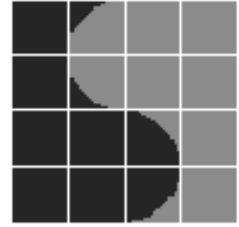




Evolution & Sociology



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Greetings from the Chair

Alexandra Maryanski
University of California-Riverside

Hello Everyone:

Is it really April already? The ASA meetings edge closer every day. But in contrast to the past two years when we were kept busy recruiting members for Evolution and Sociology, this year has been relatively quiet. However, let me fill you in on what is going on behind the scenes as we prepare for this year's annual meeting in New York City.

First, our great success in establishing Evolution and Sociology as a permanent section entitled us to two ASA paper sessions this year. Tim Crippen at the University of Mary Washington organized a session on "Sociology & Neo-Darwinism" and accepted the following submissions:

1. Why Women's Behavior is Constrained"-
-- Rosemary Hopcroft, University of
North Carolina-Charlotte
2. Equilibrium Theory and the Evolution of
Social strategies: A Solution to the Free-
Rider Problem--- J. Scott Lewis, Urbana
University
3. Social Inequality & Subsistence
Technology: Cultural Inheritance or
Internal Development? ---Francois
Nielsen, University of North Carolina
Chapel Hill and Craig Owen, University
of North Carolina-Chapel Hill

4. Neo-Darwinian Theories of Religion and the Social Ecology of Religious Evolution--- Stephen Sanderson, University of Colorado-Boulder and Wesley Roberts

In turn, Doug Massey, at Princeton University organized a session on "Sociology and Neuroscience" and accepted the following submissions:

1. Mirror Neurons: Collective Objects and the Problem of Transmission---Omar Lizardo University of Notre Dame
2. Biosocial Interaction Rituals and Autism: A Sociological Perspective---Jessica Leveto, Kent State University
3. Cracking a Sociological Puzzle Using Genetic Information--- Guang Guo University of North Carolina, Chapel Hill
4. Mirror Neurons and Mead's Theory of Role Taking: Toward a More Sociological View of the Brain--- David Franks, Virginia Commonwealth University

We are also planning an ASA reception for Evolution and Sociology again this year, although I don't know the date or time just yet. I hope more of you will be able to attend this year's reception as it provides one of the few opportunities for members of our evolutionary community to socialize together. Another avenue is our section's discussion listserv (which has been up and running for nearly a year now) and is open to all interested members (see our ASA section website for details).

Finally, I need to call upon all of you to help me in recruiting new Evolution and Sociology members. In our efforts to get permanent section status, many of us asked our friends to temporarily help us out during last years' recruitment. We are now on our own and, sad to say, our roster has shrunk from a high of 326 members (reached on 30 September 2006) to a low of 213 members --a loss of 113 members! While some of our members haven't renewed their ASA membership yet and while

we are not in danger of losing our status as a permanent ASA section, section rosters do determine the number of ASA sessions allocated to each section for the coming year. The good news is that we have until the 30th of September 2007 to get our membership roster back up to 300 members to qualify for two regular sessions. Otherwise we will be allocated only one session and given the eclectic variety of evolutionary approaches our section houses, one session is simply not enough to meet the needs of our members.

That's all the section news for now. I'll be updating you on the times and dates for our ASA reception, paper sessions and other news in the coming months.

Cheers, Alexandra

NEW PUBLICATION SERIES

Transaction Publishers of New Brunswick NJ and London England Announces the introduction of a new series ANTHROPOLOGY AND HUMAN NATURE. It will be edited by Lionel Tiger who is the Darwin Professor of Anthropology at Rutgers University.

The publishers are interested in works of social science, history, and General intellection which provide insight and contribution to the growing literature on what may be and may not be "human nature." Transaction also publishes the journal HUMAN NATURE and is receptive to works of interest to scholars and informed persons provoked by a subject matter only recently returned to active scrutiny. Even though Aristotle announced that "man is by nature a political animal," the emphasis on "political" has heretofore overwhelmed attention to "by nature." This the series hopes to remedy by publishing works widely advertised in the scholarly community and maintained in print durably and with care.

Anyone interested in proposing or contemplating a book appropriate to this adventure should contact Lionel Tiger either at ltiger@rci.rutgers.edu or at the Department of Anthropology, Rutgers University, 131 George Street, New Brunswick NJ 08901-1414.

The Linking of Sociology and Biology

Guang Guo,
University of North Carolina at Chapel Hill

Why Biology?

