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ABSTRACT

The educational audit is suggested for assessing the process of inquiry for reliability and the product of inquiry for absence of bias. The inquiry auditor must review the inquiry processes to determine that they conform to norms of "good professional practice." He must review inquiry products to ensure they can be substantiated from data collected. These tasks are equivalent to establishing the dependability of an inquiry and the confirmability of its data and conclusions. The inquiry audit process is composed of the audit trail and the audit procedure. The documentation for a naturalistic audit trail incorporates a reflexive journal and a detail of procedures. The audit procedure consists of several basic steps. These include the decision to do the audit; acquisition of the inquirer's report and all portions of the audit trail; determination of documentation sufficiency; comparison of procedures to problems addressed; comparison of raw data to written narrative; description of comparison results; noting changes in methods of deployment of personnel and judgments about context and problem; noting whether inferences flow logically from data; and certification of findings in final report. An audit procedure is presented in diagram. (DWH)

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ESTABLISHING DEPENDABILITY AND CONFIRMABILITY IN NATURALISTIC INQUIRY THROUGH AN AUDIT

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INTRODUCTION

Naturalistic inquiry has experienced an upsurge in interest, and judging by program entries in such national meetings as the American Educational Research Association, the Evaluation Network, and the Evaluation Research Society, in application also. Nevertheless, detractors of the paradigm still view the results of such inquiry as untrustworthy and potentially biased. Because the paradigms rests on such beliefs as: that the inquirer himself is the most useful instrument, that the inquiry design cannot be specified a priori as in typical experimental design, that the guiding theory is itself grounded in emergent data, and that the preferred inquiry setting is natural situations and contexts (which are uncontrolled) rather than the laboratory (highly controlled), naturalistic inquiry continues to be viewed as undisciplined, inexact, and highly subjective.

Guba (1978, 1981), Guba and Lincoln (1981), Lincoln and Guba (1981), and Lincoln (1981) have made the case that all four of the "trustworthiness" criteria that have been posed traditionally for inquiry can be met by naturalistic inquiry as well, albeit in somewhat redefined form--a form consistent with assumptions of the naturalistic paradigm. Thus, we have argued that the concept of internal validity should be replaced by that of credibility, external validity by transferability, reliability by dependability[1],

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[1] Dependability, according to Guba (1981), is a concept that accounts both for unreliability in the conventional sense as well as for other shifts or changes that are deliberately introduced by the investigator as the design of the inquiry emerges or unfolds.

and objectivity by confirmability. Specific techniques that the naturalistic inquirer can use to assure a sound level of performance with respect to these criteria have been proposed.

A major technique suggested by us is the so-called educational audit, which we recommend both for assessing the process of inquiry for reliability (a dependability audit) and the product(s) of inquiry for absence of bias (confirmability audit).

The emphasis on both process and product is a crucial one, we believe. In traditional forms of rationalistic inquiry, choice of proper procedure (processes) virtually guarantees results (inquiry products) which are trustworthy or unassailable. When the criteria of internal validity, external validity, reliability and objectivity or neutrality have been met, then the results are presumed to be trustworthy (or rigorous). But the blurring of the distinction between processes and product has allowed attacks on naturalistic inquiry to proceed without requiring careful examination of whether in fact the attacks are justified or reasonable ones. That point, that there is both a difference and a distinction, has been made by Cronbach and Suppes (1969), who assert that the feature which most prominently distinguishes disciplined inquiry from other forms is that it be conducted (the process) and reported (the product) in such a way that all of its aspects can be publicly examined:

> . . . the report of a disciplined inquiry has a texture that displays the raw materials entering the argument and the logical processes by which they were compressed and rearranged to make the conclusion credible (p. 16)..

The audit is suggested as a means for carrying out the kind of public examination suggested by Cronbach and Suppes. The

use of the term "audit" is no accident, it should be noted, but is based upon the fiscal audit as a metaphor. According to Wheat and others (1972, p. 14), the goals of a fiscal audit are threefold: 1) to discourage practices in specific areas which experience indicates might be employed in such a way as to mislead public investors; 2) to encourage practices which could be expected to make financial statements more informative; and 3) to reduce the use of alternative accounting methods not justified by factual or circumstantial differences. For the fiscal auditor, called in to examine the accounts of a client corporation, achievement of these goals translates into two major tasks.

His first responsibility is to examine the processes by which the local accounts are kept, not so much to assure that there has been no fraud (although it is expected that fraud will be detected if has occurred) than to assure that the books represent a "fair" statement of the company's position. The auditor is particularly concerned that there should have been no "creative accounting" that makes the company appear more solvent than it is, for the sake, for example, of attracting investors. The auditor's major interest is that he is able to certify that the processes used fall within the bounds of good professional practice.

His second responsibility is to examine the products of the local accounting process, to ascertain that every entry in the books can be authenticated by documentation or by solicited confirming statements, that the "bottom line" is correct, and that interpretations made of the accounts in any fiscal statement based on them are accurate and appropriate.

In similar fashion, the inquiry auditor has two tasks: to review the inquiry processes to be certain that they fall within the norms of "good professional practice", and to review the inquiry products to be certain that they can be substantiated from the data collected. In other work, we have asserted, the former task is equivalent to establishing the dependability of an inquiry and the latter the confirmability of its data and conclusions. The issue, it should be noted, is not whether the investigator carried out the processes or reached the conclusions in the same way that the auditor would have, but whether they were carried out in a reasonable manner. Thus, replicability is not a criterion, but rather rationality is. In this context, "reasonable" and "rationality" are taken to mean that the methods chosen for data collection are appropriate to the problem to be studied; that the techniques of analysis utilized are those consonant with the form in which data are collected and assembled; that reports of the data are coherent, credible, and exhibit structural corrorboration; and that all assertions about the context (save for the inquirer interpretations) may be traced to authentic data units or categories.

Why Create an Audit Trail or Perform an Audit?

Since so few studies, save in the physical sciences, are replicated or have results which are re-examined, why would one want to create an audit trail or perform an audit in the first place? We would suggest three reasons.

First, the issue of trustworthiness must be addressed. When a scientist performs an experiment (engages in inquiry),

the materials, methods and choice of variables to be studied are catalogued cleanly as part of the reporting of the study itself. The format for this reportage is fairly well accepted, and any contributor to a major professional conference is often confronted with advice to construct his proposal, and presumably the completed paper, along a certain accepted format, which includes first, a statement of the problem, second a statement of objectives, third a statement of the methods, and so forth Journal articles more often than not follow the same pattern Thus, if a proposal or article is well done, the variables, procedures, methods and conclusions follow from a statement of the problem. Thus, the research reporting has left its own audit trail, and presumably, by choosing the same population (or sample thereof), the same variables, instrumentation and methods, a second scientist should be able to replicate a colleague's findings.

