

# Role of Evaluation in Research Design

This author analyzes, clearly and forcefully, the significance of the matter of prizing and the matter of judging in the area of research design.

THE ACT OF "placing value upon" involves the dual process of cherishing or prizing and of appraising or judging. These processes come into play in the act of choosing and hence, where choices are to be made, evaluation plays an important part.

There is no specific problem relating to research design until there is some notion of a research to be undertaken. This research is *chosen* from among alternatives and the determination of what research to do is a resolution of a more or less complex value-type situation. This is true whether or not the research worker is conscious of making a choice, because there is always the single alternative of *not* doing the particular research in question. Choosing a problem is an act of evaluation. One places values upon alternatives in the process of judging them.

## Significance

Choosing the problem often involves a great variety of considerations. There is no necessary sequential order in which factors are taken up and, as problems vary, the factors change more or less. In choosing what research to undertake, evaluation is often brought

to bear in a large number of ways. The researcher may consciously consider the significance of the proposed research with respect to the drawing of a conclusion which may extend beyond the sample studied. He is concerned with selecting a design which will allow him to draw a warranted inference about the population from which the sample was drawn. This design involves choosing a sample for the study in certain ways, and the choosing of statistical measurements and tests of statistical significance which have meaning for that particular situation.

Sometimes the significance of a study has a quality of greater universality because it is closely related to a theory whose influence would extend far beyond the sample studied. The research may be testing a single hypothesis which has been suggested by the theory and the results of the study go beyond the proof, disproof or doubting of the particular hypothesis: the testing of the hypothesis is also, in part, a testing of the theory itself from which

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the hypothesis was derived. Choosing researches which have their roots in theory involves placing a value upon theory and in this process evaluation is clearly seen.

The idea of significance extends beyond considerations of sampling and theory. A research may have social consequences of greater or lesser import. Matters of money, or time, or effort may be related to the findings. The research may be closely related to the conduct of the profession in its training institutions and thus have a professional significance. The study may be of great personal significance for the researcher in that it fits into a larger plan in which he is engaged. Seeing the relationship of a particular research to a larger program and judging significance in terms of that program also involve evaluation.

In developing a research design the investigator makes a decision about the level of statistical significance which will be acceptable in his study. This too involves evaluation and no ready-made formula will solve the problem for him. Where deeply cherished human values are at stake, the 5 per cent level may be rejected and a choice made of the 1 per cent level of statistical significance. Similarly, if huge sums of money are involved, or if many hours of teachers' or children's time are involved. There may be occasions where a 10 or 15 per cent level would be evaluated as acceptable.

Sometimes the choice of research is considerably influenced by the sources immediately available. Under these circumstances, there is need for considering the training, the skill and the in-

terests of those who might play an important role in the contemplated research. There is need to consider the equipment available for carrying the research to completion. One must consider the samples available for investigation and whether or not they can be chosen in terms of the requirements of the statistical design. Judgments about the role of time in a research are often crucial. All of these judgments involve evaluations.

### Control and Accuracy

Many researches involve the consideration of control factors. The literature must be searched to find what previous investigators have discovered about control and this literature must be evaluated. Beyond this, moreover, there is usually the need for the selection of new factors which are thought to influence considerably the consequences of the research. This choosing is more of an art than a science and the investigator is guided by hunches and by inspired guess work. He is seeking factors which may have a bearing on the results and he is hopeful that they will contribute greatly to the possibility of predicting those results. To the degree that the one or many control factors are identifiable, and to the degree that, taken together, they constitute an accurate base for prediction, the investigator comes to believe that his research is controlled. On many occasions, after the design has been worked out and the data have been gathered, the experimenter reworks the material to find out to what extent he has "controlled" the study. These many acts of choosing, or of weighing and of making judgments are acts of evalua-

tion and play an important role in the design of research.

In many research studies the investigator develops a "pilot plan" or makes a "trial run." These offer only tentative bases for judging the adequacy of the research plan but they do constitute a form of evidence which allows the researcher to reconstruct some of his procedures, to develop new ways of handling data, and to anticipate certain difficulties in the research development. These considerations are evaluative ones and are an important part of research design.

To these must be added the research worker's concern for the accuracy of his computations. This activity involves the selection of instruments of measurement and often, before the study begins, a judgment has to be made about the probable reliability and validity of the measurements with respect to the particular group from which they are to be derived. This is an act of evaluation. Setting up procedures for the objective checking of the computations before presenting the results is another desirable quality in research design and the choice of these processes and the ways they shall be carried out involve evaluations by the research worker.

In every research the conclusions depend, in part, upon the data which are collected, upon the design which has been chosen, upon the assumptions which are made and upon the processes of reasoning which are involved in drawing a conclusion from all of the

foregoing. In distinguishing between findings, inferences, conclusions and implications the investigator is making evaluative judgments. These involve a weighing of the assumptions which are involved, a weighing of their relationships to the suggested but tentative conclusions, and a deliberate, reflective, considered choice of words and phrases in accurately communicating the researcher's relative certainty or doubt or confusion as he sums up his work. The act of evaluating is inherent in these processes.

Enough has probably been said to indicate that in research design the matter of prizing and the matter of judging are of great significance. Formulas do not tell us what to do, or when to do it, or where to do it. Formulas do not tell us what kinds of inferences can be drawn from their application.

Every research involves a great deal of evaluation and it probably helps the research worker to be aware that he is making such judgments in choosing the research, in designing it, in carrying it out and in drawing conclusions from it. As this writer sees it, from start to finish, and all the way along the line, from the critical selection of the problem to the forms of final publication, the research worker is making value-type decisions. It is here assumed that the quality of, and the significance of educational research would be strengthened if there was more conscious awareness of these acts of "valuing" in the designing of research.

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