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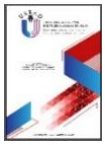

# NEUROSOCIOLOGY: A NEW PERPECTIVE ON UNDERSTANDING THE INDIVIDUAL AND SOCIETY

NÖROSOSYOLOJİ: BİREY VE TOPLUMA YENİ BİR BAKIŞ AÇISI

**Burcu DOĞAN KOÇAK**
Dr., İstinye Üniversitesi, Sosyal Bilimler, Sosyoloji, İstanbul/Türkiye.
Dr., Istinye University, Social Sciences, Sociology, Istanbul/Türkiye.
brcdgnkck@gmail.com
**ORCID ID:** 0009-0009-5349-3447

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**Summary**: Neurosociology is an interdisciplinary field located at the intersection of neuroscience and social sciences. It is a multi-level, integrative perspective that aims not to replace established sociological traditions, but rather to strengthen and draw inspiration from them. Essentially, it aims to examine the biological origins of human behavior, their neurological functions, and the complex relationships between them and social interactions. It investigates how the brain and nervous system are related to social interactions, emotional responses, decision-making processes, and other cognitive functions. The main goal of neurosociology is to understand human behavior within the complexity of biological, neurological, and social factors. This allows for a broader perspective in evaluating human thoughts, emotions, decisions, and social interactions. The literature presented under the title of neurosociology in revealing the neurological foundations of social behavior is quite new. The aim of this study is to provide information about neurosociology, which is still relatively unknown in our country, through a literature review method and to make a small contribution to the literature.

**Key Words:** Neuroscience, Sociology, Neurosociology, Human Behavior, Social Life

**Öz:** Nörososyoloji, sinirbilim ve sosyal bilimlerin kesişim noktasında yer alan disiplinlerarası bir alandır. Bu alan, yerleşik sosyolojik geleneklerin yerine geçmeyi amaçlamak yerine, onları güçlendirmeyi ve onlardan ilham almayı hedefleyen çok düzeyli, bütünleyici bir bakış açısına sahiptir. Temel olarak, insan davranışlarının biyolojik kökenlerini, bu davranışların nörolojik işlevlerini ve bunların sosyal etkileşimlerle olan karmaşık ilişkilerini incelemeyi amaçlar. Beyin ve sinir sisteminin sosyal etkileşimler, duygusal tepkiler, karar verme süreçleri ve diğer bilişsel işlevlerle nasıl ilişkili olduğunu araştırır. Nörososyolojinin ana amacı, insan davranışını biyolojik, nörolojik ve sosyal faktörlerin karmaşıklığı içinde anlamaktır. Bu, insan düşüncelerini, duygularını, kararlarını ve sosyal etkileşimlerini değerlendirirken daha geniş bir bakış açısı sağlar. Sosyal davranışların nörolojik temellerini ortaya koyan literatür, nörososyoloji başlığı altında sunulmaktadır ve oldukça yenidir. Bu çalışmanın amacı, ülkemizde hâlâ nispeten az bilinen nörososyoloji hakkında bir literatür taraması yöntemiyle bilgi sağlamak ve literatüre küçük bir katkı yapmaktır.

**Anahtar Kelimeler:** Sinirbilim, Sosyoloji, Nörososyoloji, İnsan Davranışı, Sosyal Yaşam



## Introduction

When it comes to understanding human behavior, it is becoming increasingly evident—particularly as we move towards an era of interdisciplinary and even transdisciplinary science, that relying on a single, one-dimensional perspective makes it extremely challenging to unravel the complexity and multidimensionality of humans as a system. To comprehensively understand humans as social beings and illuminate their existence as a whole, perspectives from numerous disciplines such as biology, psychology, sociology, anthropology, and philosophy are undeniably necessary. The intersection between anthropology and neurosociology reflects a growing recognition that human social behavior must be understood through both cultural-symbolic systems and the biological substrates that support them. While anthropology traditionally emphasizes meaning-making, ritual, and collective representations, neurosociology builds on these insights by investigating how social structures and cultural practices are encoded and expressed through the brain and nervous system. As Jonathan H. Turner and Alexandra Maryanski (2005, p. 4) argue, neurosociology seeks to explore "how the human nervous

system shapes, and is shaped by, the socio-cultural environment". For instance, anthropological analyses of kinship or status hierarchies can now be enriched by neuroscientific findings on mirror neurons and the neurobiology of social bonding. Ultimately, both disciplines converge in their commitment to understanding how human beings create and sustain meaning within relational and embodied contexts. This interdisciplinary dialogue has led to new research that integrates ethnographic methods with neuroimaging and affective neuroscience, particularly in the study of empathy, symbolic cognition, and ritual participation (Immordino-Yang & Damasio, 2007). Social behavior is meaningful within specific social structures, but it also intersects with physiological systems in many ways and must therefore be examined through a multidimensional lens. Neurosociology posits that human behaviors are the result of interactions between both biological factors (neurobiological structures, genetic influences) and cultural contexts (social norms, values, traditions). For instance, an individual's reaction in a particular social situation is influenced by both neurochemical processes in the brain and the cultural context in which that individual exists.

During the 1990s, recognized as the "Decade of the Brain" (Franks, 2010), research on the brain and its role in shaping human social behavior gained significant momentum, particularly with the rise of social neuroscience. Contrary to earlier assumptions, research from the latter half of the 20th century revealed that environmental factors can continue to alter brain structure and function well beyond the formative years. This discovery led to the emergence of social neuroscience, a field dedicated to developing more comprehensive explanations of human behavior by examining interactions across neurobiological, psychological, and social-psychological levels of organization. While social neuroscience primarily addresses psychological processes at the individual level, such as empathy and decision-making, neurosociology focuses on the social relationships between individuals and how these relationships influence broader societal structures (Kalkhoff et. al., 2016, p. 247).



Thanks to advancements in neuroscience, which have progressively unraveled the mysteries of the human brain, it has been shown that changes, damages, and traumas in brain chemistry, caused by various factors, can result in significant alterations in individuals' emotional, intellectual, and social realms. However, the brain does not function as an isolated entity, detached from the external world, the information it processes, or the individual's lifestyle. Since these elements are intricately interwoven, it becomes essential to strengthen the interconnections between research fields, rather than separating them with rigid boundaries, in order to understand such a complex system as the human being. Prominent neuroscientist Michael Gazzaniga (1985) emphasized the social nature of the brain and how critical social life is for brain development. Similarly, L. Brothers noted that "the human brain is fundamentally structured by social interactions. Studies have shown that a human brain cannot fully develop or function at its maximum capacity without others. While synapses exist in every brain, they require a social

world to develop in a healthy manner" (Brothers, 2001), highlighting the strong link between social life and the brain.