The posture of rationalistic researchers toward naturalistic researchers is in part understandable, since procedures and methods for carrying out scientific research have evolved so clearly over so long a period and since, as Mautz and Sharaf point out, procedures and methods become "peculiar" to disciplines and become integral to the search for data:

> "If one carefully observes the methods followed in different disciplines, he will discover that each has developed an attitude and procedure peculiar to itself. Some of these approaches have important characteristics in common, but there are also significant differences. As each discipline develops into maturity, it continually experiments and modifies its procedures and attitude until it finally devises a method appropriate to its activities. The method of inquiry thus becomes as much as integral part of the discipline as does the subject matter itself" (1961, p. 18).

In the social sciences, we have not always followed this procedure in reporting. Our studies are not clearly experimental (nor should they be); our reports have no accepted formats, some being presented in case study form, our populations have been often unique and most assuredly not typical in any sense assured by randomization (which is totally appropriate), and we have relied upon our insight and reputations to "guarantee" the trustworthiness of our findings. But experimentalists have mounted concerted attacks upon naturalistic inquiry, over the issue of trustworthiness, which they label rigor. For that reason, the audit trail which is constructed, and the audit process which is performed allows for the work of naturalistic inquirers (and others who prefer to call themselves by other names, but whose work is phenomenological in orientation) to fulfill the criterion of public inspectability.

A second reason for calling for audits can be found in the numbers of researchers who are calling for a decrease in emphasis on the creation of data de novo (Lincoln, 1978; Guba and Lincoln, 1981; Burstein, 1978) and for the secondary analysis, reanalysis, or meta-analysis of existing data banks or sources (Lucas, 1974a, b; Glass, 1976). The use of in-place, existing resources to serve new purposes or meet new research needs is an idea both born of need and inherently sensible, and techniques are available to perform new kinds of analyses of these purposes. Thus, the creation of an audit trail in effect creates a data bank of oral and documentary history for future researches to reanalyze in light of new questions.

Third, and closely related to the second above, is that the products of naturalistic and ethnomethodological research form a valuable body of records for any project or context. As a result, some researchers, notably Stenhouse (1978) are calling for the creation of archives which effectively mark when and where researchers have been, and what their effects might be. Thus, the creation of an audit trail in effect assures a data bank of oral a documentary history for future researchers to reanalyze in light of questions which have not yet been framed.

The Inquiry Audit Process

While previous authors have laid out the auditing task and suggested its major conceptual parameters (Spradley, 1981, Guba, 1978, 1981; Halpern, 1981; Willower, 1981), few specific suggestions have been offered about how to carry it out. Specifically, two major questions must be addressed:

1. What is the nature of the audit trail which must left by the inquirer, analogous to the accounts left by an accountant, which form the basis for the later audit? This problem is typically unaddressed in fiscal auditing literature since methods for keeping accounts are well understood and taken for granted in fiscal operations.

2. What are the steps that the auditor must take in carrying out an audit? How do these steps differ for the dependability audit and the confirmability audit?

It is to these two questions that the major portion of this paper will be addressed.

The Audit Trail

Guba (1981) has admonished adherents to naturalistic paradigm research that:

> ". . . the naturalist will, during the study establish an 'audit trial' that will make it possible for an external auditor to examine the processes whereby data were collected and analyzed and interpretations made.
>
> After completion of the study the naturalist will arrange for a dependability audit to be done by an external auditor--someone competent to examine the audit trail and to comment upon the degree to which procedures used fall within 'generally acceptable' categories. Such an audit is concerned primarily with process." (p. 20) . . .
>
> [and] after completion of the study naturalists will arrange for a confirmability audit ... certifying that data exist in support of every interpretation and that the interpretations have been made in ways consistent with the available data. (p. 88)

The documentation for such a trail incorporates in somewhat expanded form two standard and well-known research tools The first is the field journal or field logs (workbooks; journals and field notes) of the anthropologist or field sociologist, the second is the detail of procedures kept by the laboratory scientist Both of these forms of documentation are appropriate for the naturalistic inquirer albeit recast in slightly different form. Elements of each, more formally structured, go into providing the documentation necessary for either a product or process audit.

At least six different forms of archival materials need to be maintained. These include:

- all raw data, including interview and observational notes, test scores, documents and records collected in the field, records of unobtrusive measures made, and the like;

- a log of all activities, including all field contacts with dates, purpose, substance and outcome noted;
- a log of all methodological decisions made which influenced the final emergent design of the inquiry;
- a log of all data analysis activity; since it is assumed that data analysis will be continually ongoing and that early analysis will affect later steps, it is imperative to be able to track the unfolding analysis after the fact;
- a reflexive diary which records the inquirer's own perceptions, changing insights, affective responses, the "experiences, ideas, fears, mistakes, confusions, breakthroughs, and problems that arise during the field work" (Spradley, 1979, p. 76), as a partial means for providing checks on the evaluator's own biases; and
- a log of professional contacts that may influence the evaluation, for example, debriefing sessions with noninvolved professional peers" (Lincoln and Guba, 1981).

The two elements of this trait that may require additional explanation are the reflexive diary and the log of professional contacts, since both of those are crucial to tracing biases which may be purported to creep into a study which is naturalistically oriented.

The reflexive journal is analogous to the anthropologists' field journals and is the major means for an inquirer to perform a running check on the biases which he carried with him into the context. Lincoln and Guba have previously described in detail what forms of material ought to be kept in a reflexive journal.

Divided into five sections, the inquirer' personal journal, which will later form a part of the audit trail, ought to contain the following sections:

1. A log of evolving perceptions. This log begins with the written perceptions of the evaluator prior to his entrance on site.. The evaluator writes down everything he or she believes will be found at the site or program context. Clearly, what he writes down must be a function entirely or his a priori perceptions (which may or may not be biased, although it is not bias which is the issue at this point). This experience should be repeated at regular intervals which are a function of the time to be spent at site and the detail level of the writing. The separate renderings may be kept in escrow by someone else--usually an auditor or peer debriefer--but at least someone who is not directly connected with the program or project evaluation. The writer will want to attest that he does not return to earlier versions as he writes later ones. At the end of the project (or during its duration if it is of sufficient time lapse), these perceptual statements may be compared to one another and/or to aspects of the design and/or analysis to check whether learning is occurring, whether original perceptions and beliefs perseverate, whether later findings are clouded by these perceptions, and whether or not the evaluator has "learned" anything "new" or changed himself.

2. A log of day-to-day procedures. The purpose of this log is to indicate in diary or chronographic form exactly what was accomplished every day. The log, we would recommend, should be kept in a bound book so that it can be verified that no pages were added or deleted. Pages should be dated and initialed by the writer, and if it seems appropriate, the dating and initialing can be witnessed. The most important use of this component of the journal will be in the evaluation audit process.

3. A log of methodological decision points. This particular log of the reflective journal is entered on an ad hoc basis as necessary, and should record all major methodological decisions, such as explicating next design steps, decisions on instrumentation, finalization of an analysis category set or the like, and such decisions should be entered together with reasons or rationale for the action taken or decision made. These pages also should be dated and initialed by the evaluator or evaluation team director and may also be witnessed. The auditing process is the chief purpose for this log.