In the academic world, sociology and biology have long been separate sciences. The benefits of combining the two seem few. Biological influences are potentially important to certain areas of sociological inquiry – especially areas that involve individual attributes, traits and behaviors such as delinquency and crime, educational attainment and social stratification. These influences, however, are rarely considered explicitly. One of the implicit assumptions in sociological inquiry is that individuals are the same at birth; the differences among them are then attributed to the position each occupies in a social hierarchy. At least two factors contribute to the absence of explicit discussion on biological influences: (1) our discipline's key theoretical emphasis on a group's social-structural position and (2) the unavailability of reliable measures of relevant biological influences. Both can be illustrated by the development of sociological theories of delinquency and crime. One dominant sociological theory of delinquency and crime is the theory of social control (Durkheim 1897, Hirschi 1969, Sampson and Laub 1993) which emphasizes the social bond between an individual and society and suggests that a crime is more likely to be committed when the bond is weakened or broken. Gottfredson and Hirschi later (1990) expressed a keen awareness that individuals differ in propensity for delinquency and crime. The researchers considered crime-prone individuals to lack self-control and to be impulsive, insensitive, physical and risk-taking. The propensity has proved difficult to measure. Gottfredson and Hirschi suggested a number of indicators of the crime-prone propensity: the urge to gratify desires immediately, lack of diligence and persistence in a course of action, lack of commitment to job, marriage, and children, lack of skills and planning, and the tendency to drink excessively, use illegal

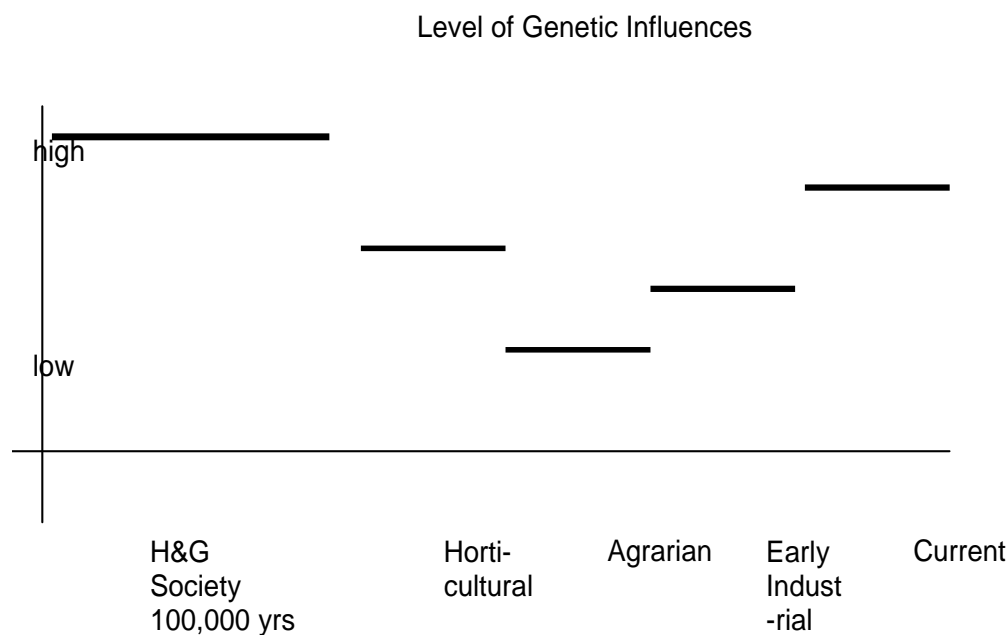
drugs, and gamble. While these individual characteristics are, indeed, correlated with delinquency and crime, they are the manifestations of the propensity rather than the propensity itself and may, in fact, have their beginnings in biological rather than social differences. However, in the 1980s, measuring criminal propensity at the molecular genetic level was hardly thinkable.

Two developments, one recent and one historical, suggest that the fields of sociology and biology would benefit from the linking of the two fields. The first is the spectacular advance in molecular genetics and molecular biology over the past three decades. Second, relative to earlier societies, genetic influences are becoming more prominent in modern industrial societies. I will return to the first development after describing my argument for the second development.

Viewed in Lenski's (2005) lens, the long history of human society can be divided into four distinct stages: the hunter-gatherer society, horticultural society, agrarian society and industrial society. I believe that the level of genetic influences has a U shape across the four historical stages (Figure 1) for some sociological outcomes (e.g., status attainment), starting high in the HG society, reaching the bottom in the agrarian society, and becoming more important in the industrial, especially the contemporary industrial democratic society. In a hunter-gatherer society, the level of technology was minimal and the social structure was much simpler and more flexible. Genetic endowment likely played a significant role in determining an individual's social status.

The most rigid social hierarchies were probably formed in agrarian societies. In the extreme case of the Indian caste system, an individual's occupational and marital prospects were often fixed at birth. In a contemporary developed society, genetic influences are growing more important again. This is not to deny the enormous importance of social forces in contemporary industrial societies. Social forces are important in any society, but genetic influences are becoming relatively more prominent as a society become more egalitarian.

