

Defining Relation in Generative Relational Being

A Position Paper

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Abstract

Generative relational being places relation at its centre and has so far left the concept open. This paper supplies a working definition: a relation is the constraint through which generation unfolds in history. Existing understandings of relation, as interaction, as background structure, as difference, as tie, and as correlation, are each stated at an instant, where a framework concerned with historical generation requires a concept answerable to succession. The definition's historical clause carries the weight, since the constraint is borne and revised by the very process it constrains, which separates the proposal from structuralism. The paper argues that unconstrained succession fails to be maximal generation, since where succession is free nothing accumulates, and it answers the objection that a relation is a coupling and not only a constraint. A taxonomy on two axes follows, the domain of the relata and the mode of bearing, with some forty instances assigned across four modes. Relations borne by a single party are the decisive case, since relations whose counterpart does not exist are relations in the full sense here, while the interaction and tie readings must deny them the name.

Keywords: relation; constraint; generativity; historical generation; relational ontology; conceptual definition; generative relational being.

A note on the standing of this paper. This is a position paper, and its ambition is bounded accordingly. It does not offer a universal philosophical definition of relation, and it does not claim that the philosophical and sociological traditions surveyed in §2 have misunderstood their subject. It proposes a working definition of relation for one framework, generative relational being, states the considerations that recommend that definition over the alternatives available, and tests it against cases from several domains. Whether the definition earns its place is settled by what it lets the framework say and by what it forbids the framework from saying, and both are exhibited here as plainly as the author can manage. The definition is offered as revisable, which is a commitment the framework itself requires and not a courtesy. Objection, correction, and counter-example are welcome at huangwanhong@serendip.ngo.

1 THE PROBLEM OF AN UNDEFINED PRIMITIVE

Generative relational being is a framework built on a word it has not defined. Its claims are stated in terms of relation: that subject, meaning, value and normativity co-emerge through generative relational processes; that asymmetry in a relation produces power which sufficient generation absorbs; that what degrades in social life is a relational grammar and not only a distribution of goods. Each of these is a claim about relations, and each has so far borrowed its central term from the reader.

Leaving a primitive open has its uses, and the framework has drawn on them. An undefined term accommodates cases the author has not yet examined, and it postpones commitments that would be premature. There is a point, however, at which the postponement begins to cost more than it saves, and the framework has reached it. Three costs can be named.

The first is that the framework's distinctive claims become indistinguishable from claims already made elsewhere. If relation means a tie between individuals, then the thesis that relations generate value restates network sociology; if it means an interaction, the thesis restates exchange theory; if it means a differential position in a system of signs, the thesis restates structuralism. The framework has been arguing that it says something these do not, and it cannot show this while its central term is supplied by whichever of them the reader happens to have read.

The second is that an open primitive silently imports the commitments of whatever fills it. A reader trained in network analysis will hear relation as a state variable, an edge that is present or absent at a time. On that hearing, several of the framework's propositions become false or trivial: the proposition that a relation is revised by what happens within it becomes a claim about edge updating, which is a modelling convenience with no ontological weight, and the proposition that a subject is constituted in relation becomes a claim about the effects of network position, which has been studied for decades and is not what the framework means.

The third cost is internal. A framework that intends to model constraint evolution, as the historical branch of this programme does, needs to say how the constraint at one scale stands to the relations at another. That statement cannot be made while relation is undefined, since the two terms would be free to collapse into one another whenever the argument required it.

1.1 *The Task and the Scope*

The task of this paper is therefore narrow and, within its narrowness, foundational. It proposes one definition, argues for it, unpacks its terms, and illustrates it across five domains. It introduces no other part of the framework beyond what the argument requires.

The scope of the claim must be stated at the outset, since almost every difficulty in defining relation comes from taking the task to be larger than it is.

Scope. *This paper does not attempt to provide a universal philosophical definition of relation. It proposes a working definition for generative relational being, whose purpose is to analyse generative processes across physical, biological, social and symbolic domains.*

The consequence of this scope is that the paper is not in competition with Aristotle's treatment of the relative, with Leibniz on relational space, with Whitehead's prehension, with Cassirer's functional concepts, with Simmel, with Latour, or with the relational political philosophy of the last two decades (Aristotle, 1984; Leibniz & Clarke, 1717; Whitehead, 1929; Cassirer, 1910; Simmel, 1908; Latour, 2005; Ceva, 2016). Each of those is an answer to a question about what relation is. The question asked here is what concept of relation a particular framework requires in order to do the work it has set itself. The two questions can be answered differently without either being wrong, and a framework that conflates them takes on a burden of proof it does not need and cannot discharge.

1.2 The Central Claim

Central claim. *Generative relational being understands relation as the historical constraint through which generation unfolds, and not as a static connection between entities. Everything that follows supports this one sentence.*

The sections proceed in the order of the argument. §2 surveys what is available and identifies what none of it supplies. §3 states the definition and unpacks its four terms. §4 argues the point on which the definition stands or falls, that constraint is the condition of generation and no obstacle to it, and answers the objection that constraint omits what a coupling adds. §5 develops a taxonomy on two axes and works the cases. §6 marks what the definition is not and what it leaves unsettled. §7 places the result within the wider programme.

2 EXISTING UNDERSTANDINGS OF RELATION

What follows is a classification and not a literature review. Five readings of relation are distinguished, each stated in its strongest form, each credited with what it achieves, and each examined for one question only: whether it makes relation answerable to the historical unfolding of generation.

2.1 Relation as Interaction

On the first reading a relation is what accumulates from repeated interaction. Two parties act upon one another; the encounters leave a residue of expectation, obligation and habit; the residue is the relation. The lineage runs from Simmel's account of sociation through symbolic interactionism to exchange theory (Simmel, 1908).

