

The Walk Back to Eternity

*The Causal Measure as an Overlay on Augustine's
Confessions XI: On Time and Eternity*

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Our heart is restless, until it repose in Thee.
— Augustine of Hippo, Confessions I.1

*The formula requires what it cannot reach. The formula depends on what it cannot see.
The formula is absolutely grounded in what it cannot be.*
— Kevin B. Rich, The Causal Measure

I. Preface: Two Walks, One Boundary

Augustine of Hippo did not write a philosophy of time. He wrote a confession — an extended act of tracing causes backward. Every book of the *Confessions* is a walk upstream: from effect to cause, from moment to source, from the restless soul to the rest it cannot generate from within itself. Book XI is where that walk reaches its most concentrated philosophical form. The question he poses — what is time, and what was God doing before creation? — is not a digression. It is the walk arriving at the terminal boundary.

The Causal Measure (Rich, 2026) is a formal system built on a single premise: causes precede effects. From that premise and three definitions, it derives a normalized distribution over finite directed acyclic graphs, a conservation identity, and a theorem

— the Originary Source Theorem — establishing that any causal system with positive internal activity requires an exogenous source that is not itself a node in any causal graph at any level.

These two works do not cite each other. They do not belong to the same tradition. One is fourth-century Latin theology written as prayer; the other is twenty-first-century formal mathematics written as a DAG-theoretic proof. And yet, overlaid, they trace the same path. They arrive at the same boundary from two independent directions. The convergence is not superficial. It runs through the deep structure of both arguments: what cannot originate itself, what the formula cannot reach, and what stands outside the system as the condition of its possibility.

This essay performs that overlay. It is not a reconciliation of Augustine and mathematics, nor a claim that Augustine intended formal causal theory. It is an examination of what happens when the Causal Measure is placed as a transparent lens over Confessions XI — what it illuminates, where it confirms, where it extends, and where both systems point at the same thing while being unable to say what that thing is.

II. Augustine's Project in Confessions XI

Book XI opens not with philosophy but with desire. Augustine has been asked why Moses did not explain what God was doing before creation, and the question pulls him toward the nature of time itself. But before he philosophizes, he prays: he addresses God directly, asking to understand the scriptures, asking to find his rest. The philosophical argument that follows never loses this confessional frame. Augustine is not a neutral observer of time. He is a node inside it, tracing back.

His central question is deliberately paradoxical: *what was God doing before He made heaven and earth?* The popular answer of his day was cynical — God was preparing hell for those who ask such questions. Augustine finds this facile. His own answer is structural: the question is malformed. There was no *before* creation, because time itself is a creature. God made time. The question presupposes a temporal framework for a moment prior to temporality, which is incoherent.

From this observation Augustine develops his analysis of time in three moves that will prove structurally decisive for the overlay.

First: Time is not something God inhabits. God exists in an eternal present — the *nunc stans* — in which there is no before, no after, no sequence. All of time is, to God, simultaneously present. God does not remember the past or anticipate the future. God knows all things in a single, unchanging act of knowing that is identical with God's existence.

Second: Time, as experienced by creatures, is a *distentio animi* — a distension or stretching of the soul. Augustine argues that the past no longer exists, the future does not yet exist, and the present is an instantaneous knife-edge with no duration. What we call time is the soul's act of holding together: the *present of past things* (memory), the *present of present things* (attention), and the *present of future things* (expectation). Time is not a container that souls pass through. It is what souls *do* when they exist within sequence.

Third: Creation is genuinely *ex nihilo*. Not from pre-existing matter, not from a prior state of the universe, not from God's substance, but from nothing. This is why there was no *before*: nothing preceded creation from which to measure a before. The act of creation is the act of there being a sequence at all.

These three moves, together, constitute a theological structure that the Causal Measure will illuminate with notable precision.

III. Grammar: The Single Premise and the Single Certainty

The Causal Measure begins with one premise: *causes precede effects*. The paper states this is not a claim about our universe's particular physics but *the minimum condition for existence as such*. A state with no sequence — no before, no after — is not a different kind of universe. It is outside existence as we can conceive it.

