**Reviewing an Article**

To read an article critically is to read it thoroughly and in detail and to intersperse some evaluative thinking. Every research report should contain a reasonably complete statement of:

1. Why the investigator did the research (introduction)
2. What the investigator did (method)
3. What the investigator found (results)
4. What the investigator concluded (discussion)

The critical reader must first try to understand what the investigator did in each of these aspects of the report and then ask, “Is this adequate?”

**(1) INTRODUCTION: PURPOSE OR CONCEPTUAL FOUNDATIONS OF THE RESEARCH (Why the Investigator Did the Research)**

Usually the reason of any research study can be identified at two different levels. At a general level, the study is concerned about a problem area (e.g., curiosity, play behavior, work attitudes, incidental learning). Within this area, certain questions will have occurred to the investigator, and he or she has formalized one or more of these questions into a more specific question or hypothesis to study.

Some studies may relate to the general purpose as mainly exploratory in nature. In these types of studies, the more specific questions may well lack the precision of sophisticated research hypothesis. The intent in this type of research is to generate hypotheses rather than to test them. Other studies may be based upon methodological questions, such as “Is this measure of job satisfaction a valid one?” Reports of exploratory or of methodological research seldom include formally stated hypotheses; nevertheless some hypotheses are usually implicit. In any critical reading of research, one necessary step is to identify the hypotheses, and evaluate their adequacy.

In other types of research, the testing of a hypothesis is the explicit purpose of the study. Since the hypothesis is a statement of presumed relationship between two or more variables, critical analysis must first focus on these variables. The variables should be identified and defined conceptually. If causality is relevant to the interpretation of results, the designations of independent and dependent variables are needed. Finally the operations by which these variables can be defined and measured must be clearly identified.

Evaluation then takes two forms: (1) the general relevance of the specific problem to the broader area of interest and (2) the adequacy of the development of the conceptual arguments leading to the hypotheses.

**(2) METHOD: PROCEDURAL AND METHODOLOGICAL ISSUES**

**(What the Investigator Did)**

Evaluation of the methodology used to investigate the hypothesis is a critical part of the appraisal. A useful step here is to consider alternate hypotheses. What other independent variables that are not covered by the hypothesis might be to some degree causally related to the dependent variable? What contaminating variables are created as an artifact of the procedure? In short, can the results be explained as possibly due to influences other than the independent variables of the hypothesis?

Are the variables adequately operationalized? Do they have construct validity? Do the measures adequately reflect the constructs of interest?

Another important question to be asked when evaluating the methodology has to do with the appropriateness of the design chosen. Does the design chosen by the investigator allow for an adequate test of the hypotheses or is there a better design? There are many designs that are adequate to test a given hypothesis. The issue here is simply whether the design chosen allows the investigator to test the hypotheses of interest.

There are flaws in every study. The crucial question to ask in each case is “How seriously is this likely to have influenced the results?” If this flaw were removed, is it likely that the results would be enough different to change the directions of the conclusions reached? Through such questions, the telling criticisms can be distinguished from the petty ones.

**(3) ANALYSIS OF RESULTS**

**(What the Investigator Found)**

Raw data are not themselves meaningful; they must be subjected to sorting, classification, and analysis. Since the data usually represent a sample of data that might have been obtained, the analysis necessarily involves statistical inference.

Different kinds of measurements require different kinds of statistical analysis. Evaluation of the statistical procedures used calls for an understanding of the procedures used, the basic assumptions implicit in their use, and their limitations.

**(4) DISCUSSION: INTERPRETATIONS OF THE RESULTS**

**(What the Investigator Concluded)**

The investigator’s conclusions should be consistent with the data obtained in this investigation and limited to them. The test of a single hypothesis tells nothing about other hypotheses that could have been studied but were not. It tells nothing about other populations that could have been studied but were not. It tells nothing about other operational definitions that could have been used but were not.

The results of any single piece of research can, moreover, be due to chance, even if the result is statistically significant. The significance of results obtained is enhanced if these results are consistent with other relevant research findings. Evaluation of the investigator’s conclusions depends on the investigator’s (1) general scientific caution, (2) avoidance of overgeneralization, and (3) thoroughness in relating his or her results to current knowledge.