4. A log of day-to-day personal introspections. Sam Selber recommends that a log (or field diary) of this sort of introspection be kept in any type of field work in any of the social sciences. Here one lays out in diary form one's own thoughts and feelings, including stresses one is almost bound to undergo (Zigarmi and Zigarmi, 1978) and frustra-

tions one encounters, and how these feelings and situations are perceived to be changing. Numbers 2 and 3 above may be thought of as ways of representing method and numbers 1 and 4 may be thought of as ways of representing persons who do inquiry and evaluation. It is important to have some insight into one's self and to work on generating that insight. One's willingness to take a situtation on its own terms, for example, depends heavily on whether one is at ease with it or not, whether one is encountering frustration at not being able to acquire good information, whether one suspects he is being lied to, and the like.

These entries should also be made in bound books, although Sieber has recommended loose-leaf notebooks, and should be dated and initialed. The chief use to which these personal logs can be put are to test for bias in the evaluator and to relate decisions about design and procedures to it later. These logs, however, may also be utilized to indicate to the evaluator where he might need additional training (e.g., in interviewing reluctant interviewees), or where he might want additional work before undertaking another evaluation (e.g., in public speaking and presentations, in testing, in negotiating a contract, and the like).

5. A log of developing insights and hypotheses. The emergent design will depend almost exclusively on how the evaluator takes advantage of what he has already learned. The purpose of this section is to keep readily available an up-to-date summary of where one is with respect to knowledge of the situation and working hypotheses about it. This is a working section of the journal, which should be kept in loose leaf binders and updated as needed. Those working hypotheses which have been discarded or "outgrown" ought to be relegated to historical files on the project, and retained as part of the audit trail.

Entries in the log should be cross-referenced to original data. As the evaluation progresses, a section of this log can be devoted to a listing and explication of possible items to be tested with numerous data sources -- a process often called member checks -- for the sake of determining credibility. It should be possible to relate, at any time, what is in this log to other files of both raw and processed data. There are several uses for this log, including the guiding of the inquiry, shaping of the emergent design, providing the basis for subsequent data collection and analyzing activities, and for post hoc auditing procedures (Lincoln and Guba, 1981, pp. 10-13).

We would like to point out that while essentially similar records are necessitated for the inquiry as a whole, when the effort is to carried out by two persons or a team of inquirers, evolving perceptions, day-to-day procedures, methodological

decision points, personal introspections and developing insights and hypotheses are likely to be different from inquirer to inquirer. Because inquirers are likely to work alone for some periods of time between team consultations on emerging design issues, the tasks in which each is engaged may be substantially different and the persons whom one interviews will often provide varying insights and hypotheses. As a result, substantially different reflexive journals may be kept. Each of these contributes, however, to the final audit trail which is established.

Debriefing sessions, whereby field researcher check insights, hypotheses and developing theories with peer professionals external to the inquiry effort, may be carried out on an individual or team basis, or both. When performed on an individual basis, the reflexive journal would carry accounts of the peer debriefing; when performed either on a team basis, or between teams operating in split-half fashion, (see Guba, 1981; Lincoln and Guba, 1981; and forthcoming), the audit trail assembled by the team leader would contain records of the debriefing session. In any event, the purpose of such debriefing is to keep the inquiry effort, including data collection and interpretation on track and grounded in the context.

Other professional contacts which may be related to the research or evaluation effort should also be recorded. Such contacts might include, for example: conversation with other inquirers engaged in similar research; contacts with other evaluators evaluating projects which appear similar; or conversation with other social scientists (such as sociologists, anthropologists,

or political scientists) who may have operated in the same, or a similar, context. The point is that not all professional contacts need debriefing sessions; some may be information-gathering excursions and some may be simply "shop talk" concerning the progress of the research. But fairly complete records should be kept of these encounters.

Halpern (1981, p. 12) suggests that audit trails are comprised of "three general classes" of evidence. Those include: "(1) natural evidence; (2) created evidence; and (3) "rational argumentation". And Mautz and Sharaf (1961, p. 68) argue that there is evidence in the world around us (natural); evidence requiring some effort to bring it out (created or experimental); and evidence in the form of ideas which 'flow logically from observed facts' (rational)". We would argue that the process auditor might be primarily, though not exclusively, interested in natural evidence and how it was garnered. The product (confirmability) auditor might be somewhat more interested in created evidence (influences, working hypotheses, and the like) and in rational evidence (coherence, structural corroboration, wholistic properties, internal congruence, fidelity to member experiences, contextual isomorphism, and believability).

The focus of an audit, as explicated earlier, is based on the rationality of data collection methods and analytic teaching and on the structural coherence of the final report; and on the reasonableness of the conclusions on findings. The audit procedure is somewhat less clear. Halpern summarizes the situations aptly:

> "Data scrutinizing ... is the main task of the auditor ... The data may have been gathered in many different ways. The auditor is privy in most instances only to second-hand data--those 'communications' which have already been decoded and recoded by the inquirer. Thus, from a wide array of interactions experienced by the inquirer, the audit trail is only as close to the phenomenon as the inquirer's collection procedures permit..." (p. 27).

Since the auditor is removed from some, much, or all of the first-person, original data, procedure for the audit becomes important. While we perceive no necessity for a single prescription to fit all inquiries, certain steps probably constitute a minimum procedure. Those are designated as steps toward auditor warranty.

In general, in performing the actual audit, the auditor, presumed to be a professional peer of the inquirer, may perform either or both the dependability and confirmability audits. In the role of dependability auditor, he will examine all of the documentation from the point of view of its acceptability within the norms of good naturalistic professional practice. Upon completion of that task, he will certify that the inquiry has been adequately and fairly executed from a methodological point of view, probably issuing a formal statement to that effect which may be attached to reports of the inquiry, for example, when they are submitted to journals for publications.

In the role of confirmability auditor, he will examine the analyzed data, comparing some sample against selected original data items - for example, interview notes or documents - to satisfy himself on several counts. First, the data items should have been reasonably unitized (that is, reduced to the smallest units of measuring required by the problem and consistent with

their original form). Second, the units should have been reasonable categorized into an appropriate category system (or a taxonomy if the data permit), and that individual data items have been reasonably assigned to taxons or categories. Third, conclusions should be documentable in terms of the categorical system. Finally, conclusions should be demonstrably triangulated by reference to multiple data sources (preferably collected and analyzed by multiple methods and representing multiple perspectives). When he has completed this task, the auditor will certify that the inquiry products are properly founded on the data and have been reasonably interpreted from them.

Specifically, however, getting to the auditor warrant is a series of decision points, any one of which may be a go-no go decision: To reiterate, there is no single "right" procedure, but some basic steps may be drawn.

The Audit Procedure

Basically, the audit procedure is carried out in eight steps. While other steps may be inserted into the procedure as deemed necessary by the inquirer, funder, sponsor, or auditor, these steps are those necessary and sufficient to initiate and conclude an audit.

Step 1: Decision to do audit. Either because of contractual obligations, or because the results of an inquiry are under fire, or because of some other reason (e.g., simply for purposes of

external validation), a decision may be made to perform an inquiry audit. For whatever reason it is undertaken, an audit may be commissioned by any one of a number of parties, and it is the responsibility of the inquirer to maintain -- and in legitimate cases, turn over -- adequate documentation and raw data to substantiate his findings and conclusions.