The reading achieves something the others struggle to: it makes relation dynamic without special machinery, since a relation on this account simply is a history of encounters. Its limit is that it requires the parties to be individuated in advance of the relation, as beings capable of interacting before any relation obtains between them. A framework holding that subjects are constituted in relation cannot take this reading as basic, since the reading presupposes what the framework proposes to explain. There is a further limit, less often noticed. Interaction is an event, and a relation composed of events is present only when the events occur. The reading has difficulty saying what a relation is during the long intervals in which nothing passes between the parties, and yet those intervals are where much of relational life is lived.

2.2 Relation as Background Structure

On the second reading relations precede interactions and configure them. Positions exist before the occupants of positions; what two people can do to one another is set by the structure within which they stand. Structuralism holds this, and so does the relational sociology that follows Emirbayer's programmatic statement, on which the transaction and not the substance is the primitive of social analysis (Emirbayer, 1997).

This reading corrects the first at exactly the right point: *relata* can now be constituted by relations, and the framework's ontological commitments become sayable. Its limit lies in the standing of the structure. The structure conditions everything and is itself conditioned by nothing within the account; it enters the analysis as given, and its own transformation is either left to a separate theory or supplied by exogenous shocks. For a framework whose central question is how constraint evolves, a concept of relation that leaves the evolution of relations outside the concept is unusable.

2.3 Relation as Difference

On the third reading relation is difference: a term has its identity through what it is distinguished from, and the system of distinctions is prior to any positive content. Saussure's value, in which a sign is constituted by its differences from other signs, and Bateson's difference that makes a difference, are the canonical statements (Saussure, 1916; Bateson, 1972).

The achievement is considerable. This reading dispenses with substance altogether, which no other reading manages, and it explains how relation can be efficacious without being a thing. Its limit is temporal. Difference is a synchronic notion: it describes the state of a system of distinctions at a moment, and it says nothing about how one moment gives way to the next. Bateson's formulation gestures at succession, since a difference that makes a difference is a difference with a consequence, and the gesture is exactly what the present paper takes up. As it stands in the tradition, however, the reading gives a theory of contrast and no theory of course.

2.4 *Relation as Tie*

On the fourth reading a relation is an edge: a link between nodes, present or absent, weighted or unweighted, directed or undirected. This is the working concept of network analysis, and its virtue is that it is measurable. Whole literatures have been built on it, and their findings are real.

Its limit for present purposes is that the tie is a state variable. It records that a connection obtains and says nothing about what governs the succession of states within it. When network models let ties change, the rule of change is supplied from outside the concept of the tie, as a dynamics imposed upon the graph. The concept therefore locates relation in the wrong layer for a framework whose interest is precisely the rule of change.

2.5 *Relation as Correlation*

On the fifth reading, common in the sciences and often tacit, a relation is a statistical or functional dependence between quantities. This is operational and it travels well between domains.

Its limit is that correlation is symmetric and timeless, and that it does not distinguish a relation from a coincidence. Two quantities may covary because one constrains the succession of the other, because both are constrained by a third, or because a finite sample was unlucky. A framework that must tell these apart cannot take the undifferentiated notion as its primitive.

2.6 *The Common Limit of the Surveyed Readings*

Each reading captures something, and the framework has been drawing on all five without acknowledging that it was doing so. The point to be extracted from the survey is that they share a feature. Each defines relation at an instant. Interaction is an event at a time; structure is a configuration at a time; difference is a contrast at a time; a tie is a state at a time; a correlation is a property of a distribution, which is timeless by construction. Where succession enters any of these accounts it enters as something applied to the relation from outside.

A framework concerned with historical generation needs the opposite arrangement. It needs relation to be the thing in virtue of which a system's later states depend on its earlier ones. That is the requirement the definition below is built to meet.

3 THE DEFINITION

Definition (Relation in GRB). A relation is the constraint through which generation unfolds in history.

The sentence is short, and its brevity is deliberate: a definition of a primitive should be quotable and should carry no argument inside itself. All the argument is in the surrounding text. Four terms do the work, and each is now taken in turn.

3.1 *Constraint*

Constraint here means a restriction on succession. It concerns how the states of what is related may follow one another, and it does not concern which states exist. This is a narrower reading of the word than ordinary usage supplies, and the narrowing is essential; §4 shows that most of the resistance the definition provokes comes from hearing constraint in the wider sense.

The distinction can be put plainly. A constraint on configurations says that certain states are unavailable. A constraint on succession says that certain states, being available, may be reached only from certain others. The first impoverishes a system. The second gives it a shape in time. It is the second that is meant.

3.2 *Generation*

Generation is the appearance, within a system, of what was not specifiable in the system's own prior terms. The formulation is deliberately thin, and it is thin for a reason that must be stated openly. The framework treats generative tendency as a postulate: it holds that relations exhibit generation, and it declines to explain why. The refusal is principled. To answer the question why systems unfold their own dynamics is to name some more fundamental good that generation serves, and generation would then become the means to that good. Any such answer, whatever term filled it, would convert the framework into a variety of utilitarianism. Physics does not explain why the action is extremal, and mathematics does not explain why sets exist. The parallel is claimed here as licence for the same abstention.

One consequence of the abstention should be recorded, since it bears on the standing of the definition and is taken up again in §3.6. Because generation appears in the definition of relation, the sentence *relations exhibit generative tendency* cannot be read off the definition as a discovery. It is a postulate about the systems the framework studies, and it must be stated as one.

3.3 *Unfolding*

Generation has a course. To say that generation unfolds is to say that it takes time, that it passes through states, and that its passage is neither predetermined nor arbitrary. A predetermined course would make the constraint the whole story and generation an illusion. An arbitrary course would make the constraint idle. The term marks the middle case, which is the only case in which the definition has content: a course that is shaped without being fixed.

3.4 History

This is the clause that carries the most weight, and it is the clause a reader is likeliest to take as decoration. It is not decoration. To say that generation unfolds in history is to say that the constraint through which it unfolds is itself borne by the process it constrains.

Without this clause the definition would be a statement of structuralism, and a weak one. The constraint would condition generation and would itself be given from outside, and the framework would have arrived, by a longer route, at the position identified as insufficient in §2. With the clause, relation is at once condition and product: it constrains the succession of states, and it is revised by the succession it constrains.

