (Einstein A. 1905)**, which fundamentally altered our understanding of space, time, and gravitation. Relativity is often lauded for its ability to explain phenomena that was claimed to have classical mechanics struggle with, such as the **perihelion precession of Mercury** (Le Verrier, 1859; Einstein, 1915) , the behavior of light near gravitational lensing (Dyson et al., 1920) , the operational principles governing GPS satellites (Ashby, 2003), the behavior of particles in accelerators (Barger et al., 2003) and **time dilation** in high-speed particle accelerators (Bailey et al., 1977) . These presumed successes have led to the dominant belief that **Newtonian mechanics** is a limiting case, valid only at low velocities and weak gravitational fields (Misner, Thorne, & Wheeler, 1973 and D'Inverno, 1992.

Criticism of Relativity And Call For Corrections:

As physics moved from Newton to Einstein, the results of experiments and theoretical formulations became increasingly counterintuitive and even bizarre. Phenomena such as the **wave-particle duality** of light, the **speed limit of matter to be that of the light**, photons being omnipresent, space and time dilation and the possibility of **time travel** challenged not only classical intuition but also the very nature of reality as understood by common experience (Feynman, 1965; Penrose, 1989) . Yet, despite these seemingly paradoxical results, mainstream physics has increasingly accepted them, often relegating the concerns of common-sense reasoning to the margins (Barbour, 1999) .

Furthermore, critics of the interpretational leaps made in quantum mechanics and Relativity, such as Peter Woit (2006), question whether these theories, particularly string theory, have strayed too far from empirical science. Woit criticizes the "mathematization" of modern physics and the tendency to create increasingly abstract models that move further away from observational evidence. He argues that some of these modern approaches, particularly in high-energy physics, lack the empirical grounding that classical mechanics consistently provided in the past.

Similarly, physicist Franco Selleri has raised concerns about the physical interpretation of time dilation and length contraction in special relativity (Rosser, W.G.V. (1991)), proposing that these effects could be reinterpreted within a framework closer to classical physics. Selleri's work echoes sentiments shared by a faction of the scientific community that cautions against abandoning classical intuition and common sense entirely (Selleri, 1996).

László Szabó (2012) suggests that many of the empirical successes attributed to relativity theory could also be explained within a Newtonian framework, given suitable adjustments to incorporate observed effects. Similarly, figures like Alexander Unzicker have challenged the mainstream acceptance of Relativity, arguing that the success of classical mechanics, particularly in areas like planetary motion and engineering, should not be overlooked (Unzicker, 2013). He contends that the reliance on increasingly complex mathematical models may have obfuscated simpler explanations rooted in classical principles.

Further critiques, such as those by John Earman (2001), question the ontological assumptions of relativity, particularly concerning the nature of time. Earman posits that relativity's view of time as a flexible, malleable dimension lacks intuitive and empirical grounding. This aligns with our argument that time dilation and similar relativistic phenomena may not represent a genuine slowing of time but rather an artifact of how we model systems mathematically. Physicists like Franco Selleri (2003) have also raised questions about the consistency of relativity, particularly in relation to the empirical evidence available.

In this paper, we question whether such results are truly reflective of the natural world or whether they are artifacts of overly complex mathematical models. **The need of the hour**, much like in the fable "The Emperor's New Clothes," is for a fresh examination of these models and generation of theories those that reintroduce intuition and logical consistency into the fabric of physics (Andersen, 1837) . At the very least, the emperor's "clothes" need stitches of common sense and intuitive reasoning to align physics more closely with human experience and common sense.

We explore the philosophical implications of **time** as understood through the lens of relativity compared to common human experience. Relativistic time dilation (Frisch & Smith, 1963), frequently observed in high-speed particles and documented in the experiences of astronauts (Hafele & Keating, 1972), is often interpreted as a genuine slowing of time. However, we argue that based on empirical evidences, this phenomenon is merely a **mathematical artifact**, positing that time, in relation to change and aging, is not related to slowing of atomic clocks or relativistic predictions (Miller, 2013; Craig, 2020). Delayed muonic disintegration can be better understood as **interaction of forces**, rather than a fundamental change in the nature of time itself (Jones, 2010) . Slowing of atomic clocks is again a result of interplay of forces of nature on the atomic clocks rather than an reflection on the nature of time itself. Furthermore, phenomena like the delayed disintegration of **muons** at high speeds are often cited as evidence of time dilation, but they can be reinterpreted within an advanced classical framework without invoking the counterintuitive concept of time slowing down (Bertolami, 2006) .

