

This paper argues that network analysis as a methodology should be developed beyond its conventional status as a tool into a relational theory of international politics. The central premise of this paper is that international outcomes are not only shaped by the internal characteristics or aggregate capabilities of global actors, but also by their positions within overlapping networks of military, economic, institutional, technological, financial, and ideational relations.

The literature on ‘networks’ already contains many insights that can form the necessary foundations for such a theory. It treats actors as interdependent, considers indirect and higher-order relations politically consequential, connects local interactions to emergent systemic structures, and reconceptualized power through concepts (e.g. access, brokerage, dependence, and exit options) (Hafner-Burton et al., 2009; Maoz, 2012a, Maoz et al., 2004). However, these insights have generally been presented as methodological innovations and advantages in studying IR rather than integrated into a coherent substantive theory.

This paper therefore distinguishes and combines 3 elements

- Network ontology: IR consists of actors embedded in patterned and evolving relations
- Network theory: positions, ties, and relational structures shape political opportunities, constraints, power, vulnerability, behaviour and outcomes
- Network analysis: the methodological tools used to describe, measure, model, and evaluate relational claims

The goal of the paper is not to argue that network theory should replace existing IR theories and approaches. Rather, it proposes a relational, middle-range theory that identifies mechanisms through which network structures shape international politics. It seeks to explain how actors convert capabilities into influence, how dependencies and vulnerabilities arise, how shocks and ideas diffuse, and how interactions generate wider patterns of hierarchy, clustering, polarization, and fragmentation.

Introduction: Building the Case for a Network Argument

IR has traditionally explained world politics through theories that emphasize capabilities, interests, institutions, domestic characteristics, norms, identities, and strategic interactions. These approach remain valuable. However, contemporary IR increasingly demonstrates the limits of explanations that begin with actors as relatively self-constrained units and subsequently add relationships between them.

The international system is made up by dense and overlapping relations. States depend on supply chains, communications infrastructure, payment systems, energy routes, alliances, IOs, technological standards, and access to markets. Conflict, competition, and cooperation do not occur outside these systems but increasingly take place through efforts to influence, control, bypass, disrupt, or reconstruct them.

Unlike liberal IR theory argues, these interconnectedness doesn't necessarily create harmony. The same relations that facilitate cooperation can generate dependence, vulnerability, inequality, and coercive leverage. Hafner-Burton & Montgomer (2012) demonstrate that institutionalized economic relationships do not automatically produce peace. Their effects depend partly on the relative positions and asymmetries that those relationships create. Dense connectivity may therefore produce both cooperation and conflict.

This is particularly visible in cases involving strategic chokepoints and concentrated infrastructures. A materially weaker actors may acquire significant leverage when it occupies a position through which important flows must pass. Recently, the significance of a maritime chokepoint such as the Strait of Hormuz has shown that it is important to not simply aggregate military or economic power of surrounding states in order to understand global events. Rather, its importance is produces by its position within overlapping networks.

The points here is not that material capabilities have become irrelevant. Rather, capabilities acquire strategic meaning within relations structures. The military depends on alliances, based, logistics, information and access. Economic power depends on markets, currencies, infrastructure, supply chains, and institutional relationships. Technological power depends on access to knowledge, components, standards, talent, and production networks.

This leads to an important question: how do actors' positions within overlapping international networks shape their power, vulnerability, behaviour, and ability to influence international outcomes?

Network analysis is well suited to this question because it studies structured relationships rather than treating actors or dyads as fully independent observations. However, the network literature remains divided over whether network analysis constitutes a theory, a framework or merely a family of methods.

This paper tries to address this tension by first examining how networks have been used in IR, then clarifying what makes an intellectual framework a theory, before formulating the foundations and implications of a relational theory of networked international politics.

How Network Analysis Has Been Used in International Relations

Network analysis starts with the proposition that actors are connected and that these connections produce patterns that cannot always be understood by examining actors or bilateral relations separately.

To speak in the language of network analysis, actors are represented as nodes and relations as ties. Nodes can include states, IOs, companies, armed groups, political leaders, or individuals. Ties can represent alliances, trade, conflict, institutional membership, diplomatic representation, financial flows, communication, technological dependence, or shared identities, among many other things.

What network analysis' contribution makes it different is not that it simply visualizes relationships. It assumes that political observations may be interdependent. A state's decision to form an alliance may depend on its prospective partner's other alliance. The effects of a trade agreement may depend on each state's wider institutional position. 3rd-party intervention may depend on the full structure of relations among an intervener and the original disputants rather than on separate bilateral relationships (Corbetta & Grant; Cranmer et al., 2012).