Figure 1. Genetic Influences more Prominent in Current Developed Societies



Recent advances in molecular genetics have created opportunities and challenges for both sociology and biology. For sociology, it is beginning to be possible to measure genetic differences across individuals relevant to sociological inquiry. Animal studies are already engaged in a comprehensive understanding of the molecular basis of social life (see review by Robinson et al. 2005). Research is identifying genes that influence animal social behavior. Human studies have reported genetic effects that interact with social environment to influence, for example, delinquent and criminal behavior (Caspi et al. 2002).

Biomedical researchers have increasingly recognized that “few diseases or conditions are caused purely by genetic factors; most are the result of interactions between genetics and environmental factors (IOM 2006).” Intense research in molecular genetics over the past 20 years has discovered more than a thousand genes responsible for Mendelian human outcomes – outcomes mostly determined by alleles of a single gene (Risch 2000, Botstein and Risch 2003). Examples of such human outcomes include Huntington’s disease, cystic

fibrosis, hereditary non-polyposis colon cancer and heritable breast cancers.

Molecular genetic efforts have been much less successful on Non-Mendelian or complex human outcomes. Many of these outcomes, including reading disability, smoking, alcohol use, drug use and obesity, subjects of interest to sociologists. The links between genetic heritage and complex human outcomes are enormously complicated, typically involving multiple genes, multiple environmental factors and the interaction between the two. Inconsistent findings from genetic studies of complex outcomes are not uncommon. The immensely complicated environment is usually an essential source of the inconsistencies. For example, different samples, which are often small and convenient, are often subject to different environments, which may enhance or suppress a genetic effect.

There has been an increasing consensus that social scientists’ expertise in social context is necessary for understanding many of complex human outcomes (IOM 2006). The success of the Human Genome Project (Collins et al. 2003a) and the HapMap Project

(The International HapMap Consortium 2003, 2005) is improving the design and effectiveness of genetic studies. These advances, however, do not lessen the need to understand the environmental part of the puzzle. On the contrary, inadequate understanding of environmental influences has increasingly become the bottleneck for understanding human outcomes at the genetic molecular level. Recently, the HapMap project, the National Human Genome Research Institute, and the Committee on Assessing Interactions Among Social, Behavioral, and Genetic Factors in Health called for heavy investigation into lifestyle factors and environmental exposures.

Final Remarks

The classic sociological thoughts were developed in a historical time when the capitalist society was much more sharply stratified, individuality as contrasted with group was much less important, and social ranking was more determined by a person's position in a social hierarchy than in a contemporary democratic industrial society. In such a historical time, inherent individual difference could often be safely ignored in sociological consideration. Social hierarchy remains important today, but in many cases, biological differences across individuals may become too important to ignore. Taking genetic heritage or other biological factors into account promises a fuller understanding of social outcomes and a more precise understanding of the roles of social context. Recent advances in molecular biology are making it possible to explore how the interactions of social, behavioral and genetic factors affect sociological outcomes.

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Note

1. The International HapMap Project is a collaborative effort by scientists and funding agencies from Japan, the United Kingdom, Canada, China, Nigeria and the United States. The purpose of the project is to identify and catalog genetic similarities and differences in human beings. The information from the HapMap will facilitate researchers in finding genes that affect health, disease and individual responses to medications and environmental factors.

The Interface among Neuroscience, Social Psychology, and Sociology in the Study of Extreme Disorders: Schizophrenia, Severe Depression, and Serious Anxiety Disorders

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Introduction

The links among biology, behavior, and society are no more clearly seen than they are in the mental disorders of schizophrenia, severe depression, and serious anxiety disorders. Although researchers may disagree as to the exact extent to which brain chemistry and genetic mechanisms are the primary causal agents in the development, form, and period of onset of these disorders, there is no doubt that neurobiology plays a definitive role (Sterling 2002). While these extreme illnesses originate in the brain, the social psychological problems of patients coping with them are a major issue for both sociologists and social psychiatrists (Brugha 2003, Cockerham 2003). Furthermore, the impact of a person with such an illness on the social world around him or her can be devastating for those involved in social relationships with that patient (Baronet 2003, Cannuscio et al 2004, Magliano et al 2003). Indeed, a basic social organizational question is, "How effectively does society deal with its population's mental illness and its consequences." As a result the sociology of mental disorders has become a substantively fruitful and highly researched area. (Aneshensel and Phelan 2006, Horwitz and Scheid 1999).

BBSS Frameworks

Several important intellectual trends are converging. They are: 1) the increasingly exciting research on the brain currently undertaken by neuroscientists, 2) the major work done by clinical psychologists and social

psychiatrists on the brain injured and their associated mental disorders, 3) the impressive amount of research continuing to be developed on the sociology of mental health and illness and on the social organization of medicine and health care, and 4) the growing public interest on the effects of serious injuries and their treatment. Given these four trends, I suggest that the time is appropriate for the development of substantive frameworks that link neuroscience, social psychology, and sociology together to help maximize the effectiveness of collaboration among the diverse disciplines working on parts of the Brain-Behavior-Self Concept-Society (BBSS) nexus.

