

during the tasks and activities, children's proximity and contribution, and the nature of children's and caregivers' involvement. Methods include narrative recording, task analysis, and rating scales.

**Form 7: Recording Conditioned Stimuli, Positive Reinforcers, and Aversive Stimuli** This form helps caregivers to keep a running list of a variety of events that elicit a child's attention and feelings (respondent behavior) or that serve as consequences that strengthen or weaken a child's instrumental (operant) actions.

**Form 8: Recording a Child's Cooperation** This form more precisely describes how often and under what conditions a child cooperates and how caregivers try to get a child's cooperation. It utilizes continuous event recording and/or narrative recording of both naturally occurring episodes and a child's response to a set of pre-arranged requests.

**Form 9: Recording a Child's Ongoing Behavior** Form 9 is useful whenever caregivers need a detailed description of any behavior of interest. Examples include a child's play, locomotion, head control, use of hands for reaching and grasping, and communication. Narrative recording is the primary method used.

**Form 10: Assessing Features of the Communication Environment** This form is generally used in conjunction with Form 11 for assessing a child's communication. It provides a description of the communication climate (e.g., caregivers' expression of enjoyment in being with the child); interaction format (e.g., degrees of caregiver directiveness); congruence between materials and caregivers' talk and the child's level of understanding; and the extent to which the child is given opportunities to communicate. Measurement involves rating scales, event recording, and narrative recording.

**Form 11: Assessing a Child's Participation in Communication** This instrument helps to describe part of a child's communicative repertoire, including responsiveness to the communicative acts of others, the child's communicative acts that express intention, the child's reciprocations of others' initiations, and the child's efforts to repair communication difficulties. Observations are made in a variety of environments, such as routine tasks and activities, and lessons. Methods include continuous event recording, narrative recording, and rating scales.

## METHODS OF MEASUREMENT USED IN THE FORMS

Forms 3-11 involve several methods of measurement. These are defined below to facilitate following the instructions in each form.

### Narrative Recording

Narrative recording is concerned with *how* events are organized, rather than how many times they occur. Narrative recording involves describing live or tape-recorded happenings in sportscaster fashion—short sentences, everyday language, concrete terms, and in the sequence in which events occur. Narrative descriptions are usually written, with wide margins for notes (e.g., on a pattern that seems to be emerging, on what to observe later, or on implications for programs). Narratives can also be spoken into a tape recorder (see, for instance, Form 9). Later, tapes are analyzed to extract information useful for program planning.

There are two sorts of narrative recording. *Running records* are useful when one is not sure of exactly what to look for. For instance, running records are made of how a child performs a new task or how children and caregivers accomplish a lesson or meal.

*Specimen description* is another kind of narrative recording. It is used when important recurring events have been identified, perhaps from earlier running records. Instead of recording the whole flow, an observer looks for and describes only the identified—specimen—events. For instance, instead of describing all of the exchanges that happen during a play activity, the observer only describes exchanges in which the caregiver makes requests of the child (see Forms 3 and 8).

### Counting or Event Recording

Event recording is often used after narrative recording has identified important events and described how they are accomplished. Event recording is concerned with how often and/or for how long specified events happen. There are two kinds of event recording—continuous and intermittent.

**Continuous Event Recording** During continuous event recording the observer tries to count all instances of an event—usually an event that does not happen at too high a rate. For instance, during a sample of routine activities during several days, an observer counts every episode of a child's reciprocation of another's communication (see Form 11). Or, all day long, in shifts, observers count every episode of proper toileting versus accidents.

Continuous event recordings are summarized in several ways.

