GST 87 — Persistent Causal Organisation

Formal Description

Causal organisation may be transient or persistent. Some causal processes and transfers occur for relatively short periods, while others recur or continue sufficiently reliably to maintain causal relationships and configurations over longer periods. Persistence is relative to the timescale of observation rather than an absolute property.

This distinction helps clarify the causal significance of circumstances, conditions and constraints. Circumstances need not be passive background features surrounding an event. They may themselves arise from persistent causal organisations that continue to operate while more transient causal events occur within them.

A **circumstance** is a feature of the causal context within which an event or process occurs and may function as a condition or constraint in relation to that event or process. Conditions and constraints are not fundamentally different ontological categories but describe different causal emphases. A **condition** emphasises enablement or permission: it contributes to making a process or behaviour possible. A **constraint** emphasises restriction, inhibition or channelling: it limits the range of processes, behaviours or transfer pathways that can occur.

Conditions and constraints are relational. The same circumstance may enable one process while constraining another. Their significance therefore depends upon the particular process or behaviour under investigation.

Persistent causal interactions may also establish a persistent configuration. Such a configuration does not imply that every possible causal interaction is continuously occurring. Instead, it establishes continuing causal possibilities. Particular processes and transfers may subsequently realise some of those possibilities as transient causal activity. Persistent causal interactions may also coexist with these transient interactions within the same organisation.

This provides an important distinction between potential and realised causality. Persistent configuration establishes pathways and possibilities through which causality can occur; transient processes and transfers realise particular causal pathways at particular times.

Plain English Explanation

Imagine a road network late at night when very few vehicles are travelling.

The roads, junctions and bridges still exist. They establish pathways along which vehicles could travel even though most of those pathways are not presently being used. When morning arrives, many of the possibilities established by the road network become realised as actual journeys.

Persistent causal organisation can be understood in a similar way.

A system does not need to have causal transfers occurring along every possible pathway all of the time. Its relatively persistent organisation can make some causal interactions possible and others impossible, while particular transfers occur only when the relevant circumstances arise.

This gives us a useful distinction:

Persistent organisation → establishes causal possibilities

Transient activity → realises some of those possibilities

Consider a river and its floodplain. The river channel, banks, bridges, drainage systems, buildings, roads and ground surface may persist for years. Together they establish a causal organisation through which water can move in some directions more readily than others.

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Most of the time, many flood-related causal pathways remain unrealised. Water remains within the river channel and drainage network. During heavy rainfall, however, transient transfers of water may activate pathways through that persistent organisation. Water levels rise, drainage capacity may be exceeded, river banks may be overtopped and water may flow across land and into buildings.

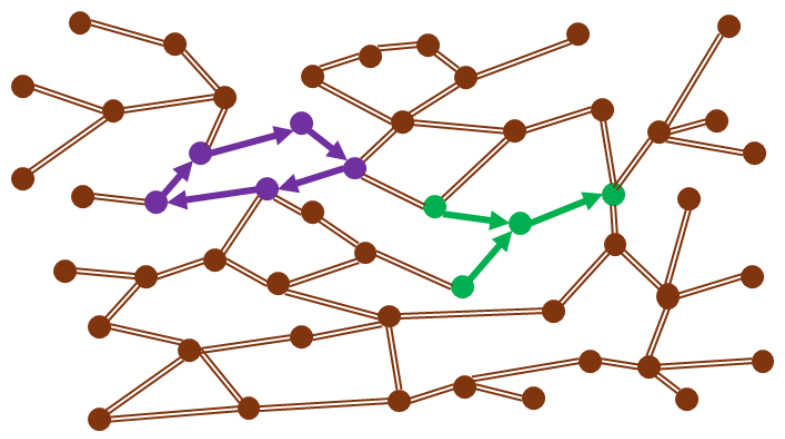
The persistent organisation has not suddenly appeared because it started raining. It was already there, establishing the possibilities within which the transient flood event developed.

This helps us understand circumstances more causally. Saying that a flood occurred "under particular circumstances" need not mean that the circumstances were merely descriptive background information. Soil condition, river configuration, drainage capacity and the configuration of the built environment can all have causal consequences.

Some circumstances function as conditions because they enable particular processes. Others function as constraints because they restrict, inhibit or channel them.

A river bank, for example, constrains water from spreading sideways and channels it downstream. The same bank may simultaneously enable the river to convey a larger flow without flooding adjacent land. Whether we emphasise its enabling or constraining role depends upon the process we are considering.

