Data Collection Methods

Reference Guide

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FREQUENCY / EVENT & RATE RECORDING

Description:
These methods involve counting the number of times a behavior occurs in a specific time period. Use these methods if the behavior can be easily counted and the behavior has a clear beginning and end. Do not use these methods if the behavior is occurring at such a high rate that an accurate count is impossible (e.g., pencil tapping) or the behavior occurs for extended periods of time (e.g., 2 tantrums, but the duration of each tantrum is one hour).

Examples:
Event recording is best for behaviors with a distinct beginning and end.

Event recording has been used to measure behaviors such as:

- Task initiation and protests to task demands
- Inappropriate sitting and littering
- Correct and incorrect academic responses
- Tardiness

Teachers have used event recording to measure their own behaviors, such as:

- Praise statements
- Response opportunities provided to students

Event recording is best for behaviors that occur with enough in between to distinguish between the end of one response and the onset of another.

Special Considerations:
A frequency measure should be used only when the length of observation time is consistent from day to day (e.g., always 2 hours).

A rate measure should be used if the length of observation time varies from day to day (e.g., 60 minutes on Monday, 300 minutes on Tuesday).

Summarizing the Data:

Frequency: At the end of the observation period, total number of occurrences. For example, Anna left her seat 5 times during 7th period.

Rate: Count the number of times the behavior occurred in the time observed. Divide the count by the length of time the behavior was observed. For example, if Anna kicked a peer 30 times in a 10 minute observation, the rate would be 3 kicks per minute (30 kicks divided by 10 = 3 kicks per minute).
DURATION RECORDING

Description:
This method documents the length of the behavior by recording the time the behavior begins and ends. Use this method if your primary concern is the length of time the student engages in the behavior and the behavior has a clear beginning and end. Do not use this method if the behavior occurs with high frequency or the behavior starts and stops rapidly.

Examples:
Duration recording is appropriate for behaviors that have a distinct beginning and ending or for those that occur at such high rates that it would be difficult to get an accurate frequency count (e.g., number of taps during pencil, finger, or toe tapping).

Duration recording has been used to measure behaviors such as:

- On Task: Looking at the assignment, writing and asking questions related to the topic, using assigned materials, and following teacher directions
- Compliance to task demands
- Academic writing tasks

Consider collecting frequency data for the target behavior in combination with duration recording to provide a more accurate picture of behavior.

Special considerations:
It can sometimes be difficult to accurately record the exact duration of the behavior. On the other hand, duration recording not only tells us how long the student engages in the behavior, but it automatically provides us with how many times the behavior occurred.

Summarizing the Data:
Duration can be summarized in two different ways:

- **Percentage of observation with behavior**: Sum the total number of min/sec/hrs that the behavior occurred during the observation, divided the sum by the total number of min/sec/hrs of the observation, and multiply by 100.

- **Average Duration of Behavior**: Sum the total durations and divide by the total occurrences.

Example: During a 60 minute observation, David had 3 tantrums that lasted 3 minutes, 7 minutes, and then 5 minutes with a total duration of 15 minutes.

The % of observation with behavior = 15 minutes divided by 60 minutes = .25 times 100 = Tantrums occurred during 25% of the observation.

Average duration – 15 minutes divided by 3 tantrums = Average of 5 minutes per tantrum.
INTERVAL RECORDING

Description:
Interval recording documents whether a behavior occurred during a particular period. In order to determine this, an observation period is divided into brief intervals. At the end of each of these, the observer records whether or not a behavior has occurred. There are two types of interval recording: whole and partial interval. When utilizing whole-interval recording, an observer indicates whether the behavior occurred during the entire time. (Example: A student worked on an assignment during an entire thirty-second interval.) When utilizing partial-interval recording, an observer indicates whether the behavior occurred at any point during the time interval. (Example: A student worked on an assignment during fifteen seconds of a thirty-second interval. The record indicates that the behavior occurred.)

Examples:
Interval recording is used when it is difficult or impractical to constantly observe behavior.

-Whole-interval recording yields data on the total duration of the behavior.
-Partial-interval recording yields data on the proportion of the observations period that the behavior occurred.

Both whole and partial-interval data are reported in terms of the percentage of total intervals during which the behavior occurred (the number of intervals the behavior occurred / the number of intervals the behavior occurred + the number of intervals the behavior did not occur times 100).

Special Considerations:
Interval recording often takes less time and effort, especially if the behavior occurs at a high frequency, because the observer records the behavior only once during the interval, regardless of how many times the behavior occurs. However, interval recording only provides an estimate of the actual number of times that a behavior occurs. If the intervals are too long (e.g., 1 hour), the results can overestimate the frequency of the behavior. The shorter the interval, the more accurate representation of how often the behavior is occurring. For example, if aggression occurred once per hour in a 5 hour observation, a 1 hour interval recording form would conclude that the behavior occurred during 100% of intervals (1 occurrence in each 1 hour interval). However, if a ten minute interval recording form was used, the results would conclude that the same behavior occurred during only 16.7% of intervals (5 of the 10 minute intervals contained behavior out of a possible 30 intervals).