1. Determining the total number of events that occurred. For instance, the observer tallies the total number of times that a child spoke, the number of words the child said, or the number of different words the child used.
2. Determining the rate of events (e.g., the number of communicative acts per minute). Rate is especially important to know when the size of observation periods (e.g., routine activities) varies.
3. Determining how long events occur. For example, an observer counts each time a child self-initiates play and how long each play episode lasts. The observer then sums the durations of the play episodes to find the total duration of play. If desired, the total duration is divided by the number of play episodes to show the average duration of play episodes. Sixty-six minutes of play during 10 episodes equals 6.6 minutes per episode.
4. Determining percentages. For instance, having counted 37 total communicative acts made by a child during a meal, the observer determines what percentage of the 37 communicative acts were requests, questions, offerings, and protests. Or, having found that a child's self-initiated play during 3 hours of observation amounted to 45 minutes, the observer divides 45 by 180 minutes to learn that self-initiated play occupied 25% of the observation period.

**Intermittent Recording** When events occur at a high rate, one cannot count all of them. Therefore, instead of continuous event recording, *intermittent recording* (or time sample recording) is used. This involves dividing the observation period into relatively short, consecutive, equal time intervals. A simple recording sheet could be one or more pages divided into rows. Each row is divided into boxes that represent each time interval. Frequently checking a watch or clock, the observer, one interval box after another, marks *whether* the specified events happened during an interval, as suggested below.

Consecutive 20-Second Intervals

1	2	3	4	5
Play	Play	Self-stimulation		Play

One technique is to record the first episode of an event no matter when it begins in an interval. It does not matter whether the event occupies the entire interval; the interval is marked *if* the event happened. If the event episode continues into the next interval, that interval is marked, too. Another technique is to mark an interval only if the event is occurring at the moment the interval *ends*.

Each interval in the series must be the same duration (e.g., 15 seconds, 30 seconds, or even longer). The duration chosen depends on how often the behavior is known to happen and how long episodes of the behavior usually last. Imagine that one is interested in a child's attention to the activity of others. If attention episodes are known to be short (e.g., about 15 seconds), and if breaks between attention episodes also are short, then the consecutive time intervals should be short as

well. This will provide a series of many intervals, giving the child's attention many chances to be recorded. Note that if observation intervals were much longer, perhaps 5 minutes, then the child would be alternating between paying attention and not paying attention many times in the same interval. However, because only the first attention episode is recorded, one does not learn how much time the child actually pays attention during any 5-minute period. Nor does one learn how often the child alternates between attention and inattention.

Generally, time sampling is summarized by calculating the percentage of intervals in which the behavior occurred. For instance, a child's attention to others might be recorded in 15% of the intervals. In addition, scanning the whole series of intervals, one identifies patterns. For instance, a child may pay attention during more intervals at the start of a social activity.

Both continuous and intermittent event recording require consideration of how much *time* should be spent observing. In general, the less often targeted events happen, the more time is spent observing so as to catch events when they happen. Conversely, if a child talks at a high rate, it is not necessary to observe all day to get a representative sample of how often the child talks and what words the child uses.

### Rating Scales

Rating scales are simultaneously qualitative (impressionistic) and quantitative (give information about degrees of more and less). They are especially useful in *summarizing* observations. For example, after a lesson, an observer rates how much a caregiver paid attention to the child and their collaborative activity, as well as how much effort the child expended on the tasks.

In general, a rating scale is created by first determining the *dimensions* along which a variable can vary. For example, caregivers' attention when interacting with children can vary with respect to both the degree of attention (e.g., from obvious disinterest to keen attention) and how often keen attention is expressed.

Next, selected dimensions (e.g., frequency of expressions of keen attention) are divided into levels, degrees, or *ranks*, such as: 1) keen attention was predominant throughout the activity, 2) keen attention was expressed a lot during the activity, 3) keen attention occurred some during the activity, and 4) keen attention occurred rarely or not at all during the activity.

Then, the prospective scale of rankings is *tested* to see if the ranks make sense to users. For example, do several observers score the frequency of a caregiver's keen attention as "3"? Or, is the word "some" too ambiguous? If so, the scale is rewritten using clearer words. For instance, rank 3 could be changed to "Keen attention was expressed three or four times." Or, instead of four ranks, the dimension of frequency could be rescaled on fewer levels, making it easier to choose between them (e.g., 1 = attention was adequate; 2 = attention was not adequate). Forms 3, 4, 6, 10, and 11 all contain rating scales.

