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# Assessing Procedural Descriptiveness: Rationale and Illustrative Study

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Procedural descriptiveness refers to the extent to which the activities defined in a procedure are complete and specific. Procedures used in research or human service that are poorly described raise important questions such as whether the procedures can be replicated or generalized and, in the case of human service, whether they can be properly evaluated and made accountable. The assessment of procedural descriptiveness is an important and heretofore neglected area that should be an integral part of assessment methodology. To illustrate the assessment of procedural descriptiveness, the critical incident technique was employed to obtain a sample of limitations of a case-management procedure in a family

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service agency. The results provide directions for revision and refinement of the procedure and illustrate some of the advantages and disadvantages of the use of the critical incident technique to assess procedural descriptiveness.

In their seminal paper on the dimensions of applied behavior analysis, Baer, Wolf, & Risley (1968) introduced the term technological to describe one of the dimensions of applied behavior analysis. As these authors defined it, "... 'technological' here means simply that the techniques making up a particular behavior application are completely identified and described" (p. 95). They further indicated that the best rule of thumb for judging a procedural description as being technological is "... to ask whether a typically trained reader could replicate the procedure well enough to produce the same results, given only a reading of the description" (p. 95). Despite its importance in research and practice in human service, the technological dimension has received little conceptual or empirical attention. The purpose of this paper is to present a rationale for assessing procedural descriptiveness, a definition of procedural descriptiveness, and the results of an illustrative study.

# RATIONALE

Procedures are the principal means by which the objectives of human service and research are achieved. Intervention techniques and programs are among the main procedures of human service and instructions and other stimuli intended to guide the behavior of experimenters and subjects are among the important procedures of research. Procedures are used by researchers to manipulate independent variables, particularly in experimental research. In service, the therapeutically active ingredients, which may be thought of as the independent variable of the helping effort, are guided and otherwise mediated by the procedures that helping agents and others are to follow in providing the service. If procedures are poorly defined, there may be many adverse effects.

In service, for example, poorly defined procedures may lead to inconsistent and variable service delivery (e.g., Wodarski, Feldman, & Pedi, 1984). Procedural reliability may thus be threatened (e.g., Billingsley, White, & Munson, 1980), and treatment integrity may be jeopardized (e.g., Yeaton & Sechrest, 1981). Without explicit description, it is difficult to examine the clarity of the relationship between the treatment or program procedures and their goals and theoretical base (Hawkins, Fremouw, & Reitz, 1981). Descriptions that are unclear or not standardized may interfere with dissemination and adoption of procedures (Matthews & Fawcett, 1979; Paine, Bellamy, & Wilcox, 1984). And, finally, the lack of procedural explicitness raises questions about whether the procedure can be properly evaluated and about the accountability of the services to which the procedure relates.

There are analogous problems in research when procedures are poorly defined (e.g., Peterson, Homer, & Wonderlich, 1982). These include in-

consistent and uncertain manipulation of the independent variable, and difficulty in establishing a functional relationship between the independent and dependent variable. More generally, in both service and research, failure to describe procedures explicitly makes it difficult to replicate them and to generalize from the results that derive from their use, thus threatening the internal and external validity of the outcomes obtained (Campbell & Stanley, 1966; Kratochwill, 1978).

Although there is increasing recognition that procedures used in research and practice need to be described, little attention has been given to the assessment of how adequately procedures describe the activities to be carried out by those who are to follow them. Assessment technology has been centered largely on the dependent variable, with emphasis on the reliable and accurate description and observational analysis of the dependent variable (e.g., Hawkins & Dobes, 1977). Similar assessment of the independent variable has been neglected, as highlighted by Peterson et al. (1982) in their analysis of the integrity of independent variables in behavior analysis. These authors surveyed the articles in the *Journal of Applied Behavior Analysis* and found that the majority of the articles did not report any assessment of the actual occurrence of the independent variable and a sizable majority did not provide operational definitions of the independent variable.

