

“Reintegrating the Social Sciences

The Dahlem Group

by

David Colander, Roland Kupers, Thomas Lux, and Casey Rothschild,

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DEPARTMENT OF ECONOMICS
MIDDLEBURY COLLEGE
MIDDLEBURY, VERMONT 05753

<http://www.middlebury.edu/~econ>

Reintegrating the Social Sciences

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David Colander, Middlebury College, Roland Kupers, Smith School for
Enterprise and Environment Oxford University Thomas Lux, U. of Kiel, Casey
Rothschild, Middlebury College

Abstract

Social science disciplines see themselves as distinct, with their own territory, their own methods, and their own framework. Within such an environment multidisciplinary work involves enormous conflict and translation problems. This situation is no longer acceptable. Dealing with modern problems requires researchers with broad transdisciplinary knowledge and with the ability to communicate with other social science researchers in a way that will allow them to arrive at transdisciplinary recommendations. Complex issues such as healthcare, income distributions, crime prevention, industrial policy, agriculture require not only insights from multiple social disciplines, but the integration of those insights.

This document offers a proposal for training social science researchers. Specifically, it proposes reintegrating the social sciences by modifying the current system of training—which provides completely separate training for researchers in each sub-discipline—to incorporate a common first year “core” of training for all social science researchers. If implemented, the proposal will reduce the babble that currently characterizes much of the interdisciplinary conversations.

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Introduction

When Elinor Ostrom won the Nobel Prize in economics in Oct 2009, the following representative comments quickly showed up on the “Economics Job Market Rumors” blog.² “Multidisciplinary?? Other disciplines are all rubbish. Why let them contaminate our purity?” and “Economics is superior. Don’t let political science contaminate us!” While most economists would likely be more nuanced, such comments do capture the way multidisciplinary work is viewed within the economics profession.

In sociology, it is no better; economists are often viewed as rational robots, content on foisting an economic ideology on the public. While many sociologists covet the policy prominence given to economists, most are unwilling or unable to face up to the formal modeling and statistical structured arguments that have given economics its prominence. The situation in political science is similar; while some political scientists have adopted an economic rational agent framework, and statistical empirical approach that reflects economics thinking, it is often a framework and statistical approach that cutting edge economists abandoned years ago. Only in psychology and economics has there been useful interchange, but that is only by a small portion of each, and few of the deeper psychological insights have worked their way into economics.

The reality is that the social science disciplines see themselves as distinct, with their own territory, their own methods, and their own framework. Within such an environment multidisciplinary work involves enormous conflict and translation problems. This situation is no longer acceptable. While the division of the social sciences may have been appropriate in the past it no longer is today. Modern problems have social, economic, cultural and physical aspects, and solving the major problems facing modern societies requires drawing insights from multiple social-science disciplines. The interconnections between these aspects are often not second order

¹ This whitepaper was prepared at the 100th Dahlem Conference by the subgroup of scholars at the conference. David Colander served as moderator for the group. He, Thomas Lux, Roland Kupers, and Casey Rothschild took the lead in drafting this latest report. This 100th Conference was organized by Carlo Jaeger, with David Colander, Thomas Lux and Dianna Mangalagu forming the scientific committee. This conference was a continuation of an earlier Dahlem Conference, which considered whether there was a mathematics of social science. The group, which included mathematicians, natural scientists and social scientists, as well as broader researchers met for five days to discuss what the appropriate follow-up to the much discussed report, [The Financial Crisis and the Systemic Failure of Academic Economics](#), (Colander et al. 2009, available at many places on the web) and its strong criticism of the economics profession for its failure to develop models that even allowed for the financial crisis. That earlier report argued that a fundamental change was necessary within the economics profession; this proposal is one part of the fundamental change that we see as necessary. This report continues that theme, arguing that the best way to reform the economics profession is to reintegrate it into the broader social science profession. This paper proposes a first year core program designed for all social scientists.

² This blog is popular among upper level graduate economic students. It is anonymous posts and thus the comments should be seen as less nuanced than comments one would have gotten if one had interviewed students on the record. But the sensibilities these comments convey are consistent with more nuanced discussions one has with students and with economists.