This is what makes the definition historical in a sense stronger than the observation that relations have pasts. Relations are not merely dated. They are made of what has passed through them. The point has a familiar formulation in the historical-materialist tradition, that people make their own history and do not make it under circumstances of their own choosing, where the circumstances are themselves the sediment of earlier making (Marx, 1852). The definition proposed here is an attempt to state the structure of that sentence at the level of the concept of relation itself.

3.5 The Propositions Unfolded from the Definition

The definition may be unfolded into four propositions, which together constitute the position this paper defends.

Proposition 1 (Historicity). *Relation is a historical concept and admits no timeless specification. A relation is individuated by the constraint it imposes on succession, and that constraint has a date, a provenance and a career.*

Proposition 2 (Dynamism). *Relation is defined over succession, and it is itself subject to succession. The constraint governs how states may follow one another, and the sequence so governed revises the constraint. Relation is therefore dynamic in two senses, and the second is what distinguishes this account from the structural reading.*

Proposition 3 (Constraint as Condition). *Constraint stands in no opposition to generation. It is the condition under which generation unfolds. Where succession is unconstrained, nothing accumulates and no course is retained, and what results is noise and no generation at all.*

Proposition 4 (Method). *Generative relational being individuates and studies relations by the part they play in historical generation, and not by the metaphysical status of their relata. Whether the relata are physical, biological, social, symbolic or imagined is immaterial to whether a relation obtains.*

Proposition 3 is the philosophical contribution and is argued in §4. Proposition 4 is the methodological payoff and is exhibited in §5, where it does the work that lets a single definition span five domains.

3.6 *The Standing of the Definition*

A definition of this kind is stipulative, and honesty about that is worth more than a show of discovery. The paper does not claim that this is what relation has always meant, nor that other definitions are mistaken. It claims that a framework with these purposes requires a concept with these properties, and that the sentence above states one.

Two consequences follow, and both are constraints on how the framework may argue in future.

The first has been anticipated in §3. Since generation appears in the definiens, no proposition of the form *relations are generative* may be presented as a result. The substantive claims in this vicinity are existential and empirical: that constraints of the defined kind exist in physical, biological, social and symbolic systems, and that in those systems the constraint is in fact borne and revised by the succession it governs. Those are claims about the world and can be false. The definition itself cannot be false; it can only be useless, and its use is what §5 is for.

The second concerns teleology. A definition that ties relation to generation invites the reading that relations exist for the sake of generation, and that reading would be a serious error. The definition says how relation and generation stand to one another, and it assigns no purpose to either. The framework has independent reasons for refusing to make generation a good, since a system that treats the free unfolding of its own dynamics as an end can justify the destruction of whatever impedes it, and that justification is available in the framework's own vocabulary unless the vocabulary is guarded. The guard is stated here so that the definition does not quietly undo it: relation is defined through generation, and generation is thereby given no normative standing whatever.

4 CONSTRAINT AS THE CONDITION OF GENERATION

The definition asks a reader to accept a sentence that sounds false on first hearing. This section takes the appearance seriously, states it in its strongest form, and answers it.

4.1 *The Received Intuition*

The intuition runs as follows. A constraint removes options. Fewer options mean less freedom. Less freedom means less creation. Constraint therefore stands opposed to generation, and defining generation's condition as constraint is a paradox at best and an equivocation at worst.

The intuition is not naive. It underwrites a great deal of moral and political reasoning, and in the cases it is drawn from it is correct: the prisoner has fewer options and generates less; the censored writer has fewer options and generates less. Any answer that dismisses the intuition will be dismissed in turn.

4.2 *The Argument from Unconstrained Succession*

The answer begins by asking what a system with no constraint on succession would look like. Its next state would be independent of its present one. Nothing that happened would bear on what happened next. Such a system passes through states without passing through a course: it has no trajectory in any sense that survives inspection, since a trajectory is a sequence whose parts are answerable to one another. Nothing accumulates in it, because accumulation requires that the past bear on the present. Nothing can be built in it, because building requires that a step taken remain taken.

This system is at the maximum of unconstrained succession and at the minimum of generation. It is noise. And noise is the limiting case that the received intuition never examines, because the intuition is drawn from cases in the middle of the range, where a constraint is removed from a system that has plenty of others left.

The general form of the point is that generation requires the retention of its own past, and constraint on succession is what retention consists in. A relation, on the definition offered, is exactly what makes a system's later states answerable to its earlier ones. Where there is no such answerability there is no history, and where there is no history there is nothing for generation to unfold in.

Four familiar cases display the same structure, and they are offered as analogies and not as parts of the definition. Grammar constrains which strings count as sentences, and the constraint is the condition under which an unbounded set of new sentences becomes sayable and understandable. Counterpoint constrains which voices may move how against which, and composers have found in the constraint the condition of invention and not its enemy. A crystal lattice constrains which positions an atom may occupy, and the constraint is what allows structure to propagate over distances no unconstrained aggregate could span. An institution constrains what its members may do, and the constraint is what allows an action taken today to still mean something next year.

4.3 *The Limit of the Argument*

The argument establishes that constraint is necessary for generation. It does not establish that constraint is sufficient, and the definition should not be read as claiming this. Some constraints on succession close a system's continuations down to one, and a system so constrained generates nothing further. The distinction between constraint that leaves continuations open and constraint that forecloses them is the substance of the framework's account of relational degradation, and it is deliberately left outside this paper.

What the definition contributes at this point is the ability to state the question. On the readings surveyed in §2, the difference between a relation that sustains generation and one that ends it must be imported from a theory of something else, since none of those readings has succession inside the concept of relation. On the definition proposed here, the difference is a difference between two constraints on succession, and it can be posed as one question about one kind of object.

4.4 *Constraint and Coupling*

One objection deserves its own treatment, because it is the most serious available and because it was raised against this definition during its development. It runs as follows. A relation does more than restrict. In physics, the coupling between two spins is a constraint, and it is also a coupling: a channel along which influence passes. In institutions, a relation restricts what may be done, and it also establishes the routes through which coordination, influence and joint development occur. Constraint appears to name only half of what a relation is, and the missing half is precisely the productive half.