**Methodology**

As the aim of this study is to introduce the field of neurosociology, it was deemed appropriate to use the method of literature review to compile existing studies related to this field. A literature review is considered a critical stage in scientific research and forms the foundation of the research process. This method allows the researcher to gain a deep understanding of the existing body of knowledge and develop new research questions. The literature review also serves to establish the theoretical framework of a study, identify methodological approaches, and contribute to the advancement of scientific knowledge. It strengthens the relationship of the research with academic literature and guides the direction of the scientific inquiry. The foundations of a research project are laid through a literature review, and this phase enables the researcher to acquire comprehensive knowledge of the topic. Moreover, the literature review helps identify gaps and contentious areas within the literature (Webster & Watson, 2002), thus providing the researcher with an opportunity to produce an original study that contributes to the body of knowledge. The literature review also forms the theoretical framework of the research, defining the key concepts and relationships that underpin the study (Creswell, 2014). This process enhances the academic validity of the research and facilitates a clearer understanding of the research by the academic community. The first step in a literature review is to define the research topic and clarify the research questions. The research question determines the scope and direction of the literature review. By examining which questions have already been answered in the literature and which remain contentious, the researcher shapes their own research questions (Boote & Beile, 2005). The collected literature is then analyzed and synthesized using thematic, chronological, or methodological approaches. This process aims to identify the main trends, theoretical approaches, and methodological differences within the literature. The synthesis of the literature enables the researcher to detect gaps and contradictions in the current body of knowledge.



**1. Sociology and Neuroscience**

This section will begin with brief definitions of sociology and neuroscience, followed by an exploration of the points where these fields converge and diverge. Neuroscience (also known as neurobiology) is an interdisciplinary field that studies the nervous system in living organisms. Its primary goal is to understand how the brain, spinal cord, and other components of the nervous system function and to use this knowledge to examine behavior, emotions, learning, and other mental processes. Research in this field encompasses the brain, spinal cord, nerve fibers, and other components of the nervous system. In neuroscience, elements like nerve cells (neurons) and synapses, which facilitate communication between these cells, are studied. Additionally, topics such as neurotransmitters, the electrical activities of neurons, neuronal plasticity (flexibility), the functions of different brain regions,

sensory processing, motor control, learning, memory, emotions, and behaviors are the focus of neuroscience studies.

Neuroscience plays a vital role not only in treating neurological disorders such as Alzheimer's, Parkinson's, and depression, but also in revealing how social life is biologically embedded. Recent research shows that the human brain is inherently social, wired for connection, shaped by relationships, and highly sensitive to social cues (Cacioppo & Patrick, 2008, p. 3,5). Through methods such as brain imaging and neuroendocrine analysis, neuroscience has helped uncover how social isolation, exclusion, or chronic stress directly impact brain regions like the amygdala and hippocampus, altering emotional regulation and cognitive function (Hawkley & Cacioppo, 2010).

Neuroscience research employs various techniques, including brain imaging, genetic studies, and cellular and molecular biology methods. In short, neuroscience is a multidisciplinary field that investigates the nervous system and contributes to the understanding of neural processes, the treatment of brain diseases, and even advancements in artificial intelligence.

Sociology, on the other hand, is the scientific study of society or social phenomena. It examines how individuals and institutions within a society function and interact, and investigates human social behavior. Sociology is considered the science of modernity (Giddens, 2013, p. 38). With the developments stemming from the Enlightenment, such as the scientific revolution, the industrial revolution, and the French Revolution in the 19th century, it became necessary to study social structures and the problems associated with them. Phenomena that had previously been explained theologically or metaphysically now required new modes of evaluation. Following the advances in the natural sciences, sociology emerged as the "science of the new industrial society," adopting the positivist method as a model (Bottomore, 2012, p. 6). Figures like Henri de St. Simon, Auguste Comte, Max Weber, Emile Durkheim, and Karl Marx are among the founding figures of sociology, and their influence continues to resonate today.



At first glance, these two fields may seem largely disconnected, based on their definitions. However, they are closely related because human beings are at the center of their research. Sociologists tend to see humans as agents responsible for their actions and prioritize social structures and culture. Consequently, the atomized individual and internal processes occurring within them are somewhat contrary to the core interests of sociology (Franks, 2010, p. 24). Over time, psychology, a field closer to neuroscience, took up the discoveries made in neuroscience, while sociology maintained a more distant stance. However, in the past 20 years, neuroscience and sociology have managed to create a "new field." Sociology, which studies humans as beings shaped primarily by social interaction and communication, and the biological and physiological approach, which sociology long considered reductionist, now seem to be drawing closer together. The vast differences between these two fields in terms of method, theory, approach, and tradition may actually present certain advantages (Franks, 2019, p. 2). In 2002,

Douglas Massey, the former president of the American Sociological Association, emphasized the importance of neuroscience in contemporary sociology during his keynote address (Franks, 2019, p. 2).

From the founding of sociology to the present, we can see that while some prominent sociologists incorporated the individual, their inner world, and their connection to the external world, many others focused solely on society as the object of study and argued that sociology's primary focus should be macro-level research. For example, Auguste Comte, one of the founders of sociology, believed that social life could not in any way be reduced to the individual or to a reflective subject. He treated subjective experience as little more than a metaphysical construct (Giddens, 2000, p. 158) and did not even consider psychology worthy of inclusion in his hierarchy of sciences. In his view, cognition consisted of historical and collective dimensions, which biology was insufficient to explain (McVeigh, 2020, p. 331). Therefore, understanding human cognitive development requires a sociological investigation that is more comprehensive than what physiology and biology can provide. Both Auguste Comte and another significant figure in sociology, Émile Durkheim, argued that society is not merely the sum of individuals coming together, but that the social has its own inherent existence. Therefore, society should be understood as a reality given in and of itself. According to these leading figures in sociology, the social takes precedence over the individual, and the primary subject of inquiry is the social. This perspective later found empirical resonance in mid-20th century social psychology, particularly in studies demonstrating how group norms, authority, and situational contexts shape individual behavior. Experiments by Solomon Asch (1951) on conformity, Stanley Milgram’s (1963) obedience studies, and Philip Zimbardo’s (1971) prison experiment all revealed the profound influence of social structures on individual choices—supporting Durkheim’s view that social facts exert a coercive force over individuals.



In contrast to views that prioritize the social over the individual and see biology and physiology as reductionist and inadequate for understanding social life, there are also thinkers who argue that humans, as living beings, should be studied as part of the natural world and the process of evolution. These thinkers assert that social life is a continuation of human physiological and biological needs. For example, Herbert Spencer argued that collective actions in nature, such as hunting, gathering food, finding shelter, protection, and warmth, became advantageous for survival and eventually evolved into a social "order" that has been maintained over time (Spencer, 1974, p. 4). For Spencer, sociality indicates a process acquired over time due to the benefits it provided. Similarly, figures such as Gabriel Tarde, Charles Horton Cooley, Vilfredo Pareto, and Georg Simmel argued that the individual, their inner world, and interactions between individuals must be considered in understanding social life, and this perspective gained increasing momentum in the second half of the 20th century. Despite our development of many things in connection with society and environmental life, it was emphasized that we are not solely social beings and that we must also look

into the "depths of organic life" (Tarde, 2009, p. 57). Tarde argued that, contrary to Durkheim's views, sociology should include "inter-brain psychology," studying conscious connections between two or more individuals and integrating cells, heredity, and imitation into its framework (Tarde, 2019, p. 33).