# A CONCEPT OF PROCEDURAL DESCRIPTIVENESS

The descriptiveness of a procedure involves at least two somewhat overlapping characteristics: completeness and specificity. Completeness, as Hawkins and Dobes (1977) have indicated in the context of a complete response definition, delineates the "boundaries" of what is or is not to be included as an instance of the desirable response. For a procedure to be complete, it should indicate (a) the behaviors that are to be carried out in order to accomplish a given objective, (b) the person(s) who should engage in the behaviors, (c) the target person(s), or clientele who are to be affected by the procedure, (d) the conditions under which the behaviors are to be carried out, and (e) the goals that will be accomplished through the use of the procedure. To be specific, a procedure should denote the precise details of the activities to be performed. The description should be clear in that it is readable and unambiguous for the user, and it should refer to the observable characteristics of the activities to be performed (e.g., Hawkins & Dobes, 1977).

The concept of procedural descriptiveness can be illustrated with the example of a recipe. If a recipe for making a chocolate cake left out instructions for heating the oven or for selected ingredients, such as sugar or salt, it would not be complete. If its directions were not appropriately detailed, such as not indicating the exact temperature to which the oven should be preheated or the amount of sugar to add, the recipe would not be specific.

As has been indicated, if a procedure is described sufficiently, the typically trained reader should be able to carry out the procedure well enough to produce the intended results, given only a reading of the description (Baer, Wolf, & Risley, 1968). It is important to emphasize that what is sufficiently descriptive for a given objective depends very much upon the level of prior training and experience. For example, an experienced cook should already know about broiling, blanching, and braising such that a recipe requiring any of these operations need not describe them fully for the experienced cook whereas a full description would be required by a novice cook. More generally, that which is descriptive depends upon what is required of a procedure to produce the desired results, given the level of assumed training, experience, and repertoire of the users. Because of their importance in determining what constitutes the completeness and specificity of a procedure, the objectives of the procedure and response repertoire assumed for the user need to be clearly indicated.

Procedural descriptiveness should be distinguished from the related concepts of treatment integrity and procedural reliability. Treatment integrity has been defined as a degree to which a treatment is delivered as intended (e.g., see Yeaton & Sechrest, 1981). An analogous concept in research is that of procedural reliability. That concept has been defined by Billingsley, White, & Munson (1980) as ". . . the degree to which all variables (whether presumed to remain constant or manipulated in some fashion) occur in accordance with the experimental plan" (p. 231). An important common denominator of treatment integrity and procedural reliability is that they both deal with the extent to which those using the procedure follow its guidelines. Procedural descriptiveness, in contrast, pertains exclusively to the technological qualities of the procedural guidelines themselves and does not involve the question of whether the activities prescribed in the procedure are reliably performed. Procedural descriptiveness and compliance are thus different and each calls for its own methods of assessment. Compliance with treatment or experimental procedures is an important and heretofore neglected area of inquiry (Billingsley et al., 1980; Vermilyea, Barlow, & O'Brien, 1984), but, in general, compliance should not be examined until it has been determined that the procedures in question have attained a satisfactory level of descriptiveness. Before one asks, "Was the procedure carried out?" one should first ask, "Does the procedure appropriately describe the activities that are to be carried out?"

# AN ILLUSTRATIVE STUDY USING THE CRITICAL INCIDENT TECHNIQUE

#### Introduction

Flanagan (1954) defined the critical incident as any observable human activity that is sufficiently complete in itself to permit inferences and pre-

dictions about the person performing the act. To be critical, Flanagan indicated that the incident must occur in a situation where the purpose and intent of the act seems clear to the observer, and where its consequences are sufficiently clear to leave little doubt concerning its effects. Although this technique or modified versions of it have been employed in exploratory research for purposes of generating behavioral hypotheses (e.g., Glaser & Strauss, 1967), to our knowledge there have been no applications of this technique to the assessment of procedural descriptiveness.

Considered in relationship to procedural descriptiveness, critical incidents are defined here as concrete instances of failure to carry out a procedure because it is incomplete, not specific, or both. The collection and sorting of such incidents make it possible to draw inferences about the overall descriptiveness of the procedure and to pinpoint areas requiring further work. In this study, a critical incident consisted of a concrete instance of a difficulty the practitioner had in carrying out a case-management procedure.

