

MEASUREMENT  
OF CONSUMER INTEREST

# CONFERENCE ON EXPERIMENTAL METHOD

*Sponsored by the*

UNIVERSITY OF PENNSYLVANIA

*May 1946*

## PARTICIPANTS

Paul H. Musser  
Alfred Politz  
Archibald M. Crossley  
Malcolm G. Preston  
A. B. Blankenship  
J. R. Doubman  
J. Stevens Stock  
Estelle Ellis  
J. Parker Bursk  
L. L. Thurstone  
Francis W. Irwin  
Louis Guttman  
Colston E. Warne  
John S. Adams, Jr.  
Edgar A. Singer, Jr.  
W. Edwards Deming  
C. West Churchman  
A. G. Ashcroft  
S. S. Wilks  
Paul Peach  
Ralph F. Breyer  
J. H. Curtiss  
D. H. Palmer  
Morris Hansen  
Samuel G. Barton  
A. N. Watson  
Russell L. Ackoff  
Morris S. Viteles  
Dorwin Cartwright

# MEASUREMENT OF CONSUMER INTEREST

*Edited by*

C. WEST CHURCHMAN

RUSSELL L. ACKOFF

MURRAY WAX

---

*Philadelphia*

UNIVERSITY OF PENNSYLVANIA PRESS

LONDON: GEOFFREY CUMBERLEGE

OXFORD UNIVERSITY PRESS

1947

*Copyright 1947*

UNIVERSITY OF PENNSYLVANIA PRESS

*Manufactured in the United States of America*

# CONTENTS

---

INTRODUCTION: C. West Churchman; Russell L. Ackoff; Murray Wax, <i>Editors</i>	1
ADDRESS OF WELCOME: Paul H. Musser	8
PROBLEMS IN PRACTICE: Alfred Politz, <i>Chairman</i>	10
EXAGGERATED RESPONSES IN POLLING: Archibald M. Crossley	11
PREFERENCE AND PERFORMANCE: Malcolm G. Preston	13
THE RESEARCH CLIENT AS A PROBLEM; A. B. Blankenship	16
AN EXPERIENCE IN CONSUMER EDUCATION: J. R. Doubman	20
THE PROBLEM OF CALL-BACKS: J. Stevens Stock	22
THE RESEARCHER AS A PROBLEM: Estelle Ellis	25
DISCUSSION	28
WAYS OF EVALUATING PREFERENCES: J. Parker Bursk, <i>Chairman</i>	39
THE PREDICTION OF CHOICE: L. L. Thurstone	39
SOME SITUATIONAL EFFECTS UPON PREFERENCES: Francis W. Irwin	55
THE CORNELL TECHNIQUE FOR SCALE AND INTENSITY ANALYSIS: Louis Guttman	60
THE MEANING OF CONSUMER INTEREST: Colston E. Warne. ( <i>Banquet Address</i> )	85
THE MEANING OF MEASUREMENT: John S. Adams, Jr., <i>Chairman</i>	92
ISOLATION OR COÖPERATION: Edgar A. Singer, Jr.	92
SOME CRITERIA FOR JUDGING THE QUALITY OF SURVEYS: W. Edwards Deming	106
THE CONSUMER AND HIS INTERESTS: C. West Churchman	122
SPECIFICATIONS FOR CONSUMERS' GOODS: A. G. Ashcroft, <i>Chairman</i>	133
RESEARCH ON CONSUMER PRODUCTS AS A COUNTERPART OF WARTIME RESEARCH: S. S. Wilks	135

LABORATORY TESTING AND ACTUAL QUALITY IN THE CONSUMER GOODS FIELD: Paul Peach	138
QUESTIONS ON SPECIFICATIONS FOR CONSUMERS' GOODS FROM THE POINT OF VIEW OF MARKETING: Ralph F. Breyer	142
THE GOVERNMENT'S USE OF SPECIFICATIONS FOR CONSUMERS' GOODS: J. H. Curtiss	146
THE NEED OF INSTITUTIONAL BUYERS IN RELATION TO THE PROBLEM OF CONSUMER WANTS: D. H. Palmer	149
DISCUSSION	152
 SAMPLING TECHNIQUES: Morris Hansen, <i>Chairman</i>	 155
CONSUMER PANELS: Samuel G. Barton	155
WHAT'S AHEAD IN STATISTICAL SAMPLING AS APPLIED TO MARKET RESEARCH: A. N. Watson	163
RANDOM SAMPLES AND BIASED SAMPLES: W. Edwards Deming	167
DISCUSSION	170
 APPLICATION OF MEASUREMENT OF ATTITUDES: Russell L. Ackoff, <i>Chairman</i>	 177
THE MEASUREMENT OF EMPLOYEE ATTITUDES: Morris S. Viteles	177
SURVEYS OF THE WAR FINANCE PROGRAM: Dorwin Cartwright	198
 INDEX	 211