According to Cooley, all our socially active impulses are "sociobiological." He argued that biology and the environment should be viewed as an "inseparable total organic process" (Cooley, 2010, p. 11). For instance, although language and the ability to use it are biological capabilities, the particular language we speak, how we use it, and our communication skills depend on the social structure, culture, time period, and opportunities in which we are immersed. Therefore, for Cooley, biological nature and the social environment are inseparable elements when it comes to understanding humans. Focusing solely on one area would be misleading and deceptive. Moreover, rituals, storytelling, and collective practices are now understood to foster neural synchrony and oxytocin release, reinforcing social trust and cohesion (Whitehouse, 2013). In this light, neuroscience contributes to a deeper understanding of how shared meaning and emotional connection are not just cultural products, but also neurological processes. As Candace Pert (1997, p. 187) states, "our emotions are not just in our heads, they are embodied in the very chemistry of the brain and body".

Another important figure in sociology, G. Simmel, included the seemingly mundane aspects of everyday life, interpersonal communication, and interactions in his research, focusing on life itself in all its details. Simmel argued that to understand life, one must understand the processes within organisms and the totality formed by these processes (Simmel, 2009, p. 50). Since both the smallest cells and large social structures and institutions have significant effects on human life from different perspectives, Simmel argued that macro sociology should also incorporate micro-levels.



Pareto, meanwhile, suggested that the notion that humans are predominantly rational beings who display logical behaviors does not always hold true. He argued that most human actions are impulsive and emotional (Pareto, 1935, p. 179).

The analogy of social structure to a biological organism composed of parts is a metaphor frequently used in sociology. For instance, following in the footsteps of Durkheim, Talcott Parsons, who conducted macro-level research and adopted a functionalist approach, later argued that physiological mechanisms could underlie all human behavioral processes, and he emphasized that in higher organisms, including humans, the central nervous system and especially the brain are the focal points (Parsons, 1970, p. 260).

As mentioned earlier, while many thinkers since the founding of sociology have regarded the biological structure, brain, and emotional world of humans as significant factors in determining behavior, sociology and neuroscience were treated as separate and vastly different disciplines until very recently. In 1975, evolutionary biologist Edward Osborne Wilson sought to bridge the fields by introducing the concept of "sociobiology," which he defined as the systematic study

of the biological foundations of all social behavior. He focused on the underlying physiology of social adaptations and on animal communities, their population structures, hierarchies, and communication (Wilson, 1998, p. 5). From the perspective of sociobiology, there are parallels between the biological tendencies of humans and the characteristics of human social systems. According to Wilson, social organization is nothing more than the behavioral outcome of interactions between organisms with fixed biological tendencies, because in society, there is nothing that does not already exist in organisms (Sahlins, 2003, p. 5). Wilson's attempt to synthesize sociology and biology, however, met with negative reactions from the sociological community. It was seen as lacking a scientific foundation, and Wilson was even accused of promoting racism later on. One of the main reasons for this negative reaction was the fear that, much like "social Darwinism" once attributed to Herbert Spencer, it could lead to ideological polarization and justify certain political decisions, such as those based on racial superiority (Segerstrale, 2000, pp. 17, 34).

Sociologists were concerned about deviating from the clear boundaries established by the founding figures of sociology, fearing that placing too much emphasis on individual attitudes would cause them to stray into fields like psychology or biology. Leading figures in the field tried to avoid addressing the relationship between biological and neurological processes and social processes by excluding them from the scope of sociology. In recent decades, however, particularly with advancements in neuroscience, sociobiology has resurfaced. As neuroscience research has provided more empirical support for explanations of human behavior, social science disciplines have increasingly incorporated neurological foundations into their practices. In this context, a "neuroscientific turn" has been observed in fields such as economics, philosophy, anthropology, law, and psychology (Scheve, 2003, p. 256). As research in neuroscience has increasingly shown that different brain regions, as systematic wholes, play roles in behavior, emotions, thought components, and social activities, sociologists have also shown a growing interest in evaluating these findings. Berkoski noted that developments in the tendency to link social behavior to brain systems in sociology and neuroscience are primarily driven by the increase in research that reveals connections between brain function and the social world (Berkoski, 2017, p. 346). As Damasio said, "I am not trying to reduce social phenomena to biological ones; rather, I am trying to show the strong connection between them" (Franks, 2019, p. 7). Similarly, Nobel laureate Gerald Maurice Edelman (1992, p. 166) stated that "reducing human behavior to molecular interactions is absurd; to explain human behavior and consciousness, physical, biological, and social domains and their mutual interactions must be examined." These perspectives emphasize the importance of an integrative approach to human behavior, one that resists simplistic reductionism and recognizes the dynamic interplay between biology, cognition, and social context. This is particularly important to prevent misreadings that might lead to evolutionary or deterministic interpretations which overlook the emergent, relational, and meaning-driven nature of human social life.

## 2. Understanding Neurosociology

### 2.1. The Emergence of Neurosociology

Warren TenHouten was the pioneering sociologist who introduced the concept of "neurosociology," inspired by neuroscientist Joseph Bogen to investigate the brain's social structure. In subsequent years, TenHouten, alongside Charles D. Kaplan, authored the first comprehensive work on neurosociology in 1973, where they explored the influence of culture on neuronal activity in the human brain. This work posited that specific regions of the brain have evolved to accommodate the demands of the social environment, and these adaptations differ across cultural contexts[1] (Franks, 2019, p. 12).

In his seminal work, "The Nexus Between Neuroscience and Social Psychology", David D. Franks (2010) lays the groundwork for a transdisciplinary dialogue between the biological and the social sciences, particularly through the lens of what he terms neurosociology. Rather than positioning neuroscience and sociology as opposing domains, Franks argues that both fields are essential for understanding the full spectrum of human behavior, from reflexes and emotions to beliefs, values, and social action. He provides numerous examples of empirical and theoretical research that demonstrate how brain function and social context co-construct each other, with neither operating in isolation.