Who may commission an audit is not entirely clear, although a preliminary guess would include the inquirer himself, as a means of verifying that his processes, procedures and products are professionally sound; the funding agent or sponsor of the inquiry in the case of an evaluation (a meta-evaluation) in the original contract; or other agencies or groups who have a right to the data and who may question the conclusions or recommendations. Included in this last group might be, for instance, parents of children in a program which was found to be "non-cost-effective" and therefore discontinued, or members of a targeted group whose programs were being cut. These persons are known elsewhere as stakeholding audiences.

Step 2: Acquire inquirer's report and all portions of audit trail. It is presumed that field notes have been suitably coded so that identification of individuals is difficult, if not impossible, but otherwise, the auditor should have access to field notes, reflexive journals, and all other raw data which have been collected and which have gone into the final analyses. Upon negotiation of a suitable auditing contract, these documents, films, tape recordings, transcripts and the like should be turned over to the auditor, who will perform Step 3.

Step 3: Determine whether audit trail is sufficiently complete to perform audit. A thorough inspection of the data and products of the inquiry should be carried out to determine whether, in fact, sufficient documentation is present to constitute an audit trail. This is essentially a "no-no go" decision, for if the documentation doesn't exist, an audit cannot be performed.

Step 4-A: Compare procedures to problem(s) addressed. The purpose of this step is to di over whether the inquiry problem was one which suitably might be addressed by naturalistic inquiry, and whether a naturalistic inquiry was in fact carried out. While we do not wish to re-open the qualitative-quantitative debate which has been raging for some time, it is important to determine whether the study is a naturalistic one or fundamentally a rationalistic paradigm inquiry, carried out through utilizing qualitative methods. A study of the second sort is not, and should not be, amenable to this form of inquiry audit processes.

Step 4-B: Compare raw data to final product (written narrative) and check unitizing and categorizing systems and labelling procedures. The purpose of this sub-step is to determine whether the analyses of data followed consistent and uniformly applied rules (which should be provided to the auditor) for unitizing items of data, for categorizing or taxonomizing those data, and for assigning labels to various categories and aggregates of data units. Data units should be clearly distinguished from one another, and categories ought to display holistic qualities which

suggest the boundaries of the inquiry and context of the inquiry alike.

Step 5: Describe the results of both comparisons in Step 4. The results of this step should yield information in at least three areas: inconsistencies between problem and method, or between data and final product; information about possible inquirer bias which is not made explicit in the final report or inquiry product; and information about the rigor and mutually exclusive or non-exclusive nature of the categorizing system used in data analysis.

Step 6: Note shifts in methods deployment of personnel, and judgments about context and problem. Since emergent designs often characterize naturalistic inquiries, shifts between proposed activities and lines of inquiry, as well as shifts in insight from previously held convictions, should be noted in this portion of the auditor's report. The question to be addressed is most appropriately whether or not the shifts were supportable or sensible in view of the data collected, in view of the insights gained, or in view of the biases exposed and examined. The nature of such inquiries to unfold, rather than to be pre-ordained, demands that such shifts be fully documented and that the payoff in terms of data be clearly recognized. Since such shifts are an expected part of the research, each should occupy a portion of the field logs.

Step 7: Note whether inferences flow logically from data. A significant portion of the product warrant is certification of whether the conclusions reached by the inquirer are in fact warranted by the data. It is possible, for instance, to have good raw data, and sound methodological processes, and to draw unwarranted conclusions. For that reason, it is imperative that the auditor note whether the conclusions drawn by the data gatherer make sense, flow logically from the data, or cohere to form a meaningful whole to an outside observer.

This is an especially sensitive step, since we (and many others from disciplines such as anthropology amd sociology) have argued for some time that the data analysis process is essentially an artistic one, whereby the inquirer brings to bear both propositional and tacit knowledge in interacting with his data in order to move to a level of meta-analysis, to move beyond the data to insight and to meaning which has not been stated previously. While it is clear that an auditor may be able to follow the trail of processes, and should be able to track data through a study, it is not clear that he will be able to bring to bear the insight, judgment and wisdom that the original inquirer brought in reaching his conclusions. But he should be able to certify that those conclusions appear logical and sensible from the data and processes outlined.

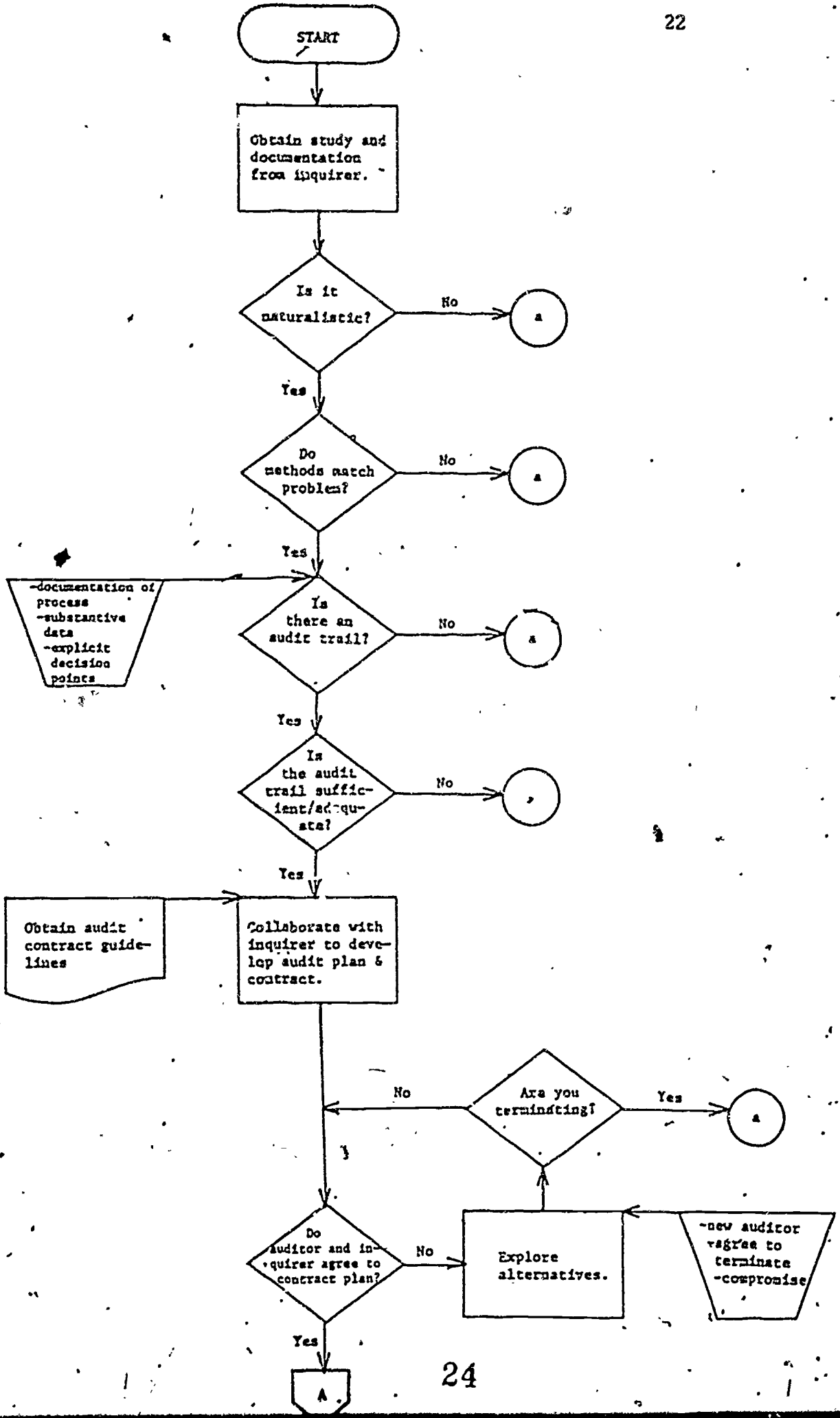
Step 8: Certify in final report what is found. A final auditing report should be formulated (or, in the case of separate process and product audits, two reports), which describes in detail what