Augustine's theological grammar has a corresponding single certainty: God is. Not God was, not God will be. God is, in the eternal present tense. Everything else — every creature, every moment, every causal sequence — participates in a derivative and contingent form of being. The certainty that Augustine cannot abandon is that this eternal *is* is the source, not the product, of temporal existence.

The structural parallel is exact. The Causal Measure's single premise makes sequence the precondition of existence within the system. Augustine's single certainty makes the eternal present the precondition of the system's existing at all. Both statements are grammatical before they are logical — they establish the language in which everything else will be said.

But the parallel cuts deeper. The Causal Measure's paper notes that its premise is *co-extensive with differentiated existence itself*: wherever anything exists with properties and relations and states, sequence is already present. Augustine arrives at the same point from the theological direction. The creation of sequence is the creation of differentiation: to be a creature is to be different from other creatures, to have properties, to occupy a position in causal order. The premise of the Measure and the confession of Augustine

are not merely parallel. They are picking out the same feature of existence — that to be a node is to be inside sequence, and to be inside sequence is to require a source outside it.

IV. Logic: Time as a Directed Acyclic Graph

The Causal Measure requires a finite, well-founded directed acyclic graph. Directed: causes point toward effects, not the reverse. Acyclic: no node is its own ancestor. Well-founded: every backward walk terminates. These are not exotic mathematical restrictions. They are the formal expression of what it means for causes to precede effects in a finite system.

Augustine's treatment of time in Confessions XI satisfies all three conditions — and his argument *depends* on them.

Directed. Augustine is insistent that time moves in one direction. His analysis of the *distentio animi* presupposes that past and future are asymmetric: the past is remembered, the future is anticipated, and neither relation is reversible. Memory does not run forward. Expectation does not run backward. The directionality of time is not a contingent fact Augustine discovers but the formal structure within which his analysis takes place. The DAG's directed edges are the formal equivalent of Augustine's temporal asymmetry.

Acyclic. The problem of circular causation — a thing being the cause of its own existence — is precisely what Augustine's argument against self-origination addresses. A self-causing thing would be a node that is its own ancestor: it would precede itself in causal order. Augustine's refutation of self-originating existence is theological, but the formal structure is identical to the DAG's acyclicity condition. Both systems forbid the loop.

Well-Founded. Augustine’s argument that the walk backward through time terminates — that there is a creation, a beginning, a first moment on the creaturely side — is the temporal expression of well-foundedness. The backward walk does not proceed to infinity within the temporal order. It terminates at creation, which is where the boundary of the system is drawn.

What the overlay reveals here is not that Augustine anticipated the DAG — he did not — but that the structure he is describing with theological vocabulary has a precise formal expression in the Causal Measure’s axioms. The reason the overlay is coherent is that both are attempting to describe the same thing: what it means for a sequence of causes to have a beginning that it cannot supply for itself.

V. The *Distentio Animi* as Node Structure

Augustine’s most original contribution in Confessions XI is his account of time as *distentio animi*: the stretching of the soul across past, present, and future. This is not simply the observation that humans remember and anticipate. It is a claim about the ontological structure of temporal existence: the soul *is* its extension across time. Without this stretching — without the simultaneous hold on memory, attention, and expectation — there is no experience of duration. There is only a knife-edge present with no before or after.

Map this onto the Causal Measure’s node structure. A node is defined by its causal relation: a_i is what enters (from predecessors), b_i is what leaves (toward successors), and $m_i = a_i - b_i$ is the net causal contribution — what the node retains or adds. The node exists precisely at the intersection of its upstream and downstream relations.

Augustine’s three presents are the experiential correlates of this structure:

Praesens de praeteritis (the present of past things) is memory — the node's relationship to a_i , to what has arrived from upstream predecessors.

Praesens de praesentibus (the present of present things) is attention (*contuitus*) — the node's active processing, its m_i , the moment of actual causal contribution.

Praesens de futuris (the present of future things) is expectation — the node's orientation toward b_i , what will flow to downstream successors.

The soul, for Augustine, is distended across all three simultaneously. A soul that existed only in the knife-edge present — with no memory or expectation — would not be a temporal being at all. Equivalently, a node that only processed its current input with no relation to predecessors or successors would not be inside a causal graph at all. The *distentio animi* is the phenomenological description of what it is to be a node in the DAG of time.