Franks' approach emphasizes the bidirectional nature of this relationship: just as neural mechanisms influence how individuals perceive and interact with their social world, so too do social structures, institutions, and cultural meanings shape brain development and neural plasticity. Drawing from areas such as affective neuroscience, social cognition, and symbolic interactionism, Franks explores how macro-level societal forces; such as inequality, authority, and ideology, can find expression in micro-level neural patterns, such as stress responses, emotional regulation, and interpersonal perception. Importantly, Franks critiques the limitations of both reductionist biology and overly abstract social theory. He argues for a more integrative paradigm where embodiment, emotion, and cognition are studied not in isolation but within the flow of social experience. For instance, he discusses how mirror neurons, implicated in empathy and imitation, are not only biological artifacts but also sociologically meaningful, as they help explain processes like social learning, conformity, and symbolic interaction. Ultimately, Franks' contribution lies in showing that brain and society are not separate realities but dynamically intertwined processes. His work continues to influence scholars who seek to bridge the explanatory gaps between individual agency, biological embodiment, and collective life.



[1] This example demonstrates how the navigational abilities of Australian Aboriginals, without the use of any external tools, reflect the necessities of their living environment Additionally, unlike Westerners, they perceive time as cyclical, which leads to significant differences in how they understand life and existence. As can be understood from this, cultural differences allow for the brain to develop in diverse ways (Franks, 2019, p. 12).

On the other hand TenHouten defined neurosociology as follows (1997, p. 10): "*Neurosociological analysis treats the neural functions and mental lives of society's members as a level of reality, and in this sense, it requires a radical micro-level analysis. This focus does not involve the biological reductionism or determinism seen in some trends in sociobiology. Instead of viewing social behavior merely as a product of brain structure and genetic design, the central emphasis in neurosocial analysis is on the social production of thought and the social determination of brain structure and function*." In this context, the initial observations regarding the potential for collaboration between neuroscience and sociology have centered on the impact of emotions on behaviors and, particularly, the relationship between the brain and the social environment. Neurosociology allows for the testing of social theories using neuroscientific methods. For example, identity theories, social roles, social cohesion, and group affiliation can be examined using brain imaging techniques. Research in this field contributes to understanding the biological foundations of sociological theories, which in turn enables a deeper comprehension of social theories (Kalkhoff et. al., 2016, p. 244).

### 2.2. Interdisciplinary and Transdisciplinary Approaches

Sociology, in its effort to explain social action and social order, often tends to draw on the work of other disciplines. This tendency arises from the nature of sociology and the multidimensional structure of the subject it examines. Just as Max Weber's work cannot be separated from history, economics, and even religion, Durkheim cannot be viewed independently of philosophy and anthropology. Thus, social sciences, by their very nature, must progress alongside other fields. The clear distinctions between the methods and domains of the natural and social sciences are relatively recent developments. Previously, scholars tended to specialize in multiple fields and approached their research holistically, depending on the needs of the subject. With the growth of university departments in modern times, each discipline has claimed its own autonomy and has sought to distinguish itself from others. For example, a social sciences student might not only be separated into countless subfields within the discipline but also be completely disconnected from the natural sciences. This situation creates gaps and discontinuities in education.



A significant limitation in understanding human behavior stems from the disciplinary divide between fields that explore behavior, social interaction, and their underlying factors. Social behavior spans multiple levels, from the sensory social cues investigated by cognitive neuroscientists to the culturally shared practices and rituals studied by sociologists and cultural anthropologists. Given the multi-layered nature of social behavior, a comprehensive understanding of its neural foundations requires the integration of these various levels of analysis (Hari, 2016, p. 2). Consequently, disciplines like sociology must increasingly engage with neuroscience, while neuroscience should likewise incorporate the valuable perspectives offered by sociology in explaining behavior.

Traditional interdisciplinary approaches generally support interaction between different disciplines while maintaining some degree of protection for their specific epistemological and ontological questions. However, strategies that align with neuroscience require a transdisciplinary approach. This term refers not merely to the juxtaposition of two or more disciplines, but rather to a dialogue between different perspectives that formulates common problems and integrates various skills and expertise to solve them (Frazzetto, 2020, p. 2). A transdisciplinary model of study must go beyond the boundaries and methods of all the disciplines it includes, offering new approaches while adopting both inclusive and differentiating elements (Hari, 2016, p. 6).

### 2.3. The Use of Neuroscientific Methods and Techniques in Neurosociology

Our understanding of social organization and behavior is shaped by the techniques and methods we employ to gather data, measure concepts, and test hypotheses. In other words, our knowledge is influenced not only by the theories themselves but also by the methodologies we use to evaluate and refine them, including specific measurement tools (Thye, 2000). Neuroscientific methods offer a unique advantage by allowing real-time observation of both conscious and unconscious thought processes and emotional responses, minimizing the risk of intentional response bias (Laureiro-Martinez et al., 2015, p. 322). As a result, these methods hold significant potential for advancing theoretical development. In neuroscience, many tools are available to demonstrate the relationship between neuronal activity and certain brain regions during an organism's behavior. Brain imaging techniques have shown revolutionary progress over the past century, offering highly efficient and reliable results in detecting the functions of different brain regions and identifying brain disorders or neurodevelopmental dysfunctions. While many methods exist that exceed the scope of this discussion, we will briefly touch on two of the most prominent techniques relevant to our field: functional magnetic resonance imaging (fMRI) and electroencephalography (EEG).



The first, fMRI, is used to examine how and when oxygen is delivered to different parts of the brain. The measurement is based on the principle that neurons drawing the most oxygen are the most active. This allows us to draw some parallels between the brain's regions and the behaviors, perceptions, or responses that emerge. Since its introduction, fMRI has been one of the most popular methods for brain imaging due to its relatively non-invasive nature. Particularly in recent years, its frequent use has significantly contributed to our rapidly expanding understanding of functional localization in the brain. In this context, fMRI has become a tool not only for uncovering the neural bases of pathological behaviors but also for revealing the neurological background of the key indicators that form thinking, memory, sensations, and even self-images. It has quickly become a central tool in brain studies, measuring how certain areas of the brain are activated when specific behaviors are requested (Logothetis, 2008).

EEG, on the other hand, is a technique used to measure the brain's electrical activity. It focuses on recording the electrical signals produced by neuronal firing in the brain. It provides a graphical representation of the voltage differences between two brain regions' functions recorded over a certain period. In EEG, electrodes are placed along the scalp to measure electrical activity, and low-voltage electrical functions are recorded. Since EEG allows for the direct measurement of brain activity, it enables researchers to record brain activations in one or more participants in response to specific stimuli or tasks at different times or simultaneously. It also helps identify which cortical regions are associated with the absence or presence of certain behaviors. In this respect, social psychologists prefer to use EEG to examine a range of social processes, such as person perception, emotional responses, and empathy (Luck, 2008).