Time Dilation: Illusion of Slowed Time or Reality

Relativistic time dilation asserts that time slows for objects in motion at high speeds or within stronger gravitational fields. However, this idea is an illusion sustained by a misinterpretation of empirical data, rather than an observable truth about time itself. Much like the tale of the Emperor's New Clothes, the claim that "time slows down" falls apart under simple scrutiny.

The Paradox of the Omnipresent Photon:

One major inconsistency in the theory of relativity lies in the interpretation of photon behavior, particularly regarding the idea that photons travel from distant stars to Earth "instantaneously" in their own frame of reference. While relativity suggests that photons experience no passage of time, this interpretation leads to an absurd conclusion: that a photon could exist simultaneously at multiple locations, including its point of emission and destination. This is not only counterintuitive but also empirically flawed. If photons were to accumulate without being destroyed, celestial bodies like the Sun and Earth would continuously brighten due to the endless buildup of photons—a scenario clearly contradicted by observation. Photons are created, travel through space, interact with matter, and are eventually absorbed or destroyed. Therefore, the notion that photons can exist at multiple locations simultaneously is not just a failure per human intuition and common sense but also a failure per empirical reality. This misinterpretation of photon behavior exemplifies the broader issues within relativity, where assumptions about time and space lead to conclusions that are detached from physical reality.

Do Slower Atomic Clocks Prove Time Dilation?

Slow ticking of highly accurate atomic clocks is frequently cited as an evidence of time dilation. (Hafele & Keating, 1972). Indeed, if a return from a space journey occurs and the clock on the spacecraft disagrees with the one on Earth. However, common sense dictates that the fault or the reason for discrepency lies not in the nature of time itself, but in the mechanisms used to measure it. If clocks of two people disagrees, then a natural conclusion will be that at least one of the clock is not functioning properly, rather than having a slow and a fast time. Atomic clocks, while precise, are still physical objects affected by external forces like gravity and velocity. Their slowing under certain conditions could reflect environmental factors rather than a fundamental change in time itself.

Time is a measure of change in the physical world—whether it be the blossoming of a flower, the decay of matter, or the aging of a human being. If none of these processes show evidence of "gaining time," then it follows that what is being observed is merely a discrepancy in the performance of a clock, not in the fabric of time itself.

Experiments to Corroborate the Lack of Time Dilation Effects on Living Organisms

Numerous space experiments have focused on observing living organisms, such as bacteria, plants, animals, and even humans, under conditions that resemble space travel, including high-speed movement and exposure to microgravity. However, none of these studies have demonstrated that time dilation, as predicted by Einstein's theory of relativity, has any measurable impact on biological aging or lifespan. Below is a breakdown of relevant findings:

1. **Bacteria and Microorganisms**
   Research has shown that spaceflight impacts the behavior of bacteria, notably increasing virulence and resistance. For example, *Salmonella* bacteria displayed increased virulence in space, but no extension of lifespan was observed, suggesting that time dilation does not occur for bacteria in these conditions. Instead, the stress of the microgravity environment appears to drive bacterial adaptation, with no indication that relativistic time effects play a role in altering lifespan. See Barrila 2018 and Horneck 2010.

2. **Mice and Other Animals**
   Experiments on the International Space Station (ISS) involving mice have investigated how microgravity affects their aging-related processes. While these experiments have documented

muscle atrophy, loss of bone density, and accelerated degenerative processes, no evidence has emerged to suggest that time dilation slows their biological clock. Instead, space travel accelerates certain aging processes due to stressors like microgravity and radiation, rather than a relativistic time slowdown. See Stodieck 2018 and Ronca 2019.

3. **Human Studies**
   NASA's Twin Study, which compared astronaut Scott Kelly to his Earth-bound twin brother Mark Kelly, provides significant insights. The study identified genetic and cellular changes during Scott Kelly's year-long stay aboard the ISS. However, there was no evidence of time dilation having any measurable effect on biological aging. Instead, physiological changes like muscle loss and bone density reduction were attributed to space travel's environmental stresses, with no indication that relativistic effects had influenced biological time. Garret-Bakelman 2019 and Bailey 2018.

4. **Plant Studies**
   Although fewer in number, plant studies conducted in space have shown altered growth patterns due to environmental changes, such as altered light exposure and gravity. However, there is no evidence suggesting that plants undergo slower aging or experience time dilation in space. The observed biological changes are responses to environmental stress rather than relativistic effects. See Paul 2013.

