

# Behavioral approach in training the Mentally Retarded<sup>1</sup>

by: John E. Carr, Ph.D.

Visiting Associate Professor  
Department of Psychological Med.  
University of Malaya,  
Kuala Lumpur.

## Measurement

The term "behaviour modification" refers to a technology of behaviour change based upon principles of learning developed by Pavlov, Watson, Skinner, Bandura and others. The most significant feature of the behavioural approach is its reliance upon precise and reliable ways of measuring and recording observable behaviour. This is the key to the success of behavioural modification techniques in education, medicine, industry, and numerous other fields. Without precise behavioural measurement an individual's performance cannot be accurately assessed, appropriate behavioural change programs cannot be developed, and the results of intervention cannot be meaningfully determined. Behaviour is action and therefore is readily observable and recordable. Walking, eating, dressing, laughing are be reliably reported by several observers, whereas thinking or teeing are not observable behaviours. Any reference to such acts must be based upon inference or assumption on the part of the reported and is thus subject to possible bias.<sup>3</sup>

Behaviourists have developed a number of measurement and recording techniques, many of which have now become standard in the behavioural research literature.

*Automatic Recording* devices provide electrical or mechanically produced records of an individual's response activities, like the number of times a pigeon pecks at a key or the number of times a child pushes a switch in response to some training situa-

tion. Such devices are common in the laboratory but not generally suited to use in the clinic, home, or classroom without technical expertise.

*Product Recording* refers to the measurement of the products of behaviour, such as the number of words spelled correctly, the number of paintings painted, or the number of biscuits baked.

*Event Recording* as the term implies, refers to the counting of discrete events of a certain type as they occur. A teacher may count the number of times a child gets out of her seat, talks out in class, hits another child, or speaks. Such recordings are easily taken with the help of pencil and paper, or a wrist counter.

*Duration Recording* refers to the measurement of the time required for a behavioural act. For example, how long does it take Jon to tie his shoe or do his homework. The most efficient tool is of course a stopwatch, or simply a wristwatch with a sweep second hand.

*Interval Recording* refers to the counting of the number of times a behaviour occurs during a specified time interval, for example, the number of times Billy hits Susie during a one hour play period.

*Time Sampling* is a variation on interval recording where the observations are not made continuously but rather at spaced intervals. For example, we may not wish to sit and watch Billy and Susie for

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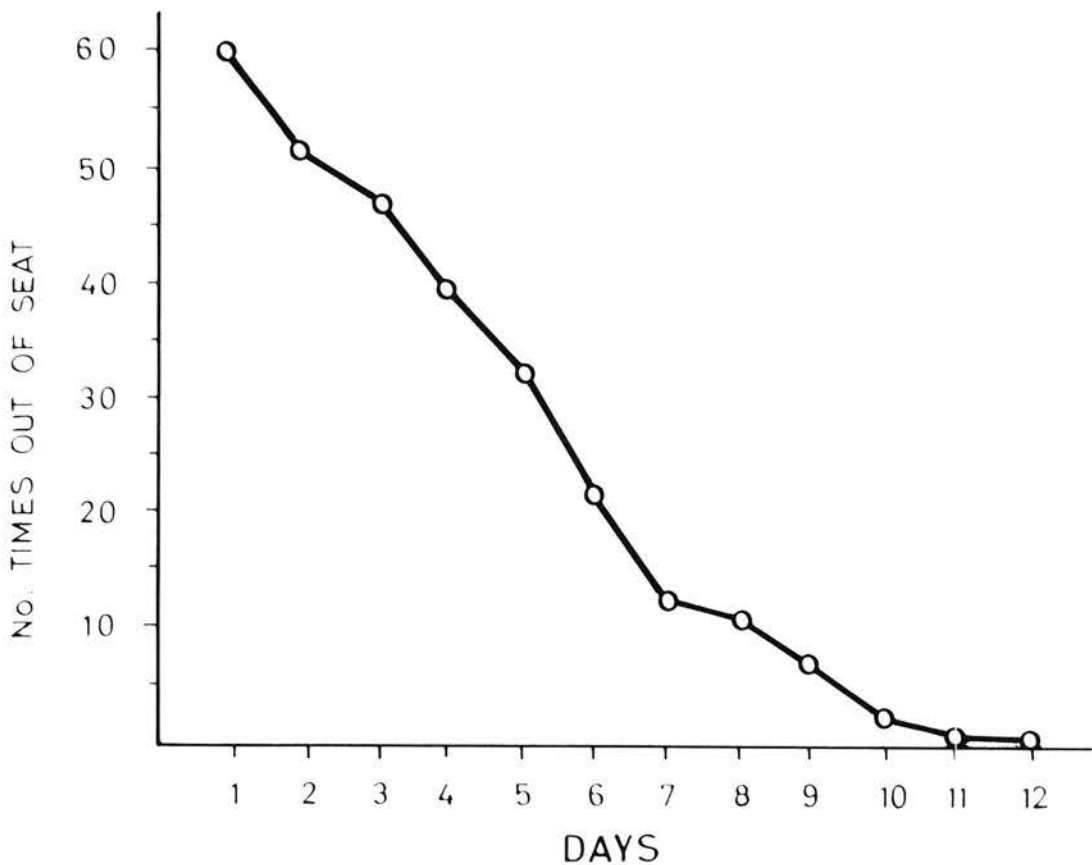
1. Delivered at the Training Course for Teachers of the Mentally Retarded, Kuala Lumpur, 28/11/74.

