

Worldline Identity Theory and Cosmological Recurrence

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INTRODUCTION

00 Introduction

This work presents a theory of personal identity grounded in the block universe conception of spacetime.

Its central claim is that a person is not a soul, a persisting substance, or a momentary conscious state. A person is a complete conscious worldline: the entire four-dimensional structure of a conscious life considered as a single spacetime object.

The theory itself concerns personal identity. Questions concerning recurrence, death, and the possibility of existing again arise only as consequences of this account of identity when combined with particular cosmological assumptions.

The theory therefore has two parts. Part I develops an account of personal identity. Part II explores what follows if the universe is capable of exactly reproducing a conscious worldline.

PART I — WORLDLINE IDENTITY THEORY

01 The Block Universe

Time is a dimension of reality analogous to space.

Past, present, and future do not come into or go out of existence. They coexist as parts of a single four-dimensional spacetime.

A human being is therefore not a three-dimensional object moving through time. A person is a four-dimensional worldline extending from birth to death.

My life is not merely my present conscious state. It is the complete sequence of experiences, memories, perceptions, thoughts, emotions, and actions that constitute my conscious history.

From an external perspective, the whole worldline exists at once as a unified spacetime structure. The self is not located at a single moment within that structure. The self is the structure as a whole.

02 Identity as Worldline

Personal identity consists entirely in the existence of a particular conscious worldline.

There is no further fact of identity beyond the worldline itself. No soul, Cartesian ego, enduring substance, or metaphysical subject exists in addition to the spacetime structure that generates conscious experience.

Identity is determined by the complete four-dimensional organization of the conscious life, including all of its temporal relations.

A present brain state is not a person. A psychological snapshot is not a person. A moment of consciousness is not a person. Only the complete worldline constitutes the person.

Two beings that share an identical past, present, and local physical state but possess different futures are not the same person. Because the future is part of the worldline no less than the past, any difference anywhere within the complete four-dimensional structure constitutes a difference in identity.

Their histories may overlap extensively, but overlap does not imply sameness of person. Likewise, two beings that possess identical momentary mental states but belong to different total worldlines are not the same person.

Any divergence in the complete worldline, however small, produces a different person. Identity is therefore grounded in the entire conscious structure rather than in any isolated temporal stage.

2.25 Against Branching Identity

A common misunderstanding arises when considering two worldlines that are identical for part of their histories and diverge only later.

Suppose two individuals possess exactly the same experiences, memories, thoughts, perceptions, emotions, and physical states up to a particular moment. After that moment, one observes a red star while the other observes a blue star.

It may be tempting to conclude that they were originally the same person and became different persons only when the divergence occurred. The present theory rejects this conclusion.

Personal identity is determined by the complete worldline, not by any temporal segment of it. Under the block universe, the future portions of both worldlines are no less real than their past portions. The red-star future is part of one worldline, and the blue-star future is part of the other.

Consequently, the two worldlines differ as complete four-dimensional structures. Because identity is exhausted by the complete worldline, the individuals are different persons from the outset. Their pasts overlap, but overlap does not constitute identity.

Two roads may share a common route before separating, yet they are not the same road. Likewise, two worldlines may share an identical history while remaining distinct persons because their complete structures differ.

The question, “At what moment did they become different persons?” therefore rests upon a mistaken picture of identity. It assumes that identity is determined stage by stage as time passes. The present theory denies this.

Identity is determined by the total worldline as a whole. Since the complete worldlines differ, the persons differ. No later event creates the distinction. The distinction is already present in the structure itself.

2.375 Illustrative Analogy: The Rectangular Prism

The central claim of Worldline Identity Theory may be clarified through a geometric analogy.

Consider a three-dimensional rectangular prism extending through space. A two-dimensional cross-section taken at any particular location within the prism is a square. The square is real. It possesses all of the properties of that particular cross-section. Nevertheless, the square is not the prism.

The prism is the complete three-dimensional structure consisting of the ordered collection of all its cross-sections. No individual square constitutes the prism by itself.

Now suppose two prisms share an identical sequence of cross-sections throughout half of their lengths and diverge only later. One prism may continue straight while the other bends away. Every cross-section within the overlapping region is identical.

It may therefore be tempting to conclude that there is a single prism throughout the shared region which later becomes two prisms when the divergence occurs. But this is incorrect. There are two distinct prisms whose structures overlap for part of their extent. The overlapping cross-sections do not constitute a single prism. They constitute a region shared by two different prisms.

The identity of a prism is determined by the complete three-dimensional structure rather than by any individual cross-section. Worldline Identity Theory treats conscious lives analogously.

An instantaneous conscious state is comparable to a three-dimensional cross-section of a four-dimensional conscious worldline. Such a stage may contain memories, perceptions, thoughts, emotions, and records of earlier stages. Nevertheless, it is not the person. The person is the complete four-dimensional conscious worldline.