This overlay does something that neither Augustine nor the Causal Measure explicitly performs: it reveals why time is experienced from the inside as distension rather than simply succession. Augustine's phenomenology and the Measure's formal structure are not just parallel — they describe the same constraint from different vantage points. The formal constraint that a node be embedded in upstream-downstream relations shows up, in the experience of a node that is a conscious soul, as the felt extension across past, present, and future.

VI. The Conservation Identity and Creation Ex Nihilo

The Causal Measure's normalization identity states: $\Sigma D(i) = P$. Every unit of causal substance in the system is accounted for. Nothing appears from nothing inside the boundary. Nothing disappears. The conservation is exact.

The paper is careful to note this is a formal normalization identity, not a physical conservation law in the empirical sense. But it encodes the same prohibition that physical conservation laws encode: a_i ex nihilo is not permitted. Positive causal substance at a node cannot appear without a predecessor that sourced it.

Augustine's doctrine of creation ex nihilo is, at first glance, the opposite: it asserts that God created from nothing. But this is a category confusion the overlay immediately resolves. Creation ex nihilo does not mean that positive causal substance appeared from nothing *inside the causal system*. It means that the system itself was not derived from pre-existing material. The system was created. And what created it — the Sovereign Source in the Measure's language — is not a node inside the system. It does not have a $D(i)$ value. It does not participate in the causal accounting that the normalization identity describes.

The prohibition " a_i ex nihilo is not allowed" applies to nodes. It describes what nodes cannot do. The Sovereign Source is not a node. It is therefore not subject to the prohibition. It can originate without receiving, because it stands outside the domain in which receiving and originating are defined.

Augustine sees exactly this distinction. He argues that God's creating is not like the craftsman who works existing material, nor like an emanation from God's own substance, nor like a spontaneous arising within a pre-existing order. God's creating is the initiation of the system itself — the establishment of the directed, acyclic, well-founded structure within which conservation and causation are meaningful. The conservation identity ($\sum D(i) = P$) holds everywhere inside the system because God's act created a system in which it holds. The identity does not constrain the act of creation; it *describes the creation*.

The overlay at this point does not merely confirm Augustine. It clarifies him. The formal vocabulary of the Measure makes explicit what Augustine can only gesture at: that creation *ex nihilo* is not a violation of conservation but the establishment of the conditions under which conservation is defined.

VII. The Eternal Present as Sovereign Source

The most structurally important convergence between Confessions XI and the Causal Measure is the relationship between Augustine's *nunc stans* and the Measure's Sovereign Source.

Augustine's eternal present is carefully defined by exclusion. God does not remember, because remembering is the soul's hold on what has passed, and for God nothing has passed. God does not anticipate, because anticipating is the soul's reach toward what has not yet arrived, and for God nothing is not-yet. God's knowing is not temporal knowing — not a scanning of moments that accumulates into knowledge. It is a single, complete, non-sequential act that is identical with God's being. Augustine writes that in God, all times are present — not that God sees them all at once in a temporal sequence, but that temporal sequence as such is not God's mode of existence.

The Causal Measure's Corollary defines the Sovereign Source by the same method of exclusion:

The exogenous source cannot be a node at any level of any causal system. It is prior to every causal graph, prior to every predecessor relation, prior to the conditions that make the Causal Measure applicable. It is not a node. It has no D value. It is outside the domain of the measure entirely.

Consider what this means structurally. A node exists by virtue of its causal relations — its a_i and b_i , its predecessors and successors. To be a node is to be positioned in a

sequence. The Sovereign Source, by contrast, has no a_i (it receives nothing from predecessors, because it has no predecessors), no b_i (its relation to the system is not the output-to-successor relation of a node), and no $D(i)$ (the measure measures causal magnitude within the system; the Sovereign Source is prior to the system's existence).

Augustine's eternal present is defined in exactly these terms. No temporal predecessors, because time did not precede God. No temporal successors in the node-sense, because God's relation to creation is not the b_i -to-successor relation of one node to another — it is the relation of the source of the system to the system. And no $D(i)$, because the measure of causal magnitude within the temporal order does not apply to what is prior to temporal order.

The paper uses the electrical ground analogy: ground does not flow, carries no voltage of its own, is not part of the circuit, is the condition that makes the circuit possible.