One illustrative case comes from a study by Ito and Cacioppo (2000), in which participants were shown photographs of faces from different racial backgrounds while their brain activity was measured using EEG. The results revealed that event-related potentials (ERPs), specifically the P200 and N200 components[2], showed differential activation patterns depending on the perceived race of the face. These early neural responses indicated that racial categorization processes occur rapidly and automatically in the brain, often before conscious awareness. This study exemplifies how EEG can be used to uncover subtle, temporally precise neural mechanisms underlying social cognition. It also demonstrates the ethical and interpretative complexity of social neuroscience: the brain does not merely reflect our social world, it participates in constructing it.



While both techniques have their advantages and disadvantages, social researchers may choose to use them as auxiliary tools depending on their research goals; however, it should be noted that the data obtained are not definitive but serve as supplementary information to the research process.

### 2.4. The Use of Neuroscience Terms in Neurosociology

Disruptions in the neurological functions that guide social behavior can lead individuals to behave in ways that differ from their typical patterns. The sociological literature provides a wide scope for explaining the social causes of pathological social behavior. However, what is often overlooked is the fact that "abnormal" social behavior may also, in certain cases, be rooted in specific neurological factors. This raises an important question: If we accept that normal behavior is influenced by the proper functioning of biological systems, why do we not consider these biological foundations when explaining social behavior? At this point, it is important to first understand what constitutes "normal" behavior. According to neuroscientist Hanna Damasio (2005, p. 37), "normal social behavior" is typically considered behavior that conforms to a culture's social traditions, ethical rules, and laws. While social behavior is largely shaped by the social

[2] *P200 and N200* are early event-related potential (ERP) components observed in EEG studies. P200 reflects early perceptual attention, while N200 is associated with conflict detection and categorization processes (Luck, 2014).

environment and culture, it is also influenced by human biological and neuronal systems. Therefore, the presence of normal social behavior requires that certain biological systems function without disruption. Just as a social problem can turn someone into an emotionally and cognitively unstable individual, certain pathologies in the brain can render someone emotionally and cognitively unpredictable (Cacioppo & Berntson, 2005, p. 20).

### 2.4.1. Prefrontal Cortex

Neuroscience has conducted and continues to conduct studies on the connections between certain regions of the brain and social and emotional-cognitive behavior. Recent case studies have provided substantial evidence linking damage to specific brain regions with alterations in social behavior. Beyond the prefrontal cortex, damage to the cingulate gyrus and amygdala has also been shown to lead to social and cognitive impairments, particularly in social reasoning. The prefrontal cortex plays a critical role in mental synthesis, organizing thoughts into intentions, and creating mental representations essential for social interactions (Franks, 2019, p. 43-60). According to Damasio's (2021) research, thoughts and emotions are closely connected. Thus, emotions play a significant role in logical decision-making processes. In one study, it was found that individuals with damage to the ventromedial prefrontal lobe had no problems with intellectual abilities and could feel emotions like anger, yet they were unable to experience emotions connected to their social environment, such as shame or guilt. These are emotions that help humans, as social beings, maintain connections and communication with their surroundings, ensuring they are not ostracized by their social environment by allowing them to correct their mistakes.



In this sense, the expansion of this region of the human brain is largely responsible for reasoning, planning, and performing mental simulations of possible outcomes of actions. A healthy prefrontal cortex contributes to reasoning, memory, and cooperative abilities (Cacioppo & Berntson, 2005, p. 1). It is well known that damage to this region leads to significant behavioral issues, depending on the specific location of the damage, such as impairments in attention, reasoning, or mental planning. In other words, damage to this area can impair judgment, decision-making, and self-control, often leaving devastating effects on the affected individual's life[3]. Moreover, the lack of social interaction also leads to measurable changes and damage in the brain. For instance, research by Makino

[3] According to neuroscientist Antonio Damasio, after a railroad worker named Phineas Gage suffered an accident that caused damage to this region of his brain, he experienced no significant issues with his motor skills, yet he transformed into an almost completely "different" person. His character traits changed, and he began displaying behavior that was far outside of social norms. This case highlights that certain areas of the human brain are responsible for social faculties such as reasoning, empathy, and moral judgment. Through this example, Damasio emphasizes that brain damage does not always relate to motor skills; it can also cause damage that might be difficult to understand from an external perspective, suggesting that some of a person's behaviors may be beyond their control. While not all abnormal behavior can be explained by brain systems, Damasio points out that "specific social behavior disorders involving the violation of ethical norms can be linked to specific brain systems and explained by neurological dysfunction in the absence of causal sociocultural factors" (Damasio, 2005, p. 45).

(2012) showed that social isolation caused visible changes in the white matter of the prefrontal cortex and disrupted the normal development of glial cells.

In conclusion, the factors that make a person's behavior sociologically pathological are not limited to a bad social environment or learned poor values. The possibility that certain biological dysfunctions within an organism can disrupt the normal flow of social life provides a significant basis for why sociology should incorporate neuroscience. In particular, the examination of numerous cases documented in the literature and the development of discussions around the relationship between social behavior and the prefrontal cortex suggest that neurosociology can provide more productive research by establishing stronger foundations.

### 2.4.2. Mirror Neurons

Another significant concept in the field of neurosociology is mirror neurons, discovered by Rizzolatti and Sinigaglia. Franks (2014, p. 126) described the mirror neuron system as "one of the most intriguing findings for a neurosociologist." According to Ramachandran, mirror neurons not only play a role in understanding the actions of others but also facilitate imitation, language skills, social interactions, empathy, and even the formation of culture. He suggested that "what DNA did for biology, mirror neurons will do for sociology" (Ramachandran, 2009). These circuits are activated both when we perform an action and when we observe someone else performing the same action, allowing the observer to understand the nature of the action. Thus, mirror neuron activity offers a model that explains how behavior is constructed through interaction and engagement with others, via mutual observation.



## 3. Suggestions and Discussions

### 3.1. Neurosociology Research Areas

Neurosociology, as a nascent but rapidly evolving interdisciplinary field, examines the reciprocal relationships between neural activity and social processes. Its potential is especially significant in bridging the explanatory gaps between individual brain function and the complex structures of social life (Franks, 2010). In this section, the major areas of research within neurosociology are outlined, alongside relevant examples from the literature that illustrate how neuroscientific methods can be applied to classical and contemporary sociological questions.

**Social Interaction**: Understanding how the brain processes social interactions, group dynamics, and interpersonal bonds is central to neurosociological inquiry. Studies using EEG and fMRI have revealed that neural synchrony occurs during joint attention and cooperative tasks (Dikker et al., 2017), suggesting that the brain is neurologically attuned to social environments. Moreover, research on mirror neurons supports the idea that humans are neurologically predisposed to understand and simulate the actions and emotions of others (Rizzolatti & Sinigaglia, 2010).

**Social Structure and Thought**: Neurosociology also addresses how cultural frameworks and societal structures influence neural development and cognition. For instance, Kitayama and Park (2010) demonstrate that individuals from collectivist and individualist cultures exhibit different patterns of brain activation during self-reflection tasks, indicating that social context shapes not only behavior but the neural representation of the self.