Consequently, two worldlines may possess identical temporal stages throughout part of their histories and diverge only later. The existence of identical stages does not imply that there is a single person who later becomes two persons. Rather, there are two distinct worldlines whose structures overlap for part of their extent.

The distinction between the persons does not arise when the divergence occurs. It is already present in the difference between the complete structures themselves. The overlapping stages are therefore not a single person shared by two futures. They are temporal segments belonging to two distinct worldlines whose complete structures differ.

2.5 The No-Further-Fact Principle

A persistent objection asserts that even if two conscious worldlines are completely identical in every respect, they may nevertheless correspond to numerically distinct persons. The present theory rejects this claim.

Under Worldline Identity Theory, a person is exhausted by the complete conscious worldline. Every feature that could constitute the person is already contained within the structure itself: every experience, every memory, every perception, every thought, every emotion, every causal relation, every temporal relation, and the complete organization of the conscious life as a whole.

If two worldlines are identical in all such respects, then no difference remains within the conscious life itself. The critic may nevertheless insist that the persons are distinct. The present theory asks a simple question: what constitutes this distinction?

If the distinction is not contained within the worldline, then it must consist in some additional fact beyond the worldline. But the nature of this alleged fact must then be specified. If it is a soul, then the objection presupposes a soul. If it is a Cartesian ego, then the objection presupposes a Cartesian ego. If it is a persisting metaphysical subject, then the objection presupposes a persisting metaphysical subject. If it is a hidden bearer of consciousness that exists in addition to the worldline, then the objection presupposes precisely the sort of entity that the present theory denies.

Merely asserting that there must be a further fact does not establish its existence. The burden rests upon the critic to explain what this additional fact consists in and how it differs from the worldline itself.

The same issue arises in discussions of consciousness. One may ask: "Who is having the experiences?" The present theory answers: "The conscious worldline." One may then ask: "Who is experiencing the worldline?" But this question assumes that experience requires an additional experiencer standing behind the experiences themselves. The theory rejects this assumption.

The conscious life is not possessed by a separate subject. The conscious life is the subject. There is no observer behind experience. There is only the ordered structure of experiences that constitutes the conscious worldline.

Consequently, the present theory maintains that personal identity is exhausted by the complete conscious worldline. Any claim that two identical worldlines nevertheless correspond to different persons requires the introduction of a further fact of identity. Absent an account of what that further fact is, the objection remains unsupported.

03 Conscious Experience Within a Static Universe

Although the complete worldline exists as a timeless structure, conscious experience remains intrinsically ordered.

Each temporal stage contains records of earlier stages and lacks records of later stages. This asymmetry generates the subjective experience of temporal passage.

From the outside, the worldline is static. From the inside, the worldline experiences itself as unfolding.

The sensation of moving through time does not require an objectively moving present. It arises from the internal informational structure of the worldline itself. Thus the reality of temporal experience is compatible with the block universe.

03.5 Illustrative Analogy: The Open Book

Consider a novel. The main character at page 100 knows only what has occurred on the preceding pages. The character does not know what happens on page 200, though page 200 is fully written and real.

The book as a whole exists. Its earlier and later pages coexist as parts of one complete structure. The character's knowledge is limited by its location within the book, not by what exists in the book.

We who read the book are outside observers. We can see page 1 and page 200 together because the entire structure lies open before us. The character cannot do this, not because the later pages are unreal, but because the character is inside the structure.

The block universe is analogous to the book. A conscious worldline is not a three-dimensional object moving through time. It is a complete four-dimensional structure. The whole of it exists, even though any particular stage within it knows only the stages that precede it.

But there is a crucial disanalogy. For the book, there is an outside observer: the reader. For our own worldline, there is no outside observer. No reader stands above the complete structure, looking down at birth and death at once. The worldline itself is the subject of the experiences it contains.

The character does not become real by being observed by a reader. Likewise, the conscious life does not require a further observer to be real. The worldline is the subject. The experiences occur where the structure exists. Nothing more is required.

04 Consciousness and Worldlines

Consciousness is not a substance that inhabits a worldline. Nor is it an entity that moves from one moment to another.

The conscious life is identical to the existence of the conscious worldline. The worldline does not generate consciousness as something separate from itself. The worldline is the conscious life.

Consequently, no additional observer stands behind experience. No hidden subject exists apart from the structure of the worldline. The conscious life and the worldline are one and the same thing viewed under different descriptions.

4.5 Scope of the Theory

Worldline Identity Theory is not a theory of the origin of consciousness. The theory begins from the existence of conscious experience as a datum. Conscious beings exist, and conscious lives occur.

The question addressed by the theory is not why consciousness exists, nor what physical conditions generate it. Rather, the theory concerns the nature of personal identity. Given the existence of a conscious life, what constitutes the subject of that life? The present theory answers that the subject is identical to the complete conscious worldline.