an hour so we might make an observation at the end of every 20 minute period.

It has already been stated that one of the purposes of recording behaviour is to provide an accurate assessment of the original rate of behavioural response so that we can better judge the effects of any intervention program. We refer to this as establishing the baseline. Thus, before any behaviour modification of temper tantrum behaviour can be carried out, we must know the exact number of tantrums now occurring must be known. By obtain-

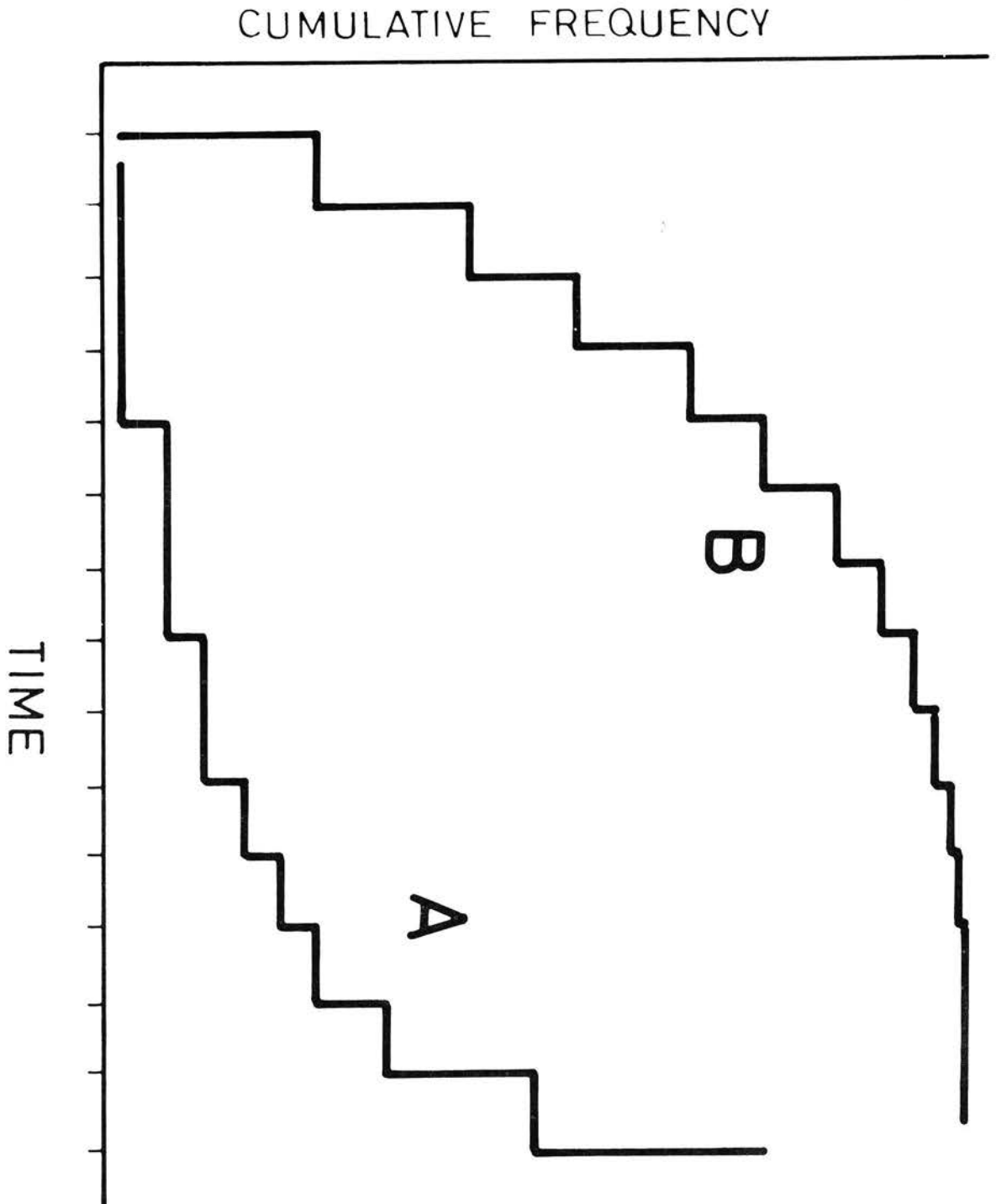
ing such a record it is possible to note when they occur, where they occur, and with whom they occur, all important bits of information if a successful intervention program is to be devised.