**Social Ethics**: The neural basis of ethical behavior, prosociality, and social justice is another key area. fMRI studies show that moral decision-making activates brain areas associated with both cognitive control and affective processing, including the prefrontal cortex and amygdala (Greene et al., 2001). Such findings provide insight into how neurological mechanisms underlie complex social behaviors like empathy, fairness, and altruism.

**Emotional and Social Functions**: Neurosociology investigates how emotional responses are neurologically encoded and socially modulated. For example, studies have shown that the anterior insula and orbitofrontal cortex are implicated in processing emotional stimuli and regulating social emotions such as guilt and shame, which are deeply embedded in social norms (Immordino-Yang & Damasio, 2007).

**Decision-Making Processes**: Decision-making is shaped not only by rational choice but by social inputs and emotional feedback. Neuroscientific studies utilizing tasks like the Iowa Gambling Task or the Ultimatum Game reveal how social context influences the activation of reward-related brain regions (Sanfey et al., 2003, p. 1756), showing that decisions involving risk, punishment, or cooperation are inherently social and emotional in nature.



**Education and Learning**: The application of neurosociological insights to education is an emerging domain. Research has demonstrated that learning is enhanced when it occurs in socially enriched environments, with brain imaging showing increased activity in memory-related regions during collaborative learning tasks (Lieberman, 2013). Understanding how attention, motivation, and memory function within social learning settings can help design more effective pedagogical strategies.

**Collaboration and Empathy**: Collaborative behavior and empathy are essential for social cohesion and are mediated by specific neural networks. For instance, the activation of the medial prefrontal cortex and the temporoparietal junction has been consistently associated with empathic concern and perspective-taking (Decety & Lamm, 2006).

**Group Dynamics and Social Interactions**: Neurosociological research on group behavior investigates how leadership, hierarchy, and group affiliation modulate brain activity. Functional neuroimaging has revealed that group membership can bias the activation of regions associated with reward and threat processing, suggesting that social identity shapes neural responses (Cikara & Van Bavel, 2014).

**Social Categorization and Prejudice**: Implicit biases and stereotyping can also be examined through a neurosociological lens. EEG and fMRI studies have shown that exposure to socially salient cues, such as race or status, elicits rapid neural responses in the amygdala and fusiform gyrus, indicating that social categorization is an automatic and neurologically grounded process (Kubota et al., 2012, p. 942).

Overall, these examples demonstrate that neurosociology is not simply an abstract theoretical endeavor but a methodologically grounded research program that employs tools from neuroscience to enrich and sometimes challenge traditional sociological assumptions. Future research can benefit from more interdisciplinary collaboration, increased methodological rigor, and critical reflection on the ethical implications of integrating brain-based data into the study of society.

### 3.2. Possible Methodological Approaches for Neurosociology

In order to advance neurosociological research, it is essential to identify and apply appropriate research methodologies that reflect the interdisciplinary nature of the field. Neurosociology requires a delicate integration of both sociological and neuroscientific techniques to investigate the interplay between brain processes and social behavior. The following section outlines methodological approaches that can be effectively employed in neurosociological studies, aiming to guide researchers in selecting appropriate tools for exploring the biological underpinnings of social phenomena.



**Mixed Methods**: Since neurosociology addresses both neurological and sociological dimensions, a mixed methods approach is especially suitable for integrating the methodological frameworks of these two disciplines. Mixed methods combine quantitative and qualitative data collection and analysis techniques. Quantitative components could include neurological measurements such as brain imaging techniques (fMRI, EEG) and neuropsychological tests. For example, fMRI data could be collected to examine how specific social behaviors are reflected in brain activity (Lieberman, 2007). The qualitative component could involve gathering data on individuals' social behaviors through in-depth interviews, focus groups, or ethnographic observations. This approach provides a holistic understanding of the subjective social experience and its neurological correlates.

**Experimental Method**: Experimental designs enable researchers to investigate causal relationships between social stimuli and brain responses. Participants are given specific social tasks while their brain activities are measured using techniques such as EEG or fMRI. This method is particularly effective in isolating the neurological effects of targeted social interactions. For instance, Eisenberger et al. (2003) demonstrated that experiencing social rejection activates the anterior cingulate cortex, a brain region associated with physical pain.

**Literature Review and Meta-Analysis**: Systematically reviewing existing neurosociological literature is crucial for synthesizing current knowledge and

identifying research gaps. Meta-analysis allows for drawing generalizable conclusions by combining data from multiple studies. For example, a meta-analysis might assess how consistent the activation of the reward system is in response to prosocial behaviors across various studies (Schurz et al., 2021).

**Case Study**: The case study method allows for an in-depth exploration of specific individuals or groups, offering rich qualitative and neurological data. This is particularly useful when studying unique populations or rare social phenomena. For example, a case study could explore how prolonged social isolation impacts the structural connectivity of the prefrontal cortex.

**Cross-Sectional Study**: Cross-sectional designs are useful for comparing different demographic groups at a single point in time to assess how neural mechanisms vary across social categories. For instance, researchers could examine how adolescents and older adults differ in their neural responses to social inclusion or exclusion (Blakemore & Mills, 2014).

**Longitudinal Study**: Longitudinal methods enable researchers to observe how neural and social changes co-evolve over time. This is valuable for understanding the developmental trajectory of social cognition or the long-term neurological effects of early social experiences. For example, longitudinal research could track how adverse childhood experiences influence brain development and social functioning in adulthood.



**Contextual Analysis**: Contextual analysis focuses on how socio-cultural settings influence neurological processes. This method emphasizes ecological validity by interpreting neural data within the context of lived social environments. Cultural neuroscience, for example, has shown that brain regions associated with self-construal are activated differently in individualistic versus collectivistic societies (Kitayama & Uskul, 2011).

These methodological approaches demonstrate the richness and versatility of neurosociological inquiry. Choosing an appropriate method depends on the research question, population of interest, and the theoretical orientation of the study. Employing such methods allows for a more comprehensive and interdisciplinary understanding of the social brain.

## Conclusion

Neurosociology, as a field that strengthens the bridges between social sciences and neuroscience, helps us understand the biological processes underlying social behaviors (Franks & Turner, 2013, p. 4). According to Franks (2010, p. 127), neurosociology, with its non-reductionist biological approach, expands the core understanding of sociology by adding a significant dimension to the discipline.

Neuroscience not only advances sociological theory but also provides new perspectives on enduring sociological issues, leading to more accurate predictions and the creation of more robust theoretical models. By integrating sociological and neuroscientific approaches, we can enrich the broader understanding of human

behavior. As increasingly detailed neurosociological explanations of behavior and social organization emerge, the discipline's connection to practical applications is likely to strengthen. As Durkheim (2017, p. 85) aptly questioned, "*What is the use of acquiring knowledge of reality if it cannot serve our lives?*" In this era of integrated sciences, the objective should be to close the gap between fundamental and applied sciences by translating scientific discoveries into practical interventions that enhance human well-being (Kalkhoff et. al., 2016, p. 250).