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complications: they are first order, and the interconnections need to be dealt with in an integrative manner. What this means is that dealing with modern problems therefore requires researchers with broad transdisciplinary knowledge and with the ability to communicate with other social science researchers in a way that will allow them to arrive at transdisciplinary recommendations. Complex issues such as healthcare, income distributions, crime prevention, industrial policy, agriculture require not only insights from multiple social disciplines, but the integration of those insights.

This document offers a proposal for training social science researchers. Specifically, it proposes reintegrating the social sciences by modifying the current system—which provides completely separate training for researchers in each sub-discipline—to incorporate a common first year “core” of training for all social science researchers. If implemented, the proposal will reduce the babble that currently characterizes much of the interdisciplinary conversations.

There have been many attempts in the past to create interdisciplinary courses, but they often failed because researchers in the different disciplines lack a common framework and language. Their training should provide that. Currently it doesn't. This means that many of the rich insights in the sociological and political sciences that have been neglected by economists so far because the possibility to give them rigor through mathematical tools has not been realized and, similarly, that political scientists and sociologists have been slow to incorporate economic insights into their analysis.

We believe that the integration of insights from the different social science disciplines into formal models holds great promise for the future. For example, with some notable exceptions, young sociologists often lack the advanced technical training that would allow them to challenge economists and to integrate sociological insights into problem solving. Similarly, young economists today are generally not introduced to the wide variety of models that allow them to tackle modern problems, including dynamic non-linearities, learning, and norms, issues that have been addressed by other social scientists.

The challenges of bringing transdisciplinary knowledge to bear on social problems are enormous, but they must be faced. To do so we need a common framework and language that allows communication among scholars from various disciplines. For example, a sociologist must be able to communicate their insights to economists, political scientists and natural scientists, and they all must be able to communicate their integrated insights to policy makers. That rarely happens at present; instead, separate researchers provide often conflicting advice that policy makers have no way to integrate into a coherent whole. The result is the combined value of the advice is significantly reduced.

Developing researchers able to provide coherent transdisciplinary advice requires a change in their training. This document outlines a proposal that we see as a first step in such a change. Specifically, it proposes that social science training for theoretical and hands-off applied policy researchers (researchers whose primary audience for their research is other social scientists, not policy makers) be modified so that all these social scientists are trained

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within a common conceptual framework and provided with a common language and tool-set. The proposal is to adopt a common first year graduate training which is inclusive enough to incorporate all the social sciences. The vision behind our proposal is that the different disciplines remain, but that they are interconnected by a common theoretical and scientific foundation. Reconnecting the disciplines would allow scientists and policy analysts from various disciplines to communicate, to challenge each other effectively, and to integrate their policy advice into transdisciplinary advice.

Two intellectual advances make this reintegration possible today: advances in theory, analytical and computational techniques, have opened the door for a much more inclusive theory of social systems; and advances in statistical analysis now allow dramatically better quantitative analysis of social data than has existed in the past. Previously, models and theories had to choose between rigorous analysis, achieved by assuming large portions of the social dimensions of problems away—as happened in economics—or heuristic analysis, which captured the broader issues but did not allow for a rigorous expression of those issues—as happened in sociology. The result was a failure to communicate, and an even larger failure to work effectively together. Today we are able to bridge the gap because analytic techniques have developed that provide a common scientific foundation for all social sciences.

Adopting this common framework will require significant change in the thinking of the various subdisciplines of social science. For example, economists will have to recognize that the underlying social theoretical model needs to be much broader than the one they have recently used. It must be able to incorporate sociological, cultural and political insights, and that the problems faced by society are much more complex than their current standard atomistic models recognize. Sociologists, on the other hand, will have to recognize that the development of a rigorous social model is necessary for scientific advancement, and that such a model need not be designed to rule out their insights, but simply to formalize them in a way that will allow modern analytic tools to integrate those insights with insights from other fields. Our proposal doesn't involve the economics imperialism that has characterized the relationship in the social sciences over the past few decades and has resulted in a narrowing of social policy. Instead it provides a framework in which the significant contributions of other social sciences can be integrated in the core of all social science training.

