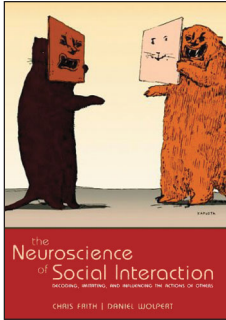


## Interacting social minds



### The Neuroscience of Social Interaction: Decoding, Influencing, and Imitating the Actions of Others

by Chris Frith and Daniel Wolpert

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Reviewed by Elizabeth A Phelps

The new discipline of social neuroscience (or social cognitive neuroscience, depending on who you ask) is the result of recent interest in the neuroscience of social behavior. Like the early days of cognitive neuroscience, however, a large body of research fits into this domain, even though there is as yet no journal, society or annual meeting devoted to the topic. Investigators conducting research on the neuroscience of social behavior have primary interests in neuroscience, cognitive neuroscience or social psychology. These different backgrounds yield slightly different approaches to this emerging field.

*The Neuroscience of Social Interaction: Decoding, Influencing, and Imitating the Actions of Others* explores a slice of the field that reflects the expertise of the editors—Chris Frith, who has broad interests in the neuroscience of higher cognitive functions, and Daniel Wolpert, who trained in physiology and combines psychophysics, computer simulations and neuroimaging to examine motor behavior. Rather than broadly exploring social neuroscience, the authors focus on two-person interactions and the importance of nonverbal social cues. This may seem a narrow discussion to the nonspecialist, but as this book nicely illustrates, the perception and interpretation of nonverbal cues is a fundamental, early component of most social interactions.

The book's three sections are each devoted to a stage of two-person social interaction. The first section focuses on how an observer decodes social signals in another individual and explores both the perception of biological motion and the development of mentalizing abilities, or theory of mind. This is followed by an examination of the imitation of perceived actions, with an emphasis on the role of mirror neurons, which respond to the action of another as if the action were performed by the observer. The final section examines how an observer's perception, interpretation and imitation of nonverbal social signals lead to a reaction in the person being observed, thus completing the nonverbal social interaction. Disorders of social interaction (such as autism) and mathematical and computational approaches to characterizing social dynamics are highlighted.

In each section, the authors emphasize three approaches to understanding social interaction. Some chapters focus on the neuroscience lit-

erature, such as the first chapter (by Puce and Perrett), which reviews human and nonhuman primate research on the neural representation of movement in faces and bodies. Other chapters provide a developmental perspective, with some examining abilities in infants or across species, and others emphasizing changes in social aptitude over time. Finally, each section has at least one chapter providing a mathematical or computational perspective on the characterization of social interactions.

This book will especially please researchers interested in the development of social interaction, because Frith and Wolpert clearly believe that an understanding of nonverbal social interactions cannot be obtained without exploring how these interactions develop, both across the lifespan and through evolution. Over half of the chapters emphasize a developmental or cross-species comparison approach to understanding nonverbal social interactions. Understandably, given how difficult it is to study the brain in developing humans, some of these chapters do not integrate data from neuroscience. However, a few of the human development chapters (such as those by Frith and Frith and by Meltzoff and Decety) manage to combine developmental data with brain imaging in adults, providing excellent examples of the power of combining developmental and neuroscience perspectives in attempts to understand human social behavior.

The chapters that emphasize mathematical or computational approaches mostly fail to incorporate neuroscience in any significant way. (The chapter by Wolpert and colleagues is an exception.) Although these chapters provide valuable insight into attempts to precisely characterize relatively simple, nonverbal social interaction, and the difficulties of such attempts, it would have been helpful to know how this approach could be integrated with the neuroscientific and developmental data presented in the rest of the book. Maybe this is an unrealistically high bar to raise for an edited volume on two-person social interactions, however. This volume is not unusual in failing to integrate computational and mathematical models with other approaches or to form links across different chapters.

With their book, Frith and Wolpert have made an important contribution to the nascent field of social neuroscience by precisely defining a specific subtopic and emphasizing different perspectives. However, the volume lacks insight from social psychology, with only the chapter from Griffen and Gonzalez highlighting the social psychology literature. Consistent with their interests, Frith and Wolpert chose to emphasize comparative, developmental and computational research on the neuroscience of social interaction. Previous efforts to organize volumes and meetings on social neuroscience, mostly instigated by social psychologists, have included social psychology but have not always highlighted developmental or computational approaches. Although I would not have chosen to eliminate these unique perspectives in favor of social psychological research, this book reminded me of how far apart the different approaches to social neuroscience still are.

A decade from now there will most likely be a journal, society and annual meeting devoted to social neuroscience, but it is still unclear how all of the research relevant to this topic will combine to form this new discipline. Organizing the extant literature on the neuroscience of social behavior, as this volume has done, will help shape the growth of this emerging field. ■

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