# INTRODUCTION

---

By

C. WEST CHURCHMAN

RUSSELL L. ACKOFF

MURRAY WAX

*Department of Philosophy, University of Pennsylvania*

THAT modern science is facing a crisis in methodology, no serious student can deny. We are passing beyond the age of the nineteenth-century giants, whose contributions in the main were ascribable to the individual genius. Most of the problems of present experimental science cannot be handled adequately by one man, or within one field.

To consider but a few examples. There was a time when the experimental physicist could ignore the contribution of the psychological characteristics of the observer to his final results. He felt that he could set up experimental operations which could be performed in much the same manner by all normal individuals. But the advances in experimental psychology have shown us that the behavior patterns of individuals, even in relatively simple stimulus-situations, differ radically: the thresholds of sensation, the sensitivity, the intelligence characteristics, are all psychological measures that vary among the normal individuals of a culture. Hence the future of precision in all experimental fields will have to depend more and more upon the advances in experimental psychology. Even attempts to reduce the effect of the observer will have to depend upon a study of those aspects of observation which remain more or less invariant. We are just beginning to become aware of the importance of sociological measures in this connection; the way in which we represent the results of an experiment, the meaning of these results, and their most fruitful interpretation are evidently matters whose adequate handling depends upon a future experimental science of society.

Again, the industrial engineer could at one time consider the problem of the most efficient design of a production process without recourse to allied fields; but the modern designer must enlist the aid of the physicist

(in the design of machines), of the biologist (in the elimination of health-hazards), the psychologist (in the design of the most efficient working conditions), to mention but a few.

Perhaps the most important step in the realization that scientific activity must turn coöperative is the recognition of the special field of research called methodology. A physicist of but a few years ago could represent his results by a weighted mean and "probable error," and claim a confirmation of his theory if his results agreed "reasonably well" with the predicted values. But modern mathematical statistics has shown that there exist precise methods for evaluating data, and that the criteria of confirmation can be, and ought to be made, as precise as the criteria for an adequately designed apparatus.

More generally, the self-conscious philosopher has come to realize that philosophy should immediately undertake an important role in science. It should act as a coördinator of research in the sense that it supplies general criteria for the adequacy of an experimental investigation. The new role of philosophy is that of a critique of experimental techniques; it attempts to define the most general conditions under which a procedure is said to be experimental, a process is said to be in experimental control, a question is said to have meaning.

This role of philosophy may seem to be a glorified one, as though philosophical thinking were in some sense basic to all inquiry. The new philosophy, however, is insistent on the point that its own progress demands the same kind of coöperative effort as does progress in any field. The methodologist cannot devise his criteria of adequacy within the ivory towers of an endowed institution. He must come to know what scientists are actually doing, what they can do, what society demands they do, in order to formulate the idealized criteria of what scientists ought to do. These criteria differ from the actual behavior patterns of scientists or from the actual demands of a society, but they depend upon this sort of information. The philosopher of science who is unaware of the problems and activities of present-day science is as unproductive as the statistician who analyzes data without being aware of their sources.

The Conference whose proceedings are contained herein was called together by philosophers with the aim of coördinating research on a problem vital to our national welfare: the measurement of consumer interest. It seems almost too obvious to note the wide diversity of research fields which must be brought to bear on this one problem. We must know what a measurement is, what "interest" and "consumer" signify. We must know how to sample a population to obtain reliable information. We must know how to analyze the data obtained. We must know what questions to ask and how to ask them. We must know how to use



the results of inquiry in the most efficient possible manner. The measurement of consumer interest thus involves (at least) the coöperative aid of methodologist, statistician, sampling expert, psychologist, and marketing researcher.