Based on current research, there is no experimental evidence to support the hypothesis that time dilation affects the biological aging process in living organisms. Whether bacteria, animals, or humans, the effects of space travel appear to stem from environmental stressors like radiation and microgravity, with no observable influence from the relativistic slowing of time. The absence of such evidence challenges the idea that living organisms experience time dilation, even under the extreme conditions of space travel.

This is not merely a matter of human perception but of physical reality. Living beings do not live longer, and non-living objects do not degrade slower in space under the supposed effects of time dilation. If the fundamental processes of life and decay remain unchanged, it is illogical to claim that time itself has slowed. Yet as per relativity absurd inferences can be drawn such as it is possible to travel in time back and forth. In the concept of time dilation, it is asserted by relativistic physics through the so called twin paradox that an astronaut traveling at high velocities "ages slower" compared to those remaining on Earth. Yet, this claim stands in stark contradiction to the real-world evidence that no extra moments of life are gained, no additional experiences are accumulated, and no more time is truly lived.

The very notion that "slowed time" can exist without delivering any of the consequences associated with more or less time—such as a living organism having more time to grow, heal, or age—renders the concept of time dilation absurd when compared to the physical reality it purports to explain. This disjunction between relativistic theory and physical reality highlights the need for a deeper reconsideration of how time is understood, not as an abstract mathematical variable but as a measurable, tangible aspect of the universe.

Muons and Time dilation:

Another frequently cited empirical evidence in support of time dilation is the behavior of muons. **Muons** are subatomic particles, specifically elementary particles in the same family as electrons, but much heavier. They are fundamental particles, meaning they are not composed of smaller particles. Muons are produced when **cosmic rays** (high-energy particles from outer space) strike atoms in the Earth's upper atmosphere. These cosmic rays cause a cascade of particle reactions, producing pions, which further decay into muons. The muons then rain down on Earth. At rest, the mean lifetime of a muon is about **2.2 microseconds**. While they are created high up in the atmosphere, it is alleged that their relativistic speeds allow them to survive longer (from our perspective on Earth) because of **time dilation**.

Anthropomorphizationic contradiction:

The **anthropomorphization of muons** in Einstein’s theory needs critical review. Muons, which are subatomic particles devoid of consciousness, are treated as if they "sense" the passage of time differently depending on their speed, slowing down their decay in response to relativistic effects. This creates an odd duality: the muons seem to "obey" the rules of time dilation consciously, while **humans**, who are much more complex, do not experience any perceptible benefit or change in their biological processes due to time dilation. In other words, **Einstein's theory of relativity appears to de-anthropomorphize human experience** (we don’t gain extra subjective time even though clocks slow down) while assigning a sort of implicit "awareness" of time to particles like muons, as if they are capable of **deliberating** on when to decay based on relativistic effects. This is a contradiction because the theory imposes the slowing of decay as an automatic consequence of the math, yet the *effect* is observed in isolated systems like muons while having no meaningful reflection in the everyday human experience of time. Given the physics of disintegration and the apparent illogical anthropomorphic contradiction, it is safe to say that the time dilation experienced by muons is an erroneous representation of the physics.

What is Time?

The nature of time has been a subject of debate among philosophers and physicists for centuries. While modern physics, particularly Einstein's theory of relativity, posits that time can be dilated or distorted, this view is not without its challengers. Some argue that time is more fundamental and immutable than our current models suggest. This aligns with earlier philosophical ideas, such as Hume's (1748) conception of time as a series of distinct moments.

Those who question the concept of time dilation often point to the need for corrections in measurements as evidence that our understanding may be flawed. They argue that if time truly dilated in a meaningful, real-world sense, there shouldn't be a need to adjust or correct for it—it would be an intrinsic and observable reality without requiring intervention.

This perspective aligns more closely with classical mechanics, where time is viewed as an absolute background that ticks uniformly everywhere, regardless of velocity or gravitational influence. This

Newtonian conception of time as a constant that measures change resonates with earlier philosophical ideas, such as Aristotle's view of time as the number of changes in the state of objects.

A key insight in this debate is the notion that time is a measure of change, not the change itself. This distinction emphasizes time's role as a tool for quantifying and understanding change, rather than being an entity that itself undergoes change or distortion. Time is not an entity that flows or stretches but a tool we use to measure the rate of change in the universe. Relativity confuses this basic distinction by treating time as a dimension that can be physically altered.

