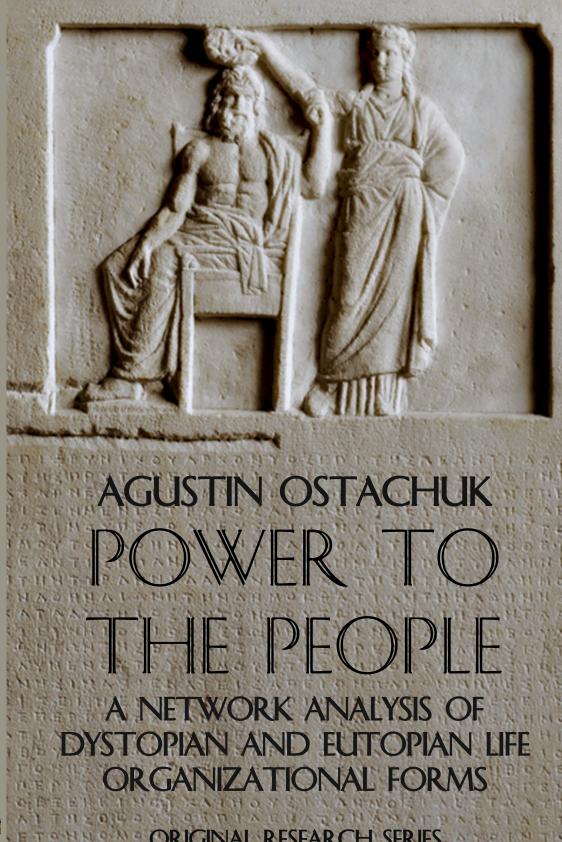
The human race has been socially organizing itself for probably about 1.8 million years. The first form of human organization was the hunter-gatherer, which was the form of organization in which man lived for about 99 % of his history. This mode of life caused humans to organize themselves into small groups and lead a nomadic life. The nomadic life ensured that these groups had no possessions and no wealth could be accumulated. In this manner, this form of human organization ensured egalitarianism, a form of primitive communism. This changed dramatically with the development of agriculture in the so-called Neolithic Revolution in 10,000 BC. With the development of agriculture and the consequent development of technology, man became sedentary, the first towns were formed, and the class system made its appearance, that is, the separation between an administrative class and a productive class. The egalitarian and communist primitive society gave way to an increasingly centralized and hierarchical society. From network theory, they have been insisting for years on the benefits of the so-called scale-free networks, networks governed by certain privileged nodes called hubs. These networks are said to be slightly vulnerable and highly robust to errors. In this work, we perform a deep network analysis of a group of centralizedhierarchical networks and a group of decentralized-distributed networks. This work provides clear and compelling evidence that, contrary to what is maintained, decentralized-distributed networks are the least vulnerable and most robust networks, and are the networks that ensure an equitable and equal distribution of power and influence among their members. These results are analyzed in the context of network theory, and are discussed in relation to the theories of Jeremy Rifkin, Ernst Schumacher, Alexander Bogdanov and Aldous Huxley.



Dr. Agustín Ostachuk is a Transdisciplinary Scientific Researcher born in Argentina. He is devoted to the Big Questions of Life and the Nature of Reality/Existence. His main research area is Life Evolution and Development, from both a theoretical-philosophical (BioTheory, BioPhilosophy) and an empirical-biological (Evo-Bio, Evo-Devo) approach, Agustín Ostachuk is the author of "A Theory of Evolution as a Process of Unfolding" (2020), a theory that challenges prevalent assumptions about Evolution, transcends the false and stagnant dichotomy between Intelligent Design (ID) and Darwinism, and proposes an evolutionary process carried out by teleological-purposeful formal agents. He is the Founding Director of EVOLUTIO: A Research Center for Evolution and Development, a new research space for the development of new ideas without the constraints and limitations established by the scientific-academic system. The mission of the center is to investigate new concepts on biological evolution and development, but also to study the necessary conditions for the development of a healthy, good-living society, harmoniously integrated with nature, and in which life and not economy is at the center of its existence.