How to Collect the Data:
Identify the observation period at the times during which the behavior is most likely to occur. Typically, observations last between ten minutes and one hour, although it is more accurate and less burdensome to use shorter periods.
1. Divide the observation period into equal intervals. These intervals are usually between five and fifteen seconds long.
   A. Whole interval: Record an “x”, plus sign, or check mark if the behavior occurred throughout the duration on the interval (e.g., if using ten-second intervals, the behavior must last the entire ten seconds). If the behavior did not occur for the entire interval, then record the nonoccurrence of the behavior with a minus sign or 0. (Note: Nor more than one behavior at a time should be observed when using whole-interval recording, due to the necessity of observing during the entire interval.
   B. Partial interval: Record with an “X”, plus sign, or check mark if the behavior occurred at any point during the interval (e.g., if using ten-second intervals, the behavior must occur at least once during that particular interval). If the behavior did not occur during the interval, record the nonoccurrence of the behavior with a minus or 0. (Note: Multiple behaviors can be observed during partial interval recording because an observer only has to document whether a behavior occurred at all during an interval.)

2. Count the number of intervals during which the behavior occurred. Divide this number by the total number of intervals and multiply by 100 to determine the percentage of intervals during which the behavior occurred.
   - Consider using a prompt to signal the beginning and end of intervals, such as an audio recording with beeps (headphones should be used!).
   - If you find that you have unmarked intervals, you may have accidentally lost track during the observation and marked the wrong interval.

Keep in Mind: Interval recording provides an estimation of behavior.

   - Whole-interval recording typically underestimates the overall duration of the behavior because if a behavior occurs—but not for the entire interval— it is not recorded or documented as occurring.
   - Partial-interval recording typically overestimates the overall duration and underestimates the rate of the behavior because if a behavior occurs multiple times during an interval, it is still documented as occurring only once.

Summarizing the Data:
When using interval recording, the level of the behavior is reported as the percentage of intervals in which the behavior occurred. To calculate the % of intervals, count the number of intervals in which the behavior was recorded, divide the total number of intervals during the observation period and multiply by 100.

Example: Mary was out of her seat during 4 out of 10 intervals. 4/10=.40 times 100= Mary was out of her seat during 40% of intervals recorded during the observation.
LATENCY RECORDING

Description:
Use latency recording when you’re interested in how long a student takes to begin performing a particular behavior once the opportunity has been presented. For example, if a teacher makes a request for a student to put an activity away, the observer would be interested in the length of time it takes for the student to comply with the request. Use this method if the opportunity and the behavior have a clear beginning and end. Do not use this method if the opportunities are continuous or if they start and stop rapidly.

Examples:
Latency recording is appropriate when the teacher wants to measure how much time passes between when an instruction, cue, or prompt is provided and the behavior begins.

- Time delay between a statement/question and the student’s attempt to communicate
- Lapse in time between instructions and compliance with task
- Time delay between being shown a word and pronouncing it

Special Considerations:
Latency and Duration both measure time; however, latency is how long it takes to start the behavior and duration is how long the behavior lasts. As with duration, latency can also be difficult at times to record the exact length of time it takes for the behavior to start. On the other hand, latency is a helpful measure if the goal is to reduce the amount of time it takes for a student to start an appropriate behavior or increase the amount of time between an environmental trigger and the occurrences of inappropriate behavior.

Summarizing the Data:
This data is summarized by calculating the average latency (average time it takes for the behavior to start). To calculate, sum all of the latencies and divide by the total number of opportunities.

Example: Shelly’s teacher assigned work 4 times during the observation. Shelly took 60 seconds, 90 seconds, 35 seconds, and 50 seconds to start the four assignments. So, 60+90+35+50=235 divided by 4= Shelly took an average of 58.75 seconds to start her assignment during the observation.
TIME SAMPLING RECORDING

Description:
Time sampling is a variation of interval recording. Small samples of time (30 seconds) are set up within larger intervals (5 minutes). Instead of noting whether a behavior occurred or did not occur within an entire interval (5 minutes), the observer only looks at the student during a sample of time (30 seconds), usually at the beginning or end on an interval, and records whether the behavior is occurring at that instant or small sample of time. Use this method if the teacher is interested in group performance (multiple behaviors of multiple students). Do not use this method for low frequency behavior.

Examples:
Talking, on-task/off task behavior, screaming, and in-seat/out-of-seat.