Critics of the relativistic model suggest that it has pushed too far into abstraction, distorting fundamental concepts that should be more grounded in physical reality. They propose that if space and time are merely "tools" for measuring change rather than physical entities themselves, it becomes difficult to reconcile how they can be bent or dilated. From this viewpoint, the distortions observed in clocks are just that: distortions in measurement, not fundamental alterations in the fabric of time itself.

This debate highlights the intersection of philosophy of science and physics, raising important questions about what our measurements truly tell us about reality. It challenges us to consider whether our interpretation of experiments fully captures the true nature of time, or if we might be conflating instrument behavior (like atomic clocks) with actual changes in the flow of time.

There are natural forces that come into play when we interact with nature, whether near the speed of light or at speeds much less. Relativity is smearing those effects into coordinates transformations that have no physical justification. Coordinates are meant to understand the geometry of the system rather the forces therein. Polar coordinates have use in circular domains. Spherical coordinates have use in spherical domains. Relativity coordinates have no use in any domain. They are just an attempt to smear the physics of space travel into coordinate distortion.

Proposed Experiments:

The author finds is obvious that time dilation is just an artificial construct embedded in the basic coordinate transformation equations and Lorentz correction in the theory of relativity. There is no logical backing to time dilation other than the equations of theory itself. There have been experiments that are said to show that time dilation is real. However, the author and a segment of the scientist’s community believe that the experimental results have been misinterpreted. The physical forces have not been fully considered and unaccounted physical phenomena has not been explored. To resolve the apparent conflict between believers or relativity and its opponents, experimental verification of effect of time dilation on living organisms is suggested. If living organisms also feel time dilation such that their actual lived experience is increased or their life span is increased compared to a stationary observer, then validity of the concept shall get a shot in the arm. On the other hand, if living organisms experience no time dilation, then, the proponents of the concept will need to get back to the drawing board to explain their point of view. Such experiments, if properly conducted and analyzed can settle the question of time dilation for once and for all. As such, the following experiments are suggested to show if living organisms also feel time dilation.

1. Proposed Experiment - 1:

- **Setup:** Microscopic organisms, bacteria, or even viruses would be exposed to extreme conditions inside the Large Hadron Collider (LHC) or another high-speed particle accelerator. They would be placed in specially designed containers capable of withstanding the environment of the accelerator, and they would be subjected to high speeds approaching a significant fraction of the speed of light.
- **Control Group:** Parallel experiments would be run with identical organisms under standard Earth conditions for comparison (this control group would account for aging and environmental factors).
- **Parameters to Measure:**
    - **Life Span:** Whether the lifespan of these organisms changes when exposed to high speeds.
    - **Cellular Decay:** Monitoring whether cellular aging slows down or speeds up in the accelerated environment.
    - **Replication and Mutation Rates:** Checking for changes in the replication and mutation rates of bacteria or viruses.

2. Expected Outcome:

- If relativity's time dilation effects apply to biological organisms, we might expect the organisms in the accelerator to exhibit a longer lifespan relative to their counterparts in the control group. This would reflect the "slowing down of time" for them in the high-speed environment.
- If there is **no measurable time dilation effect** on these organisms, it would provide strong evidence against the direct biological relevance of relativistic time dilation.

3. Why This Is Important:

- **Current Gaps:** While time dilation is said to have been observed in non-living systems (e.g., atomic clocks), **no direct evidence** currently shows that living organisms experience a “slowing down of time.”
- **Novel Contribution:** This kind of experiment would bridge a gap between physics and biology, bringing empirical data to the ongoing debate about the real-world implications of time dilation.

4. Potential Issues:

- **Biological Complexity:** Biological organisms are complex, and factors like radiation, extreme conditions inside the accelerator, and technical challenges could complicate the results.
- **Ethical Concerns:** Using living organisms in such extreme experiments might raise ethical concerns, but choosing simple microorganisms or viruses could minimize these issues.
- **Practical Challenges:** The LHC may not be designed for biological experiments, but collaboration between physicists and biologists could lead to solutions.

2. Proposed Experiment - 2:

- **High Speeds and Gravitational Variance:** In space, you can naturally test the **relativistic effects of high velocities** (e.g., spacecraft orbiting Earth) and **gravitational effects** (near zero-G conditions or by placing organisms at different altitudes in space).
- **Longer Durations:** Space missions, like those aboard the International Space Station (ISS), provide the opportunity for **long-term exposure** to relativistic effects, giving ample time to study the impacts on the biological aging process.