The objection is answered by attending to the level at which the constraint is predicated. Take a system of two spins with a coupling term in its Hamiltonian. The coupling forbids no configuration whatever: every joint state remains in the state space. What it does is make the transitions of one spin depend on the state of the other. That single fact admits two accurate descriptions. Described one way it is a restriction, since the first spin's succession is no longer free of the second. Described the other way it is a channel, since influence now passes from the second to the first. There are not two structures here, one restrictive and one productive. There is one structure and two vocabularies for it.

Claim (Identity of restriction and channel). *A restriction on joint succession and a channel of influence are one structure under two descriptions. Constraint on succession therefore already contains what the objection asks to be added, and no further term is required in the definition.*

The objection has a source, and naming it disarms the residual discomfort. Constraint predicated of configurations does not contain coupling: a rule that forbids certain states says nothing

about influence passing between anything. Since configurational constraint is what the word ordinarily suggests, a reader's first hearing of the definition will be the hearing on which the objection is sound. This is why §3 narrowed the term at the outset. Constraint on succession is the whole of what is meant, and on that reading a relation is a channel in the same breath in which it is a restriction.

5 THE CLASSIFICATION OF RELATIONS

A definition of a primitive earns its place by classifying. If the definition proposed here is doing work, it should sort relations into kinds, the sorting should follow from the definition and not be imported alongside it, and the resulting classes should hold across domains ordinarily treated by separate theories. This section attempts that, and then works the cases.

5.1 *The Principle of Classification*

Two candidate taxonomies present themselves, and each fails alone in a way that shows what a successful one must do.

The first classifies by the domain of the relata: relations between bodies, between organisms, between persons, between signs, and between a party and a figure that does not exist. This is how the disciplines divide, it is immediately recognisable, and it has the merit of being exhaustive in a rough and useful way. It cannot be the framework's principle of classification, since Proposition 4 holds that relations are individuated by the part they play in constraining succession and not by the metaphysical status of their relata. A taxonomy keyed to that status would contradict the proposition it is meant to illustrate. Nor is it a taxonomy in the strict sense: it is a list of regions with no principle generating them, and it has nothing to say about why a relation in one region should resemble a relation in another.

The second candidate is the triad of the real, the symbolic and the imaginary, which is available and which several of the framework's neighbours use (Lacan, 1977). It is set aside here for a specific reason, and the reason is worth stating because the triad is otherwise attractive. Those three are registers of a subject. They classify the modes in which a subject stands toward its world, and each of them presupposes a subject to stand in it: there is no imaginary without one who imagines, and no symbolic order for a lattice of spins. A framework proposing to treat physical coupling, synaptic efficacy, institutional role and inherited obligation as instances of one concept cannot take its top-level division from a theory of human subjectivity without narrowing its own claim at the first step.

The definition supplies a principle that neither candidate has. It has two clauses. The first, that a relation is a constraint on succession, is common to every relation and classifies nothing. The second, that the constraint is borne by the process it constrains, varies systematically. Relations differ in what carries the constraint and in the channel through which the carrier is

revised, and that difference has consequences: it determines what a relation can survive, how it changes, and how it fails.

The classification adopted here is therefore two-dimensional. The domain of the relata is retained as the first axis, since it is what a reader recognises and since the coverage of the definition is best displayed against it. It carries no theoretical weight, and nothing in the framework is derived from it. The mode of bearing is the second axis, it is derived from the definition, and it does the work. The cross-tabulation of the two is where the taxonomy pays, and it is given in §5.8.

MODES OF BEARING AND THEIR ORDER

Four modes are distinguished, ordered by a single criterion, namely what the constraint can survive the loss of.

A constraint is *materially borne* when it is carried by a physical configuration and revised by physical process. It survives the loss of all representation of it. Nothing need know of it, and it holds.

A constraint is *inscribed* when it is carried by a record and revised through a specified procedure operating on that record. It survives the loss of anyone's memory of it and the lapse of its use, since a dormant statute remains law and an unread rule still executes. It does not survive the loss of the record, nor does it change except as the procedure allows.

A constraint is *circulated* when it is carried by a token maintained in use among more than one party and revised by that use. It survives the loss of any particular party and does not survive an interruption of the circulation. Nothing is written down, and revision requires no procedure and no decision.

A constraint is *singularly borne* when it is carried by one party's figure of a counterpart and revised by that party's own succession of states. It survives the loss of the counterpart and of the community alike, and it does not survive the loss of the party who bears it.

The series descends in independence, from a constraint independent of everyone, through one independent of use, through one independent of any individual, to one dependent on a single party. Each position carries its own characteristic failure, set out in §5.9.

THE INDEPENDENCE OF THE AXES

The two axes coincide often enough that a reader may suspect the second of being the first renamed. They come apart in both directions, and the cases where they do are the proof that two axes are needed.

A relation whose counterpart does not exist may be borne in circulation and not in one party. A shared myth, a nation, a lineage venerating its founder: in each of these the figure is maintained by a whole community, and no member's private representation carries it.

Anderson's central observation about national belonging is precisely this, that the unmet co-members are supplied to each member by an apparatus he did not build (Anderson, 1983). The relatum is imagined and the bearing is circulated.

Conversely, a relation whose counterpart exists in full may be borne singularly. A junior scholar's relation to a living authority he has never met, sustained entirely by his figure of what that authority would say, is a relation to an existing person borne in one party. The authority may be unaware of him. Should the two ever meet, the figure would be corrected by something outside the bearer, and the bearing would change mode while the relation persisted.

5.2 *The Protocol of Examination*

Each case below is put to the same three questions, and the discipline of answering all three is what distinguishes an illustration from an assertion.

The first question is what the constraint on succession consists in: concretely, what may follow what, and what could have followed what in its absence. An answer that cannot name the foreclosed successions has not identified a constraint.

