

Dynamics of Triads

In models of network evolution, scholars often assume a direct propensity to close triads. Cartwright and Harary's structural balance theory offers a motivational account for triad closure in signed networks, where the relation between two actors may be positive or negative. Specifically, disagreement between positively tied friends (or agreement between negatively tied enemies) leads to psychological tension, fostering a drive among the parties to resolve this dissonance. In a friendship triad, when a friend of a friend is an enemy, then either the enemy will become a friend or one of the friends will become an enemy, to resolve tension in relations.

Recent work has challenged Simmel's emphasis on the triad as an irreducible lens for analyzing social dynamics, showing that triadic patterns may be byproducts of social dynamics in dyads. For example, a dyadic propensity toward homophily (choosing friends who are in the same social categories) will tend to foster transitivity, even if actors have no direct propensity to close triads. In an office of engineers and lawyers, if engineers prefer other engineers as friends while lawyers prefer other lawyers, then this generates a tendency toward transitivity. In the extreme, all engineers will be friends with all engineers and all lawyers will be friends with all lawyers, and so all triads will be closed without any direct propensity to do so. Empirical research considering homophily and triad closure—recently employing exponential-family random graph models (ERGMs)—shows how entangled these dynamics are. Such interdependence of social dynamics at the dyadic and triadic levels requires a greater sophistication both in theories and in statistical models of network evolution.

Implications

Regardless of the social processes generating observed patterns in triads, those patterns have substantive implications for the dynamics of groups, organizations, and markets. For example, James Coleman argued that closure in triads leads to interpersonal trust, greater cooperation, and enforcement of norms. This argument can be generalized to larger settings, offering predictions for the level of cooperation in groups as a function of network structure.

Mark Granovetter posited that transitivity is more pervasive in triads linked by strong ties (than in triads linked by weak ties), resulting in dense clusters of strongly tied actors with weak ties reaching beyond local

clusters. He thus argued that weak ties convey more novel information between clusters. Ronald Burt developed a theory of structural holes, elaborating on strategic advantages of occupying a network position along such paths. Both derive important high-order consequences from patterns at the triadic level.

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See Also: Exponential Random Graph Models (ERGM/p*); Homophily; Network Evolution; Signed Networks; Structural Holes; Tie Strength.

Further Readings

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Trust and Networks

Trust is a fundamental element of social networks. Historically, the degree to which a network advances or recedes is critically tied to issues of trust. There are extensive lines of research exploring issues of trust in and between networks, both from humanistic and

social scientific perspectives. Yet these areas also continue to be an ongoing concern in such diverse public fields as education, health, media, business, scientific industry, nonprofits, computer networks (security and e-commerce), and politics—and in more private associations like families, neighborhoods, and other small groups and communities.

Published findings on social networks contribute to the knowledge of how more or less person-to-person trust impacts any group, organization, institution, or collective. While there are numerous scholarly definitions of the terms *trust* and *networks*, each can be defined in relatively simple terms. Trust is the expected degree of honesty, reciprocity, and interdependence one may assume in relation to others. Networks describe various configurations of individuals who are tied together in relationships for some common purpose or goals. Throughout the ages, many thinkers have perceived trust as necessary to the very foundation of civilization—noting that human beings cannot progress in any way without some basic care and accountability toward one another. That is, some threshold of reciprocity between oneself and others underpins the development of all networks within and between different societies and cultures.

These reciprocal conditions are necessary to both the most virtuous and the most heinous networks. A charity such as Habitat for Humanity can be seen as exhibiting a high degree of trust between its employees, the citizens served by its organization, and the larger publics who donate to its activities. Yet to function, even the most odious social networks such as hate groups or terrorist cells must maintain some semblance of trust within their memberships, while they continue to assert separations between themselves and others.