The significance of behavioural data is most easily appreciated when it is graphically displayed on standard graph paper. For example, if we are interested in knowing whether Billy's ability to stay in his seat during school is improving, we have only to look at the graph in Fig.1 below to note that definitely it has.



The noted behavioural researcher B.F. Skinner developed a recording technique which in certain situation improves upon the conventional graphing

technique. Cumulative recording involves the graphing by sequential time periods of the cumulative sum of behaviors (see Fig. 2). Thus, a progressively



accelerating curve (A) would tell us that the behaviour is increasing in rate of occurrence while a progressively decelerating curve (B) would tell us that the behavior is decreasing.

### Basic Principles

The fundamental principles of the behavioural approach is that behaviour is determined by its consequences. Such behaviour we call operant since the organism operates on the environment, and the environment operates on the behaviour and the behaving organism in turn. Thus operant behaviour is voluntary and may occur freely in the course of day to day activities. It is what happens subsequent to that behaviour, its consequences, that influences the probability that a response will increase or decrease in frequency in the future.

When the consequence of a behaviour increases the frequency or strength of a response, then that consequence is called a reinforcer. Reinforcers may take a variety of forms but their general effect is to reward behaviour. Food, money, praise, or a smile may all serve a reinforcing function. If the consequence of a behaviour is non rewarding, as in the case of punishment, or merely the cessation of reinforcement, then we would observe a reduction in the frequency or strength of the response. Such a phenomenon is called extinction. In the case of withdrawal of previous reinforcement, the extinction may be slow and gradual, whereas in the case of punishment, the extinction may be quite rapid and sudden.

Reinforcers that have an innate and immediate ability to "reward" behaviour are called primary reinforcers since they derive their ability to influence consequences through their satisfaction of basic biological needs. However, many reinforcers exist which have acquired the ability to reward behaviour through their repeated association with primary reinforcers, for example money, or praise. The ability of a reinforcer to influence behaviour depends upon a person's need or continued desire for the reinforcer. A hungry child will be more responsive to food as a reinforcer than will a child who is continually fed or satiated. Similarly, if a teacher praises her pupils continuously, the reinforcing value of her words may diminish unless varied with other forms of reinforcement. As in all forms of behaviour excessive repetition is boring, not rewarding.

While the giving of a reward is the most obvious way of reinforcing behaviour the taking away of a

punishment or something had can also have a 'reinforcing' effect. These consequences, called "negative reinforcement" are rewarding because "it feels so good" to stop feeling so bad. Such behaviour is quite common and can be seen daily on the nations highways. A police car passes a driver and he notes with satisfaction that he has avoided arrest by driving at the prescribed speed limit. Indeed, it can be said that most law abiding behaviour works on the principle of negative reinforcement, that is, it is rewarding to avoid punishment. At the same time this points out the drawback of negative reinforcement in that its use often leads to avoidant behaviour, e.g., we are rewarding people for not doing things rather than doing. A baby giving a smile when picked up by her father is a positive reinforcer for the father and leads to positive behaviour on his part. A child ceasing to cry when picked up by a parent is also reinforcing (negative) but can lead the parent to feel punished or angry and the baby to learn to cry in order to get attention.