#### Method

The Procedure Evaluated. The procedure examined in this study was the Procedure for the Assessment and Modification of Behavior in Open Settings (PAMBOS), a 16-step case-management framework. Based upon the assumptions and recommended steps described in earlier reports (Gambrill, Thomas, & Carter, 1971; Thomas & Walter, 1973), PAMBOS constitutes a set of guidelines and a framework to aid the practitioner in open service settings to organize practice activities in a sequential and systematic fashion (see Table 2 for the list of PAMBOS steps). Previous research employing PAMBOS had indicated that it was effective in guiding case-management with a variety of cases in an open community agency (Thomas & Carter, 1971; Thomas, Abrams, & Johnson, 1971; Thomas & Walter, 1973). Two guides to PAMBOS (Carter & Gambrill, 1970; Carter, 1973) were employed in the case-management activities of the practitioners involved in the present study (see Table 1 for a sample from the guidelines of one of the PAMBOS steps). PAMBOS presupposes that its users are familiar with the main principles and procedures of behavior modification, have had prior skill training in behavior modification and experience in interpersonal helping. and are familiar with the procedure and how to carry out the constituent steps and activities of the procedure.

*Practitioners and Agency Setting.* Data were gathered in the behaviorally oriented Family Service Agency of Genesee County, Flint, Michigan, by two second-year students earning the Master of Social Work Degree. The student practitioners had had prior courses in the theory and practice of behavioral intervention, one year of prior field experience as student social workers, were familiar with the writings on PAMBOS, had been trained in the use of PAMBOS, had been employing the procedural guidelines examined here as a regular part of their case-management activities for four months prior to the study, and had carried out the practice for the project with an experienced supervisor who followed PAMBOS in the supervision.

I ROBLEM INVENTORY				
Place to Indicate Completion	Guidelines for Step 2, Intake and Problem Inventory			
1.           2.           3.           4.           5.           6.           7.           8.           9.	<ul> <li>Social introductions and amenities, as appropriate.</li> <li>Form signing, as appropriate (e.g., client consent forms).</li> <li>Initial socialization of client; inform client: <ul> <li>a. Focus will be on current problems; give reasons why.</li> <li>b. Will obtain a list of problems; give reasons why.</li> <li>c. Will not gather details on any one problem now; give reasons why.</li> </ul> </li> <li>Probe client for <i>all</i> relevant problems.</li> <li>Suggested probes: <ul> <li>a. "Are there any other things that concern you now?"</li> <li>b. "Is there anything else you'd like to add to this list?"</li> </ul> </li> <li>Write down all problems client mentions.</li> <li>Mention and discuss additional problems you infer or observe.</li> <li>Add to list any of these you agree on mutually.</li> <li>Review list of problems with client. (Read off or display list to client.)</li> </ul>			

 
 TABLE 1

 Sample of PAMBOS Procedural Guidelines for Step 2, Intake and Problem Inventory\*

\* From Carter and Gambrill (1970).

*Client Subjects.* Twenty-four clients were seen by the practitioners, 11 by one and 13 by the other. After determining the type of counseling desired at intake, clients were assigned to practitioners according to the standard practice of the agency (i.e., practitioners had the option of accepting or rejecting a new case based upon the needs of the client and the availability and interests of the practitioner). Clients were usually seen once a week for approximately an hour. Over a 12-week period, a total of 104 client contacts were made by the two practitioners, 67 by one and 37 by the other, with a mean of 4.33 per client. Although all of the clients continued contacts long enough for the practitioners to have completed some of the steps of PAMBOS and some progressed from assessment to modification, few clients continued long enough to reach a mutually agreed upon termination. The failure to reach agreed upon termination occurred partly because a few clients stopped prematurely, which is common in open community agencies, and partly because some had not yet progressed to the point of termination at the time the study period ended.

*Procedure.* The practitioners were fully informed about all aspects of the study and were active participants. As part of their involvement, they were instructed and agreed to follow the PAMBOS procedural guidelines with their clients. A critical incident was defined as any occasion when the practitioners' case-related behavior during an interview session with a client was not guided by the PAMBOS guidelines. During any interview when they noted that their behavior was not sufficiently directed by the PAMBOS guidelines, the practitioners made brief unobtrusive notes as reminders for subsequent recording. After the interview, the practitioners recorded the incidents as procedural "issues" on forms prepared for the study (see Figure 1). The critical incidents were collected three

#### ASSESSING PROCEDURAL DESCRIPTIVENESS

Practitioner

78 Husband Child and wife Manage- ment
<ul> <li>/78 Parent Çhild Manage- ment</li> <li>/78 Female Personal</li> </ul>

FIG. 1. Form for recording critical incidents with illustrative entries.

days a week for 12 weeks while the practitioners were seeing clients as part of their field placement activities. Their judgments were considered valid indications of lack of procedural descriptiveness, although the incidents were submitted once a week to the entire research team, of which the practitioners were members. The research team discussed the nature of the incidents collected and implications for further procedural development. Essentially all incidents were accepted as valid limitations of the procedure.