Social cognition and interaction are complex phenomena that should be analyzed from multiple levels of reality. As neuroscience continues to reshape our understanding of human behavior by offering fresh insights and explanations on topics such as sociality, agency, emotion, addiction, desire, and the distinctions between normal and abnormal behavior, it creates greater opportunities for meaningful collaboration between sociology and neuroscience (William, 2010, p. 530). Neurosociologists, therefore, must integrate these emerging neuroscientific findings with their deep sociological expertise, using this data not only to describe but also to explain social behaviors (Abend, 2018, p. 89).

Neurosociology offers significant potential for enriching social theories and generating novel theoretical frameworks. The integration of data and methodologies from both neuroscience and sociology presents numerous opportunities for advancing research on human behavior and social life. Scheve (2003, p. 269) suggests that one way to strengthen the connection between these disciplines is by adopting a more collaborative approach toward the brain sciences, while maintaining the traditional critical stance of sociology. Equally important is the necessity of making neuroscientific tools more accessible to sociologists. A promising strategy for achieving this could be the formation of interdisciplinary teams that bring together scholars from diverse fields to enhance collaboration.



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**GENİŞLETİLMİŞ ÖZET:** Nörososyoloji, sinirbilim ve sosyal bilimlerin kesişiminde yer alan disiplinlerarası bir alan olarak, birey davranışlarının biyolojik kökenlerini ve bunların sosyal etkileşimlerle olan karmaşık ilişkilerini incelemeyi amaçlar. Bu alan, yerleşik sosyolojik geleneklerin yerine geçmeyi değil, aksine bu gelenekleri güçlendirmeyi ve onlardan ilham almayı hedefleyen bütüncül bir yaklaşım sunar. Beyin ve sinir sisteminin sosyal etkileşimler, duygusal tepkiler, karar verme süreçleri ve diğer bilişsel işlevlerle nasıl ilişkili olduğunu araştırırken, insan davranışlarının biyolojik, nörolojik ve sosyal faktörlerin karmaşıklığı içerisinde anlamlandırılmasını sağlar. Nörososyolojinin ortaya çıkışı, 1990'lı

yıllarda "Beyin Onyılı" döneminde sinirbilimde yaşanan büyük gelişmelerle yakından ilgilidir. Sosyal sinirbilim, bireysel psikolojik süreçlere odaklanırken, nörososyoloji bireyler arası sosyal ilişkileri ve bu ilişkilerin toplumsal yapılarla olan etkisini inceler. Bu çalışmalardan elde edilen bulgular, çevresel faktörlerin beyin yapısı ve fonksiyonlarını şekillendirebildiğini ortaya koymuş, bu da nörososyoloji alanının önünü açmıştır. Sosyoloji, toplumu ve sosyal olguları incelerken, bireyi ve bireyin dış dünyayla bağlarını genellikle ihmal etmiştir. Sinirbilim ise bireyin sinir sistemi, beyin yapısı ve fonksiyonlarına odaklanmış bir bilim dalıdır. Günümüzde bu iki alanın arasındaki farklılıklar azalmaktadır; özellikle beyin yapılarının sosyal davranışlarla olan ilişkisini ortaya koyan çalışmalar bu konuda büyük ilerleme sağlamıştır. Bu iki alanın birbirini desteklemesi gerektiği düşüncesi, özellikle Douglas Massey gibi sosyologların nörobilimi sosyoloji için bir olanak olarak görmesiyle daha da güçlenmiştir. Sosyolojinin kurucularından Emile Durkheim, Auguste Comte ve Karl Marx gibi düşünürler, toplumu bireylerin toplamından daha fazlası olarak görümüşler ve biyolojik temelli yaklaşımları eleştirmişlerdir. Ancak, Herbert Spencer, Gabriel Tarde ve Georg Simmel gibi düşünürler bireyin iç dünyasına ve bireyler arası etkileşimlere odaklanarak biyolojik ve sosyal unsurların birbirinden ayrılamaz olduğunu savunmuşlardır. "Nörososyoloji" terimi ilk kez Warren TenHouten tarafından ortaya atılmış ve 1973 yılında Kaplan ile birlikte bu alanda öncü bir çalışma yayımlanmıştır. TenHouten'a göre, nörososyolojik analizler bireylerin beyin fonksiyonlarını ve zihinsel yaşamlarını toplumsal bir gerçeklik olarak ele alır. Bu yaklaşım biyolojik indirgemeciliğe karşı durur ve sosyal davranışı sadece genetik dizaynın bir sonucu olarak görmez. Aksine, beyin yapısının sosyal şartlara göre şekillendiğini ve düşüncenin sosyal olarak üretildiğini savunur. Nörososyoloji, sosyal bilimler ve sinirbilim arasındaki köprüler aracılığıyla, sosyal davranışların biyolojik temellerini anlamamızı sağlar. Bu disiplin, sadece teorik bilgi birikimini zenginleştirmekle kalmaz, aynı zamanda uygulamalı çalışmalar için de çok önemli bir temel oluşturur. Özellikle beyin görüntüleme teknikleri, bireylerin sosyal deneyimlerinin nörolojik temelini anlamada kritik bir rol oynar. Son yıllarda, nörososyoloji, sosyal etkileşimler, duygusal fonksiyonlar, karar verme mekanizmaları ve ahlaki kararlar gibi alanlarda önemli bulgular sunmuş ve bu bilgiler sosyal teorilerin yeniden şekillendirilmesine katkıda bulunmuştur. Örneğin, bireylerin sosyal kimliklerinin doğrulanması sonrasında yaşadıkları olumlu duyguların, beynin ödül sistemlerinde nasıl işlendiğini göstermek için fMRI gibi teknikler kullanılmıştır. Beynin sosyal bağları ve grup dinamiklerini işlerken, bu deneyimleri dönüştürebilecek yapısal özelliklere sahip olduğu ortaya konmuştur. Sosyal izolasyonun beyinde nasıl kalıcı etkiler bıraktığı, prefrontal korteks ve sinirsel plastisite gibi konular da bu alanda derinlemesine incelenmektedir. Nörososyoloji, ayrıca grup dinamikleri, empati, çatışma çözümü ve liderlik davranışlarının biyolojik temelleri gibi daha spesifik konuları da ele almaktadır. Bu alan, bireysel ve toplumsal seviyelerdeki davranışların nörolojik kökenlerine dair derinlemesine analizler sunarak, sosyal bilimlerde yeni teorik yaklaşımların ortaya çıkmasına olanak tanır. Disiplinlerarası yaklaşımların artışıyla birlikte, nörososyolojinin gelecekte daha fazla akademik ve pratik katkı sağlaması beklenmektedir. Sosyologların, sinirbilimin sunduğu fırsatları kullanarak sosyal teorilere yeni bir boyut kazandırması, toplumsal meselelerin daha derinlemesine anlaşılması için kritik bir öneme sahiptir. Sosyal teorilerde nörolojik unsurların ele alınması, empati, önyargıların azaltılması ve daha kapsayıcı bir toplumsal yapının oluşturulması gibi konulara önemli katkılar sağlayabilir. Bunun yanı sıra, nörososyoloji, eğitim alanında da yeni perspektifler sunmaktadır. Beynin öğrenme süreçlerindeki rolü ve sosyal etkileşimlerin bu süreçlere etkisi üzerine yapılan araştırmalar, daha etkili eğitim metotlarının geliştirilmesine olanak tanır. Farklı sosyo-kültürel bağlamlarda bireylerin öğrenme becerilerinin nasıl farklılaştığı, grup içi öğrenme dinamiklerinin beynin hangi bölgelerini etkilediği gibi sorular, nörososyolojinin çözüm aradığı önemli meseleler arasındadır. Son olarak, nörososyoloji sağlık bilimlerinde de katkıda bulunabilir. Sosyal bağların ve toplumsal desteğin bireylerin zihinsel sağlığı üzerindeki etkileri konusunda yapılan araştırmalar, depresyon, anksiyete gibi rahatsızlıkların tedavisinde yeni yaklaşımların geliştirilmesine yol açabilir. Beynin duygusal bölgelerinde sosyal destekle meydana gelen değişikliklerin incelenmesi, bireylerin toplumsal yaşamla olan bağlarının güçlendirilmesine dair yeni stratejiler sunabilir. Bu bağlamda, nörososyoloji hem akademik hem de toplumsal pratiklerde devrim yaratabilecek