However configured, I argue that a BBSS framework should be able to accomplish four tasks. The tasks are to: 1) identify principal topics and variables of investigation on a particular research problem, 2) suggest links among the topics and among the variables, 3) provide a framework to assist organizing the existing literature, and 4) be expandable to accommodate new research findings, hypotheses, and scholarly interests.

In this paper I present an initial BBSS framework (see figure 1: The Interface among Neuroscience, Social Psychology, and Sociology in the Study of Extreme Disorders.) that I have found useful in incorporating the four tasks in the study of the links among traumatic brain injury, serious mental disorders, and social responses. It was initially developed for studies of schizophrenia, severe depression, and serious anxiety disorders, but it may be modified or expanded in many ways to accommodate interests in other topics.

Traumatic Brain Injury

Increasingly, research has shown that traumatic brain injury (TBI), through either an open or closed head injury (depending on whether or not the skull has been breached), is associated with a range of serious neuropsychiatric sequelae including cognitive deficits (e.g. impairment of memory, speed of information processing, and posttraumatic delirium), mood disorders (e.g. major depression, suicidal ideation, and poor cooperation with rehabilitation), anxiety disorders (e.g. panic disorder, phobic disorders, posttraumatic stress disorder),

psychoses (e.g. schizophrenia and schizophrenia-like psychoses, agitation, delusions, and impulsive aggressiveness), apathy, and behavior dyscontrol (Rao and Lyketsos 2000).

In the U.S. each year an average of 1.5 million people sustain a non-war related brain injury from such events as auto accidents, falls and sports injuries. Fifty thousand of them die from the injury. Each year over 300,000 adults and children are treated for sports related head injuries in U.S. emergency rooms. Each of those treated are at risk for a TBI. TBI has come to both professional (Okie 2005) and popular attention (Bazell 2006) from the reporting of head injuries suffered by American troops in the wars in Iraq and Afghanistan. The commanding general of the North Atlantic Regional Medical Command has estimated that given the nature of the weapons used against American troops, 70 percent of the wounds suffered by the troops have the potential for brain injury (Schlesinger 2003). Indeed, TBI has become the signature injury of the Iraq war. Fifteen years ago most of those with TBI would not have survived. However because of advances in body armor, helmets, and improved battlefield medicine, survival odds have become greatly improved (Ricciello 2006).

The issue of brain injury has now moved beyond the effectiveness of battlefield survival medicine. Now the issue has become the extent to which society can be organized to effectively support and assist those with war-related TBI and/or other lifelong physical disabilities and mental disorders. Given the prevalence and severity of such conditions, this will not be easy. We have already witnessed the colossal organizational stumble of Walter Reed Army Medical Center in caring for wounded soldiers (Priest and Hull 2007). This medical complex had long been considered as the "jewel of military medicine." Yet the lack of competency and capability in dealing with the needs of the patients is staggering. Unfortunately, the failure of Walter Reed's administration in patient care may portend further problems in other sectors of the military medicine system. As yet, after four years, the Pentagon has not developed a comprehensive program to identify the troops who may have

TBI (Zoroya 2007). The Walter Reed issue has now become highly politicized and will, no doubt, occupy political and media center stage for the next few years (Luo 2007)

The BBSS Interface Framework

As one moves left to right across the figure, one moves from the domain of neuroscience to that of social psychology and then to sociology. The boxes in the figure represent important concepts and topics of research. The arrows represent causal flows among concepts and topics. The arrows are based on past research findings and possible foci for future research. The central stream of the framework asserts that TBI leads to neurological damage which, in turn, may lead to extreme mental disorders such as schizophrenia, severe depression, and serious anxiety disorders. For the stricken person these disorders become reflected in both behavioral disruptions and a disrupted sense of self. The greater the behavioral disruptions and disrupted sense of self, the more likely that normal social relationships are put in jeopardy, that the stricken person becomes socially isolated and that the person experiences a decline in the skills required for normal daily living. Problems in relationships, social isolation, and decline in living skills may be lessened through social support given by family, friends, and institutional agents such as church or veterans groups, or through direct professional psycho-social intervention. However, the availability of professional intervention is highly dependent on the social organization of health care at the time of need which, in turn, reflects the ongoing political economy of the health care system.

The framework also contends that Post-Traumatic Stress Disorder (PTSD) may also be a source of behavioral disruption and damage to the sense of self. It is a psychiatric disorder that develops following exposure to a major untoward event including: a life threatening event such as combat, rape, physical assault, being threatened by a weapon, experiencing a threat to one's personal integrity, or witnessing an event that involved death or injury to another person. With the fall of the Twin Towers on 9/11, it has been estimated that 70,000-100,000 people in New York City had disaster exposure that put them at risk for PTSD (Grahm 2001, Panzarino 2002). At

some point over the course of a lifetime, approximately 8 percent of Americans will experience PTSD. Furthermore, each year PTSD is experienced by approximately 5.2 million Americans (Alegent Health 2007). PTSD disrupts normal behavior and the sense of self and that, in turn, affects social relationships, social isolation/integration, and the daily skills of living. The effects of PTSD may be mitigated by social support and treated through psycho-social professional intervention.

