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Neurosociology: Fundamentals and Current Findings

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To my son Danny and Audrey my wife for their generous help in editing this book.

Contents

Chapter 1
Introduction

Abstract Data are presented about the recent growth of neuroscience. Next, I describe why and how the book is addressed to different readers. Reservations that some sociologists have about neuroscience are reviewed and shown to be unfounded. The differences of the halves of the brain separated by the corpus callosum are described along with how this dovetails with important sociological concepts. This is followed by a discussion of the social nature of the brain. If this is true, sociologists should know about it even though it goes against our westernized notion of the self separated from others. The idea of reductionism seen by many as essential to science is challenged and contrasted with mind as an emergence. Important generalizations about the nature of the brain are presented. Following this is a discussion of the history of the term "neurosociology" started in the early 1970s by TenHouten. His top-down treatment, i.e., culture working down to affect the brain, is contrasted with Davis's cybernetic (top-down/bottom-up) approach. The chapter ends with a discussion of theory and methods in neuroscience and briefly describes the book's chapters.

Keywords Neuroism · Accounts · Corpus callosum · Vocabulary of motives · Units of analysis · Agency · Reductionism · Self-consciousness · Social control · Determinism · Reductionism · Emergence · Linguistic turn · Astonishing hypothesis · Plasticity · Synapses · Persistent inequality · *f*MRI · TMS · Wada test

It would be hard to overemphasize just how social our brains really are. The first researcher to draw attention to this was a leading neurologist named Michael Gazzaniga (1985), but as he knows now, he only scratched the surface to the social nature of our brains. One may think that neurology and sociology make strange bedfellows, but that is not the case as the reader will see below.

This volume is written for a broad group including those unfamiliar with neurosociology and wanting an introduction to fundamentals, and those interested in the newest issues and findings of the field. For this reason, I have kept parts of my 2010 book that deals with basic things one needs to know about our social brains. I have also added a glossary describing brain areas for those who are newcomers to our field.

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Many sociologists still think that neuroscience is incompatible with sociology because of the former's reductionism and a remaining bias among sociologists against biological explanations for behavior. This bias goes back to early days when sociology had to compete with genetics to explain human behavior.

This updated revision of my 2010 book on neurosociology is produced because much of interest has been written in the last 8 years that is relevant to neurosociology that those interested should know about. As Douglas Massey, former president of the American Sociological Association, stated in his 2002 presidential address to the society: "neuroscience may be essential for a contemporary sociology." Obviously, we agree. If our brains have been forged evolutionarily over the many centuries for social life, sociologists should have the opportunity, if not the duty, to know about it whatever the reservations of some who think that any approach that includes biology must be reductionistic. Reductionism can be exemplified as seeing the person as their smallest parts whether that be cells or the carbon and oxygen that comprise them.

Emphasizing our social natures is hardly new. In 384 B.C. the Greek philosopher, Aristotle said that "man is by nature a social animal." Little could he have known about our social brains responsible for this nature. In this volume, armed with information about modern brain scans that allow us to literally look into the brain, we will bring readers up to date so they can understand just how social we are.

Traditionally brains have been considered organisms lodged solely inside of peoples' heads and separate from other people. However, neuro-psychologist, Leslie Brothers back as far as (2001), was critical of this isolated image even in her own field of psychology where she refers to it as "neuroism." This is not to say that neuroscience and sociology are partners – far from it. As a matter of fact, it would be hard to imagine two fields so different in terms of method, theory, tradition, and practice. But herein could lie an advantage and that is to break us out of our comfortable sociological "assumptive order" and develop insights which may have otherwise been impossible, or at least very difficult to develop within our own perspective. If different theoretical positions like sociology and neuroscience using different methods converge on the same findings, their validity is strongly enhanced. This is because in hypothesis testing, construct and convergent validity are the most highly regarded methods of privileging a thesis.

1.1 The Split-Brain Research of the Neurosciences and Symbolic Interaction's Vocabulary of Motive: An Example of Convergence[1]

Michael Gazzaniga's findings in his split-brain research confirm a core notion in the theory of "accounts" by Scott and Lyman (1968). Their work posits that our explanations for our behavior are seldom accurate reflections of our motivations seen as

[1] This is taken from Franks D. (2010) Neurosociology. The Nexus Between Neuroscience and Social Psychology, The Springer Press, N.Y. New York.

an "individual wellspring of action." Gazzaniga's neuroscientific results come from working with patients who have extreme epilepsy. As a treatment for such cases, the *corpus callosum*, which allows communication between the right- and left-brain hemispheres, is severed. The corpus callosum is a massive cable of 200 million fibers which enables the fully linguistic left-brain (in right-handed people) to know what the characteristically nonlinguistic right brain is doing. The mute right brain communicates only with electrochemical means. Sensory information from the patient's left side is processed by the right side of the brain and vice versa. The severed right side can no longer tell the conscious left side what it is doing. Thus, a patient can be given a written message flashed to the left side of his face instructing him to draw something. The patient is not aware of the message, as it cannot be communicated to the left hemisphere because of the severed corpus callosum. This leaves one person with two brains, one of which is ignorant of the other.