Existing IR scholarship has used network analysis in at least 5 important ways:

1. Describing International Structure: network analysis measures different concepts: centrality, density, connectedness, reachability, clustering, and community structure. This allows researcher to identify hubs, brokers, peripheral actors, coalitions, cliques, and patterns of polarization. Network analysis is therefore able to produce empirical observable representations of structures that IR theories frequently describe on only abstract terms (Hafner-Burton et al., 2009; Maoz et al., 2004).
2. Modelling Interdependence: conventional IR models are often dyadic and assume that observations are conditionally independent. Network analysis challenges this assumption. Hoff and Ward (2004) show that political relations include sender, receiver, reciprocity, clustering, balance, and transitivity effects. Cranmer et al. (2012) similarly demonstrate that alliance form as components of a wider network rather than isolated bilateral choices.

3. **Connecting Levels of Analysis:** network analysis can link the behaviour of actors to the formation of regional and systemic structures. Maoz et al. (2004) argue that a network approach can connect state, dyadic, regional, and international-system levels within one conceptual framework. Local decisions about forming or terminating ties generate systemic properties, while these properties subsequently affect actors' choices.
4. **Reconceptualizing Power and Interdependence:** Hafner-Burton et al. (2009) distinguish forms of network power based on access, brokerage, dependence, and exit options. This shifts the attention from the amount of resources an actor possesses to its capacity to access, facilitate, obstruct, or redirect flows. Hafner-Burton and Montgomery (2012) further demonstrate that asymmetric positions within trade-institution networks can create distrust and increase conflict risks.
5. **Explaining Network Formation and Diffusion:** network scholarship identifies mechanisms through which relations and structures develop. Preferential attachment suggests that actors that are already central in the network are more likely to acquire further ties. Homophily suggests that actors form relations with similar actors. Structural balance and transitivity explain patterns within triads and groups, while diffusion mechanisms explain how shocks, ideas, practices, technologies, conflict, and cooperation spread through relational structures (Corbetta & Grant, 2012; Maoz, 2012b).

These applications show that network analysis is not just a visual or statistical technique. However, its theoretical status remains contested. Maoz (2012a) explicitly describes network analysis as a methodology with which propositions derived from existing IR theories can be studied. In contrast, Menninga and Goldberg (2022) present it as both a theoretical framework and methodological toolkit. Hafner-Burton et al. (2009) occupy an position in between these: they treat network analysis as a means of reconceptualizing established concepts while also calling for existing network theories to be tested in IR. The disagreement thus concerns whether its relational assumptions, concepts, and mechanisms are sufficient to constitute a theory.

From Network Analysis to Network Theory: An Explanatory Architecture

By simply listing concepts, we don't solve the disagreement over whether network analysis is a theory. Measurements or descriptions exist until they are connected to an explanation to

political outcomes. The goal therefore should be to identify the explanatory logic that transforms relational observations into theoretical claim.

I try to adopt a specific understanding of theory. A theory provides a reasoned account of what entities and relations constitute a phenomenon, how they generate outcomes, under what conditions those processes operate, and what evidence would support or challenge the explanations. This definition combines 4 philosophical components: relational ontology, generative mechanisms, bounded or middle-range explanation, and empirical operationalization.

When we would apply this definition to network analysis, the argument becomes: network analysis becomes network theory when it explains how the configuration of relationships converts actors' attributes and interactions into political opportunities, constraints, and outcomes through identifiable relational mechanisms.

This definition also addresses Maoz's (2012a) criticism that network analysis is not itself a theory. Maoz is correct if analysis refers only to a collection of measures and techniques. However, the criticism is less decisive when network analysis is understood as containing a relational ontology and a set of propositions about how structured relationships influence behaviour.

The theoretical contribution therefore arises from an explanatory architecture connecting 5 elements:

1. Actor and their attributes
2. Ties and the resources or meanings they carry
3. Actors' positions within wider structures
4. Relational mechanisms activated by those positions
5. Political outcomes and subsequent structural change

The Ontological Claim: Relations are Constitutive, and not just Additional

The first requirement of a theory is an account of what the political world consists of. Relational approaches challenge the assumption that actors exist as fully formed entities before entering relationships. Instead, capabilities, opportunities, and sometimes identities are partly created through relations and processes (Emirbayer, 1997; Jackson & Nexon, 1999).

