Globalization and the erosion of geo-ethnic checkpoints

Understanding the ecology of complex adaptive systems, such as organisms, societies, and languages, poses many challenges. Dr Chris Girard, Associate Professor of Sociology with the Department of Global and Sociocultural Studies at Florida International University, has developed an evolutionary model, known as coevolving informatics, that offers a transdisciplinary approach to understanding complex adaptive systems. Coevolving informatics employs complexity and evolutionary theories to examine the processing of information within systems and demonstrates how racial and ethnic signals can coevolve with society's geospatial dynamics.

Understanding the ecology of complex adaptive systems, such as organisms, societies, and languages, poses many challenges. A thorough understanding of all of the individual components necessitates an understanding of the system as a whole, given that the whole system is more than the sum of its parts. Dr Chris Girard, Associate Professor of Sociology with the Department of Global and Sociocultural Studies at Florida International University, has developed an evolutionary model: coevolving informatics. This paradigm offers a transdisciplinary approach to understanding complex adaptive systems. Throughout this research, Dr Girard adopts an informatics perspective, employing complexity and evolutionary theories to examine the processing of information within natural and artificial systems.

THREE COEVOLVING DIMENSIONS

Dr Girard explains how complex adaptive systems are made up of three coevolving dimensions: spatial boundaries, thermodynamic-economic specialisation, and signal processing, which are central to major transitions in evolution.

SPATIAL BOUNDARIES

When a system becomes more complex, its spatial boundaries are realigned. These systems undergo extensive growth, increasing their size, or the number of component parts, which in turn increases the system's complexity. Consequently, the system's spatial boundaries go through an intensive process of realignment, resulting in the system boundaries becoming more open or porous.

THERMOECONOMICS

In line with thermodynamic-economics specialisation, when a system's complexity increases so does the exchange of resources required in order for the system to grow and reproduce. Initially, during the extensive phase, these exchanges tend to be vertical, or hierarchical. Later, the system moves into the intensive phase and these exchanges become progressively more horizontal.

SIGNAL PROCESSING

When entities interact with each other they produce new information, or signals, increasing the system's total information. The system's signal processing facilitates its adaptation to a changing environment. Dr Girard comments: "Indeed, major evolutionary transitions in complex adaptive systems are based on new ways of storing, transmitting and processing information. Most significantly, this transformation allows information processing to become more independent from physical location."

CYBERNETIC PARALLELISM

The uncoupling of signal processing and physical locations allows for more location-free signal topology. Computer science has shown that this enhances the ability to adapt to new situations with spatially independent coevolving competitors learning from each other's developments. Dr Girard refers to this feature of signal processing as 'cybernetic parallelism' as it allows numerous simultaneous entities to be processed in parallel, and describes how independent agents, such as scientists, organisms and immune systems, learn from their mutual exchange of information. Furthermore, this free exchange of ideas enhances the independence and creativity in a system's adaptive process.

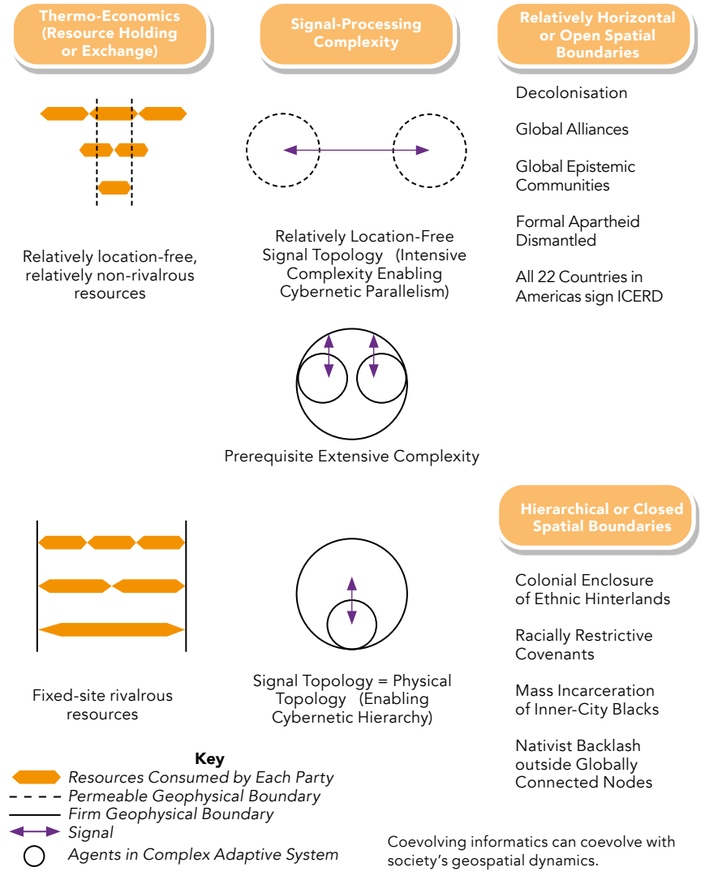
This learning process is the foundation for successful ecological adaptation, but it is also constrained by path dependency and probability, since learning relies on how things have been done previously and is somewhat built on trial-and-error. Charles Darwin recognised this in his principles of descent and divergence, when he recorded that different adaptations are capable of existing simultaneously.