Analysis. A free-sorting method described by Gottman and Clasen (1972) was used to categorize critical incidents according to procedural issues that appeared to be thematically similar. In this sorting, the reader first read one of the critical incidents, wrote a label for the type of incident, and then placed the incident under the label. Then the next incident was read and, if similar in content to the previous incident, it was placed under the same label and, if dissimilar, a new label was created and the incident was placed in that category. Labels were subject to change when a new critical incident added a new dimension to the concept that was being developed for a given category. This procedure was repeated until all of the critical incidents had been read and placed into categories. Ten categories were created [the number recommended by Gottman and Clasen (1972)].

# Results

Twenty-seven critical incidents were collected from the 104 contacts, yielding a rate of .26 incidents per hour, or one every four treatment hours. There were 24 such client cases (14 for Practitioner A and 13 for Practitioner B), providing 1.13 critical incidents per case.

The large majority of the incidents (20 of 27) involved cases of child management. There were, in addition, four incidents for cases involving personal counseling and one each for cases involving marital, school, and miscellaneous problems.

When the critical incidents were analyzed by the step of the procedure to which they related, it was found that the majority (20 of 27, or 74%) fell in steps involving the assessment phase, embracing Steps 1 through 8 (see Table 2). The three incidents identified for multiple steps also involved assessment. There were two incidents relating to the intervention phase (Steps 9 and 11), one for maintenance and no incidents for the steps involving termination and follow-up.

The 10 categories generated by the free-sorting procedure present a different thematic ordering for the procedural limitations. The definitions and examples for the categories are given below.

1. Data-based decision making, in which the procedure provided insufficient detail for guiding practitioner behavior when clinical decisions were to be made on the basis of examining data collected by the practitioner, clients or mediators. See the third issue in Figure 1 for an example.

2. *Mediator selection*, wherein the procedure provided insufficient detail for guiding the practitioner behavior in the appropriate selection of clinical mediators for assessment tasks. See the second issue in Figure 1 for an example.

3. Inclusion of specialized procedures, inasmuch as the PAMBOS guidelines provided insufficient detail for guiding the practitioners' use of specialized assessment techniques, such as checklists, questionnaires, and diaries. Example: "To meet a problem in clarifying what was meant specifically when the client indicated that he 'got upset' the practitioner requested that the client keep a record of such incidents for purposes of better specification—something of a 'specification probe'."

4. Other agency involvement, defined by incidents indicating that the procedure provided insufficient detail for guiding practitioner behavior when other agencies, such as schools, courts, and community service agencies, are involved in the definition of the client problems. Example: "Parents came seeking help after a school conference. No problems were

#### ASSESSING PROCEDURAL DESCRIPTIVENESS

PAMBOS Steps	Critical Incidents per Step	
	n	%
Assessment Phase	,	
Intake and problem inventory (Step 1)	4	
Problem selection (Step 2)	2	
Commitment to cooperate (Step 3)	0	
Behavioral specification (Step 4)	6	
Baselining of target behavior (Step 5)	6	
Identification of probable controlling conditions (Step 6)	0	
Identification of environmental resources (Step 7)	2	
Specification of behavioral objectives (Step 8)	_0	
Total	20	74
Modification Phase		
Formulation of the modification plan (Step 9)	1	
Implementation of the modification plan (Step 10)	0	
Monitoring the outcomes of modification (Step 11)	_1	
Total	2	7
Maintenance Phase		
Formulation of the maintenance plan (Step 12)	0	
Implementation of the maintenance plan (Step 13)	0	
Monitoring the outcomes of maintenance (Step 14)	1	
Total	1	4
Termination and Follow-up		
Termination (Step 15)	0	
Follow-up (Step 16)	0	
Total	0	(
Miscellaneous		
Multiple steps	3	
Other	1	
Total	4	15
Total	27	100

TABLE 2 Frequency of Critical Incidents by PAMBOS Steps

indicated at home, but there were those indicated at school. When school or court is involved, the procedure might require a problem inventory with teachers or court caseworkers."