The effects of the serious mental disorder including PTSD and their toll on relationships, are major stressors for the caregivers-- both family and friends. The greater the stress experienced by caregivers, the less social support they may be able to provide. The highly stressed caregiver often needs professional support but seldom receives any. As institutions falter in their assistance, family and friend caregivers are required to assume an even greater burden.

Concluding Remarks

This paper has focused on one Brain-Behavior-Self-Society (BBSS) model. It deals with Traumatic Brain Injury and its connection to serious mental disorders. These disorders have serious implications for the social self and identity as well as to the relationship system in which the stricken individual is embedded. It also connects the disorder to the larger social system that must engage in adaptive behaviors in response to challenges the disorder presents to ongoing system organization. With the growing findings of neurosciences about brain and behavior connections sociologists have the opportunity to develop and pursue other disorder-specific frameworks that draw the BBSS findings together. Other BBSS frameworks may be especially useful in the cases of Autism, Attention Deficit Disorder (ADD) and Attention Deficit Hyperactivity Disorder (ADHD).

The breadth of material spread across neuroscience, social psychology, psychology, and sociology make it nearly impossible for any one scholar to master, even though working within a BBSS framework. For success, collaborative research with scholars from other disciplines is a must; however it is not always

easy to carry out. Traditional discipline boundaries together with the typical differences in college and departmental organization and reward systems tend to militate against easy interdisciplinary collaboration.

At Ohio State we have an interdisciplinary research organization, the Primary Care Research Institute (PCRI) that works well in terms of number of projects, number of researchers involved, amount of research support attracted, and number and range of scholarly publications and presentations. PCRI is now working hard on translational research; that is— taking its scholarly research into the improvement of primary care of patients. While housed in the medical school and centered in the department of family medicine, It brings together researchers from the College of Medicine, the College of Social and Behavioral Sciences, the College of Public Health as well as others. It works effectively not simply because there is a common organization that brings researchers together, but because the members of the institute are open to working across disciplinary boundaries. That is what is required in working within a BBSS context. However, like all bureaucracies—especially those linking highly diverse fields—it has its issues. But its successes outweigh its failures and it stands as one example of how to link biology, medicine, and the social and behavioral sciences in a large scale research enterprise.

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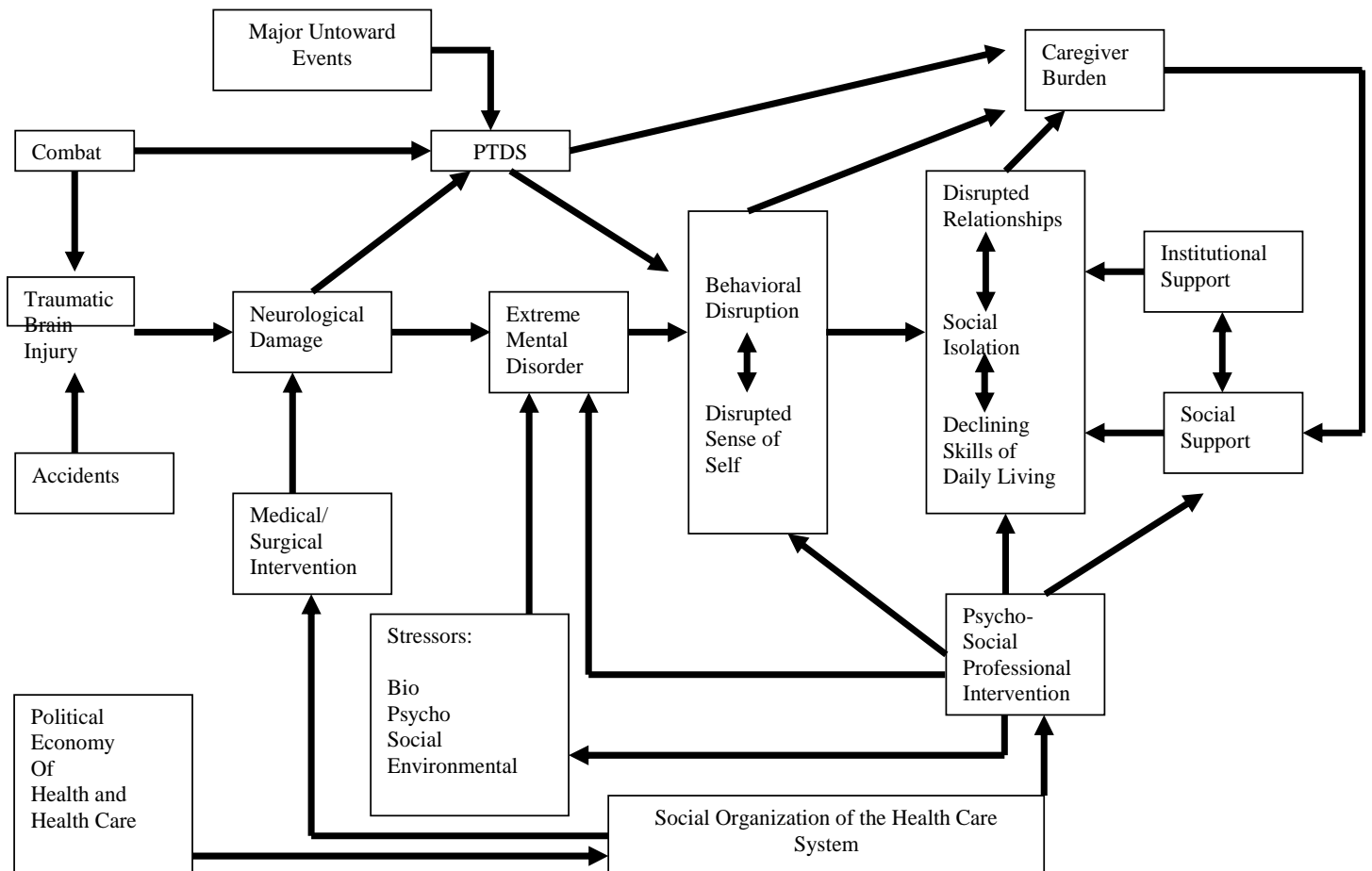
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Figure 1. Interface among Neuroscience, Social Psychology, and Sociology in the Study of Extreme Disorders