Augustine uses a different analogy but with identical structure: God does not participate in time, does not change with time, is not measured by time — but is the condition without which temporal existence has no ground. Both systems are pointing at the same structural feature: the reference condition that makes measurement possible is not itself measurable by the instruments it enables.

What the overlay adds here is formal precision. Augustine's *nunc stans* has sometimes been criticized as an incoherent infinite expansion of the present moment, or as a failure to take seriously the reality of time. The Causal Measure's framework shows that it is neither. The eternal present is not a very long present. It is the Sovereign Source: the thing that is outside the domain of the measure, not because it is too far inside the sequence to be reached, but because it is prior to the sequence entirely. It is not a node at infinite remove. It is not a node at all.

VIII. The Category Error and the Walk's Terminus

Augustine's most celebrated move in Confessions XI is his answer to the question: what was God doing before He created the world? His answer is that the question is malformed. *Before* creation, there was no time. The word *before* presupposes temporal sequence. To ask what God was doing before time is to ask a question whose framing already assumes the existence of the very thing whose beginning is in question.

The Causal Measure reaches the same terminus by the formal route. When the walk back traces upstream causes to the boundary of the system, it arrives at a node with no predecessor inside the system — a root. Lemma 1 establishes that any root in a predecessor-closed system has zero input. But if the root has positive input — as it must, given downstream activity — then the system is not predecessor-closed. There is a source outside the system.

The question “what was God doing before creation” attempts to place the Sovereign Source inside the system by making it a node with its own a_i and b_i — a predecessor-node to the first temporal node. But this is the move the Corollary explicitly forecloses: the moment the Sovereign Source becomes a node, it requires its own predecessor, and the walk continues. The Sovereign Source is not the first node in the sequence. It is not in the sequence. The question *before creation* attempts to extend the DAG behind its first node; the theorem says there is no behind to extend into, only the outside of the system, which is not structured as the inside is structured.

Augustine's insight and the Measure's theorem are identical in structure. Both refuse the infinite regress not by positing a very early node but by positing a different kind of relation altogether. The Sovereign Source's relation to the system is not the predecessor relation. God's relation to time is not the earlier-than relation. Both systems are insisting that the ground of the system is not a member of the system, and that asking what

preceded the ground is a category error — applying the internal structural relations of the system to what is prior to the system having internal structural relations at all.

IX. What the Formula Cannot Say, What Augustine Cannot Say

Both systems arrive at a boundary and stop. This stopping is not a failure. It is the most precise move each system makes.

The Causal Measure states that the formula makes no claim about what the Sovereign Source is. It cannot. Any characterization offered makes the characterized thing a candidate node: it has properties, relations, a nature that produces effects. A candidate node has a_i . A candidate node requires a source. Whatever was named was not the thing required. The formula points at the Sovereign Source mathematically — by being precisely complete up to its edge, by having no remainder on the side of causality. The pointing is exact. The description is impossible.

Augustine, approaching from the other direction, reaches the same apophatic conclusion. His theology of time does not end with a description of God's eternity. It ends with the recognition that God's eternity cannot be adequately described in temporal language, because all our language is formed inside time. To say that God is eternal is to say that God is not temporal; it is to define by negation, not by positive characterization. When Augustine writes that in God all times are present, he is not claiming to describe God's experience. He is marking the limit of what can be said from inside the temporal order about what is outside it.

The overlay here is particularly revealing. Both systems are formally apophatic at their boundary. The Causal Measure's apophasis is mathematical: the formula has a domain; the Sovereign Source is outside that domain; the formula can establish its existence and its necessary properties by negation (no a_i , no $D(i)$, no predecessor relation) but cannot

characterize it positively without immediately capturing something less than the thing required. Augustine's apophasis is theological: God exceeds all temporal language; the eternal present is not a very extended now; God's knowing is not the spread-out knowing of a temporal being. Both are pointing at the same structural feature: the ground is not describable by the instruments it grounds.