The difficulty with which trust is distributed among human beings is illustrated by these types of tensions. Some parallel issues in networks include how static or fluid that trust is, the frequency of trustful communication, the opportunities and limitations trustees are granted, the waxing and waning of trust over time, to whom trust is given, in what situations trust is most manifest, and the physical and social distances between individuals in a collective. There has been a great deal of study on the subject of trust and networks and the complex relationship between the two phenomena. The larger dimensions of how trust has been conceptualized in networks are most easily understood through an his-

torical perspective. Across interdisciplinary literatures, there are past, present, and future developments connecting many of the central issues regarding how trust is advanced and maintained relative to networks.

Historical to Contemporary Perspective

First, the premodern era illustrates that trust and networks were on the minds of ancient thinkers. Many theorists and practitioners deliberated over the virtues that would most contribute to healthy networks of citizens within a society. One representative example is Aristotle, who indicated that the ingredients of trust include integrity, competence, and goodwill. He believed that citizens with these characteristics would connect to one another well, and that credibility and character were linked to healthy communities. For many ancients, the efficacy of networks was directly associated with questions of relational ethics.

The contexts within which many of these premodern thinkers operated greatly affected their efforts to understand trust and social networks, however. The premodern world was, by and large, far more locally organized than in modern life, where human beings continually bump into others from different societies and cultures. In many of the towns, villages, and cities of traditional societies, individuals simply never went very far beyond the bounds of their very local communities—meaning that degrees of trust with others could often be more taken for granted than it is in much of the contemporary world. The notion of being an individual is somewhat of a modern idea, meaning that one's local network or networks were far more assumed and determining than in modern life. For millennia, these themes have been considered. The importance of trust in collectives has been emphasized by diverse authors from political theorists like Locke and de Tocqueville to sociologists like Durkheim.

Second, the contemporary era exemplifies these traditional concerns about trust in social networks, but updates them to meet the demands of an increasingly complex, globalizing world. With various tracks, offshoots, and challenges, the most central research on trust and networks deals with the concept of what Robert Putnam calls "social capital" or the "features of social organization such as networks, norms, and social trust that facilitate coordination and cooperation for mutual benefit." The idea of social capital, used broadly, has its basis in decades of research on the strength of

ties between particular individuals and groups within communities. It involves the ability of individuals and groups to leverage public values and communal actions from their networks of association.

Social Capital and Social Trust

Social capital is more than just the resources that any individual brings to a public task; it requires trustful links between individuals within a network. The more deeply these ties are connected, the better. This goes for all sorts of issues, such as education, where a network's ability to support the endeavors of an individual can translate into school achievement. An individual's social ties can even affect their health, so that more or less trust in a network can impact a person's very physiology for good or ill. Putnam indicates that 20 years of research in Italy spotlights how structured reciprocity and political solidarity in networks are preconditions for socioeconomic modernization. He also put forth a famous argument that there has been declining social capital in American society over the last several decades, evidenced by the decreasing number of people signing up for vibrant local activities such as bowling, union associations, and PTA memberships.

At the core of these concerns is the idea that people are now less trusting of one another than in previous times and places. To name just a few trends, many see the connections between individuals dissolving as citizens become less settled in particular places and engage in more temporary personal relationships with one another, and as technological advances (including everything from television to the iPod) put human beings into increasingly privatized, antisocial worlds. Yet many scholars call basic assumptions about declining trust in modern societies into question, asking whether social trust really translates directly into civic engagement to begin with. Others urge attention toward the qualitative ways that networks are formed through trustful engagements that evade statistical methods, which may fail to capture how individuals and groups actually interact to create meaning in their networks.

Various analyses have unearthed a complex range of ways that human beings orient themselves toward one another. Rather than looking at simple membership counts to determine if trust is manifested in associations, for instance, many believe it would be far better to see how meaningful trust is leveraged in public forums such as town hall meetings, where a variety of more com-

plicated behaviors emerge. Trust can be perceived as a multidimensional concept involving emotions, the past history of the people and actions within a group, and other complex forms of communication like irony. In an Alcoholics Anonymous meeting, for example, strangers may go from having little trust toward one another, to being united for a moment through the shared experience of a joke, to being less than willing to work with one another in the very next moment as members begin blaming one another for past grievances.