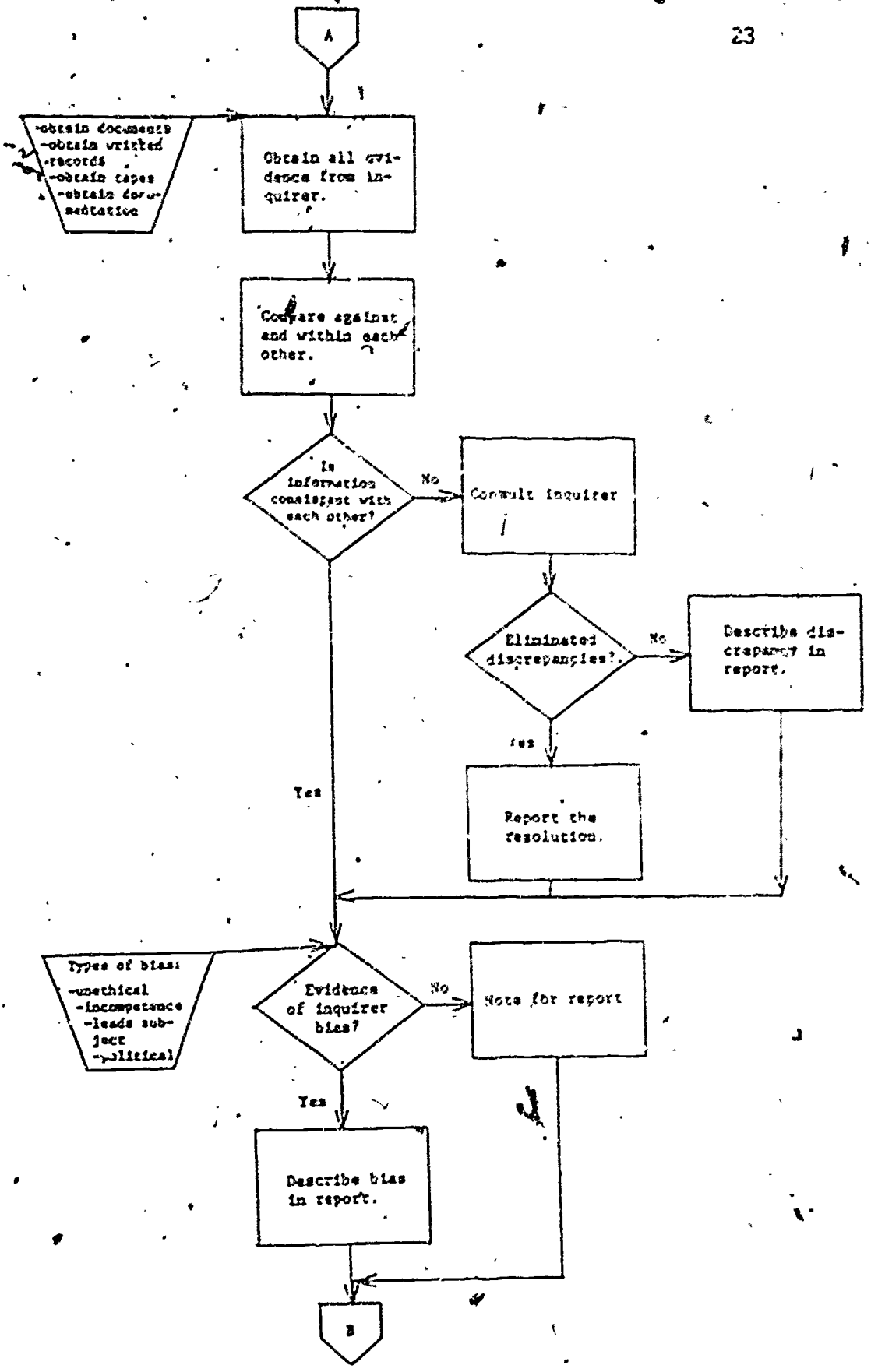
the auditor has found in tracking the study. It should note whether both processes and products appear to conform to reasonable canons of good naturalistic practice and whether structural coherence exists in the report. It should contain some summary judgment as to whether conclusions (and recommendations, if they are part of the inquirer's final report) appear to be warranted from the raw data, and should note the extent to which the final report gives a vicarious experience to the reader via thick description and strongly focussed narrative.