The second question is that of jointness: whose states are made answerable to whose. This clause keeps the definition from making every regularity of succession a relation, since a law governing the states of one system relates nothing to anything. An answer must name two terms and say in which direction the answerability runs.

The third question is that of bearing: what carries the constraint, and through what channel the carrier is revised. This is the historical clause of the definition, and a case that cannot answer it exhibits a structure and no relation in the sense defined.

5.3 *Relations of Material Bearing*

COUPLED SPINS

Consider a lattice of two-valued sites with couplings between neighbours, of the kind Ising introduced (Ising, 1925). The constraint on succession is exact and is the whole of the model: which configurations may follow which is set by the couplings. In their absence each site would evolve without reference to any other, and every joint succession would be available. Jointness is likewise exact, since the transition of each site is answerable to the current values of its neighbours, symmetrically.

The third question exposes something the model is usually not asked. The couplings are fixed by hand and have no career, so such a system satisfies the first clause of the definition and not the second: it has dynamics, and it has no history. It becomes a full instance when the couplings are permitted to evolve on a slower timescale under the influence of the site statistics they govern, at which point two timescales appear, with states succeeding one another under

fixed constraint on the fast one, and the constraint revised by the succession it has governed on the slow one.

The case is placed first because it exhibits Proposition 3 in its cleanest available form. Long-range order in such a system is produced by constraint and by nothing else, and it extends over distances vastly greater than the range of any individual coupling. Remove the couplings and the lattice becomes maximally free at every site, and it produces noise. The received intuition of §4 predicts the opposite, and here it is not a matter of interpretation which prediction is right.

THE SYNAPSE

A synapse constrains succession in the same sense: it makes the firing of one cell answerable to the recent firing of another, and a pattern of such answerabilities is what allows an activity pattern to have a successor worth calling a computation. Jointness is directional and is stated by the anatomy.

Bearing here needs no artificial supplement, since the biology provides it. Synaptic efficacy is revised by the activity it conditions, along lines Hebb proposed and a large experimental literature has since refined (Hebb, 1949). The relation between two cells is at once the constraint on what may follow what and the running product of what has followed what, on timescales separated by orders of magnitude. The separation is what makes such a system stable enough to act and plastic enough to learn.

The case matters because it removes the suspicion that the two-timescale structure is a figure imported from social theory into nature. It is a commonplace of the neuroscience, and the definition names a structure that discipline already studies.

FURTHER INSTANCES, COMPRESSED

The chemical bond constrains which nuclear configurations may follow which and is revised by the reactions it makes possible. A resonance between orbiting bodies constrains which orbital phases may follow which and is revised, over long times, by the exchange of angular momentum it governs. A trophic coupling constrains which population states may follow which and is revised by the selection those successions impose on both populations. A symbiosis constrains the metabolic states available to each partner. A contact structure in an epidemic constrains which infection states may follow which and is revised by the immunity and behavioural change the transmissions produce. Built infrastructure belongs here as well: a rail gauge, a road network or a port constrains which movements may follow which, and is revised, slowly and expensively, by the traffic it has carried. Co-presence in a room is the humblest instance and among the most consequential, since it constrains which exchanges may follow which by the plain fact of who can hear whom.

The last two instances are worth a remark, since both are materially borne constraints produced by human action, which shows that this class is no class of the natural. What places a constraint here is that it holds whether or not anyone represents it. A bridge no one remembers building still constrains what may follow what.

THE BOUNDARY OF THE CLASS

Not every physical regularity is a relation, and the second question is what excludes the rest. A law of motion constrains the succession of a system's states without making the states of two terms answerable to one another, and it is a constraint and no relation. This is the jointness clause doing the work assigned to it in §6, and the material class is where it can be seen doing so most plainly.

5.4 *Relations of Inscribed Bearing*

THE STATUTE

A statute constrains which acts of an official may follow which acts of a citizen, and which claims may follow which facts. Jointness runs between the parties it binds, and through the record that binds them. What distinguishes this class is the third question. The constraint is carried by a text, and it is revised through a procedure: amendment, repeal, judicial construction. It changes when the procedure is exercised and at no other time, which is exactly what gives written law its peculiar temporality. A statute may sit unused for a century and bind on the day it is invoked.

THE SCORING MODEL

A model that assigns a person to a category constrains which offers, prices and refusals may follow which records of him. Jointness holds: what the model may output is answerable to his recorded states, and what he may do next is answerable to its output. Bearing is inscribed, since the constraint is carried by a fitted object and revised by an update rule operating on data.

This case was entered in an earlier draft of this paper as a candidate anomaly, on the ground that it fitted no mode then available. The four-mode account absorbs it without amendment, and the absorption is worth marking because it shows that the anomaly was an artefact of a taxonomy borrowed from elsewhere. What made the case look strange was that its revision channel is neither physical process nor communal use. Once inscription is admitted as a mode in its own right, the scoring model takes its place beside the statute, and the two share the properties that matter: revision only through a specified procedure, persistence through disuse, and indifference to whether anyone understands the record.

FURTHER INSTANCES, COMPRESSED

A technical standard constrains which components may follow which in an assembly and is revised by a standards body. A protocol constrains which messages may follow which. A liturgy constrains which acts may follow which within a rite, and is revised by an authority and not by the congregation. An organisation chart constrains which instructions may follow which, and is revised by reorganisation. A contract is the inscribed form of a promise, and the difference from the circulated form is instructive: the promise between friends lapses with the practice that sustains it, while the contract survives the parties' loss of interest and is revised only through its own machinery. An accounting standard constrains which representations of a firm's condition may follow which transactions.

The genome sits at the edge of this class and is entered here with the qualification marked. It is a record, it is copied, and it is revised through channels that are specified and not arbitrary. Whether the description is more than a convenient one is a question this paper does not settle, and it is noted because the phrase *genetic code* may be less metaphorical than it is usually taken to be.