It doesn't mean that states (nodes) lack internal attributes. States possess forces, economic resources, institutions, technologies, territory, preferences, etc. however the relational claim is

that the political effects of these attributes cannot be determined independently of the relationships through which they are mobilized.

- Economic resources: markets, finance, transportation, technology
- Military Capabilities: logistics, basing rights, intelligence, alliances
- Diplomatic influence: institutions, recognition, connections to coalitions

The basic unit of network theory is therefore not just an isolated actor or the tie between states. It is the actor-position configuration: an actor with particular attributes occupying a particular location within a functionally defined system of relations.

This leads to the 1st theoretical proposition: the effect of an actor's material and ideational attributes on political outcomes is conditional on its relational position.

This explains why 2 actors with similar resources may therefore exercise different levels or forms of influence because one has better access, more alternatives or greater control over important flows. The proposition is an example of how to distinguish network theory from an approach that only adds centrality as another independent variable.

The Explanatory Claim: Networks convert resources into outcomes

The second requirement is an explanation of how network structure matters. The theory's central explanatory function can be described as relational conversion, which is a process through which an actor's attributes and relationships are translated into political effects by its position within a wider structure.

In formula form you could say: attributes + tie content + network position + structural conditions → relational mechanism → political outcome

It means that network measures do not have universal political meanings. High betweenness doesn't mean equal power, density does not mean cooperation, centrality is not influence. A structural property becomes explanatory only when 3 conditions are established:

1. This ties carry something POLITICALLY valuable
2. The actor's position affects access to or control over that value
3. The position activates a mechanism linked to the outcome

For instance, an actor located between 2 otherwise disconnected groups may be a broker. However, brokerage produces influence only if communication, resources, or access actually pass through that actor and cannot bypass it.

This mechanism-based approach follows Hedström and Ylikoski's (2010) argument that explanation requires identifying entities, activities, and interactions that generate an outcome. It also prevents concepts such as centrality and brokerage from functioning as metaphorical substitutes for explanation.

4 Core Relational Mechanisms

So, rather than building the theory around a long list of network concepts, we can organize them around four broad explanatory mechanisms

1. Positional Conversion: network position affects an actor's ability to convert existing resource into influence. Central or well-connected actors may gain access to more channels, brokers may connect groups, gatekeepers may control entry to networks or movement of resources. We should thus not claim that position replaces material capacity. Position modified the political return produced by that capacity

→ Proposition 2: Actors occupying central, brokerage, or gatekeeping positions will convert their resources into influence more effectively when they control valued and difficult-to-replace connections

This proposition can and must be operationalized by examining whether actors with comparable resources but different positions achieve different outcomes. Relevant indicators may include degree or weighted degree, betweenness or flow betweenness, access centrality, brokerage roles, control over bridges or cut points, institutional or infrastructural gatekeeping. Evidence of the mechanism also requires demonstrating that relevant flows pass through the actor and that the actor can facilitate, restrict, redirect, or condition them.

2. Dependence and Substitutability: Relations distribute dependence unevenly. An actor becomes vulnerable when it relies heavily on a relationship or network position for which alternatives are limited. This mechanism develops Hafner-Burton et al.'s (2009) discussion of exit options and Hafner-Burton and Montgomery's (2012) account of unequal positions within trade-institution networks. Dependence, however, is not identical to the volume of interaction. A highly connected relationship may create little vulnerability when alternatives are easily available. A smaller flow may create substantial vulnerability when it concerns an irreplaceable component, route, technology, or institutional service.

→ Proposition 3: Relational dependence produces coercive leverage when dependence is asymmetrical, substitution is costly, and the less-dependent actor

can credibly restrict access.

Operational indicators may include the concentration of suppliers and partners, availability and cost of alternative ties, network constraint, asymmetric reachability, dependence-centrality differences, switching or exit costs, and the time required to construct alternative connections. The proposition would be weakened if highly dependent actors consistently resisted pressure without significant costs of if nominally powerful gatekeepers could easily be bypassed.

3. Transmission and Diffusion: network ties functions as channels through which material and social phenomena travel. These phenomena do not spread evenly across the international system. Instead, their movement depends on the topology and substantive meaning of connections.

→ Proposition 4: The speeds, direction, and reach of international diffusion depend on the configuration and function of the network through which the phenomenon travels.