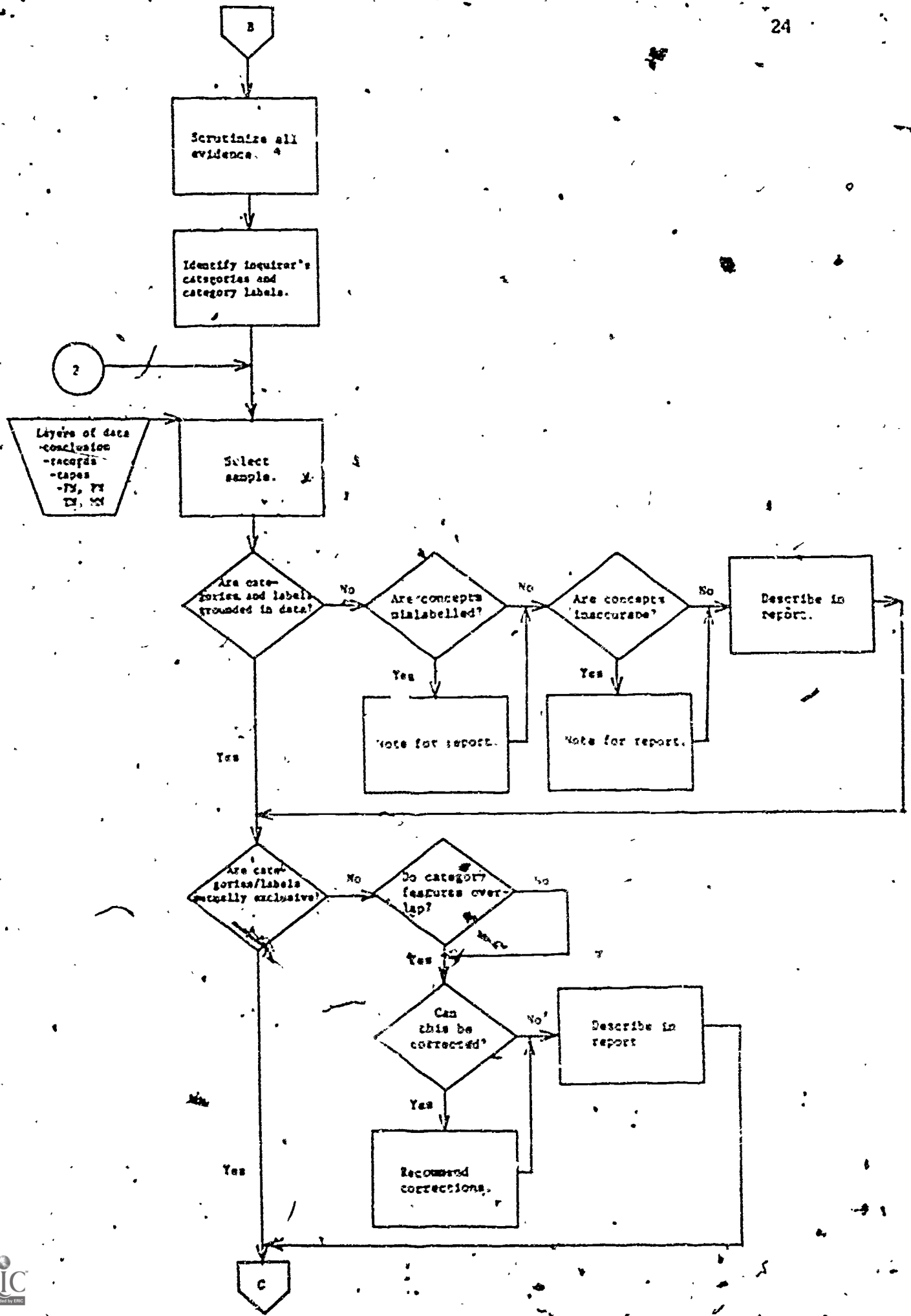
The steps appear to us to be the necessary and logical ones which one might follow in preparing an audit. There has been, however, another procedural algorithm developed by Halpern (1981), and we have included it in the following pages to demonstrate what a more complex analysis of auditing might look like.

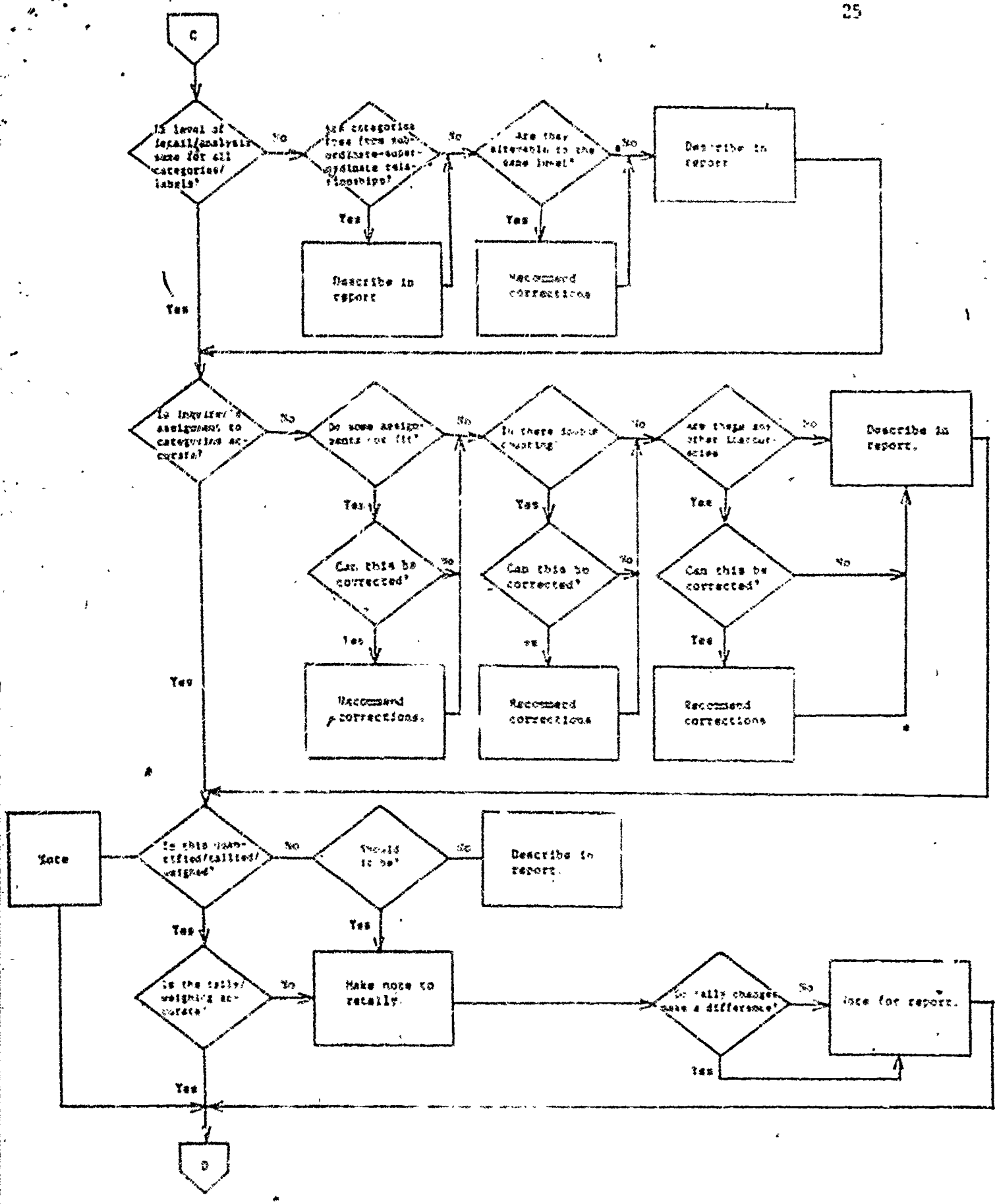
Whichever set of procedures are chosen (or perhaps, if new precedures are developed), the auditing technique constitutes a significant addition to the methodological armory of the naturalistic inquirer. While audits will not deal with all trustworthiness questions -- for example, they do not touch credibility or transferability issues -- they do provide major assurance of the dependability and confirmability of such a study. As Guba (1981) has suggested, while they may not provide unassailable evidence with respect to these criteria, they do contribute significantly to the establishment of plausibility.