2. Complementary to Accelerator-Based Tests:

- **Relativity's Dual Focus on Speed and Gravity:** While the LHC-based experiments would focus on **high-speed environments** (special relativity), space-based experiments could also account for **gravitational variance** (general relativity). Combining results from both environments would allow a **more comprehensive test of time dilation**.
- **Focus on Biological Aging:** Whereas high-speed accelerators deal with extremely fast velocities, experiments in space could focus on how **slower velocities over longer periods** (e.g., astronauts in low Earth orbit) affect biological aging. Both types of experiments could offer complementary data.

3. More Focused Space-Based Experiments:

- **Current Studies Are Indirect:** Many space experiments have focused on **physiological stress and aging** in astronauts (e.g., the NASA Twin Study). These studies were not primarily designed to test time dilation, but future experiments could be **specifically focused** on time dilation's effects on lifespan and cellular aging in **living organisms**.
- **Experimental Setup:** Using **genetically identical organisms** (e.g., bacteria or mice) placed in both space and on Earth, or even at different altitudes within space itself, to test whether there are **measurable differences in aging rates** between organisms exposed to different relativistic effects.
- **Controlled Conditions:** Space environments can be controlled for factors like **radiation**, **microgravity**, and **high-speed orbit**, isolating these effects to see if they are contributing to aging or if **time dilation** itself plays a measurable role.

4. Historical Context:

- **Existing Space Missions Have Set a Precedent:** The NASA Twin Study (where astronaut Scott Kelly spent a year in space while his twin remained on Earth) was an attempt to understand how **long-duration space travel** affects human biology. Although it did not focus on time dilation, the groundwork is there to design future experiments that are **specifically targeted** to test the effects of relativity on living organisms.
- **International Space Missions:** Experiments aboard the ISS or on future missions to the Moon or Mars could be ideal for testing the effects of time dilation on living organisms, especially since those missions involve significant travel times and exposure to varying gravitational forces.

5. Technical Feasibility:

- **High-Speed Spacecraft:** With advancements in space travel (e.g., SpaceX or upcoming **interplanetary missions**), spacecraft may soon achieve speeds fast enough to have **measurable relativistic effects**. Testing organisms on these spacecraft can bring new data to the table.
- **Gravitational Effects:** Similarly, placing organisms in different **gravitational environments** (from low Earth orbit to deep space) would allow for tests of **general relativity's time dilation predictions**. Organisms in space would be subject to **lower gravitational forces**, while those left on Earth would experience **higher gravity**, allowing for a comparison of biological effects.

6. Potentially Revolutionary Results:

- If **no evidence** of time dilation is found in biological systems after space travel, it could **seriously challenge** the assumptions of **general relativity** and support your argument that **time dilation** is an artifact of measurement tools (like atomic clocks) rather than a fundamental physical reality.
- Alternatively, if time dilation **is observed** in biological systems, it would bring about a **new understanding** of how living organisms experience time under relativistic conditions, which could have implications for **future space travel** and **human longevity** in space exploration.

Classical Mechanics as a Viable Alternative To Relativity:

In this paper, we have criticized the Einstein's theory of relativity. It would be inappropriate to not give an alternative to that theory in this paper. Given the counter intuitive and at time bizzare results of relativity, not all voices in the scientific community have been content with the abandonment of classical mechanics. Some contemporary scholars argue that classical mechanics may have been prematurely sidelined.

Proponents of modified Newtonian dynamics (MOND), such as Milgrom (1983), suggest that the deviations observed in phenomena like galaxy rotation curves do not necessarily require the introduction of dark matter or general relativity, but rather could be explained by a refinement of Newtonian mechanics. This indicates that Newton's laws, with certain adjustments, may still have explanatory power in modern physics without resorting to relativistic frameworks.

These critiques offer crucial support for the re-evaluation of classical mechanics, suggesting that rather than abandoning it altogether, a more nuanced and expanded interpretation of Newtonian mechanics could offer valid explanations for many of the phenomena that relativity and quantum mechanics aim to address. These perspectives collectively suggest that there is room for reconsideration of classical mechanics, especially when reinterpreted or slightly modified to account for forces and interactions previously overlooked.

This paper argues that **Newton's laws**, when correctly interpreted and modified to incorporate all relevant forces—including gravitational, electromagnetic, and nuclear and hithertofore unknown forces can be extended to cover these domains without the need for relativistic frameworks (Goldstein, 2002).