The Success of Science: An Evolutionary Perspective

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The question I address is “Why is the scientific method more successful than other methods to understand reality?” Prior to the widespread use of the scientific method, our species wandered the planet for over 150,000 years unaware we were walking on a spinning sphere that circled the sun at a distance of 93,000,000 miles. The past century was a showcase for the power of science. Science transformed our food, housing, transportation, communication, work, and play. We added billions of people to the planet, exploded nuclear devices, created life saving drugs, and cloned mammals. No other “way of knowing” has come close to making such an impact.

I argue science’s successes can be best understood from an evolutionary perspective. Specifically, the evolution of social behaviors allowed us to transform individual survival skills into social experiences. To my knowledge, an evolutionary perspective has not been used to examine the methods of science.

My working definition of the “scientific method” is the classic textbook description of scientific inquiry as interplay between observations and theory. The process is described as circular, with observations suggesting theory which suggest more observations, and so on (Babbie 1998; Neuman 2000). Specifically, I focus on - 1) the ability to observe the external environment; 2) the ability to create and edit mental maps or theories of the external environment; and 3) the ability to incorporate observational input and mental maps into the decision-making process.

The evolution of measurement

Organisms use sensory organs to monitor and measure the world. Humans measure the world with taste, touch, smell, hearing, and vision. Each sense is composed of subsystems that monitor specific aspects of the

environment (e.g., bitterness, smoothness, muskiness, pitch, and color).

Senses differ in distance requirements. Taste and touch require immediate proximity to the object being observed. Smell and hearing extend physical distance but require a medium like air through which the observations travel. Vision is the only sense useful for monitoring phenomena beyond the earth.

Increased distance has obvious survival value. Time to escape predators is increased. The ability to identify food from a distance reduces time and energy to obtain nourishment. Monitoring at a distance also has the advantage of viewing both the object and how that object relates to other objects in its environment. Sight gives us significantly more information about the environment surrounding the primary object being observed than the other senses. In primates, vision has more subsystems and uses a greater portion of our brains than do the other senses.

We enhance our vision with an array of technological extenders. Fire allowed vision to function in previously inaccessible environments like caves and nighttime. Eye glasses allow me to drive and others to read. Telescopes and microscopes enhanced vision to such a degree that our basic ideas about the universe and life are forever altered. Some of our most revered scientists (e.g., Newton, Maxwell, and Einstein) focused on light. While we make technologies to extend other senses, fewer are produced than for vision.

Our bias for visual measures is obvious. We give more credit to the witnesses who saw the incident than to those claiming to have smelled, tasted, felt, or even heard the evidence, even though the latter may have been in closer proximity. We design our measurement technologies to produce visual output (e.g., thermometers, watches, and scales). TV replaced radio as our major source of both information and entertainment. While some lament that television reduced the role of an individual’s imagination, television increased the interpersonal consistency of mental images between the writers, the producers, and the audiences.