Persistent causal organisation therefore helps explain why the same transient input can produce different outcomes in different circumstances. Heavy rainfall does not encounter an empty causal background. It encounters an already organised environment containing pathways, capacities, conditions and constraints.



Transient Activity within Persistent Causal Organisation

Persistent causal organisation establishes pathways through which causal interaction is possible. At a particular time, only some of these possibilities may be realised as causal transfers. Persistent causal interactions may also continue alongside transient activity.

Examples

A building provides a simple example of persistent causal organisation. Walls, floors, doors, stairways, electrical circuits and pipework establish relatively persistent configurations. They constrain movement and transfers while enabling others. People and materials subsequently move through some of the pathways established by that configuration.

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A road network similarly persists while individual journeys are transient. The configuration of roads enables travel between some locations, channels vehicles along particular routes and restricts movement elsewhere. Traffic signals and regulations add further causal conditions and constraints maintained by physical and social causal organisations.

Biological organisms also depend upon persistent causal organisation. Blood vessels, neural pathways and cellular structures establish relatively persistent pathways through which highly variable causal activity occurs. Persistence does not imply permanence: these configurations are themselves continually maintained and may gradually change.

The flood example demonstrates why this distinction matters analytically. The rainfall is transient, but it interacts with a much more persistent configuration of terrain, soils, watercourses, drains, defences, roads and buildings. Flood behaviour therefore results from transient causal activity interacting with persistent causal organisation.

Provenance and Links

The importance of relatively persistent organisation has deep roots in systems science. Ludwig von Bertalanffy emphasised that open systems can maintain recognisable organisation despite continuing exchanges of matter and energy with their environments. This helped distinguish the persistence of an organised system from the persistence of its individual material constituents.

Herbert Simon's work on complex systems and near-decomposability also drew attention to relatively stable patterns of organisation and interaction within complex causal arrangements. His work becomes especially relevant in the following module, where differences in the persistence and frequency of interactions help us consider how system boundaries can become recognisable.

The treatment of constraints as causally significant also has important antecedents in cybernetics, biology and theories of organisation. Constraints need not themselves provide the matter or energy involved in a process; by restricting possible states or pathways, they can organise how causal flows occur.

The particular distinction developed in these course modules between persistent causal organisation establishing causal possibilities and transient causal activity realising selected possibilities provides a way of physically connecting configuration, circumstances, conditions and constraints. It also helps avoid treating the circumstances surrounding an event as merely passive background.

Practical Exercise

Return to your investigation of the town experiencing local flooding after heavy rainfall. Until now, most of your analysis has concentrated upon what happens during the flood. In this exercise, shift your attention to the persistent causal organisation that already exists before the rainfall begins.

Imagine the town on a dry day. Identify several relatively persistent features relevant to possible flooding. Consider the river channel and banks, ground surface, drainage network, roads, bridges, flood defences and buildings. Add any other persistent features that you think are causally important.

Now distinguish these from the transient causal activity associated with a particular storm. Identify transfers and processes that begin, intensify or change during heavy rainfall, such as rainfall reaching the ground, runoff developing, drains receiving water, river flow increasing and floodwater spreading.

Take one persistent feature, such as a river bank or drainage channel, and explain how its configuration establishes causal possibilities even when no flood is occurring. Identify pathways it makes possible and pathways it restricts.

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Next classify several relevant features as **circumstances**. For each, consider whether it functions primarily as a **condition**, a **constraint**, or potentially both in relation to different processes. Explain your reasoning rather than assuming that each feature must fit permanently into one category.
Now consider two otherwise similar rainfall events that produce different outcomes. During the first, the town does not flood; during the second, it does. Identify changes in persistent or slowly changing circumstances that might alter which causal possibilities become realised. For example, consider soil saturation, blockage of drainage pathways, changes to river configuration or the presence or absence of temporary flood defences.
Return to the causal network you constructed in previous modules and annotate it in two different ways. Identify persistent pathways or configurations that exist independently of the particular storm, and then identify the transient transfers occurring during the flooding event.
Finally, consider the following statement:
"The flood was caused by the heavy rainfall."
Explain why this may be a useful compressed statement but an inadequate explanation if the purpose is to understand why this particular town flooded under these particular circumstances. Describe how the interaction between transient rainfall and persistent causal organisation provides a richer explanation.
Keep this representation for the next module, Causal Organisation and Systems. In that module, you will examine whether some parts of this persistent causal organisation interact more strongly or frequently with one another than with their surroundings, and how such differential coupling can help us recognise systems and their relative boundaries.

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