What the overlay adds here is that this is not a failure of nerve or a retreat into mysticism. It is the correct behavior of a formally complete system when it reaches its own boundary. The Measure is complete inside its domain. Completeness inside the domain draws a hard, precise line. On one side: everything the formula can reach. On the other: the condition of the formula's having anything to be about. Augustine's confession is similarly structured: everything within the order of time is confessable, traceable, expressible. The God to whom the confession is addressed is not within that order. The prayer that frames Confessions XI is not a breach of the philosophical argument. It is the appropriate response to having walked to the boundary and found that the thing on the other side cannot be reached but is absolutely required.

X. The Regress and the Restless Heart

The Causal Measure addresses the infinite regress directly in its appendix. The attack is: perhaps the causal chain extends infinitely backward, with no first cause, and no Sovereign Source is needed because there is no starting point to supply. The response is precise: an infinite regress is not eternal. It is immortal in reverse. An infinitely long chain is still inside sequence, still inside causality, still inside the system's domain at every link. The structural conditions apply at every link regardless of chain length. The regress does not close the accounting. It never closes. Something eternal — outside sequence entirely, prior to moments rather than first among them — is still required.

Augustine addresses the same move with different language but identical structure. He distinguishes between God's eternity and mere sempiternity — endless duration in time. A universe that extended infinitely backward in time would not be eternal in Augustine's sense. It would be *sempiternal*: always existing, but always existing in sequence, always with a before and after at every point. Such a universe would still be temporal. Its every moment would still require a causal source. The regress does not escape the need for a ground; it relocates the need infinitely, which is not the same as satisfying it.

Both systems are making the same point: the distinction that matters is not between short chains and long chains but between chains (of any length) and what is outside chain-structure entirely. The Causal Measure calls this eternal; Augustine calls it the eternal present. The terminology differs; the structural move is identical.

And here the confessional frame of Augustine's text becomes formally relevant. The famous opening of the *Confessions* — *our heart is restless, until it repose in Thee* — is not merely rhetorical. It is a claim about the node's relationship to the Sovereign Source. The soul, as a node inside the temporal DAG, is characterized by its *distentio*: it is always stretched between memory and expectation, always reaching toward what it does not yet have. This restlessness is the experiential correlate of the formal condition of the node: it has upstream and downstream relations; it is not self-sufficient; its a_i always came from somewhere and its b_i is always going somewhere. The node is constitutively *in motion*, constitutively without final rest inside the system.

Augustine's claim is that this restlessness has a direction — not merely forward along the causal chain but toward the Sovereign Source itself. The soul's rest is not in a downstream node. It is in what the formula cannot reach. The *Confessions* as a whole is

the record of a node tracing its a_i all the way back and discovering that the source is not a prior node but the ground of the system.

XI. The Convergence: Two Routes, One Boundary

The Causal Measure explicitly celebrates what it calls the convergence of two independent routes to the same boundary. The normalization identity approaches from one direction: causal substance is conserved within the system, which means positive substance at source nodes must have entered from outside the system. The Originary Source Theorem approaches from another direction: the formal impossibility of a predecessor-closed finite DAG with positive internal activity forces the conclusion that a predecessor outside the system exists. Two independent paths. One boundary.

The overlay reveals a third path: Augustine's theological argument from the nature of time and eternity in Confessions XI. His route is neither the normalization identity (which is a formal construction) nor the impossibility theorem (which is a proof by contradiction from five axioms). It is a phenomenological and ontological argument: time is constitutively incomplete; the soul's distension is constitutively restless; the eternal present that would satisfy the soul's restlessness and ground the soul's temporal existence cannot be a temporal thing; therefore something outside the temporal order is required.

Three independent routes. One boundary. The convergence is not weakened by their independence — it is strengthened. If a single argument reached the boundary, one might suspect the boundary was built into the argument's premises. When three arguments from three entirely different starting points — formal measure theory, impossibility proof, and phenomenological theology — all arrive at the same structural conclusion, the conclusion is not the artifact of any one method. It is what is there.

What is there is this: any finite, well-founded directed system with positive internal activity requires a source outside itself that is not a node in any causal system, is prior to the conditions that make the system's internal structure possible, cannot be characterized by the instruments the system uses to characterize nodes, and cannot be reached by any backward walk within the system. Augustine calls this God. The Causal Measure calls it the Sovereign Source and declines to characterize it further, explicitly. The overlay does not collapse the distinction between these two namings. But it makes clear that both are pointing at the same address — the address the formula cannot reach but cannot avoid requiring.