While this proposal may sound revolutionary, it is not; it is more a return to the past. By that we mean that the social sciences were not always divided. The 18th and 19th century social scientists were inherently multidisciplinary; for example John Stuart Mill, Adam Smith, Vilfredo Pareto were political scientists, sociologists and economists combined. The social sciences broke up as economics evolved from classical to neo-classical in the early 1900's. Neoclassical economists adopted a set of formal tools and models that precluded many social insights. Many economists and other social scientists found those formal tools unacceptable because they did not allow for the integration of important social insights. This led to

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significant fights between historical/institutional economists and neoclassical economists, for example, and to the schism of the social sciences into the various disciplines. Essentially, many of those who were uncomfortable with this narrowing of focus developed their own disciplines and conversations.

The result was problematic. The neoclassical economist's formal models gave their advice an aura of scientific rigor, which allowed economist's voices to dominate other social sciences' in policy discussions. Unfortunately, while economics became more influential with policy makers, it lost important integrative elements from the classical social science tradition because the mathematics which gave their advice a scientific veneer was unable to deal with this integration. The problem wasn't that there was too much math or formalization; the problem was that the mathematics, analytic, and statistical tools available to neoclassical economics of the time were too simple. That has now changed; the mathematical and statistical tools available to social scientists have much improved.

The analytical tools now exist to reintegrate the social sciences. It is these analytical advances that allow us to propose a new approach to training social scientists, one that is flexible enough to include elements of sociology, anthropology, political science, economics and psychology, thereby providing an integrative foundation for the social sciences.

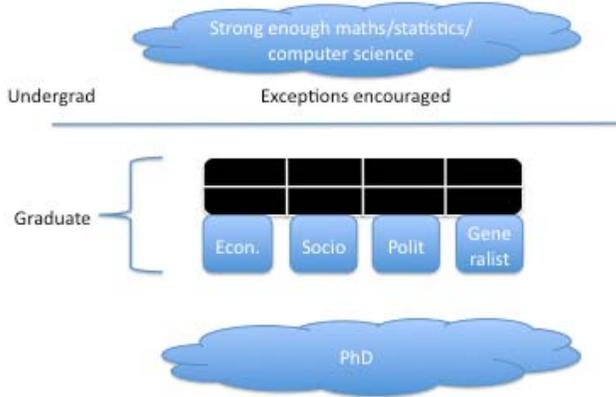
It is our belief that all social scientists need to be introduced to cutting edge analytic techniques that allow this integration. Our proposal is to do precisely that. As we stated above, in this proposal we are focusing on the training of formal scientific researchers, whose audience is other scientific researchers. For that reason, the training we propose is technical and abstract. Developing a curriculum for students whose primary work will be in teaching, or in doing hands-on applied policy research (research written primarily for policy makers, not for other scientists) is outside the scope of our proposal, though we envision that they would also be introduced to a broadly similar integrative framework, but from the point of view of a "consumer" of that framework and research rather than as a future producer of it.

Curriculum

The essence of our proposal is that all social sciences should have a common core, which is taught in the first year of a graduate social science curriculum. This common core would consist of eight courses that all students going into various social sciences would take. It would be followed either by training in the individual disciplines that is very close to what is done today, or by training in a new integrative social science program that would result in a transdisciplinary degree. (In this proposal we do not describe that further training; our focus here is simply on the first year core curriculum.)

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Because we are picturing this core for those individuals who are going into frontier research, we are assuming that students who are coming into this program have either a strong background in mathematics, statistics and computer science, or the aptitude to catch up quickly. The figure below conceptualizes the structure and position of the program.



The following is a potential outline of the eight courses in four parallel modules that fill in the black box within the above figure.

Module I - Theoretical foundations of human interactions

Modern Game Theory provides a unified intellectual framework for the study of the social interactions, which especially in its recent developments has proven extremely fruitful. Modern Game Theory is much broader than Classical Game Theory; it includes learning, social norms, endogenous preference and behavioral aspects determined from empirical work.