bir alan olarak öne çıkmaktadır. Gelecekte, disiplinlerarası iş birliğinin artmasıyla bu alanın etkisinin daha da genişlemesi beklenmektedir. Nörososyolojinin sunduğu bilgiler, insan davranışlarının biyolojik ve toplumsal boyutlarının daha iyi anlaşılmasına, toplumsal sorunlara daha etkili çözümler geliştirilmesine katkı sağlayabilir. Nörososyoloji ayrıca teknoloji ve yapay zekâ alanlarında da yeni ufuklar açabilir. Özellikle yapay zekânın toplumsal etkileri ve insana benzer sosyal davranışların modellenmesi gibi alanlarda nörososyolojinin sunabileceği katkılar ile disiplinin gelecekteki öneminin daha da artması beklenmektedir.

**Extended Abstract:** Neurosociology, as an interdisciplinary field at the intersection of neuroscience and social sciences, aims to examine the biological origins of individual behaviors and their complex relationships with social interactions. This field offers a holistic approach that seeks not to replace established sociological traditions but to strengthen and draw inspiration from them. It investigates how the brain and nervous system are related to social interactions, emotional responses, decision-making processes, and other cognitive functions, providing an understanding of human behaviors within the complexity of biological, neurological, and social factors. The emergence of neurosociology is closely linked to the significant developments in neuroscience during the "Decade of the Brain" in the 1990s. While social neuroscience focuses on individual psychological processes, neurosociology explores interpersonal social relationships and their impacts on societal structures. Findings from these studies have revealed that environmental factors can shape brain structures and functions, paving the way for the advancement of neurosociology. Sociology, while studying society and social phenomena, has often neglected the individual and their connections with the external world. Neuroscience, on the other hand, focuses on the nervous system, brain structures, and their functions. Today, the differences between these two fields are diminishing, particularly due to groundbreaking research that highlights the relationship between brain structures and social behaviors. The idea that these two disciplines should complement each other has been further strengthened by sociologists such as Douglas Massey, who view neuroscience as an opportunity for sociology. Founders of sociology, including Emile Durkheim, Auguste Comte, and Karl Marx, considered society to be more than the sum of its parts and criticized biologically based approaches. However, thinkers like Herbert Spencer, Gabriel Tarde, and Georg Simmel emphasized the individual's inner world and interpersonal interactions, asserting that biological and social elements are inseparable. The term "neurosociology" was first introduced by Warren TenHouten, who, along with Kaplan, published pioneering research in 1973. According to TenHouten, neurosociological analyses consider brain functions and mental lives as societal realities. This approach opposes biological reductionism, arguing instead that brain structures are shaped by social conditions and that thought is socially produced. Neurosociology bridges the gap between social sciences and neuroscience, offering a deeper understanding of the biological foundations of social behaviors. This discipline not only enriches theoretical knowledge but also provides a critical foundation for applied research. Techniques such as brain imaging, including fMRI, play a crucial role in understanding the neurological underpinnings of social experiences. In recent years, neurosociology has made significant contributions to areas such as social interactions, emotional functions, decision-making mechanisms, and moral judgments. For instance, fMRI has been used to show how positive emotions experienced during social identity validation are processed in the brain's reward systems. Research also highlights the brain's structural capacity to transform social bonds and group dynamics. The lasting effects of social isolation on the brain, including changes in the prefrontal cortex and neural plasticity, are also subjects of in-depth exploration in this field. Neurosociology additionally addresses more specific topics such as group dynamics, empathy, conflict resolution, and the biological foundations of leadership behaviors. By offering profound analyses of the neurological roots of individual and societal behaviors, neurosociology facilitates the development of new theoretical approaches in social sciences. As interdisciplinary approaches increase, neurosociology is expected to make greater academic and practical contributions in the future. Incorporating neuroscience into social theories provides sociologists with new dimensions, which are critical for addressing societal issues more

comprehensively. Considering neurological factors in social theories can significantly contribute to fostering empathy, reducing biases, and creating a more inclusive societal structure. Moreover, neurosociology introduces fresh perspectives in education. Studies on the role of the brain in learning processes and the effects of social interactions on these processes enable the development of more effective educational methods. Questions such as how learning abilities differ across various socio-cultural contexts or which brain regions are activated by group learning dynamics are among the key issues neurosociology seeks to address. Finally, neurosociology can also contribute to health sciences. Research into how social bonds and societal support impact mental health offers new strategies for addressing conditions such as depression and anxiety. By investigating the changes in the brain's emotional regions caused by social support, neurosociology can propose strategies to strengthen individuals' connections to social life. In this context, neurosociology emerges as a transformative field in both academic and societal practices. With increased interdisciplinary collaboration, this field's influence is expected to grow even further in the future. Neurosociology provides valuable insights into the biological and societal dimensions of human behaviors, contributing to more effective solutions for social problems. Additionally, neurosociology opens new horizons in technology and artificial intelligence. Its contributions to areas such as modeling human-like social behaviors and understanding the societal impacts of artificial intelligence underscore the growing importance of this discipline.