THE CHARACTERISTIC VULNERABILITY OF THE CLASS

Two failures follow from inscription. The first is the dead letter: because the constraint survives disuse, a record may go on constraining succession long after the relation it once described has gone. The second is more consequential for the framework. Because revision requires a procedure, and because a procedure operates on what the record can express, an inscribed constraint tends to reshape the relation it governs into the form the record can hold. What cannot be entered into the record ceases to bear on what may follow what. This is the mechanism by which indices come to displace what they were introduced to measure, and it is the reason the framework treats inscription as the most powerful and the most dangerous of the four modes.

5.5 *Relations of Circulated Bearing*

A NAME HELD BY A COMMUNITY

Consider the relation between a person and a name under which a community holds him. The constraint on succession falls on what may follow what in the community's dealings with him: what may be said next about him, what may be proposed to him, what may be expected of him, what an ambiguous action of his may be taken to have been. In the absence of the name, successions are available that the name forecloses.

Jointness runs in both directions, and this is easily missed. The community's states are answerable to the name, since what may be said next is constrained by it. The name's own

state is answerable to what the community keeps saying, since a name is nothing beyond its use.

Bearing is by circulation, and the consequence is the property that makes this class the seat of the framework's account of degradation. Nobody holds the constraint. It is carried in use and revised in use, so it changes without anyone deciding that it should, and no event marks the moment at which a description hardens into a classification. This lets a distinction be drawn that the surveyed readings cannot draw: between a community that retains a distinction and fails to act on it, and a community for which the distinction has ceased to be available. The first is a failure of generation under an intact constraint. The second is a change in the constraint. The two are indistinguishable in the conduct they produce, and they are different relations.

THE TEACHER AND THE STUDENT

Given that one party stands as teacher to the other, a correction may be followed by revision and not by insult, a question may be asked without loss of standing, an assertion may be answered in ways available in no other setting. Remove the relation and the successions change: the correction is followed by affront, the question by embarrassment.

The received intuition would read this as limitation, and would note further that the relation is asymmetric and that asymmetry is the seat of power. Both observations are correct, and the framework holds elsewhere that asymmetry in a relation always produces a power which sufficient generation absorbs. Neither observation touches the point at issue, which is that the constraint is the condition of the teaching. Without it the exchange is unavailable, and there is nothing left for power to be exercised over.

Bearing is circulated, since what carries the constraint is a pair of roles maintained in use well beyond these two people. This is why the relation can be entered by strangers on a first meeting, and why it is revised by what passes between them: by the student who comes to surpass the teacher, by the teacher who ceases to invest, by an accumulation of exchanges that leaves the parties differently placed than they began. No one need decide upon those revisions. Where the same relation is also inscribed, in an enrolment record and a set of regulations, the two modes coexist and may diverge, and the divergence between what the roles have become in use and what the regulations still say is a familiar institutional condition.

FURTHER INSTANCES, COMPRESSED

A promise constrains which acts of the promiser may follow, and is revised by the keeping and breaking of promises within a community that maintains the practice. Money constrains which exchanges may follow which holdings and is revised by the exchanges it carries. A living language constrains which continuations of a string are available and is revised by the speaking. An academic attribution constrains what may follow from a work and to whom it

accrues, and is revised by the citing practice of a field. A form of address constrains which openings may follow which encounters. A reputation constrains which dealings may follow which offers.

5.6 *Relations of Singular Bearing*

The class in which the constraint is carried by one party is the hardest and the most revealing. A person may stand in relation to the dead, to a god, to posterity, to a discipline, to a fictional figure, to an anticipated judge of his work, to his own future self, to a rival he has never met, or to an audience he believes to be evaluating him. The literature on being seen, from Otto's account of the holy through Buber's address and Levinas's face, describes a constitution of the subject under a regard whose bearer is nowhere present (Otto, 1917; Buber, 1923; Levinas, 1961).

THE PROTOCOL IN THE HARDEST CASE

The first question is answerable, and concretely. The scholar who will not publish work he would be ashamed for a long-dead teacher to read has certain successions foreclosed to him, and one may say which. The believer whose conduct is ordered by the conviction that he is seen has others foreclosed. The constraint is observable exactly where the definition says to look, in what may follow what.

The second question is where this class threatens the definition, and the threat must be stated before it is answered. Jointness requires two terms with states. Where the counterpart does not exist it has no states, and the relation appears to collapse into a one-place property of the party: a disposition, misdescribed as a relation for rhetorical effect.

The answer is that the relatum is the figure, and the figure has states. The god need not exist for the figure of the god to have determinate content, a history and a career; what the anticipated judge would approve is a matter of fact about the figure at a time, and it changes.

This answer has an obvious cost, since the figure is carried by the very party whose states it constrains, and a relation whose two terms are both housed in one party invites the collapse just denied. The reply is that the collapse does not occur, and that whether it occurs is testable. The mark of a relation here is that the party does not control the figure's succession. One cannot decide that the anticipated judge approves, and one cannot settle by resolution that the dead teacher would have been satisfied. The inability is no failure of will. Where a party can set the figure's states at will, there is a disposition being described in relational language and no relation. Where he cannot, the two terms are distinct and jointness holds. The criterion is sharp enough to be applied to particular cases and to be argued about.

The third question is answered with unusual clarity here, since nothing enters from the counterpart. The figure is revised solely by the succession the constraint has been governing,

which is precisely what the definition says a relation's revision consists in. Singular bearing is thus the purest instance of the historical clause, and the fact that the purest instance is also the one the alternative readings must reject is the strongest evidence this paper has to offer.

THE EVIDENTIAL FORCE OF THE CLASS

On the interaction reading many of these are not relations, since nothing passes between the parties. On the tie reading they are not relations, since one endpoint is missing or unreachable. On the correlation reading they are unavailable, since one of the two quantities has no values. Each reading must treat them as figurative uses of the word, or as psychological facts about one party dressed in relational language. On the definition proposed here they are relations in the full sense, and no amendment is required to make them so.

One instance deserves separate mention because of the work it does elsewhere in the framework. An audience whose evaluation is believed in need contain no one who evaluates. It suffices that a party takes himself to stand within an order in which he may be seen, placed and assessed. The constraint on succession is then fully operative with no bearer outside the party subject to it, which is why conduct organised around such an audience is so difficult to alter by showing that no one in particular is watching.