In one typical study, the researchers told the mute right brain to draw a picture of a dog. Patients had no clue about what they were drawing until the dog's form became obvious during the sketching. Only then did they realize they were drawing a dog, cat, etc. When the right brain was asked why the patient drew what he or she did, the left, usually "linguistic brain," contrives an answer that makes some sense to the patient (who is the only one deceived). The "explanations" are frequently quick and convincing to the speakers. For example, in another situation a patient was sitting in a room and her right brain was instructed to get up and leave. When asked why she was leaving, the patient said "I'm getting a Coke." No doubt she continued to do just that because she was convinced that was what she wanted. In another case, patients' right brains were asked to laugh and then they were asked what was so funny. The patients never said they did not know why they were laughing. A reason was always forthcoming that only the patients themselves could believe since the researchers knew the patients were actually only following their directives for the research.

To the sociologist, the explanations are rationalizations or "accounts" if they are based on socially acceptable statements of intent. To the neuroscientist, they are "confabulations." Scott and Lyman (1968) being sociologists go on to connect these ad hoc "vocabularies of motive" to identity concerns and to specify the situational aspects dictating when actors are challenged to make such accounts in everyday life. The human tendency to contrive such explanations independent of any actual intentions and then to believe them wholeheartedly is clearly established by split-brain studies as well as in normal populations by Gazzaniga (1985: 81–84).[2] Getting beyond the social account to the real reason – at least in the narrow case of the split-brain research above – is something that sociologists alone could not do, thus the name "neurosociology."

[2] Gazzaniga notes that some communication between the split hemispheres remains. Though the different capacities of the two halves have been exaggerated in the past, they are indeed needed to balance each other. For example, the left brain excels in cognitive interpretations and the right brain, lacking such abilities, is accurate, precise, and literalistic. Other classic experiments on split-brain research can be found in Franks and Smith (2005).

1.2 Neurosociology and the Self

One of the most difficult assignments of neurosociology is to challenge the western ideology that pictures the self in asocial individualistic terms wherein one's powers come from within. For example, long ago this author divided self-esteem into *competency*-based *inner* self-esteem and *outer* self-esteem referring to the concerns about how one appears to others. Unfortunately, the term *inner* is an example of accepting the asocial notion of the person where one's powers come from within rather than our ties to others. It would be hard to overstate the power of this image on the western imagination. Our students shrink from the idea that others strongly and unconsciously influence us, but my Asian students told me they were made uncomfortable by such an asocial notion wherein we are so separated from others.

We have a long history of courting this asocial image of the person. Indeed, the tautological ideology of "self-interest" has long been a cornerstone of our economy as well as an uncontested academic theory of motivation beginning with the sixteenth-century enlightenment thinkers. Self-interest is a tautological truism because used as a theory of motivation it is taken for granted that *everything* one does is because of self-interest – what else? Even feeding the poor can be seen as self-interest insofar as it is a way of gaining an ethical and more positive feeling of self and may convey the notion to others that the person is to be admired.

Compared to many other cultures and historical epochs, a literal individualism is simply assumed and we have little perspective on its hold on us. Nonetheless, a host of social psychologists have challenged this essentially asocial image of the person. See, for example, Geertz (1974), Sampson (1981, 1988), Elias (1982), Tuan (1982), Westen (1985), Baumeister (1986), Franks and Heffernan (1998), and Scheff (1990). Markova (2003: 9) puts it starkly: "The concept of self is a construct. It is not a 'natural kind' sited somewhere in the human brain. The western concept of self emphasizes individualism and autonomy but this view is cultural and no more scientific or truthful or advanced than the collective view of self that is developed in other cultures and which revolves around family or clan rather than the individual."

The image of the encapsulated self feels right to us, Elias says, because it correctly describes the emotional tone of life in a civilization whose valuation of the self and the metaphor of the "private realm within" forces attention on our separation from others.

One might think that taking on the Goliath of the westernized image of the asocial self was not of interest to those who study the singular brain, but there are signs that this is not the case. Certainly, the majority of neuroscientists do not see this challenge as a priority, but a growing number do. Among these are, in varying degrees, Gazzaniga (1985), Brothers (1997, 2001), Cacioppo and Berntson (1992, 2002), Cozolino (2006), Edelman (1992), Damasio (2003), and lately Iacoboni's work on mirror neurons (2008) as well as Franks (2010).