HEELKA BELOMB AROUTHS

POWER TO THE PEOPLE

A NETWORK ANALYSIS OF DYSTOPIAN AND EUTOPIAN LIFE ORGANIZATIONAL FORMS



Title: Power to the People: A Network Analysis of Dystopian and Eutopian Life Organizational Forms

Author: Agustín Ostachuk

Cover design: Agustín Ostachuk

Image: *Demos being crowned by Democracy* (circa 276 BC, Ancient Agora Museum)

1. Network theory. 2. Organizational Science. 3. Sociology. 4. Political Economy. 5. Anthropology. 6. Power. I. Title.

First edition: Buenos Aires, October 2024

Publisher: EVOLUTIO PRESS

Organization: EVOLUTIO: A Research Center for Evolution and

Development Director: Dr. Agustín Ostachuk

Location: Buenos Aires, Argentina Website: https://www.evolutio.ar

Copyright © 2024 EVOLUTIO PRESS by Agustín Ostachuk All rights reserved.

No portion of this book may be reproduced in any form without written permission from the publisher or author, except as permitted by U.S.

copyright law. For permissions contact: aostachuk@evolutio.ar

ISBN: 9798343998276

For those who dream and think of a better world, a more just and egalitarian world, where everyone can develop their talents without the need for favoritism, lobbying or political connections.

CONTENTS

INTRODUCTION	1
MATERIALS AND METHODS	9
NETWORK DESIGN	9
NETWORK PARAMETERS	10
TOPOLOGICAL DESCRIPTORS	10
COMPLEXITY MEASURES	11
CENTRALITY MEASURES	12
Vulnerability and robustness	16
RESULTS	19
NETWORK PARAMETERS	19
TOPOLOGICAL DESCRIPTORS	23
COMPLEXITY MEASURES	27
CENTRALITY MEASURES	31
MEAN VALUES	31
DISTRIBUTION PLOTS	35
VULNERABILITY AND ROBUSTNESS	49
DISCUSSION	53
THE MYTH OF CENTRALIZED-HIERARCHICAL NETWORKS AS ROBUST AND NOT VERY VULNERABLE NETWORKS	53
POWER TO THE PEOPLE: DISTRIBUTION OF	

HIERARCHICAL NETWORKS AND DECENTRALIZED-DISTRIBUTED NETWORKS55
THE THIRD INDUSTRIAL REVOLUTION AND THE RISE OF LATERAL POWER65
SMALL IS BEAUTIFUL: SCIENCE, TECHNOLOGY AND POWER CENTRALIZATION75
SCIENTIFIC CENTRALISM: THE ILLUSIONS OF A TECHNOLOGICALLY-ORGANIZED HUMANITY85
BRAVE NEW WORLD: TECHNO-SCIENTIFIC CENTRALISM AS THE FINAL STAGE TOWARDS TOTAL HUMAN DOMINATION89
REFERENCES95

RFFFRFNCFS

Albert, R., Jeong, H., Barabási, A.L. (2000). Error and attack tolerance of complex networks. *Nature*. 406(6794): 378-382.

Anderson, C. (2012). *Makers: the new industrial revolution*. New York: Random House.

Balaban, A.T. (1982). Highly discriminating distance-based topological index. *Chemical Physics Letters*. 89(5): 399-404.

Barabási, A.L. (2009). Scale-free networks: a decade and beyond. *Science*. 325(5939): 412-413.

Barabási, A.L., Albert, R. (1999). Emergence of scaling in random networks. *Science*. 286(5439): 509-512.

Barabási, A.L., Bonabeau, E. (2003). Scale-free networks. *Scientific American*. 288(5): 60-69.

Bavelas, A. (1950). Communication patterns in task-oriented groups. *The Journal of the Acoustical Society of America*. 22(6): 725-730.

Bednarski, L. (2021). *Lithium: the global race for battery dominance and the new energy revolution*. London: Hurst Publishers.

Bertz, S.H. (1981). The first general index of molecular complexity. *Journal of the American Chemical Society*. 103(12): 3599-3601.

Bogdanoff, A. (1925). A short course of economic science. London: Communist Party of Great Britain.