ENTROPIC DISORGANISATION

Dr Girard draws attention to how a system's adaptive responses may neglect to address pollution and environmental damage. This can result in environmental chaos or entropy debt, such as global warming, causing the collapse of an entire system. Racial-ethnic barriers can also incur system-taxing entropic debt resulting from costly boundary conflict. The collapse of colonial empires after World War II is a prime example of this entropic disorder.

COEVOLVING INFORMATICS

Taking the three coevolving dimensions together with his concept of cybernetic parallelism, Dr Girard has developed 'coevolving informatics', a model that "provides a digital-age view of the forces propelling racial-ethnic hierarchies infused with racism, nativism, and ethnocentrism." He explains how racial and ethnic signals can coevolve with society's geospatial dynamics. The signals carry information about the system dynamics and are only able to draw meaning from the systems that process them. The hierarchies are embedded in spatial challenges over scarce resources during a system's extensive growth period. These resources, which are essential for a system's growth and reproduction, are situated within spatially bounded sites, such as land or human bodies. Coevolving informatics links the construction of racial-ethnic boundaries to zero-sum contests over fixed-site resources. Such contests were integral to the unequal ecological exchanges of resources, such as sugar and cotton, during colonialism.

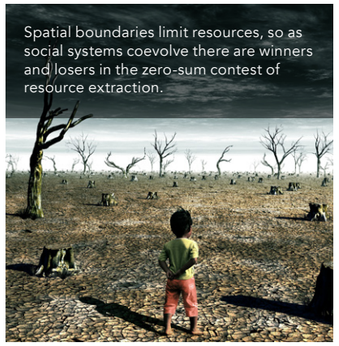


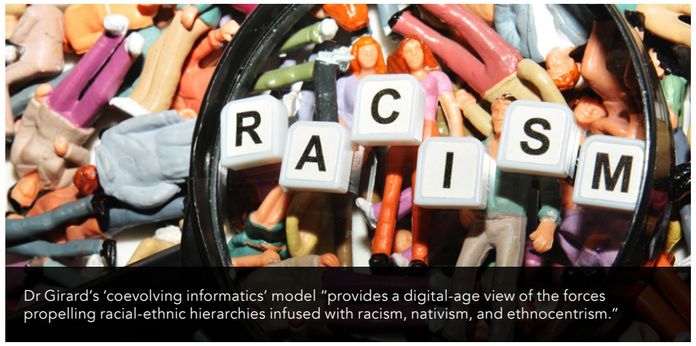
Coevolving informatics can coevolve with society's geospatial dynamics.

Coevolving informatics provides a digital-age view of the forces propelling racial-ethnic hierarchies infused with racism, nativism, and ethnocentrism.

SIGNAL PROCESSING COMPLEXITY

In the context of this research, signal processing controls whether racial-ethnic groups pass through geospatial checkpoints in socially bounded domains such as workspaces, neighbourhoods and countries. The central motivation is evolving signal-processing complexity that realigns global geospatial barriers. With his focus on evolving complexity in signal-boundary systems, Dr Girard puts forward two interconnected proposals. Firstly, if rivalrous resources cannot be separated from their specific geophysical





Dr Girard's 'coevolving informatics' model "provides a digital-age view of the forces propelling racial-ethnic hierarchies infused with racism, nativism, and ethnocentrism."

location, as with fixed-site resources, zero-sum contests ensue for control of this location and its resources. If a particular ethnic group is consistently denied full spatial access to the location and its resources, the group is subject to racialisation. This proposition imbeds racial-ethnic signals in socio-ecological systems enclosed within geophysical boundaries. Secondly, during the post-industrial era, racialised cleavages will be diminished by the coevolution of signal-processing complexity and non-territorial system adaptation. This proposition suggests that barriers entrenched by their geophysical location, such as racial-ethnic barriers, can be penetrated or realigned by a society's signal-processing complexity.