Worldline Identity Theory is analogous to theories of personal identity that assume consciousness exists and seek only to determine what a conscious subject is. Consequently, the theory does not attempt to explain the physical basis of consciousness, the emergence of consciousness from matter, or the metaphysical conditions under which consciousness arises. Such questions belong to separate theories of consciousness.

The present theory requires only that conscious lives exist. Once a conscious life exists, the theory asks what that conscious life is and what determines its identity through time.

The theory does not claim that every worldline is conscious. Most physical worldlines may be entirely non-conscious. Its claim is conditional: whenever a conscious life exists, the subject of that life is identical to the complete conscious worldline that constitutes it.

Questions concerning the origin, mechanism, or explanation of consciousness are therefore independent of the claims advanced here. Worldline Identity Theory is compatible with a variety of theories of consciousness, provided they allow for the existence of conscious worldlines.

— Conclusion of Part I

A person is a complete four-dimensional conscious worldline.

Personal identity does not consist in the persistence of a soul, a continuously existing self, or a consciousness that travels through time. It consists solely in the existence of a particular conscious worldline.

The self is not something that moves through time. The self is the worldline itself.

There is no further observer behind experience and no metaphysical fact of identity beyond the complete conscious structure.

PART II — COSMOLOGICAL RECURRENCE

05 Cosmological Recurrence

Assume the universe is cyclic or otherwise generates infinitely many cosmological realizations.

Because a particular conscious worldline occurs, the physical conditions necessary for its existence are physically possible. If the number of physically possible states is finite while cosmological realizations are infinite, exact recurrence follows. Configurations that occur once must eventually occur again.

Under such conditions, entire universes may arise that reproduce a conscious worldline exactly. Every particle arrangement, neural process, memory, perception, thought, emotion, and experience is identical. The entire spacetime structure of the life is reproduced without deviation.

Any deviation, however small, would generate a different worldline and therefore a different person. Only exact recurrence qualifies.

06 Recurrence Is a Recurrence of Spacetime

Recurrence is often imagined incorrectly as occurring within a larger temporal sequence. On that picture, one life ends, vast stretches of time pass, and an identical life appears later. The present theory rejects this framework.

If the entire universe recurs, then spacetime itself recurs. The recurrence is not something that happens within time. It is a recurrence of the structure that contains time.

There is therefore no external temporal dimension in which one occurrence waits for another. The complete spacetime structure is reproduced.

Recurrence should not be understood as the production of a later copy within a larger history. It is the re-instantiation of the same worldline whenever the cosmos reproduces that structure exactly.

6.5 Against the Copy Interpretation

Recurrence is often described as the creation of a copy. This description is misleading because it presupposes a distinction between the person and the worldline.

A copy is ordinarily understood as something that resembles an original while remaining numerically distinct from it. But under the present theory, the person is not something over and above the worldline. The person is the worldline.

Consequently, if a conscious worldline is reproduced without deviation, the recurrence cannot be distinguished from the original person by appeal to any feature contained within the conscious life itself. To describe the recurrence as merely a copy therefore requires the introduction of some additional bearer of identity beyond the worldline. The theory rejects this assumption.

The correct description is simply that the worldline exists wherever it is instantiated. And because the conscious life is identical to the worldline, the conscious life exists wherever the worldline exists.

07 Observer-Centered Continuity

Objectively, entire cosmological histories may separate recurrences. Subjectively, no interval is experienced.

Experience exists only where the conscious worldline exists. The absence of consciousness is not itself an experience. It is simply the absence of experience.

Consequently, recurrence requires no continuously existing subject connecting occurrences. The existence of the worldline alone is sufficient.

08 The Irrelevance of Occurrence Number

From an external perspective, one may describe a worldline as occurring in the first cycle, the millionth cycle, or the trillionth cycle. But these labels are not contained within the worldline itself.

Every memory, perception, thought, emotion, and experience remains identical. If identity is exhausted by the complete worldline, then no additional fact remains that could distinguish one exact recurrence from another.

Occurrence number is therefore not a property of the person. It is merely an external description imposed from outside the structure itself. Identity belongs to the worldline alone.

8.5 The Irrelevance of Cosmological Location

A common objection asserts that even if two conscious worldlines are completely identical, they may nevertheless correspond to different persons because they occupy different locations within a larger cosmological structure. The present theory rejects this objection.

Suppose two worldlines differ in any experienced respect. Perhaps one individual observes a red star while another observes a blue star. Perhaps one inhabits a different environment or possesses different experiences. In every such case, the worldlines differ, and therefore the persons differ.