Bonacich, P. (1972). Factoring and weighting approaches to status scores and clique identification. *Journal of Mathematical Sociology*. 2(1): 113-120.

Bonacich, P. (1987). Power and centrality: a family of measures. *American Journal of Sociology*. 92(5): 1170-1182.

Bonchev, D., Rouvray, D. (2005). *Complexity in Chemistry, Biology, and Ecology*. New York: Springer.

Bonchev, D., Trinajstić, N. (1977). Information theory, distance matrix, and molecular branching. *The Journal of Chemical Physics*. 67(10): 45174533.

Borgatti, S.P. (2005). Centrality and network flow. *Social Networks*. 27(1): 55-71.

Braverman, H. (1998). Labor and monopoly capital: the degradation of work in the twentieth century. New York: Monthly Review Press.

Brin, S., Page, L. (1998). The anatomy of a large-scale hypertextual Web search engine. *Computer Networks and ISDN Systems*. 30(1-7): 107-117.

Brinkmann, G., Coolsaet, K., Goedgebeur, J., Mélot, H. (2013). House of graphs: a database of interesting graphs. *Discrete Applied Mathematics*. 161(1-2): 311-314.

Brinkmann, G., Goedgebeur, J., McKay, B.D. (2012). The generation of fullerenes. *Journal of Chemical Information and Modeling*. 52(11): 29102918.

Cashdan, E.A. (1980). Egalitarianism among hunters and gatherers. *American Anthropologist*. 82(1): 116-120.

Claussen, J.C. (2007). Offdiagonal complexity: a computationally quick complexity measure for graphs and networks. *Physica A: Statistical Mechanics and its Applications*. 375(1): 365-373.

Csárdi, G., Nepusz, T. (2006). The igraph software package for complex network research. *InterJournal, Complex Systems*. 1695(5): 1-9.

Erdős, P., Rényi, A. (1960). On the evolution of random graphs. *Publications of the Mathematical Institute of the Hungarian Academy of Sciences*. 5(1): 17-60.

Estrada, E. (2000). Characterization of 3d molecular structure. *Chemical Physics Letters*. 319(5-6): 713-718.

Freeman, L.C. (1977). A set of measures of centrality based on betweenness. *Sociometry*. 40(1): 35-41.

Goedgebeur, J., McKay, B.D. (2015). Recursive generation of ipr fullerenes. *Journal of Mathematical Chemistry*. 53(8): 1702-1724.

Huxley, A. (1946). *Brave new world*. New York: Harper & Row.

Huxley, A. (1950). *Science, liberty and peace*. London: Chatto & Windus.

Ihaka, R., Gentleman, R. (1996). R: a language for data analysis and graphics. *Journal of Computational and Graphical Statistics*. 5(3): 299-314.

Jackson, M.O. (2008). *Social and economic networks*. Princeton: Princeton University Press.

Jackson, M.O., Wolinsky, A. (1996). A strategic model of social and economic networks. *Journal of Economic Theory*. 71(1): 44-74.

Katz, L. (1953). A new status index derived from sociometric analysis. *Psychometrika*. 18(1): 39-43.

Kim, J., Wilhelm, T. (2008). What is a complex graph? *Physica A: Statistical Mechanics and its Applications*. 387(11): 2637-2652.

Kropotkin, P. (1904). *Mutual aid: a factor of evolution*. London: William Heinemann.

Latora, V., Marchiori, M. (2001). Efficient behavior of small-world networks. *Physical Review Letters*. 87(19): 198701.

Latora, V., Marchiori, M. (2005). Vulnerability and protection of infrastructure networks. *Physical Review E*. 71(1): 015103.

Lee, R.B., DeVore, I. (1987). *Man the hunter*. New York: Aldine de Gruyter.

Lhomme, S. (2015). NetSwan: network strengths and weaknesses analysis.

Luxemburg, R. (2003). *The accumulation of capital*. London: Routledge.

Marx, K. (1990). *Capital: a critique of political economy*. Vol. 1. London: Penguin Books.

Marx, K. (1991). *Capital: a critique of political economy*. Vol. 3. London: Penguin Books.