5.7 *Composite Relations and the Standing of the Social*

The social has not been given a class of its own on either axis, and the omission is deliberate.

A social relation is ordinarily a composite: several constraints on succession, borne in different modes, holding between the same parties at once. A family relation is borne materially in co-presence and in the dependencies of a household, circulated in kinship terms maintained well beyond the family, inscribed in registers and law, and singularly in obligations owed to the dead. A national relation is borne circulatedly in a common practice, inscribed in documents and statute, singularly in each member's figure of the unmet others, and materially in territory and infrastructure. Money is inscribed in a settlement system, circulated in a unit of account, and borne singularly in each holder's expectation of what others will accept. A workplace hierarchy is inscribed in an organisation chart, circulated in the practice of deference, and borne singularly in the figure of the one whose regard decides who counts.

Treating the social as a class would obscure all of this, and it would place a heterogeneous category beside homogeneous ones. Treating it as composite yields two returns. The first is that a composite fails component-wise, which is what partial degradation is: the circulated component of a relation may lapse while the inscribed persists, which is the exact condition of an institution that retains its rules and has lost its practice, and the reverse condition is that of a practice that has outgrown its rules. The second is that a number of long-running disputes in social theory can be read as disputes over which component of a composite carries the weight,

TABLE 1: *Domain of the relata against mode of bearing*

<i>Domain</i>	<i>Material</i>	<i>Inscribed</i>	<i>Circulated</i>	<i>Singular</i>
Physical	Coupled spins, chemical bond			
Biological	Synapse, symbiosis	Genome (edge case)		
Social	Co-presence, in- frastructure	Statute, org chart	Role, custom, repu- tation	The believed audi- ence
Symbolic		Standard, protocol, accounting rule	Living language, a name in use	A private idiom
Imagined		Scripture, liturgy	Shared myth, na- tion	The dead teacher, a god

which is a more tractable question than the one usually asked.

5.8 *The Cross-Tabulation of Domain and Bearing*

The two axes may now be crossed, and Table 1 does so. Its cells give a representative instance where one exists, and are left empty where the combination does not arise.

The pattern of empty cells is itself a result and should not be read as a gap in the survey. Modes beyond the material become available only where at least one term is represented by some party, and the domains are ordered by how much representation their terms require. Physical relations admit material bearing alone. Imagined relations admit every mode except the material, since a figure cannot be carried by a configuration that no one represents. The two axes are therefore neither independent nor identical, and the shape of their dependence is a substantive claim of this section: representation is what opens the higher modes of bearing, and it opens them without regard to whether the relatum exists.

The cell crossing the imagined domain with circulated bearing carries the case that most needs it. A national relation is imagined in its relatum and circulated in its bearing, which is why it is neither a private fantasy nor an ordinary institution, and why it resists the treatments that suit either.

5.9 *Summary of the Modes and the Coverage*

Table 2 sets out the four modes with the properties that distinguish them. Tables 3 and 4 gather the instances worked or named above, each stated in the form the first question of §5 requires.

5.10 *The Limit of the Taxonomy*

Three limits are entered against what has been claimed.

TABLE 2: *Modes of bearing and their properties*

<i>Mode</i>	<i>Bearer</i>	<i>Revision channel</i>	<i>Survivable loss</i>	<i>Characteristic failure</i>
Material	Physical configura- tion	Physical process	All representa- tion	Rupture or decay
Inscribed	A record	A specified proce- dure	Memory, and use	Dead letter; the record reshapes the relation
Circulated	A token in use	The use itself	Any particular party	Congeaing; lapse through disuse
Singular	A party's figure of a counterpart	That party's own succession	The counterpart, and the commu- nity	Collapse of the fig- ure; its capture

The modes are modes of bearing and no kinds of thing. It is a mistake to ask whether a given relation is really inscribed or really circulated, and the right question is which of its constraints is borne in which mode. Most relations of any interest are composite, as §5.7 argued, and the modes earn their keep in the decomposition and not in the labelling.

The modes are argued from cases and not derived. The criterion ordering them, what a constraint survives the loss of, is drawn from the definition, and nothing here shows that it is the only principle the definition supplies. A different principle drawn from the same definition might cut differently and cut better.

The boundary between inscription and circulation will bear pressure. A record that no procedure governs, revised by whoever edits it and answerable to use, is inscribed in its bearer and circulated in its revision channel, and the fixed corpora of an oral tradition sit on the same line from the other side. The classification is by revision channel where the two diverge, since the revision channel is what the definition's historical clause makes decisive, and the ruling is stipulated here and not argued.

6 DELIMITATIONS

A definition is as much a set of refusals as a set of commitments, and the refusals are set out here.

6.1 *Exclusions from the Definition*

It is not an ontology. The definition says nothing about whether relations are more fundamental than their relata, whether relata exist independently of relations, or whether the world is at bottom relational. Positions on these questions are available, from Leibniz through Whitehead to the relational reading of quantum mechanics and to agential realism (Leibniz & Clarke, 1717; Whitehead, 1929; Rovelli, 1996; Barad, 2007), and the framework may eventually take one. The

TABLE 3: *Instances of material and inscribed bearing*

<i>Instance</i>	<i>Constrained succession</i>
<i>Material bearing</i>	
Coupled spins	Joint configurations reachable from a given one
Chemical bond	Nuclear configurations reachable from a given one
Orbital resonance	Orbital phases available to each body
Synapse	Firing states of one cell, given recent firing of another
Trophic coupling	Population states available to predator and prey
Symbiosis	Metabolic states available to each partner
Contact structure	Infection states reachable within a population
Built infrastructure	Movements available between places
Co-presence	Which exchanges may follow, by who can hear whom
<i>Inscribed bearing</i>	
Statute	Which official acts may follow which citizen acts
Contract	Which acts of the bound party may follow
Property title	Which uses of a thing may follow whose decision
Scoring model	Which offers and refusals may follow which records
Technical standard	Which components may follow which in an assembly
Protocol	Which messages may follow which
Liturgy	Which acts may follow which within a rite
Organisation chart	Which instructions may follow which, and from whom
Accounting standard	Which representations may follow which transactions
Genome (edge case)	Which cellular states may follow which, by a copied record

present definition is compatible with several and requires none.