5. Cycling forward in the procedure is indicated by incidents that revealed that the procedure provided insufficient detail for guiding practitioner behavior in the determination of conditions under which cycling forward to later steps in PAMBOS would be appropriate. Example: "Crises or urgencies in the client's life situation preclude practitioner from going through certain steps in procedure (e.g., baselining the determination of possible controlling conditions)."

6. Cycling back in the procedure is indicated by incidents that reveal that the procedure provided insufficient detail for guiding practitioner behavior in the determination of conditions under which it would be appro-

priate to return to earlier steps in PAMBOS. Example: "We need decision criteria that specify when it would be appropriate to work on more than one target behavior," required when introducing a new target behavior involves recycling back in the procedure to Step 2.

7. Departures from procedure as indicated by incidents which disclose that the procedure provided insufficient detail for guiding practitioner behavior in the determination of conditions under which departure from PAMBOS would be appropriate. Example: "It may be necessary to introduce other case management procedures to supplement whole steps of PAMBOS if the introduced methods are better suited to obtaining the procedural objectives."

8. Crisis situations wherein incidents indicated that the procedure provided insufficient detail for guiding practitioner behavior during crisis situations. Example: "Crisis situations represent an occasion for departure from procedure. What are the decision rules for determining when a crisis exists?"

9. Combining steps wherein the incidents indicated that the procedure provided insufficient detail for guiding practitioner behavior in the determination of conditions under which combining PAMBOS steps would be appropriate. Example: "It may be possible to combine aspects of the formulation of a modification plan and formulation of a maintenance plan. For example: the building in of maintenance procedures by formulating a modification plan that programs maintenance by changing the criteria of reinforcement."

10. Client characteristics as indicated by incidents in which the procedure provided insufficient detail for guiding practitioner behavior when client learning histories, such as illiteracy, preclude the use of PAMBOS steps or sub-steps. Example: "When written media are employed in the process, selection of a problem to work on may be a difficulty when one partner in a marital dyad is functionally illiterate."

Table 3 presents the frequency of critical incidents and PAMBOS steps sampled by the category of procedural issue identified by the free-sorting procedure. It is clear that the themes for the categories in the main involved a variety of PAMBOS steps. The two largest categories were data-based decision making (six incidents) and mediator selection (four incidents), with the remaining categories covering a variety of PAMBOS steps.

# DISCUSSION

The results of this study reflect on the case management procedure as a whole as well as its components. The rates of .26 critical incidents per hour, or one every four treatment hours, and of 1.13 incidents per case pertain to PAMBOS as a whole. Since each incident depicted a procedural limitation that has implications for procedural revision and refinement, the rates indicate that PAMBOS requires further design and development. Indeed, the rates may be underestimates inasmuch as there may

Category Number	Procedural Issue	Frequency of Critical Incidents	PAMBOS Steps Sampled	Frequency of Incidents by Step
1	Data based decision making	6	Baselining Monitoring modification Monitoring maintenance	4 1 · 1
2	Mediator selection	4	Behavior specification Baselining Environmental resources	1 1 2
3	Inclusion of specialized procedures	3	Behavior specification	3
4	Other agency involvements	3	Problem inventory	3
5	Cycling forward in procedure	3	Behavior specification Multiple steps	2
6	Recycling back in procedure	2	Problem selection Multiple steps	1 
7	Departures from procedure	2	Other Multiple steps	1 1
8	Crisis situations	2	Problem inventory Baselining	1 1
9	Combining of steps	1	Formulating modification	1
10	Client characteristics	_1	Problem selection	_1
Rei .	Totals	27		27

TABLE 3 Frequency of Critical Incidents and PAMBOS Steps Sampled by Category of Procedural Issue

have been some procedural difficulties not recognized or recorded by the practitioners. Even so, the rates are absolutely low and, considering the many procedurally relevant activities that can transpire in the time involved to which the rates apply, it is tempting to infer that the rates are relatively low and are thus favorable for the overall descriptiveness of PAMBOS. Perhaps this will turn out to be the case, but without comparative rates for other procedures, the rates identified here are difficult to evaluate. Additional studies of the rates of procedural limitations should provide an empirical basis for comparison and judgment.