Mueller, L.A., Kugler, K.G., Dander, A., Graber, A., Dehmer, M. (2011). QuACN: an R package for analyzing complex biological networks quantitatively. *Bioinformatics*. 27(1): 140-141.

Mueller, L.A., Schutte, M., Kugler, K.G., Dehmer, M. (2014). QuACN: quantitative analyze of complex networks.

Nikolić, S., Kovačević, G., Miličević, A., & Trinajstić, N. (2003). The Zagreb indices 30 years after. *Croatica Chemica Acta*. 76(2): 113-124.

Ostachuk, A. (2015a). La teoría de las dos ciencias: ciencia burguesa y ciencia proletaria. *Revista Iberoamericana de Ciencia, Tecnología y Sociedad.* 10(Suppl 1): 191-194.

Ostachuk, A. (2015b). Bogdanov e a teoria das duas ciências. *Sociologia em Rede*. 5(5): 114-118.

Ostachuk, A. (2018). La vida: el centro de nuestra existencia. *Ludus Vitalis*. 26(50): 257-260.

Ostachuk, A. (2019). What is it like to be a crab? A complex network analysis of eucaridan evolution. *Evolutionary Biology*. 46(2): 179-206.

Ostachuk, A. (2021). A network analysis of crab metamorphosis and the hypothesis of development as a process of unfolding of an intensive complexity. *Scientific Reports*. 11(1): 9551.

Ostachuk, A. (2024). A network analysis of early arthropod evolution and the potential of the primitive. *Scientific Reports.* 14(1): 503.

Ostachuk, A. (2024). *Eutopian life: a thinking life-science* for a rooted dwelling on our Home-Earth. Buenos Aires: EVOLUTIO PRESS.

Pedersen, T.L. (2020a). ggraph: an implementation of grammar of graphics for graphs and networks. *R package*.

Pedersen, T.L. (2020b). tidygraph: a tidy API for graph manipulation. *R package*.

Price, D.J.D.S. (1965). Networks of scientific papers: the pattern of bibliographic references indicates the nature of the scientific research front. *Science*. 149(3683): 510-515.

R Development Core Team (2012). R: a language and environment for statistical computing. R Foundation for Statistical Computing. Vienna, Austria.

Randic, M. (1975). Characterization of molecular branching. *Journal of the American Chemical Society*. 97(23): 6609-6615.

Ravasz, E., Barabási, A.L. (2003). Hierarchical organization in complex networks. *Physical Review E*. 67(2): 026112.

Rifkin, J. (2011). *The third industrial revolution: how lateral power is transforming energy, the economy, and the world.* New York: Palgrave Macmillan.

Rifkin, J. (2014). The zero marginal cost society: the internet of things, the collaborative commons, and the eclipse of capitalism. New York: Palgrave Macmillan.

Schoch, D. (2022). netrankr: An R package for total, partial, and probabilistic rankings in networks. *Journal of Open Source Software*. 7(77): 4563.

Schumacher, E. F. (1973). *Small is beautiful: economics as if people mattered.* New York: Harper & Row.

Stephenson, K., Zelen, M. (1989). Rethinking centrality: methods and examples. *Social Networks*. 11(1): 1-37.

Taylor, F. (1911). *Shop management*. New York: Harper & Brothers.

Testart, A., Forbis, R.G., Hayden, B., Ingold, T., Perlman, S.M., Pokotylo, D.L., Rowley-Conwy, P., Stuart, D.E. (1982). The significance of food storage among huntergatherers: Residence patterns, population densities, and social inequalities [and comments and reply]. *Current Anthropology*. 23(5): 523-537.

Voskoboynik, D.M., Andreucci, D. (2022). Greening extractivism: environmental discourses and resource governance in the 'Lithium Triangle'. *Environment and Planning E: Nature and Space*. 5(2): 787-809.

Wiener, H. (1947). Structural determination of paraffin boiling points. *Journal of the American Chemical Society*. 69(1): 17-20.

Wolfram, S. (1999). *The mathematica® book, version 4*. Cambridge: Cambridge University Press.