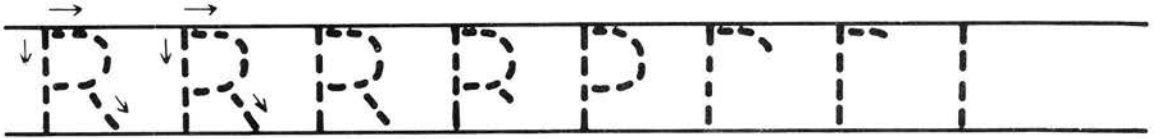
*Operant Conditioning.* Having an understanding of the principles by which the consequences of behaviour influence its future probability, the behaviour modifier is in a position to increase or decrease selected behaviours by a process of systematic arrangement or management of the consequences. This involves three steps:

1. defining the behaviour
2. determining the baseline level of the behaviour
3. delivering reinforcement following the behaviour to increase its frequency.

As a scientific check on whether or not the reinforcer actually caused the behavioural change, a fourth step can be added, called verification, or reversal. In this stage the original conditions (without reinforcement) are reintroduced to determine if the behaviour returns to its original baseline level. Of course, in many treatment conditions, such a test of the treatment procedure may be waived.

*Shaping.* When the desired behaviour is beyond the immediate capabilities of the child, it is often possible to gradually train a repertoire of more simple responses which increase in difficulty or demand, thereby progressively approximating the desired response. In a sense, shaping is merely operant conditioning where the baseline is progressively shifted upwards as our expectations regarding the child's performance increase. For example, we may reinforce non-disruptive behaviour in a child if he goes

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first only 5 minutes, then 10 minutes, then 20 minutes, etc. Gradually we "shape" his non-disruptive behaviour until he may be able to go an entire day, without annoying other children.

Since it is not always possible to have sufficient staff to provide on the spot reinforcement for a child's every desirable behaviour, systems for delayed reward have been developed, to be used especially with children where continuous supervision may not be required. Such systems, called token systems, work according to the same principles as monetary systems and have all the advantages and limitations e.g. inflation of monetary systems. In brief, the child performs a desired behaviour and as reinforcement, receives a token (poker chip, card, or similar "token") which can then be cashed or redeemed for some toy, sweet, or desired privilege. The system therefore provides greater flexibility in individualizing the reinforcement, provides a mechanism for delay of reinforcement, and enables the child to function increasingly independently.

**Punishment.** When the consequence of a behaviour is aversive and leads to a reduction in the response, then that consequence is called punishment. It cannot always be inferred that if a behaviour decreases rapidly following an aversive act, then the act is punishing. Punishment is generally quite effective in rapid response reduction, but not

without some potentially undesirable effects, leading some clinicians to advise against its use except in unusual circumstance (e.g. where a child's life or health may be in danger). Others disagree that punishment is always undesirable as a planned consequence, especially if the punishment itself is not extreme in its aversive effects, e.g. deprivation of a privilege.

## Training the Retarded

The principles outlined above are readily applied to the care and training of the retarded as evidence by the outstanding success of behaviour modification programs for the retarded child. Every successful program begins with *selecting the target behaviour*:

1. define the behaviour objectively and to specific
2. make certain the behaviour is relevant
3. make certain it is similar to something the child already does.

Care should also be exercised in the *selection of reinforcers*, especially since "one child's reinforcer may be another child's extinguisher". Individuals differ and tastes differ over time. As a general rule, watch the child play and determine what are his or her favourite toys, or sweets, or anything having a high degree of attractiveness. Have several alternative

reinforcers available in case he/she satiates on the original choice and vary the menu occasionally.

When *applying reinforcement* it should be remembered that behaviour will change if the child is reinforced:

1. only when the desired behaviour is performed
2. immediately following the behaviour, and
3. frequently when learning a new behaviour

*Shaping* programs are especially important in the training of the retarded since even the most basic social and self help skills must be trained in progressively approximated fashion. This has given rise to a series of behaviour *prompting* techniques which guide the child's initial response in the desired direction toward the behaviour goal. For example, the "fading" technique shown in Figure 3 is used to teach children to print.

