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Preface

The study of communication is characterized by its multilevel interdisciplinary character. Historically, people have approached the field from many disparate directions. This peculiar variability is exemplified by Wilbur Schramm's (1959) famous description of the field as "one of the greatest crossroads where many pass but few tarry" (p. 8). Those who stopped, however briefly, asked questions that were related to the goals of their own particular approaches.

The political scientists asked how communication affected political behavior at an individual and at a societal level. The psychologists asked how communication affected individuals or small groups. The sociologists asked how communication affected organizations and societies. The result was that communication became what Paisley (1984) referred to as a "variable field," one in which the level of analysis varies.

This has had important ramifications for the study of communication because, to some extent, the questions one asks are determined by the methods one has available to answer them. Those who came to communication from different disciplines brought the tools of their particular trade with them. As a result, communication research is characterized by the plethora of methodological approaches used by its practitioners. Among these are both qualitative and quantitative approaches including survey methods, experimental methods, content analysis, historical analysis, and rhetorical analysis.

Initially, these methods were used to investigate questions that were related to the fields from which they were borrowed. But, over time, these various methodologies have been used to investigate questions from other fields. As new methods are used to ask old questions, they both add information to what is already known and change the very nature of the question being asked.

Communication research today continues to investigate questions about communication using theories and methods imported from related disciplines. Of growing importance is a branch of communication theory that is built on the foundation of cognitive psychology and information processing. This branch of communication research attempts to relate what is known about how the human brain processes information to the study of communication.

This branch of communication studies the production and effects of communication messages at the individual level. Questions revolve around how different media and messages affect the individual's ability to perceive, attend to, work on, store, and retrieve their contents. A problem for the communication researcher interested in these sorts of questions is how to answer questions about what is happening inside the "black box." How can we investigate questions about how people process messages if the answers are not available through introspection? If we are going to ask questions about what happens to a message inside the black box, we must have tools to help us measure the flow of communication through it.

A variety of tools have been developed in cognitive psychology and psychophysiology that attempt to measure "thinking" without asking people how they do it. This book is devoted to exploring how these methods might be used to further knowledge about the process of communication. The methods chosen have all been used extensively in cognitive and experimental psychology. Each chapter in this book is designed to describe the history of the method being introduced, the theory behind it, how to go about using it, and how it has already been used to study some area of communication.

The methods introduced here vary widely in terms of the amount of equipment and training needed to use them. Some require only some theoretical knowledge and a paper and pencil; others require more elaborate hardware and software for implementation. These methods also vary widely in terms of what sorts of variables they can be used to measure. Some of them adapt quite readily to traditional communication variables like persuasion, attitude change, and knowledge; others are more applicable to process-type variables such as attention, arousal, involvement, encoding, and retrieval.

All of these methods will not be useful for all questions. Many of them, however, may be applicable to any given question, and by using multiple methodologies, the richness of the answers, and as a result, of communication theory, are sure to be enhanced.

The first two methods introduced are attempts at improving self-report as a measure of how people think. They are both attempts at measuring changes in people's thought processes that are associated with communication.

The first method, think-aloud and thought-list procedures in investigating mental processes, introduced by Shapiro, is a low-tech entree into mental processes. It uses paper-and-pencil measures in specific ways designed to uncover clues about how people think.

Similarly, chapter 2, by Biocca, David, and West, is a comprehensive histori-

cal and methodological treatment of computerized on-line, self-report measurement. Continuous response measurement (CRM) is defined as any type of measurement where a subject continuously introspects and reports on some aspect of their cognitive processing in response to a message. The data generated represents the moment-to-moment changes in a subject's thought processes, often time linked with a media message.

The question of how to measure people's attention to messages is considered in the next three chapters. In chapter 3, Thorson discusses eyes-on-screen (EOS) as a measure of television viewer's attention. The concept of moment-to-moment visual attention and the problems associated with separating "visual" and "audio" attention are dealt with.

Secondary reaction-time measures are the subject of chapter 4. Basil briefly outlines capacity theories of attention and introduces the major measure of resource allocation, secondary-task reaction time.

In chapter 5, Lang discusses the use of phasic and tonic EKG and heart rate to investigate on-line changes in attention and effort. This chapter focuses on how different analysis strategies yield different measures of cognitive processing. It also discusses the use of EKG as it has more commonly been used (i.e., as a measure of arousal).

In chapter 6, Hopkins and Fletcher continue the discussion of the measurement of arousal in a chapter on the use of electrodermal responses to communication. This chapter focuses on the use of skin conductance to assess the effectiveness of advertising.

Chapters 7 and 8 describe two different ways of refining measurement for what people remember as a result of communication. Chapter 7, by Shapiro, introduces the concepts of memory sensitivity and decision criterion levels as indicators of what viewers remember from messages and how well they remember it.

Chapter 8, by Cameron and Frieske, introduces the use of reaction time to measure how quickly people respond to questions about memory. This chapter describes the dual uses of this measure: first, its ability to test models of how people store information, and second, its use to measure the effects on information storage of different types of messages.

The next two chapters deal with the twin questions of how to design experiments that use these types of on-line, repeated measures and how to analyze time-sequenced data. Chapter 9, by Reeves and Geiger, is a comprehensive and thoughtful treatment of the differences between within- and between-subjects experimental design in terms of error variance, power, and the practicalities of the research situation.

In chapter 10, Watt explains the different types of patterns and effects that can be analyzed using time-series analysis. An extended example showing how different time-related patterns are present in, and can be extracted from, the same data is given.

Finally, chapter 11, by Lorch, discusses how all of these measures can be or

have been applied to children. She discusses the difficulties of using children as a subject population and how measures need to be adapted for use with children.

Chapter 12 is a discussion of how to go about setting up a place to use these measures. Most of them require some type of laboratory setting. The problems and requirements associated with establishing a laboratory for measuring psychological responses to communication are introduced.

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