It is not an epistemology. The definition does not say how relations are known, observed or measured. That relations of the defined kind are often invisible to the parties standing within them is an important claim, and it is a separate one.

It is not a theory of interaction. Interaction is one mode in which a constraint on succession is realised, and §5 exhibited modes in which no interaction occurs at all.

It is not a claim about the word. Physics, sociology and philosophy will go on using relation in their own senses, correctly. What is proposed is a term of art for one framework.

6.2 *Scale and the Passage Between Levels*

A question the definition raises and does not settle is that of scale. The same word is used in the framework at two levels: for the microscopic constraint that holds between particular terms, and for the macroscopic constraint that a historical situation imposes on everything within it. The definition above is stated at the first level.

The relation between the two levels is a substantive matter and is treated in the historical

TABLE 4: *Instances of circulated, singular, and composite bearing*

<i>Instance</i>	<i>Constrained succession</i>
<i>Circulated bearing</i>	
A name held of a person	What may be said, proposed and expected next
Teacher and student	Which responses may follow a correction or a question
Promise	Which acts of the promiser may follow
Money	Which exchanges may follow which holdings
Living language	Which continuations of a string are available
Academic attribution	What may follow from a work, and to whom it accrues
Reputation	Which dealings may follow which offers
Form of address	Which openings may follow which encounters
<i>Singular bearing</i>	
The dead teacher	Which works may be published, and in what condition
A god	Which acts may follow, in the absence of any witness
Posterity	Which present sacrifices may follow which prospects
One's own future self	Which present acts may follow a commitment
A fictional figure	Which construals of one's own situation may follow
An unmet authority	Which submissions may follow which drafts
A believed audience	Which conduct may follow, where none in fact evaluates
<i>Composite bearing</i>	
Family	Co-presence, kinship terms, registers, and the absent
Nation	Practice, statute, unmet co-members, and territory
Workplace hierarchy	Chart, deference, and the figure of the one who decides

branch of the programme, where the constraint of a historical situation is proposed to be a macroscopic phase of the relational field and no container standing outside it. The point to be marked here is only that the two must be kept apart in the vocabulary, since a definition of relation as constraint, applied at both levels at once, would collapse a distinction the framework needs. Relation is constraint at the scale at which the constraint holds; what constrains at one scale is generated at another; and the passage between scales is a problem, and no matter of definition.

6.3 *Open Problems in the Definition*

Four questions are left open, and they are the natural next work.

The first is individuation. The definition says what a relation is and does not say how to count relations, nor how to tell one relation from two that co-occur. A criterion is wanted.

The second is the boundary of the concept. Not every constraint on succession is a relation, or the definition would make relation coextensive with law. The clause doing the excluding is jointness, that the constraint makes the states of two or more terms answerable to one another.

§5 supplied a criterion for the hard case, that a term is distinct from the party who bears it when that party cannot set its states at will, and the criterion was argued from the imagined class. Whether it generalises, and whether it can be stated without appeal to the will of a party, is unsettled.

The third is the criterion of §4: what distinguishes constraint that leaves continuations open from constraint that forecloses them. The framework's normative work rests on this distinction, and this paper has only made it statable.

The fourth is formalisation. A definition framed in terms of succession invites statement in the language of dynamical systems, where a relation would answer to a restriction on the transition structure of a joint state space, and its historical clause to a slow dynamics on the restriction itself. Whether such a statement adds anything beyond notation is a question this paper leaves open, and the abstention is the same one made in the companion work: a formal apparatus that derives nothing borrows a rigour the argument has not earned.

7 PLACE WITHIN THE PROGRAMME

The framework of generative relational being concerns how subject, meaning, value and normativity co-emerge through generative relational processes (Huang, n.d.). Around it a set of branches has grown: an epistemology, an economics of generated value, a governance theory, and a philosophy of history concerned with the evolution of historical constraint. All of them are stated in terms of relation, and until now none of them could say what the term meant.

What the definition supplies to each is the same thing. It puts succession inside the concept. The economics can then distinguish a relation that returns what it generates to its participants from one that directs it elsewhere, and can pose the difference as a difference between two constraints on succession. The governance theory can ask what a relation permits to follow what, and can treat institutional design as the design of such permissions. The historical branch, whose subject is the evolution of constraint, acquires a microscopic term to stand under its macroscopic one, with the relation between the scales named as an open problem in §6. The taxonomy of §5 bears on each branch in the same way, since a claim about relational change is a claim about a revision channel, and the four modes have four different ones: physical process, a specified procedure, use itself, and the succession of a single party. A proposal for institutional design that addresses itself to the wrong channel will fail for reasons that have nothing to do with its merits, and the inscribed mode is where such proposals most often address themselves, since it is the only one of the four that can be altered by decision.

The claim of this paper is modest in what it asserts and immodest in what it makes possible. It asserts one sentence: a relation is the constraint through which generation unfolds in history. Everything the framework says about degradation, absorption, recognition and historical change is a claim about such constraints, and each of those claims now has a subject.

A note on revisability. A framework holding that constraints are borne by the processes they constrain owes the same treatment to its own definitions. This one is offered as a working definition, revisable by the work it makes possible, and the phrasing is not a hedge. Three failure modes are visible from where the paper stands, and each is stated so that a reader may look for it. Should the cases of §5 be shown to require amendments that differ by domain, the claim to a single concept spanning them fails, and the definition should be withdrawn or split. Should the jointness clause prove unstable in the general form §6 requires, the definition is too wide and admits every law of succession as a relation. Should the four modes of bearing prove not to be modes of one thing, or should the ordering criterion that generates them prove arbitrary, the taxonomy of §5 falls and the definition loses the principal evidence offered for it here.

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