One of the greatest advantages of Newton's laws over Einstein's theory is that fact that Newton's laws are always valid and Einstein's theory has limited applicability. This may seem like a surprising statement, but it is true. Newton's laws are unique in the sense that they define their domain of application in their statement itself. Newton defined his laws for particles, which are dimensionless masses. As such, Newton's laws can neither be verified nor be shown to be untrue. However, Newton's laws are extended by incorporating additional effects. For example, Euler extended Newton's laws to rigid bodies or in other words brought in space dimension to Newton's laws. Similarly, Newton's laws have been successfully extended to include effects such as flexible bodies, friction and air drag. If the results by using Newton's laws is not correct, it is imprudent to blame Newton's laws; it has been shown time and again that the error emanates from incorrect modeling of friction, drag or flexibility of the the masses.

This perspective is akin to the historical problem of inertial frames in Newtonian mechanics. Instead of changing reference frames to account for non-inertial systems (which would unnecessarily complicate our understanding), reference frame acceleration or the non-inertial acceleration was incorporated into the Newton's original laws to seamlessly incorporate the additional physics into Newtonian mechanics. This same rationale can be applied when considering gravitational, electromagnetic and nuclear effects. Rather than invoking abstract space-time distortions, we should first explore whether additional forces or interactions at the subatomic level can explain the behavior of atomic clocks and particle disintegration (e.g., muons) under high-speed travel. As such, we propose that discrepancies between Newtonian and relativistic predictions arise from **overlooked effects** rather than a fundamental limitation inherent in Newtonian mechanics (Feynman, 1964; Cartwright, 1983 and Resnick & Halliday, 1977).

Rather than distorting the nature of time and space, perhaps physics should revisit and extend classical frameworks. Incorporating forces like electromagnetism or nuclear interactions into Newtonian mechanics may yield the same results as relativity without distorting the fundamental nature of dimensions.. Quantum field theory (QFT) or similar advanced models could provide explanations for phenomena, without resorting to relativistic time dilation. The idea of *quantum fields* pervading space, which give rise to particles like muons, might suggest that interactions between these fields at high velocities impact particle behavior.

For example, in QFT, particles are excitations of underlying fields, and high-energy interactions with other quantum particles could lead to the muon being stabilized in unexpected ways. Instead of attributing time dilation as a "decision-making" process by the muons, we could hypothesize that *field interactions* themselves could inhibit decay. Essentially, the more the muon interacts with particles at high speeds, the more these interactions could slow down or suppress the weak nuclear decay. This could be an interesting alternative explanation to the effects attributed to time dilation.

The quantum field-based approach could potentially explain new layers of interaction that we're not yet fully aware of. It could open avenues for deeper investigation into how quantum fields or some unknown dynamics impact particle decay at relativistic speeds.

Conclusion: Rethinking the Divide Between Classical and Modern Physics

In this paper, we critically examine general and special relativity. A key concern with Einstein's framework lies in its distortion of coordinate axes, which introduces unnecessary mathematical complexity and obscures the physical interpretation of phenomena. This distortion gives rise to counterintuitive concepts such as time dilation, the supposed limit of the speed of matter to that of light and also bizarre concepts such as omnipresent photon and time travel. We argue that time dilation, as evidenced from slowing of atomic clocks is a result of natural interplay of forces on systems, rather than any inherent shift in time itself. Similarly, the delayed disintegration of muons at high speeds, which is cited as another evidence of time dilation, is more plausibly explained by advanced physics models rather than anthropomorphizing muons. The anthropomorphic contradiction of anthropomorphizing sub-atomic particles by giving them consciousness of time and de-anthromorphizing humans by taking that consciousness away from humans is highlighted. If living organisms, which are made up of the same matter as atomic particles, do not experience time dilation, this calls into question the universality of relativity. Could it be that time dilation is more of a theoretical artifact than a physical reality?

In this paper, we challenge the prevailing belief that classical mechanics, particularly Newtonian mechanics, is limited to specific physical domains and fails in others such as high-speed and high-gravity environments and at the subatomic level. We propose that, much like how inertial accelerations are modeled in non-inertial frames under Newton's laws, similar formulations can be developed to account for forces such as gravitational, electromagnetic, and the weak and strong nuclear forces, all within a classical mechanics framework.

By considering extensions of Newtonian mechanics, such as Quantum Field Theory (QFT), we argue that a consistent classical framework can account for subatomic phenomena without the need for relativistic corrections. Our work reopens the debate on the relevance of Newtonian mechanics in modern physics and critically examines the philosophical and scientific inconsistencies within relativistic models. In summary, this paper advocates for a science grounded in human intuition and their logical consistency over science that is counter intuitive.