In general, there are three types of procedural limitation disclosed by the incidents. The first pertains to the case problems that present difficulties for the users of the procedure. These were largely problems of child management. The second type involves the procedural activities and steps that have limitations. These related mainly to the steps of assessment in contrast to those of modification, maintenance, or termination. The third type consisted of general themes applying to the entire procedure. For example, according to the free-sorting analysis, there were procedural issues pertaining to data-based decision making, mediator selection, and the inclusion of specialized procedures.

The three types of procedural limitations—case problem, procedural activity, and general theme-appear to be generic and may apply more generally to characterize the limitations of procedures in many areas of human service. However, the particular profile of limitations found for each type necessarily depends upon how the incidents are sampled. In this study, each practitioner was allowed to take clients depending upon their availability and practitioner workload and preference, which slants the data base for critical incidents toward the types of clients and stages of the helping process characteristic of the practitioner's caseload. Thus, the practitioners in this study had cases consisting mainly of child management; and, because some clients terminated before later stages of assistance could be reached, most of the contacts involved the early stage of assessment and less frequently the later stages of modification. Clearly, the main advantage of such case sampling is that the incidents obtained are to varying degrees typical of the limitations encountered in the normal use of the procedure. However, a disadvantage is that this method results in over-sampling the early steps of the procedure and under-sampling later steps. The sampling bias can be corrected by obtaining a large sample of the normal workload that yields a sufficient number of incidents for each procedural step or by sampling procedural components, such as steps or other specific procedural activities, using those components as the data base for critical incidents.

A study such as this raises questions about the adequacy of the incidents obtained. The judgment of each practitioner was accepted here as a meaningful commentary on the procedure. Since each of the practitioners was familiar with the procedure and the writings related to it, one might argue that the practitioners, as typical users of the procedure, exercised judgments concerning procedural limitations that were about as valid as anyone's. Most incidents were discussed individually by the research team in the context of directions for improvement. There were others engaged in these discussions who had considerably more experience with this approach than the practitioners, yet in most cases there was high agreement that the issue raised in a recorded incident did indeed involve an aspect of the procedure that needed further work. Even so, when using the critical incident technique, practitioner judgments may be in error because of lack of training or experience. One method of determining the reliability of the incidents would be to have an outside expert systematically check the recording for each incident. By that means, a statement of reliability could be obtained and incidents attributable to skill deficits of practitioners could be eliminated.

Considered more generally as a method of assessing procedural descriptiveness, the critical incident technique has advantages and disad-

vantages. A main advantage, of course, is that use of this technique makes it possible to identify and retrieve instances of procedural activity that might otherwise be lost. Inasmuch as the incidents are recorded by users of the procedure, it is likely that the incidents will be those that are meaningful and relevant for the users. The technique is highly flexible because it allows for diverse definitions of procedurally relevant incidents. It is also highly feasible inasmuch as incidents can be identified unobtrusively, recording can be carried out during practice activity and afterwards, little time needs to be devoted to the recording of incidents and interviews, and practitioners and researchers can use the technique relatively economically and without introducing changes in the normal activities relating to the procedure. The technique is particularly appropriate in the early stages of procedural development for identifying major areas requiring further work. At later stages of procedural development, it may be used to discover any remaining limitations and to document the degree of descriptiveness by such indicators as rates per case or per treatment hour of critical incidents.

Among the potential limitations is that the critical incident technique presupposes that the judges are sufficiently familiar with the procedure to be able to make valid judgments about whether there are procedural limitations. Further, if the user of the procedure is incapable of discriminating deficiencies in descriptiveness, no number of critical incidents will make up for this shortcoming.

As behavioral assessment and related fields grow and mature, it is hoped that their definition and scope of inquiry are extended to include assessment of procedural descriptiveness. This addition to behavioral assessment would not be inconsistent with the conceptions of the field put forth by numerous writers (e.g., Barlow, Hayes, & Nelson, 1984; Ciminero, 1976; Cone & Hawkins, 1977; Nelson & Hayes, 1979), or with the scope of applied behavior analysis as put forth initially by Baer, Wolf, & Risley (1968). Procedures should be assessed for their descriptiveness as a regular part of their development and evaluation, and the techniques for such assessment should eventually become an integral part of the standard methodologies of assessment, measurement, intervention design and development, and evaluation.

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