Dense networks may accelerate diffusion but can also contain it within clusters. Centralized networks may facilitate rapid system-wide transmission while creating vulnerability around key hubs. Bridging ties may allow shocks or ideas to cross otherwise separated communities. The operationalization therefore requires identifying the relevant transmission network, exposure through direct and indirect ties, timing and sequence of adoption or disruption, cluster and community boundaries, paths through which transmission occurred, and competing non-network explanations. This proposition can be tested through economic shocks, sanctions, policy diffusion, or conflict escalation, among others.

4. Emergence and Feedback: network structures emerge from repeated choice. These micro-level choices create macro-level patterns such as hierarchy or clustering. Those patterns subsequently shape later choices. Concepts like preferential attachment, homophily, reciprocity, structural balance, etc. are not separate network measurements or theories about world politics. We should rather see them as candidate mechanisms through which local interactions produce and reproduce wider structures (Corbetta & Grant, 2012; Cranmer et al., 2012; Maoz, 2012b).

→ Proposition 5: Repeated relational choices generate emergent international structures that subsequently alter the incentives and opportunities governing later tie formation and behaviour

This produces a recursive process: actor choices → tie formation → emergent structure → altered incentives and opportunities → new actor choices

The theory therefore avoids seeing networks as static external structures. Actors respond strategically by diversifying, decoupling, or other actions. A complete network explanation must account for both the structural effects and strategic adaptation.

Multiplexity as a Conditioning Principle

So, international actors participate simultaneously in their networks. Networks effects therefore cannot always be understood within a single layer. For example, a state may be peripheral militarily but economically central. This also means it can use a position in one network to obtain influence in another. However, this multiplexity is not a 5th mechanism, but more a conditioning principle

→ Proposition 6: The effect of an actor's position in one network depends partly in its position and relationships in other network layers

An example of this could be that financial centrality may reinforce sanctions capacity only when supported by institutional cooperation and control over relevant technological or legal infrastructures.

To operationalize this, we can involve comparing positions across network layers, measuring tie overlap, examining interlayer dependence, identifying whether leverage travels from one domain to another, and testing whether position in one layer moderates effects in another. The multiplexity principle is important to prevent us from thinking the international system is 1 undifferentiated network.

Scope Conditions: When Should Network Theory Apply?

Network theory should be seen as a middle-range theory rather than a universal explanation. Following Merton's (1968) argument, its purpose is to explain defined classes of phenomena through mechanisms that are general enough to travel but bounded enough to test. A network explanation should be expected to matter most when: actors are meaningfully interdependent, ties transmit values, indirect relationships affect incentives or behaviour, access and alternatives are distributed unevenly, bypassing or replacing relationships is costly, network structures persist long enough to shape decisions, and actors can perceive or learn about at least some elements of their relational environment.

Network explanations should be less important when outcomes are almost entirely determined by internal attributes, ties are politically inconsequential, substitution is immediate, or the network boundary has no substantive justification. It is important because it makes the theory falsifiable. It can be challenged by showing that position doesn't affect outcomes after actor attributes are considered, the proposed mechanism didn't operate, allegedly central actors lacked control over relevant flows, actors could easily bypass the relationship, changes in position didn't alter behaviour or influence, and a non-relational explanation accounts for the outcome more convincingly

Operationalizing a Network-Theoretical Explanation

A network-theoretical study should proceed through 6 steps

1. Define the Political Outcome: the study must identify what it seeks to explain. E.g. coercive success, alliance formation, sanctions resilience.
2. Define the Relational System: you must specify who are the actors, ties, boundaries, time period, direction and weight of ties, and what flows or meanings they represent. It is important to note this is a theoretical, not a technical step. For example, shared institutional membership shouldn't be seen as meaningful interaction without theoretical justification
3. Identify the relevant position or configuration: the study must explain why centrality, brokerage, clustering or any other configuration should matter for the outcome
4. Specify the mechanism: the researcher must trace how the position generate the outcome through access, control, dependence, or another process
5. State scope conditions and alternatives: the explanation must specify when the mechanism should operate and what competing explanations may account for the outcome
6. Evaluate observable implications: evidence should establish the intervening process as well as a statistical association between position and outcome

Network models may demonstrate structural patterns. Qualitative methods like process tracing or comparative case studies may establish how actors perceived and used their positions. The empirical standard should therefore be: No network measure without a political interpretation; no positional claim without a mechanism; no mechanism without scope conditions, and no theory without evidence that could challenge it

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