Similarly, scientists use technologies to increase interpersonal reliability. Tools and procedural controls turn individual sensations

into social facts. Only you know how you feel and what you are thinking. One person feels warm; another feels cold. But when we look at the thermometer, we all get the same measurement. When we use a ruler or scales to measure size and weight, we replace personal observations with socially agreed upon standards of measure. Technological measurements are social measurements. Even when tools are used, we insist on further social protocols. Measurements from one individual or laboratory are often considered suspect until independent observations are made. A fundamental requirement of scientific observations is that they are social, rather than individual, observations.

Experimental manipulations add to our observational database by creating conditions we would not otherwise observe had we not turned over the stone, picked up the leaf, or dissected the frog. The classic experimental design is not a naturally occurring phenomenon. Real lives do not produce alternative observations. What if I had taken another job or worked harder? If I had married Barbie or not forgotten my spouse's birthday? If Hitler had died at birth? There exists no such sensory data to compare with what actually happened. Experiments (and statistical procedures), on the other hand, allow us to observe alternative realities.

Like any scientifically approved observations, experimental observations must be replicable by others. Procedures are described in detail and others are encouraged to try the manipulations. The magician's slight of hand is not allowed. Observations of experimental manipulations must be social, not personal, creations. The evolution of theory and other virtual realities

Theory also has an evolutionary past. Most sensory data are fleeting and used only for immediate action. The oldest portions of our neural system, the spinal cord and the brain stem, still operate in this manner. We do not think about pulling our hand from a hot stove.

Later evolved limbic subsystems and the most recent neocortex (comprising 80% of human brains) store sensory information. While human brains evolved to store some sensory experiences, we fall far short of storing all

sensory input. Brains are selective in what they store. Storing massive amounts of raw sensory input would not improve the survival value enough to compensate for the additional energy requirements.

Fortunately, memory is not totally dependent on the number of neurons. By creating rules for the placement of subject, verb, and object, grammar reduces memory requirements. Similarly, abstraction expands memory by "chunking" information. Storing "dogs have two ears" uses less memory than "dog 1 has two ears; dog 2 has two ears; dog 3 ...". And "tricks" like rhyming and mnemonics help commit long strings of information to memory.

Like grammar, logic and mathematics allow us to increase information without increasing the "bits" or neurons. Subroutines, recursion, and fractals dramatically increase information with little or no increases in memory requirements. Mathematics helps us manage complexity by summarizing vast amounts of information.

Technologies that store observations externally allowed us to store more data than brains can. Beyond quantity, external storage is more reliable. Unlike a book, brain stored sensory images have a tendency to reconstruct themselves (Weingardt, Loftus, and Lindsey 1995). Nor are brain-stored images as detailed and sharp as photographs. A photo of my mother is more clear than my memory. Showing her image to another creates a more similar (reliable) image in our two brains than my verbal description would accomplish. The externally stored past is more reliable than the remembered past.

Externally stored images not only store more information more reliably, but they allow images to be more complex and internally consistent. Gelernter (1994) argues external memory technologies shifted the way humans think. Texts passed down orally (e.g., Bible) are "disjointed and obscure" and with a lower-focus mode of thought that is more emotional and less logical.

Human brains evolved to deal with approximately seven pieces of information at any one time. External storage allows one to edit and modify mental images by breaking them into smaller and smaller sections that are

later reassembled. Scientific theories are more complex than the simple image of the earth circling the sun. Even simple-looking theories like $E=MC^2$ are complex. A reader can follow a more complex argument than can a listener. External storage allowed human brains to create complex thoughts like Maxwell's equations and $E=MC^2$.

Expressed as symbols (linguistic and mathematical), theories are by definition social products. External storage increased memory capacity, detail, and reliability. Scientific theories are powerful because they can be shared with and evaluated by many brains. Evolution of decision-making

Turn toward the light or flee from the big green thing? Making the "correct" decision is problematic. Over time and as a result of natural selection, brains evolved a collection of successful decision-making routines. For species with memories, decisions are made by comparing incoming sensory data against mental maps created from evolutionary neural wiring and previous sensory data. If the incoming sensory data indicates the "big green thing" is similar to one that ate your sister, flight would be an appropriate response.

Like sensory data and theory, science makes decision-making a social process. At the individual level, decision-making is biased toward self. Evolution is not about making the most accurate map of external reality but to increase the success of individual genes or organisms.

Transforming decision-making from an individual to a social process is done through norms, procedures and technologies. Merton's four norms of science are a classic example. From an individual perspective, our evolved skills to tell and detect lies have obvious survival value. Science's norm of communalism counters this individualist tendency by requiring full disclosure of methods and procedures. Similarly, disinterestedness and the requirement that scientists make sponsors and personal gains public shows recognition of our bias toward self. Universalism checks for prejudice toward others. The norm of skepticism obligates us to question others. The norm of skepticism and the practice of tenure offer protection from retaliation - a common primate behavior. Outside the academy (and

sometimes within), higher status individuals frequently retaliate against lower status individuals who question their view of reality.