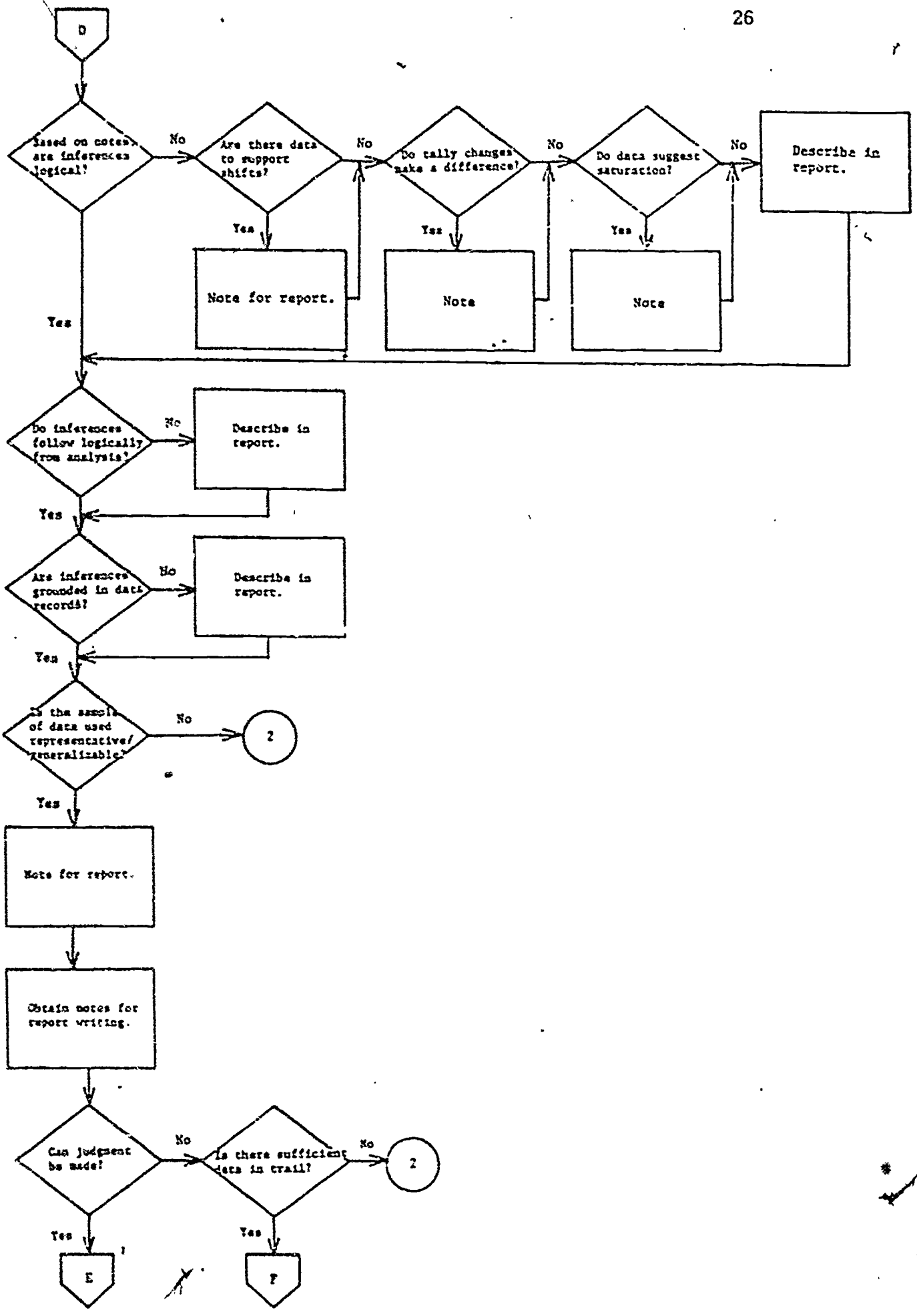
Algorithm of an audit procedure

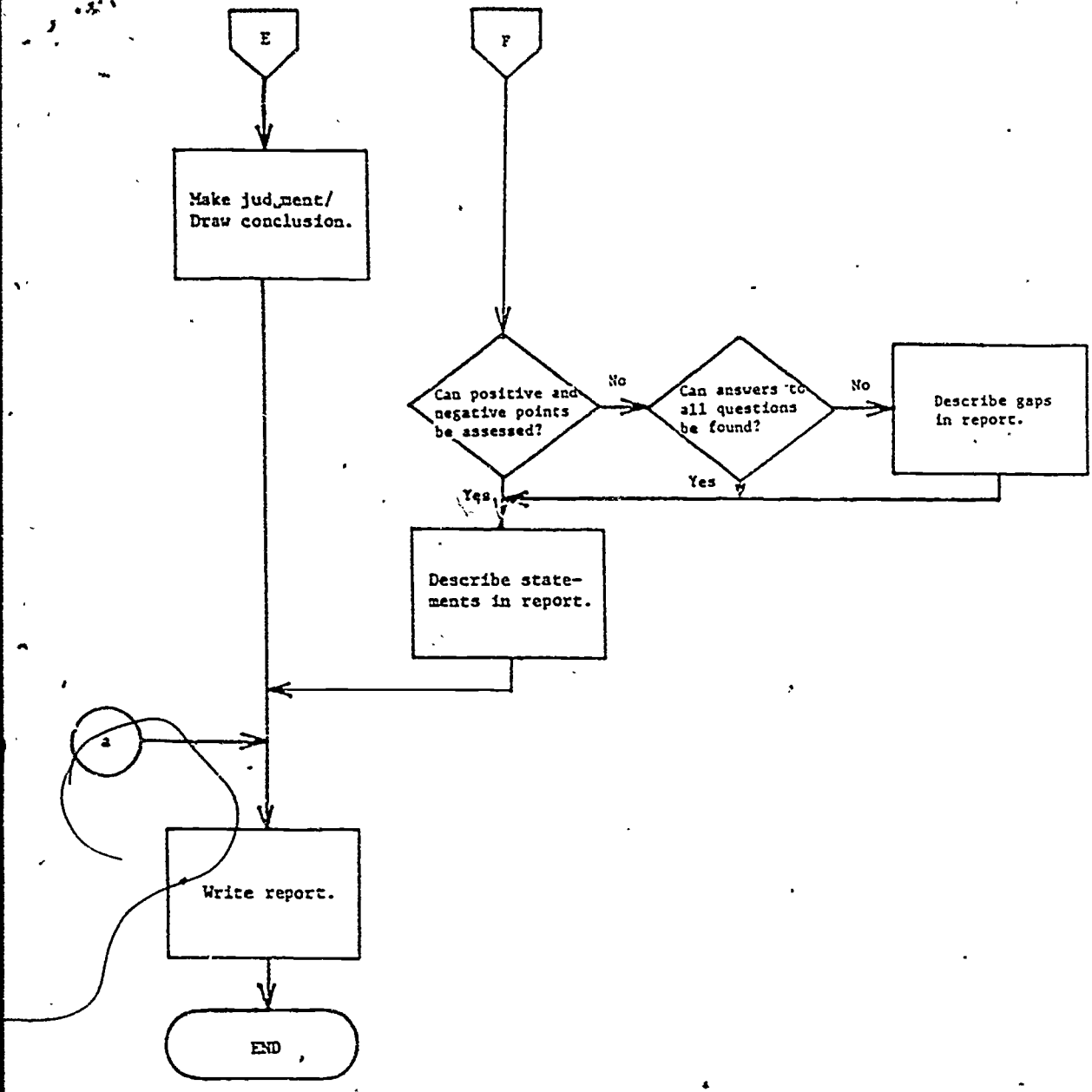

START
Obtain study and documentation from inquirer.
Is it naturalistic?
No
a
Yes
Do methods match problem?
No
a
Yes
-documentation of process
-substantive data
-explicit decision points
Is there an audit trail?
No
a
Yes
Is the audit trail sufficient/adequate?
No
a
Yes
Obtain audit contract guidelines
Collaborate with inquirer to develop audit plan & contract.
No
Are you terminating?
Yes
a
Do auditor and inquirer agree to contract plan?
No
Explore alternatives.
-new auditor
-agree to terminate
-compromise
Yes
A


