

An Introduction to the Event-Related Potential Technique

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Preface

The event-related potential (ERP) technique has been around for decades, but it still seems to be growing in popularity. In the 1960s and 1970s, most ERP researchers were trained in neuroscience-oriented laboratories with a long history of human and animal electrophysiological research. With the rise of cognitive neuroscience and the decline of computer prices in the 1980s, however, many people with no previous experience in electrophysiology began setting up their own ERP labs. This was an important trend, because these researchers brought considerable expertise from other areas of science and began applying ERPs to a broader range of issues. However, they did not benefit from the decades of experience that had accumulated in the long-standing electrophysiology laboratories. In addition, many standard ERP techniques are often taken for granted because they were worked out in the 1960s and 1970s, so new ERP researchers often do not learn the reasons why a given method is used (e.g., why we use tin or silver/silver-chloride electrodes).

I was fortunate to be trained in Steve Hillyard's lab at University of California, San Diego, which has a tradition of human electrophysiological research that goes back to some of the first human ERP recordings. My goal in writing this book was to summarize the accumulated body of ERP theory and practice that permeated the Hillyard lab, along with a few ideas of my own, so that this information would be widely accessible to beginning and intermediate ERP researchers.

The book provides detailed, practical advice about how to design, conduct, and interpret ERP experiments, along with the reasons why things should be done in a particular way. I did not

attempt to provide comprehensive coverage of every possible way of recording and analyzing ERPs, because that would be too much for a beginning or intermediate researcher to digest. Instead, I've tried to provide a detailed treatment of the most basic techniques. I also tried to make the book useful for researchers who do not plan to conduct their own ERP studies, but who want to be able to understand and evaluate published or submitted ERP experiments. The book is aimed at cognitive neuroscientists, but it should also be useful for researchers in related fields, such as affective neuroscience and experimental psychopathology.