### ANALYSES THAT ARE PART OF OR MADE POSSIBLE BY THE FORMS

Measurement methods, discussed above, are tools for collecting raw information. Methods of analysis provide formats for collecting and then making sense of the raw data and yield a more useful picture than, perhaps, counts, ratings, and descriptive sentences alone. There are several analyses to consider: task analysis, descriptive analysis, and functional analysis.

#### Task Analysis

Task analysis is a way of assessing behavior sequences that have rather definite steps and outcomes (e.g., hand washing). Task analysis might be done through narrative recording. In this case, the observer makes a detailed running record of a child's performance and of the caregiver's teaching. Later, the record is analyzed into task steps. Task analyses can also be done according to prepared lists of the usual steps, such as task analyses in Form 4.

With whichever format observations are made, the observer-task analyst looks for and records several items.

1. Whether the child's actions effectively accomplish the "work" at each step (i.e., whether the actions are the "right" ones, are done at the right time, are done long enough and with sufficient smoothness and effort)
2. The adequacy of cues, prompts, and reinforcement provided by a caregiver
3. How much the child pays attention, cooperates, and appears to enjoy the task and/or instructional interaction
4. Strong and weak behavior links found across the steps in the task

#### Descriptive Analysis

Descriptive analysis is a way of discovering connections among events. For example, after a number of task analyses (e.g., using Forms 4 or 6), the observer discovers that a child's attention, effort, cooperation, and competence appear to be affected more by the expressed enthusiasm and frequency of reinforcement from caregivers than by the kind of task. Similarly, using Form 3 and counting productive versus counterproductive exchanges in a family, an observer notes that counterproductive exchanges are more frequent in the late afternoon when parents and the child are stressed by the amount of noise, activity, and work that must be done. In sum, descriptive analysis involves observation (using narrative recording, event recording, or rating scales) under a variety of *naturalistic* conditions so that events that go together again and again will be detected.

#### Functional Analysis

Functional analysis is used to provide a relatively clear *demonstration* of possible connections among events. In contrast to descriptive analysis, which detects naturally occurring variations and regularities, functional analysis involves engineering variations in an environment to see if they have the expected consequences. For example, a caregiver might alternate between sessions in which he or she expresses a lot of enthusiasm and reinforces the child at a high rate and sessions in which enthusiasm and reinforcement are reduced to see if the child's attention, effort, cooperation, and competence vary accordingly. Forms 4, 6, 8, and 10 combined with 11 lend themselves to functional analysis.

### SUGGESTIONS FOR DIRECT OBSERVATION USING THE FORMS

The suggestions presented below will help to ensure that direct observation yields accurate and representative information.

1. Observers (e.g., team partners) are skilled at using the forms before observation begins. This can involve the following steps. First, there is discussion of definitions (e.g., "involvement") and scoring codes, as in Forms 3 and 4. Second, observers practice using the definitions as guides for noticing and describing events. For instance, when watching live or videotaped instructional sessions, they use the definitions of involvement to pinpoint behaviors that can be labeled effort, enthusiasm, attention, and cooperation. "There's an example of cooperation. That praise had virtually no enthusiasm in it." Third, in pairs or in larger groups, observers practice recording observations. For instance, they might use the task analyses and rating scales in Form 4. Observers then compare their recordings to determine inter-observer reliability. Inevitable discrepancies are discussed. It may be that some observers find the definitions too ambiguous or they may be using somewhat different definitions or scoring codes. It may be, too, that some observers are trying to record too much at once or that the recording form itself is unwieldy for the situation. (If necessary or desired, readers should revise prepared task analyses, definitions, scoring codes, and the recording formats as they see fit.) Observers