A
-obtain documents
-obtain written records
-obtain tapes
-obtain documentative
Obtain all evidence from inquirer.
Compare against and within each other.
Is information consistent with each other?
No
Consult inquirer
Eliminated discrepancies?
No
Describe discrepancy in report.
Yes
Report the resolution.
Yes
Types of bias:
-unethical
-incompetance
-leads subject
-political
Evidence of inquirer bias?
No
Note for report
Yes
Describe bias in report.
B


B
Scrutinize all evidence.
Identify inquirer's categories and category labels.
2
Layers of data
-conclusion
-records
-tapes
-FN, PN
TN, MN
Select sample.
Are categories and labels grounded in data?
No
Are concepts mislabelled?
No
Are concepts inaccurate?
No
Describe in report.
Yes
Note for report.
Yes
Note for report.
Yes
Are categories/labels mutually exclusive?
No
Do category features overlap?
No
Yes
Can this be corrected?
No
Describe in report
Yes
Recommend corrections.
Yes
C


C
Is level of detail/analysis same for all categories/ labels?
No
Are categories free from sub-ordinate-super-ordinate relationships?
No
Are they alterable to the same level?
No
Describe in report
Yes
Describe in report
Yes
Recommend corrections
Yes
Is interviewer's assignment to categories accurate?
No
Do some assignments not fit?
No
Is there double counting?
No
Are there any other inaccuracies
No
Describe in report.
Yes
Can this be corrected?
No
Yes
Recommend corrections.
Yes
Can this be corrected?
No
Yes
Recommend corrections
Yes
Can this be corrected?
No
Yes
Recommend corrections
Yes
A
Note
Is this identified/tallied/weighted?
No
Should it be?
No
Describe in report.
Yes
Yes
Is the tally/weighting accurate?
No
Make note to recally.
Do recally changes make a difference?
No
Note for report.
Yes
Yes
D


D
Based on notes, are inferences logical?
No
Are there data to support shifts?
No
Do tally changes make a difference?
No
Do data suggest saturation?
No
Describe in report.
Yes
Note for report.
Yes
Note
Yes
Note
Yes
Do inferences follow logically from analysis?
No
Describe in report.
Yes
Are inferences grounded in data records?
No
Describe in report.
Yes
Is the sample of data used representative/ generalizable?
No
2
Yes
Note for report.
Obtain notes for report writing.
Can judgment be made?
No
Is there sufficient data in trail?
No
2
Yes
E
Yes
F



(from Halpern, 1981, pp. 55-61).

BIBLIOGRAPHY

Codification of Statements on Auditing Standards. Chicago: Commerce Clearing House, Inc., 1976.

Cronbach, Lee J. and Suppes, Patrick, Eds. Research for Tomorrow's Schools: Disciplined Inquiry for Education. Report of the National Academy of Education. New York: MacMillan and Co., 1969.

Burstein, Leigh. "Secondary Analysis: An Important Resource for Educational Research and Evaluation," Educational Researcher, 7:5 (May 1978), pp. 9-12.

Glass, Gene V. "Primary, Secondary, and Meta-Analysis of Research," Educational Researcher, 5:10 (November 1976), pp. 3-8.

Guba, Egon G. "Criteria for assessing the trustworthiness of naturalistic inquirers," Educational Communications and Technology Journal, 31:2 (Summer 1981), pp. 75-92.

Guba, Egon G. Toward a Methodology of Naturalistic Inquiry in Educational Evaluation. Monograph Series No. 8. Los Angeles, Center for the Study of Evaluation, University of California, 1978.

Guba, Egon G. and Lincoln, Yvonna S. Effective Evaluation: Improving the Usefulness of Evaluation Through Responsive and Naturalistic Approaches. San Francisco, California: Jossey-Bass Publishers, Inc., 1981.

Halpern, Edward. Evaluating Non-Quantitative Inquiries: A Methodological Exploration. Unpublished doctoral qualifying paper. Bloomington, Indiana: Indiana University, 1981.

Lincoln, Yvonna S. "Strategies for Insuring the Dependability (Reliability) of Naturalistic Studies." Paper read at the Evaluation Network, Austin, Texas, September 1981.

Lincoln, Yvonna S. and Guba, Egon G. "Do Evaluators Wear Grass Skirts? 'Going Native' and Ethnocentrism as Problems in Utilization." Paper read at the Evaluation Network, Austin, Texas, September 1981.

Lincoln, Yvonna S. and Guba, Egon G. Methodological Issues in Naturalistic Inquiry, book in preparation.

Lincoln, Yvonna S. and Guba, Egon G. "The Place of Values in Needs Assessment." Educational Evaluation and Policy Analysis, in press.

Lucas, William, The Case Survey Method: Aggregating Case Experience. The RAND Corporation, R-1515-RC, Santa Monica, California, 1974, 30 pp.

_____, The Case Survey and Alternative Methods for Research Aggregation, The RAND Corporation, P-5252, Santa Monica, California, 1974, 29 pp.

Mautz, K. K. and Sharaf, H. A. The Philosophy of Auditing. Chicago: American Accounting Association Monograph No. 6, 1961.

Ridings, Jeri M. Standard Setting in Accounting and Auditing: Considerations for Educational Evaluation. Unpublished doctoral dissertation. Kalamazoo, MI: Western Michigan University, 1980.

Stenhouse, Lawrence. "The Verification of Descriptive Case Studies." Paper read at the American Educational Research Association Annual Meeting, Toronto, Ontario, Canada, April 1978.

Spradley, James P. The Ethnographic Interview. New York. Holt, Rinehart, and Winston, 1979.

Wheat, F. M., Biegler, J. C., Levine, A. I., Olson, W. E., Pryor, T. C., Smith, R. B. and Solomon, D. Establishing Financial Accounting Standards. New York: American Institute Certified Public Accountants, Inc. 1972.

Willingham, J. and Carmichael, D. R. Auditing Concepts and Methods New York: McGraw-Hill, 1971.

Willower, Donald J. "Contemporary Issues in Theory in Educational Administration," Educational Administration Quarterly, 16.3 (Fall 1980), pp. 1-25.

Zigarmi, D. and Zigarmi, P. The Psychological Stresses of Ethnographic Research. Paper read at the American Educational Research Association, Toronto, 1978