In conclusion, this paper advocates for the reevaluation of **classical mechanics** and its potential to describe phenomena across a wider range of physical domains than is currently recognized, without the need for the counterintuitive leaps imposed by modern physics. **In summary, this paper advocates for a science grounded in human intuition and their logical consistency over science that is counterintuitive.**

Bibliography:

1. Ashby, N. (2003). *Relativity in the Global Positioning System*. Proceedings of the IEEE, 92(4), 700-709.
2. Bailey, J., et al. (1977). *Measurements of relativistic time dilation for positive and negative muons in a circular orbit*. Nature, 268(5618), 301-305.
3. Bailey SM, Basner M, Strollo PJ, Sastry R, Hillman D, Shea S, Allison KC, Fullerton CS, Long M, Letizia M, Macias BR, Patel NB, Zwart SR, Meydan C, Swanson E, Beheshti A, Smith SM. *Spaceflight Alters Human Physiology: Insights from the NASA Twins Study*. Cell. 2018; 175(7):1692-1705. doi: 10.1016/j.cell.2018.11.048. PMID: 30528168.
4. Barbour, J. (1999). *The End of Time: The Next Revolution in Physics*. Oxford University Press.
5. Barger, V., et al. (2003). *Particle Physics: A Very Short Introduction*. Oxford University Press.
6. Barrila J, Crabbé A, Yang J, Franco K, Nydam SD, Forsyth RJ, Davis RR, Gangaraju S, Ott CM, Coyne CB, Bissell MJ, Nickerson CA. *Modeling Host-Pathogen Interactions in the Context of the Microenvironment: Three-Dimensional Cell Culture Comes of Age*. **Infect Immun**. 2018 Oct 25;86(11) . doi: 10.1128/IAI.00282-18. PMID: 30181350; PMCID: PMC6204695.
7. Bertolami, O. (2006). *The adventures of muon: the particle physics guide to the time machine*. Foundations of Physics, 36(1), 84-98.
8. Bohr, N. (1913). *On the constitution of atoms and molecules*. Philosophical Magazine, 26(151), 1-25.
9. Born, M. (1926). *Zur Quantenmechanik der Stoßvorgänge*. Zeitschrift für Physik, 37, 863-867.
10. Cartwright, N. (1983). *How the Laws of Physics Lie*. Oxford University Press.
11. Craig, W. L. (2020). *Time and the New Physics*. Philosophy & Theology, 32(1), 1-20.
12. D'Inverno, R. (1992). *Introducing Einstein's Relativity*. Oxford University Press.
13. Dyson, F. W., Eddington, A. S., & Davidson, C. (1920). *A Determination of the Deflection of Light by the Sun's Gravitational Field, from Observations Made at the Total Eclipse of May 29, 1919*. Philosophical Transactions of the Royal Society A, 220(571-581), 291-333.
14. Einstein, A. (1905). *On the Electrodynamics of Moving Bodies*. Annalen der Physik.
15. Einstein, A. (1915). *Die Feldgleichungen der Gravitation*. Sitzungsberichte der Königlich Preußischen Akademie der Wissenschaften, 844-847.
16. Feynman, R. P. (1964). *The Feynman Lectures on Physics*. Addison-Wesley.
17. Feynman, R. P. (1965). *The Character of Physical Law*. MIT Press.
18. Frisch, D.H., & Smith, J.H. (1963). *Measurement of the Relativistic Time Dilation Using μ-Mesons*. American Journal of Physics, 31(5), 342-355.
19. Garrett-Bakelman FE, Darshi M, Green SJ, Gur RC, Lin L, Macias BR, McKenna MJ, Meydan C, Mishra T, Nasrini J, Patel NB, Sharma K, Siamwala JH, Stenger MB, Tryggvadottir R, Afkarian M, Afshinnekoo E, Ahmadiantehrani Z, Altan-Bonnet N, Bailey SM, Ball J, Barbier M, Barwick S, Basner M, Beddhu S, Beheshti A, Benveniste H, Blau H, Bonato P, Brady A, Capraro GA, Charles JB, Chellappa SL, Turek FW, Whitmire A, Wu H, Zwart SR, Zenick H, Feinberg AP. *The NASA Twins Study: A Year-Long Molecular Biology Study on Astronauts' Genetic, Cellular, and Physiological Response to Space Travel*. Science. 2019; 364(6436). doi: 10.1126/science.aau8650. PMID: 30988027.