Creating, Maintaining, and Increasing Trust

Despite varying interpretations of the state of trust and participation within and between networks, there is widespread agreement that forming trust in the contemporary world takes more work than ever. There is far more uncertainty about others and how they operate than has been historically preceded, begging questions about when, where, and how modern citizens can be said to perform rather than simply possess trust. Thus, there is an urgent need to discover and engage standards of trust that will best propel humanity into its global future. The scholarly projects of Jürgen Habermas and others, such as Alberto Melucci, illustrate how the work of interactive communication has become the central mechanism by which networks are solidified in a fragmenting world. Values like sociopolitical freedom and equality are also inextricably intertwined with sustained, trustful communication within and between different networks.

The increasing economic interdependence and globalization of the planet has spawned empirical research about how trust might be created, maintained, and bolstered in collectives. Using game theory, studies of economic organizations, and social network analyses with empirical modeling, Vincent Buskens finds that sanctioning plays a vital role in the degrees of trust between individuals in a social network. When individuals communicate about trustworthy behaviors within networks, the trust and ties between them tends to increase. Another consistent finding throughout interdisciplinary literatures is that trust and innovation go hand in hand. Within and between networks, trustful communication creates conditions for creativity and invention in collectives.

Yet an ongoing question has been how interdependence might be engendered across networks where cultural and societal differences are the norm. For instance, a culture's orientations toward collective or individual

action will impact how trust forms, solidifies, and is lost in networks. In a highly collective culture like Japan, for instance, individuals tend to orient themselves toward others to a far greater degree than in a country like the United States, meaning that divergent cultural approaches to trust may become manifest in local and global networks.

Communication Technologies

Finally, the future looks to carry forward all of these historical issues involving trust and networks, but questions about new communication technologies have arisen. While the Internet has existed since the 1990s, the medium's potential to transform how trust is leveraged in networks keeps evolving. In the 2000s, the Internet became more of a social tool than in the past, linking diverse citizens across the globe into multiplying networks and enclaves. From blogs to vlogs, from social networking sites to massive multiplayer games, more questions remain about how trust can be created, maintained, and advanced in these spaces than research has been able to keep pace with.

One representative example of trust and networks relative to new communication technologies is the social networking site Facebook. Different than previous incarnations of the Internet where anonymity prevailed, the move to what has been called Web 2.0 has been characterized by its new awareness of social identi-



Young men learn trusting skills during a 2004 youth leadership and employability training camp in Solola, Guatemala.

ties. When adding a “friend” on Facebook, for instance, it is highly likely that individuals will know one another in offline life before they join together in the online site. Networking sites such as LinkedIn are engineered with similar motivations in mind; the site is set up in such a way that one is likely to know many of their contacts on the site in offline life before connecting with them in the online space. Beyond simply adding networks of friends, sites such as these are changing the very nature of trust and persuasion. Many credit the success of Obama’s 2008 presidential campaign to his strategy of building supportive networks through the trust of online relationships. Thus, network connections can form largely through the degree of trust one has with others in offline life.

All kinds of future questions are evoked as computer-mediated environments reconfigure how society might conceive of trust and networks. What degree of trust does one have with online networks of others? Do these ties tend to strengthen or lessen existing relationships? Furthermore, what kinds of ties are these—are they strong or weak? Is the Internet creating a space where broad rather than deep connections are the norm? And what relationships between privacy and public life are formed along these lines? Scholars are only beginning to predict the opportunities and limitations available in these new virtual worlds.

Viewed historically, there has been a decisive focus on the relationship between trust and networks throughout the ages. Human beings are constantly speculating about the degree of trust they might expect from networks of others. Trust plays a role in all networks, from those involving simple acquaintances to the deepest friendships, and studies will continue to explore these enduring, critical issues. Just as there is no human relationship that can survive without some degree of reciprocity, there is no civilization or culture that would have been possible without at least some minimum threshold of trust within and between networks.

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See Also: Charity Organizations; Cohesion Networks; Cooperation/Coordination; Egocentric Networks; Homophily; Kinship Networks; Networks, Ethics in; Organized and Transnational Crime Networks; Reciprocity; Social Capital; Terrorist Networks; Tie Strength.