While it may have been optimistic to use the term "measurement" in connection with the subject-matter of this Conference, such optimism is believed to be essential to scientific progress in this or any domain. Some of the Conference participants will be found to express doubt as to whether present-day marketing research constitutes a science, and this doubt is well founded. But none, we hope, would assert that the way is forever barred to our becoming scientific in this field. Indeed, the modesty expressed by the researcher here might well be extended to all branches of present-day science. The physicist or chemist or engineer who thinks that the problem of an adequate method has been solved in his field is no scientist, and merely lives in a world of his own fancy. Any self-conscious researcher familiar with the actual experimental techniques employed in these fields knows that there are many unexplained features of the methods, involving unconfirmed "hunches" and uncontrolled intuitions.

To make all fields of research more self-conscious, to accomplish a better understanding of method, to determine the most fruitful steps to be taken toward making research scientific, is the primary aim of this Conference, its predecessor,<sup>1</sup> and those to be held in the future. The aim is similar to that of "operational analysis" discussed by Professor Wilks in one of the Conference's informal panels, except that the emphasis here is on a coöperative effort toward a more adequate method in the various fields of research.

These Conferences are themselves an aspect of a still more general program, to establish Institutes of Experimental Method which will act within research groups as consultant bodies on method. The Institutes would operate in a manner similar to that of certain statistical groups already in existence,<sup>2</sup> except that the scope of the work of the Institute would be more general. One cannot set down adequate criteria for the design of experiments within statistical theory alone; the knowledge of an expert in general methodology is also required.

It would be wise to emphasize the primary purpose of this Conference by describing in some detail how such Institutes could be organized, and hence carry out in general the aims of such coöperative efforts as are contained in these Proceedings.

<sup>1</sup> The first Conference on Experimental Method was held at Bryn Mawr College in May 1945, and covered the fields of statistics, psychology, and physics.

<sup>2</sup> E.g., at North Carolina, Columbia, University of California at Berkeley.

The Institutes would be divided into sections, covering the general field of method within science: general methodology, mathematical statistics, sampling methods, and history of science. The sections would roughly have the following function:

1. *General methodology.* Its general research problems would include the criteria of adequacy of an experiment; the criteria of efficiency within experimental research; the meaning of the basic concepts of science; the role of formal theory; the criteria of application; etc. If, as Dr. Blankenship suggests in one of the informal panels, marketing research is not yet scientific, then we ought to begin to formulate some very definite criteria which will guide us in the direction of science; these criteria are not easy to formulate, and it is very doubtful whether most specialists have the time, knowledge, or inclination to formulate them correctly. The task would belong to the field of general methodology, just as the task of formulating the criteria of an adequate solution of a differential equation belongs to the field of mathematics.

In the case of special problems the section on general methodology would assist by attempting to evaluate an experimental design from the point of view of its adequacy with respect to the purposes of the inquiry. To illustrate: Suppose that the specialist proposes to "measure consumer interest" by making a population survey of preferences for a given item. Will his experimental plan provide adequate data for his purposes? The general methodologist would question such an experimental design on the basis that it equates "preference" and "interest," that it presupposes that verbal questioning at front doors provides pertinent information about the desires of those questioned, etc. These criticisms need not be fatal; they are merely raised for the sake of making the method complete. They force the specialist, either now or eventually, to investigate certain phases of his techniques. In other words, the task of the general methodologist is to open wide the aspects of a given experimental design, so that science may investigate all phases of its inquiry. Unless we can formulate the conditions under which such investigations are at least potentially possible, our activity is not scientific. If we cannot tell why a certain kind of response indicates preference, then we cannot be said to be measuring preferences. This does not mean that the specialist must answer all conceivable questions; but the method he uses should always leave open such answering for other investigators, or for himself. Now the task of revealing all the hidden presuppositions of an inquiry is no small one; it demands the generalizing type of mind, that is also familiar with the history of experimental method and its philosophical analysis. The point we are emphasizing is that the field of general methodology is as specialized a field of research

as physics or chemistry or biology; that the specialist in other fields must begin to seek more and more for the assistance of the methodologist. Only when such coöperative research takes place can methodology itself hope to advance.