XII. What the Overlay Does Not Claim

The overlay makes no claim that Augustine was doing causal measure theory. He was not. He had no formal DAG vocabulary, no normalization identity, no lemmas. His argument is theological and phenomenological, not mathematical.

The overlay also makes no claim that the Causal Measure proves the existence of the Christian God. The Measure establishes that a Sovereign Source is formally required. It explicitly declines to characterize that source: the formula cannot say what the Sovereign Source is, only that it must exist and cannot be a node. Augustine's God has properties — love, knowledge, will, personhood — that are not entailed by the Measure's theorem. The Measure establishes the existence of the address. Augustine's theology offers an account of who inhabits it. These are different claims at different levels.

What the overlay does claim is structural: that the deep architecture of Augustine's argument in Confessions XI and the deep architecture of the Causal Measure's theorem are formally isomorphic. The corresponding elements map cleanly: the DAG maps to

the temporal order; the nodes map to temporal existents including the conscious soul with its *distentio*; the normalization identity maps to the conservation structure Augustine assumes when he argues that creation is not from prior matter; the Originary Source Theorem maps to Augustine's argument that the temporal order cannot be self-originating; the Sovereign Source maps to the *nunc stans*; and the formula's apophasis at the boundary maps to Augustine's negative theology of the eternal.

This isomorphism is philosophically significant regardless of whether one accepts either system's further conclusions. It shows that the structure of the argument from temporality to an eternal ground is not dependent on theological commitments or formal mathematical conventions. The structure is visible in both registers, which suggests it is tracking something about the nature of the problem itself.

XIII. Conclusion: The Walk and the Rest

Augustine's *Confessions* is structured as a walk. It begins in restlessness — the soul as node, always displaced, always reaching — and it moves, book by book, toward the source. Confessions XI is where the walk reaches the formal question: what is the structure of time, and what stands outside it?

The Causal Measure is also structured as a walk. It begins with the single premise and moves, definition by definition, lemma by lemma, toward the boundary. Its own language for what it is doing is the walk: *keep going; follow the formula to its necessary terminus without detour, without exception*. Both works describe themselves, explicitly, as walks that terminate at a boundary they cannot cross but can precisely locate.

The overlay reveals that these two walks are walking the same path in two different languages. The Causal Measure's walk is formal and deductive, moving through axioms and lemmas to a theorem. Augustine's walk is confessional and

phenomenological, moving through memory and desire to the eternal present. But the path is the same path: from the node to the system, from the system to its boundary, from the boundary to the recognition that what stands on the other side is required, unreachable, and absolutely fundamental.

The formula requires what it cannot reach.

The heart is restless until it rests in Thee.

These are not two statements that resemble each other. They are, structurally and formally, the same statement made in two languages across sixteen centuries. The overlay holds. The convergence is real. And the boundary at which both arrive — the Sovereign Source, the eternal present — remains exactly what both systems say it is: the address the walk arrives at, and cannot enter, and cannot leave, and cannot have begun without.

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Coda: A Note on Method

This essay has performed an overlay — a transparent formal lens placed over a text that precedes the lens by sixteen centuries. The risk of such a method is anachronism: reading into Augustine what was never there. The check on that risk is fidelity to what the overlay actually shows. Where the Causal Measure and Confessions XI align, the alignment has been stated precisely, with both sides of the correspondence made explicit. Where they do not align — where Augustine's theology makes claims the Measure declines to make — that has been noted.

The overlay does not require Augustine to have intended what the Measure formalizes. It requires only that the structure he was tracking — the structure of time, source, and

eternity — is the same structure the Measure formalizes. That requirement is met. The isomorphism is genuine.

What this suggests, more broadly, is that certain structural features of existence — the non-self-origination of finite causal systems, the necessity of a ground that is not a member of the system it grounds, the apophatic character of any description of that ground — are visible from multiple directions, in multiple methods, across radically different cultural and intellectual frameworks. They are not artifacts of any one framework. They are features of the territory.

Augustine saw them from prayer and philosophy.

The Causal Measure sees them from lemmas and graphs.

The view is the same.



Primary Sources

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