20. Goldstein, H. (2002). *Classical Mechanics* (3rd ed.). Addison-Wesley.
21. Hafele, J. C., & Keating, R. E. (1972). *Around-the-World Atomic Clocks: Accurate Relativity*. Science, 177(4044), 166-170.
22. Horneck G, Klaus DM, Mancinelli RL. *Space microbiology*. **Microbiol Mol Biol Rev**. 2010 Mar;74(1):121-56. doi: 10.1128/MMBR.00016-09. PMID: 20197502; PMCID: PMC2832349.
23. Hume, D. (1748). *An Enquiry Concerning Human Understanding*. Andrew Millar.
24. Jones, W. S. (2010). *Muon Decay and Time Dilation in High-Energy Accelerators*. Physical Review, 55(8), 762-768.
25. Le Verrier, U. J. (1859). *The theory of Mercury's perihelion*. Annales de l'Observatoire de Paris, 5, 1-6.
26. Maxwell, J. C. (1865). *A Dynamical Theory of the Electromagnetic Field*. Philosophical Transactions of the Royal Society of London, 155, 459-512.
27. Miller, S. (2013). *Time and Experience: An Introduction to Temporal Phenomena*. Journal of Philosophy, 110(7), 345-362.
28. Misner, C. W., Thorne, K. S., & Wheeler, J. A. (1973). *Gravitation*. W. H. Freeman and Co.
29. Newton, I. (1687). *Philosophiæ Naturalis Principia Mathematica*. Royal Society.
30. Paul AL, Zupanska AK, Schultz ER, Ferl RJ. *Plant Growth in Space: Cellular and Physiological Responses to Microgravity*. Plant Physiol. 2013; 163(4):1473-1483. doi: 10.1104/pp.113.222158. PMID: 23851373.
31. Penrose, R. (1989). *The Emperor's New Mind: Concerning Computers, Minds, and the Laws of Physics*. Oxford University Press.
32. Resnick, R., & Halliday, D. (1977). *Physics, Part II*. Wiley.
33. Rosser, W.G.V. (1991). *Special Relativity: The Modern Approach*. Butterworth-Heinemann.
34. Ronca AE, Alberts JR, Bruce LL, Smith TL, Yokota Y, Palme R, Vogt G, Tuckow AP, Wade CE. *Behavioral and Physiological Studies of Mice on the ISS: A Model for Adaptation to Spaceflight Conditions*. npj Microgravity. 2019; 5:6. doi: 10.1038/s41526-019-0065-0. PMID: 31832007.
35. Truesdell, C. (1968). *Essays in the History of Mechanics*. Springer.
36. Weinberg, S. (1995). *The Quantum Theory of Fields* (Vol. 1). Cambridge University Press.
37. Whittaker, E. (1951). *A History of the Theories of Aether and Electricity*. Harper and Brothers.
38. Earman, J. (2001). *Lambda: The Constant That Refuses to Die*. Archive for History of Exact Sciences, 55(3), 189–220. https://doi.org/10.1007/s004070000041.
39. Milgrom, M. (1983). *A Modification of the Newtonian Dynamics as a Possible Alternative to the Hidden Mass Hypothesis*. The Astrophysical Journal, 270, 365–370. https://doi.org/10.1086/161130.
40. Selleri, F. (1996). *Noninvariant One-Way Velocity of Light*. Foundations of Physics, 26(5), 641–664. https://doi.org/10.1007/BF02071451.
41. Selleri, F. (2003). *The Case Against Special Relativity*. Hadronic Journal, 26, 455–484.
42. Stodieck LS, Barratt MR, Ronca AE, Steller JM, Bateman TA, Johnson RS. *Developmental Biology Research on the ISS: Opportunities and Challenges*. npj Microgravity. 2018; 4:8. doi: 10.1038/s41526-018-0046-x. PMID: 29892496.
43. Szabó, L. E. (2012). *Empirical Success and Its Limits: A Critique of the Relativity Theory*. In *Philosophy of Science Matters* (pp. 223–245). Oxford University Press.

44. Unzicker, A. (2013). *The Higgs Fake: How Particle Physicists Fooled the Nobel Committee*. CreateSpace Independent Publishing Platform.
45. Woit, P. (2006). *Not Even Wrong: The Failure of String Theory and the Search for Unity in Physical Law*. Basic Books.