Special Considerations:
This method requires less effort because the observer does not have to observe the behavior for the entire interval, just a portion of the interval or at a specific time in the interval. Time sampling enables the observer to observe one or more behaviors of one or more students, even if the observer has other commitments during the day. Instead of continuously looking for behavior, it gives the observer more time to record the observations and it is convenient when behavior cannot be observed continuously. However, time sampling is less accurate than interval recording. It can often underestimate the occurrence of behavior. For instance, if a behavior occurs at times other than the time sample when the observer is recording, the data will often display low levels of behavior. Even though the behaviors did occur, the data shows that it did not, simply because it did not occur in the small window of time that it was observed.

How to Collect the Data:
The observer divides the observation period into intervals of time, but only observes and records the behavior during part of each interval (e.g., only 1 minute during each 15 minute interval, momentarily at the end of the 10 minute interval).

Example: If the teacher wants to record a student’s on-task behavior, the observer could set a timer to beep every 10 minutes and then record the occurrences of on-task behavior only if the student is on-task when the timer beeped.

Summarizing that Data:
Time sampling data are usually presented as percent of intervals in which responding occurred. To calculate the % of intervals, count the number of intervals in which the behavior was recorded, divide by the total number of intervals during the observations period and multiply by 100.

Example: Sam was talking during 20 our 30 intervals- 20 divided by 30=.66 times 100= Sam was talking during 66.6% of intervals recorded during the observation.
PERMANENT PRODUCT

Description:
This method involves selecting a product or result that indicates the occurrence of the target or replacement behavior and a response is recorded if the product is or is not produced. It is not recommended to use this method as a primary method of data collection. Permanent products should support a primary direct observation method (e.g., frequency, interval).

Examples:
# of correctly completed homework problems, tokens for appropriate behavior, and referrals.

Special Consideration:
A benefit of this method is that the observer does not necessarily have to be present when the behavior occurs. The occurrence of the behavior is indicated by the product or lack of product produced. A limitation of this method is that the observer cannot always determine who engaged in the behavior that led to the product recorded (e.g., someone else completing homework).

Summarizing the Data:
Summarizing permanent product data is specific to the type of product. If the team is targeting homework completion, they could calculate the percentage of opportunities to complete the homework for each week or month. If the team wants to track the number of tokens a student receives for appropriate behavior, they could calculate the frequency of tokens received per day.
ABC ANALYSIS

Description:
This method involves recording the environmental variables related to the problem behavior. When the behavior of interest occurs, the observer records the target behavior, the antecedent (event that immediately preceded the behavior), and the consequence (event that immediately followed the behavior). Use this method during a functional assessment observation to identify information regarding the possible function of the target behavior. If using this method as a progress monitoring data collection method, use only with behaviors that are not high in frequency and are easy to observe and count. Do not use this method with high frequency behaviors.

Examples:
Throwing items, inappropriate comments to peers, leaving one’s seat, hitting or other forms of aggression, walking out of class without permission, and refusal to follow directions.

Special Considerations:
The ABC method is typically used during functional assessments and not for routine day to day data. Because it requires the observer to record multiple variables, it may require more times and effort to record every instance of behavior, especially high frequency behaviors. The ABC method only demonstrates correlation relationships between the problem behavior and observed antecedents and consequences. Functional relationships are not demonstrated, but can be hypothesized based on patterns of ABC relationships observed.

Summarizing the Data:
If the team is using the information as part of the functional assessment, the team should look at the patterns across behavior, such as a certain time of day, activity occurring, or antecedent observed. If the team is using the information to monitor the progress of the BSP or PBIP, the data should be summarized as a frequency count. At the end of each observation period, total the number of occurrences of behavior. For example, Joseph walked out of class 3 times.
**SCATTERPLOT**

**Description:**
The scatterplot method is an interval recording method that is typically used during functional assessment to identify the time of day that the problem behavior most often occurs. The observer divides the observation period into smaller time periods or intervals, observes the student throughout each interval, and then records whether the behavior occurred or did not occur in that interval. This method reveals temporal patterns of behavior across the observation period as well as patterns that may be associated with specific instruction. Use this method if the team wants to know when or how often the behavior is occurring. Do not use this method if the team is trying to identify specific antecedents or consequences associated with the behavior.

**Examples:**
Fighting, non-compliance, distracting peers, on-task/off-task behavior, and tantrums.

**Special Considerations:**
As with interval recording, the scatterplot often takes less time and effort, especially if the behavior occurs at a high frequency, because the observer records the behavior only once during the interval, regardless of how many times the behavior occurs. However, the scatterplot method can often overestimate the occurrence of behavior if the intervals are too long. The scatterplot method can be useful in determining optimal times for someone to directly observe the occurrences of the target behavior. Once patterns exist across certain times, the team can start to identify variables that may be contributing to the behavior.

**Summarizing the Data:**
The scatterplot is typically reported as the percentage of intervals in which the behavior occurred. To calculate the % of intervals, count the number of intervals in which the behavior was recorded, divide by the total number of intervals during the observation period and multiply by 100.

Example: Mary was out of her seat during 4 out of 10 intervals- 4 divided by 10= .40 times 100= Mary was out of her seat during 40% of intervals on 8/31/12.