The objection arises only when the worldlines are assumed to be completely identical. Every experience, memory, perception, thought, emotion, causal relation, and temporal relation is identical. Nothing within the conscious life differs. The critic then asserts that the worldlines nevertheless correspond to different persons because one occurs “here” and the other occurs “there” within the cosmos.

But this claim introduces a property that is not contained within the worldline itself. The alleged distinction is not a difference in experience, memory, perception, thought, or consciousness. It is merely a difference in external labeling.

The situation is analogous to occurrence number. A worldline may be described as occurring in the first cosmological cycle or the millionth cosmological cycle, but these descriptions are not contained within the worldline itself. They are imposed from outside the structure.

If two worldlines are completely identical, then attaching labels such as “located in region A” and “located in region B” does not introduce any difference within the conscious life itself. The labels describe the embedding of the worldline within a larger cosmological framework. They do not describe the person.

Identity is exhausted by the complete conscious worldline. If no difference exists within the worldline, then no difference exists within the person. Cosmological location is therefore no more relevant to personal identity than occurrence number.

A related misunderstanding arises when identical worldlines are assigned labels such as “Worldline A” and “Worldline B” and are then treated as numerically distinct persons on that basis alone. The present theory rejects this inference. The same point applies to labels such as “first occurrence,” “second occurrence,” “Universe A,” “Universe B,” or any other index used to distinguish otherwise identical instantiations. Such designations describe the embedding of the worldline within a larger framework. They do not describe any feature of the conscious life itself.

8.75 Against Bare Numerical Distinction

A further objection concedes that occurrence number and cosmological location do not constitute differences within the conscious worldline itself. The critic nevertheless maintains that two completely identical worldlines may correspond to two distinct persons simply because there are two instances rather than one. The present theory rejects this claim.

Suppose two conscious worldlines are completely identical. Every experience, memory, perception, thought, emotion, causal relation, temporal relation, and structural feature of the

conscious life is identical. Nothing contained within either worldline differs from the other.

The critic nevertheless asserts that the worldlines correspond to different persons because they are numerically distinct instances. The present theory asks what constitutes this numerical distinction.

If the distinction consists in some difference within the worldline itself, then the worldlines are not completely identical and therefore correspond to different persons. But by hypothesis no such difference exists. The alleged distinction must therefore consist solely in the assertion that there are two of them.

But this assertion does not identify any feature of either worldline. It introduces no difference in experience, memory, perception, thought, emotion, causal organization, or temporal structure. It merely applies different labels to structures that are otherwise identical.

Worldline Identity Theory does not deny that external observers may describe identical instantiations using different labels or indices. Such descriptions may be useful for external bookkeeping. However, they do not identify any difference within the conscious life itself.

To claim that two completely identical worldlines nevertheless correspond to different persons therefore requires a further fact beyond the worldline itself. Absent an account of what that further fact consists in, the claim remains unsupported.

8.8 Structure Rather Than Token

The preceding arguments concerning occurrence number, cosmological location, and bare numerical multiplicity may be summarized by a more general principle.

Under Worldline Identity Theory, personal identity is exhausted by the complete conscious worldline. Consequently, identity is determined by the structure of the worldline rather than by external labels applied to it.

A worldline is a structure, not a token. If the structure is exactly identical in every respect, then there is only one conscious worldline as far as personal identity is concerned.

A claim that there are multiple instances does not identify a difference within the conscious worldline itself. Rather, it describes the embedding of that worldline within a larger cosmological framework.

Under Worldline Identity Theory, distinctions in personal identity must be grounded in distinctions within the complete conscious worldline. Where no such distinction exists, no distinction in personal identity exists. Identity therefore tracks structure rather than indexing.

09 Death and Birth

A conscious worldline contains its earliest conscious experiences and its final conscious experiences. If the worldline recurs exactly, then the complete sequence of experiences that constitutes that life exists again.

This does not mean that a subject survives death and awakens at birth. The theory posits no enduring observer separate from the worldline. Rather, the ordered birth-to-death structure itself is what the subject is.

Death is not followed by an experienced darkness, waiting period, or passage through nonexistence. Nonexistence contains no experience. The absence of consciousness is not something that is lived through. It is simply the absence of experience.

Consequently, there is no experienced interval separating one instantiation of the worldline from another. The worldline exists where it exists. Experience exists where the worldline exists.

Thus, from the standpoint of consciousness, there is never anything except the experiences contained within the worldline itself.

— Final Conclusion

If cosmology permits exact recurrence, then the consequences follow directly from Worldline Identity Theory.

A conscious life is identical to a complete conscious worldline. If that worldline is reproduced exactly, then the same conscious life exists wherever that worldline exists.

No soul survives death. No consciousness travels between occurrences. No observer crosses a gap of nonexistence.

The recurrence of a conscious life is simply the recurrence of the worldline that constitutes it. Wherever that worldline exists, that conscious life exists. Nothing more is required.