2. *Mathematical statistics.* Its general and special research problems have become well defined in the past decade. Modern statistical theory has brought up to date the classical theory of errors and probability, so that we can define with considerable accuracy the formal methods for making inferences from a set of observations when certain general presuppositions have been made concerning the distribution functions and the method of drawing the observations. In particular, statistical theory provides a method for determining the "risks of error" inherent in any specific method of handling a set of data. The importance of its application to all fields of research, including the one discussed in these Proceedings, is now well recognized. It is to be noted that the general methodologist is directly involved in the work of the statistician in the question of how statistical presuppositions (e.g., of randomness) can be experimentally investigated.

3. *Sampling techniques.* As the informal panel on this topic clearly shows, the adequacy of an experimental design depends upon an investigation of the techniques for sampling. Modern social theory now recognizes that the "Complete count" is in general an expensive and inadequate way of investigating social groups. Further, since a complete count is usually an idealized construct, it is extremely difficult in practice to estimate how closely the completeness has been approximated. But sampling techniques can be operationally defined, and the errors associated with them can be estimated. From the point of view of the general methodologist, the advantage of the work of this section on sampling is that it formulates the method of inquiry in such a way that the presuppositions can be stated explicitly, and hence can themselves be investigated.

4. *History of science.* The inclusion of this section in the Institute of Experimental Method may seem surprising, until it is realized that all investigation in science is but an outgrowth of investigations made in the past. Scientific inquiry does not start and end with individuals; the modern-day scientists are simply carrying on investigations into problems they have inherited from the past. But so much of modern science ignores the problem of properly evaluating what the past has had to offer. And it is difficult to see how the specialist who is involved in the complexities of his immediate problem can make adequate investigations into the origins of his work; just as, in the case of the other aspects of experimental method, he must rely upon the advice of experts in the

history of science to determine what aspects of the past are to be used most fruitfully in the present.

The Institutes would then be organized with individuals in each of the above sections. The exact number of members would depend upon the scope of research which the Institute would be designed to cover. In general, in each of the sections, there would be individuals familiar with special branches of science: mathematical and physical, biological, psychological, and sociological. But if the research organization is restricted to one or more branches, then the membership of the Institute would be similarly restricted.

The members of the Institute would act as coöperators in any given research project; that is, the experimental scientist would feel free to consult with any of the members, and to act coöperatively with them in carrying out any program. The members of the Institute would also conduct their own research into general aspects of their fields, since advance in theoretical problems is a necessary condition in applied problems. The members would also conduct an educational program, the primary purpose of which would be *not* to teach the researcher all about methodology, statistics, etc., but to teach him how and when to use the aid of these fields. In other words, the purpose of such education should be to lay the foundations for the coöperation which is so essential to the future advance of science.

The Institute of Experimental Method has been sketched here in broad outline. It seems hardly necessary to point out that in its application to research groups it would have to vary in form and activity. But the moral of the outline and, we hope, the moral of the Conference, is that the future progress of scientific research, and indeed the future progress of all our cultural activities, depends upon such organized coöperation.

We wish to thank the members of the other sponsoring departments of the University of Pennsylvania—psychology, statistics, and marketing and foreign commerce—for their coöperation in planning and carrying through the details of the Conference. We should like to acknowledge our indebtedness to Professor T. A. Cowan of the School of Law of the University of Nebraska and Dr. W. Edwards Deming of the Bureau of the Budget, for their efforts toward the organization of the program. We also wish to make special mention of Dr. John S. Adams, Jr., of the philosophy department of the University of Pennsylvania, for his invaluable assistance and support. For their aid in the mechanics of the Conference we wish to thank Mrs. John S. Adams, Jr., Miss Judith Wingert, Robert Rueman, Sheldon Peterfreund, and the students of the University of Pennsylvania who so kindly volunteered their services.

Finally, we wish to acknowledge our indebtedness to Professor Emeritus E. A. Singer, Jr.; this Conference may be considered as a partial objectification of a program outlined in his lifework.

Permission has been granted by *Psychometrika* for the publication of Prof. L. L. Thurstone's paper, "The Prediction of Choice."

Permission has been granted by the magazines cited in Prof. Viteles' article, for the publication of the prints appearing there.