Semester 1 - Classical game theory	Semester 2- Modern game theory
Basic normal form games, equilibrium: Nash and correlated	Social norms
Coordination games	Emergence of cooperation
Coalitional games	Evolutionary game theory
	Epistemic games

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Module II - Sociometrics – the empirics of social science

Data is the key link between theory and the underlying reality. As such, understanding the world requires interfacing with data drawn from social settings. We need to link our conceptual ideas with measurable quantities, and to do that, we need a basic idea of how to conceptualize and employ data. The goal of this module is to develop literacy in quantitative empirical methods and an understanding of their limitations, and, finally, the importance of integrating qualitative and quantitative methods to arrive at a final judgment.

Semester 1 - Data analysis	Semester 2 - Analytic techniques
Tools of pre-theoretical data analysis: collecting data, descriptive statistics. Data exploration, data mining and pattern recognition Data generation - laboratory, field and computer experiments Integrating qualitative data into analysis	Multiple regression Panel methods and time series Instrumental variables Discrete methods Techniques for large and small data sets (e.g., bootstrapping)

Module III - Modeling techniques

Understanding social questions involves building models to implement our informal understanding and hypotheses. This module is designed to introduce students to a wide range of models and modeling techniques. It introduces them to concepts for aggregate and microscopic modeling. It offers tools for exploring the connection between micro and macro scales, including aggregation and complexity problems.

Semester 1 - Modeling dynamics	Semester 2 - Modeling agents and their connections
Linear and nonlinear differential and difference equations Control of dynamic systems Deterministic and stochastic systems	Agent based models Logic for agent based models Networks Complexity and emergent properties

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	Modeling uncertainty and risk
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Module IV Integrative Approaches

The current divergence of approaches and thoughts in different branches of the social sciences has historical roots. A student of the social sciences should have an understanding of these common roots, of the “big thinkers” whose ideas color current views, and of how and why those ideas became fragmented. The first semester of this module is designed to introduce students to these writings. The second part is to integrate these big ideas with the techniques that have been introduced in the other modules. This second module has two aspects: a creative aspect where students work in groups to do their own modeling and a second forward looking aspect, which introduces the current research frontiers of the various sub-disciplines. We see this module as a transition between the first year core and remainder of the students’ studies.

Semester 1 - History of ideas	Semester 2 - Apps
Epistemological foundations of social sciences Classic socioeconomic views – e.g. Smith, Mill, Marx, Pareto, Durkheim, Weber, Tocqueville More recent views – e.g. Parsons, Keynes, Meade, Samuelson Bridging natural and social sciences – e.g. Wilson, Prigogine	Group-based projects Individual-based projects Current frontiers in the specialized social sciences

Implementation

There are a number of advantages to this integrative core training. First and foremost it provides a common language that will allow social scientists to communicate and integrate their ideas in a much deeper way than has existed in the past. Second, it allows a translation of ideas outside of social sciences because the language introduced is to some extent shared with the natural sciences. This would allow for better transdisciplinary work between social and natural scientists on such issues as the connection between the environment, social norms and the economy. Third, it allows the training of a new type of transdisciplinary social science PhD’s whose expertise spans the social sciences. These transdisciplinary PhD’s would be natural fits to satisfy the increasing demand for undergraduate and research-oriented trans-disciplinary programs. Finally it offers economies of scale in teaching the first year core since

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different social sciences would take the same course, thereby meeting minimum size requirements even when the individual departments are small.

Funding is available for the development and implementation of transdisciplinary programs such as we suggest. Foundations and governments have recognized the need for integrative work and such funding has grown substantially faster than funding has in the individual disciplines.

Conclusion

We recognize that our proposal involves a radical change in the training of social science researchers. We are realists and do not expect it to be implemented immediately. It steps on too many people's toes. But change will come; transdisciplinary problems require transdisciplinary training, and it is time to begin discussion of how to change the way we train social scientists so that they can serve society better in dealing with these problems. Our hope is that this proposal will stimulate thinking about how such integration among the social sciences could occur, and our hope is that our proposal will provide a focal point for that discussion and be a catalyst for creative thinking about the need to re-integrate the various social sciences.