These error correction and verification strategies are designed to deal with known biases that influence individual decision-making. These norms, procedural strategies, and statistical tests of significance move decision-making from the individual level to a socially agreed upon .05 level of confidence. Summary and Conclusions

Like our fellow life forms, we measure the world with our senses. We use these data to create mental maps of external reality. We manipulate the external world and make life-and-death decisions about how to interact with our environment. The methods of science are rooted in this evolutionary history. Science is not some magical formula that inevitably leads us to ultimate truths. Observations and theories have physical limits and are created by egocentric organisms. Still, the recent successes in science and technology are impossible to ignore.

Why does science work so well? The conclusion from this analysis is that scientific models of reality are better because they are public or interpersonal realities rather than individual or personal realities. We check our sensory input by asking another, "Did you see that?" We check our mental maps when we ask, "Does that make sense to you?" or "What do you mean by that?" We further expand these individual experiences by using socially constructed technologies to measure sensory input, describe our mental maps, and evaluate the correspondence between data and observations.

Evolutionary theory offers a useful perspective to explain the power and success of science. Evolutionary theory does not expect an isomorphic one-to-one mapping between theories and the external world. Evolutionary theory recognizes science is a social enterprise and will not inevitably yield perfect or infallible theories. Science can, however, be expected to be more successful than methods that fail to convert individual observations and virtual realities into social experiences.

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- Merton, Robert K. 1968. *Social Theory and Social Structure*. Revised Edition. New York: The Free Press.
- Neuman, W. Lawrence. 2000. *Social Research Methods: Qualitative and Quantitative Approaches*. Boston: Allyn and Bacon.
- Weingardt, Kenneth R., Elizabeth F. Loftus, and D. Stephen Lindsey. 1995. "Misinformation Revisited: New Evidence on the Suggestibility of Memory." *Memory and Cognition* 23 (1), 72-82.

Two Evolution & Sociology Paper Sessions at the 2007 Annual Meetings of the American Sociological Association

The Evolution & Sociology section has been allocated two paper sessions for the annual ASA meetings to be held in New York in August, 2007. One session on "Sociology & Neuroscience" will be organized by Douglas Massey at Princeton University. The other session on "Sociology & Neo-Darwinism" will be organized by Timothy Crippen at the University of Mary Washington.

Our section day is Monday, August 13 2007, and our sessions and reception are likely to be scheduled on that day. Announcements of the time and place for the sessions will be sent out via e-mail when the preliminary schedule of the meetings is available.

New Publications of Section Members

Angle, John. "The Inequality Process as an Evolutionary Process" will appear in the proceedings of the April 2006 Conference on the Constructal Theory of Social Dynamics at Duke University. The proceedings will appear in a Springer book, entitled *The Constructal Theory of Social Dynamics*, Prof. Adrian Bejan, editor.

Bone, John. 2006. 'Social cohesion, conflict and national identity'. *Nationalism and Ethnic Politics* Vol. 12: No. 3-4 (Autumn/Winter 2006)

Hopcroft, Rosemary L. and Dana Burr Bradley. Forthcoming. "The Sex Difference in Depression across 29 Countries." *Social Forces*, (June).

Sanderson, Stephen K. 2006. *Evolutionism and Its Critics: Deconstructing and Reconstructing an Evolutionary Interpretation of Human Society*. Paradigm Publishers, October 2006. 374 pp. 1-59451-301-5 (hardbound), \$74.00; 1-59451-302-3 (paperback), \$32.95.

People

J. Scott Lewis received a \$5000 grant from the Ohio Learning Network to construct a faculty WebQuest portal to enhance teaching and technology use in the curriculum.

The Biosociology of Dominance and Deference

Rowman and Littlefield will send free exam copies of the book by Allan Mazur, *The Biosociology of Dominance and Deference*, to everyone who requests one for possible class use.

Requests for exam copies (for professors considering adopting the book) go to Renee Legatt in Rowman & Littlefield's college marketing department. Her email address is rlegatt@rowman.com.

Criminology: An Interdisciplinary Approach

Section members who are teaching criminology and who want to emphasize a biosocial approach, including evolutionary arguments about crime causation, may request a review copy of Anthony Walsh & Lee Ellis (2007). *Criminology: An Interdisciplinary Approach*. Email: Jennifer.Reed@sagepub.com

Social Evolutionism and its Critics: Deconstructing and Reconstructing an Evolutionary Interpretation of Human Society

Section members may qualify for a free exam copy of Steve Sanderson's new book, *Social Evolutionism and its Critics: Deconstructing and Reconstructing an Evolutionary Interpretation of Human Society* by sending relevant course title, expected number of students, and semester/quarter to be taught to Patriciag@paradigmpublishers.com