SPATIAL PARTITIONING

Spatial boundaries limit resources, so as social systems coevolve there are winners and losers in the zero-sum contest of resource extraction. This leads to the extensive phase with the vertical exchange of resources demanding the costly use of force e.g. European firepower enabling the conquest of ethnically distinct landscapes in order to acquire tropical resources. This results in racialisation because such spatial segregation restricts the inhabitants' decision-making independence, mobility, and access to resources located within these captured landscapes. Dr Girard describes how "spatial partitioning has been integral to enslavement, policing, and incarceration of racialised populations."

POST-INDUSTRIAL EROSION

Information processing becomes more independent from physical location as post-industrial society undergoes intensive growth. This coevolution of signal processing complexity and non-territorial adaptation challenges racial-ethnic hierarchies and diminishes racialised cleavages so geo-ethnic boundaries erode and become more permeable. This results from both the increasing cost of resource-holding hierarchies, such as wars, policing and prisons, and a more horizontal division of labour involved in the production of knowledge. The boundary-penetrating soft power of cybernetic parallelism increases as information becomes a larger part of a system's produced value. Cybernetic parallelism's hierarchy-levelling power is derived from the growth of education and global expert communities, together with the growth of information and communication technologies, Nevertheless, the growth of digital-age entropy debt, or entropic disorganisation, is still apparent in displaced heartland communities and global warming. Dr Girard observes that "this generates costly boundary clashes over local cultural sovereignty and material resources, reinforcing traditional ethnic hierarchies."

Cybernetic parallelism has generated epistemic and geopolitical challenges to formal apartheid and racialising immigration policies, but not without friction or reversals.

CONCLUSION

Within complex adaptive systems, signal and physical topologies are becoming more distinct. Cybernetic parallelism drives this uncoupling with independent agents learning from their mutual exchange of information. Dr Girard explains that from a coevolving informatics perspective, the progressive detachment of society from geophysical location does not bring about greater independence from the surrounding ecological system. Contrarily, this separation calls for more innovative, information-driven social adaptations, necessitating the crossing of boundaries in order to acquire suitable resources from separated networks. Moreover, it "promotes cybernetic parallelism: increasingly interactive, independent power centres enabling multi-ethnic globalism."

While racial-ethnic barriers have been reduced through cybernetic parallelism and racial-ethnic hierarchies levelled, the current turf-defending nativist resurgence could reinforce geo-ethnic boundaries and provoke more 'racially' contentious, authoritarian governance. It is unclear what course this unfolding chaos will take as, in accordance with the fundamental conjecture of coevolving informatics, not all signal-boundary systems will successfully adapt. Dr Girard concludes that "cybernetic parallelism has generated epistemic and geopolitical challenges to formal apartheid and racialising immigration policies, but not without friction or reversals."

Behind the Research

Dr Chris Girard

E: girardc@fiu.edu **W:** https://gss.fiu.edu/people/faculty/chris-girard/

Research Objectives

Chris Girard is applying his coevolving informatics paradigm to gender hierarchy, sexual dimorphism, and biological evolution.

Detail

Chris Girard
Department of Global and Sociocultural Studies
SIPA 318, 11200 SW 8th St
Miami, FL 33199

Bio

Trained as a quantitative sociologist, Dr Chris Girard received his Ph.D. from the University of Wisconsin-Madison. He teaches in the Global and Sociocultural Studies department at Florida International University. To introduce a transdisciplinary paradigm, Dr Girard recently published in an economics journal.

References

Girard, C. (2020). Globalization and the erosion of geo-ethnic checkpoints: evolving signal-boundary systems at the edge of chaos. *Evolutionary and Institutional Economics Review*, [online] 17, 93–109. https://doi.org/10.1007/s40844-019-00152-2 [Accessed 15th July 2020].

Darwin C (1859). *On the origin of species*. John Murray, London.

Personal Response

Given your research into coevolving informatics, what would be your advice to social policy makers wanting to avoid entropic debt?

"From the standpoint of coevolving informatics, reducing entropic debt requires financing and otherwise promoting global epistemic (expert) communities and multi-ethnic global citizenship. Full citizenship requires dismantling *spatial segregation* of racial-ethnic groups with regard to residence and workspaces. This will reverse rising entropic debt from policing, mass incarceration, and border enforcement. Full citizenship also requires more investment in human capital among disadvantaged groups regardless of geographic origin. At the same time, displaced homeland populations must be compensated for the entropic costs incurred by the information revolution, globalisation, and professionalisation. Ultimately, deracialised citizenship and global ecology are inseparably intertwined."