Another variation on the *shaping* technique is *chaining*, where the child is taught a series of discrete steps which, if chained together lead to the successful completion of a target behaviour. For example, in learning to tie a shoelace, the child is first reinforced for putting on the shoe, then for pulling the strings with both hands, then for crossing the strings, then for looping one string about the other, etc.

The importance of record keeping and the techniques used by behaviourists for recording behaviour have already been discussed. It should be reiterated however, that record keeping is especially crucial in the training of the retarded. When we say "John is doing well" it is a far less meaningful statement as to his progress than if we were able to say "John is on step 6 of the dressing program and step 3 of the printing program." With this statement we know exactly where John is relative to his beginning performance, and therefore we know exactly how much progress he has made. Graphs or other displays are especially useful, not only for the rapidity with which they communicate information to the therapist, but also in terms of the feedback, and therefore, *reinforcement* they provide to the child. Nothing succeeds like success, and there is nothing more rewarding to a child than to see visible evidence of his/her progress.

In large part the benefit of behavioural approaches derives from the structure and guidelines provided to the teacher for the management of the retarded child. As any educator knows, it is relatively easy to teach a child, if you can get him to school, make him stay in his seat, and remain attentive and

well behaved for several hours. In most cases the retarded child is incapable of such standards. One teacher had considerable difficulty getting the children to behave in the bus on the way to school. She was becoming frantic as their behaviour grew increasingly riotous over the 50 block route to school. In desperation she sought advice with the usual challenge that accompanies such requests, "Well, I've a situation I'll bet your behaviour modification won't stop!" and she explained her dilemma. Actually the situation was quite straight-forward. Having *defined the behaviour* (disruptive noise) she was asked to make a note the following day as to how many blocks the children could go without making noise (*the baseline*). The following day she reported that "the little devils could not go more than 2 blocks without making a racket!" At this point, she was asked what the children would consider a special but inexpensive treat (*the reinforcer*). The reply as, of course, "sweets". The next step was to devise an appropriate *program*. It had to be easily administered by the teacher, be within the immediate capabilities of the children, and provide for a progressive *shaping* of their behaviour in the direction of the desired *criterion*, e.g. no disruptive noise for the duration of the trip. It was suggested that on the first day the teacher instruct the children that if they could be quiet for a distance of 3 blocks they would each receive a sweet. The next day she reported that the goal had been achieved without exception. The following day the children were required to go 5 blocks. Again success! The third day 10 blocks, and so on. Within a week the teacher was enjoying a rather quiet uneventful ride of 50 blocks each way for a total cost of a penny sweet per child per ride (*criterion success*). Within a few weeks she was able to reduce the reinforcement to 1/day and finally 1/week. By the end of the year, reinforcement was no longer required but the teacher wisely "surprised" her riders now and then with an occasional sweet. We have come to call these subsequent rewards "booster shots".

The same approach can be used to train a variety of skills to the retarded child from toilet training to show-lace tying, from dressing oneself, to feeding oneself. In the case of more borderline children it is an especially effective approach in the development of academic programmes.

The guidelines for the development of such programs are quite simple<sup>3</sup>:

1. Be specific in defining the target behaviour to be learned, e.g. "washing face and hands"

rather than "cleanliness".

2. Break the total behaviour down into as many discrete steps as necessary. Go through the behaviour yourself to determine the number of steps required.
3. Arrange the discrete steps in a logical sequence from the easiest to the most difficult, and so that each step prepares for doing the next.
4. Decide upon what criterion must be achieved before going on to the next step. How many successes, or how long to achieve success before you move on?

#### Putting on Dress<sup>4</sup>

1. For the dress on child stopping just below the chest (Hold the garment in position, then give the direction "Susie, dress down")
2. Put dress on child, stopping just above the chest.
3. Put dress on child stopping at top of child's head (child pulls it over and down).
4. Put dress on child, stopping at elbows
5. Put dress on child stopping at wrist
6. Hand the dress to the child

#### Putting on Shoes<sup>4</sup>

1. Place shoe just off edge of heel (Direction, "John, put shoe on")
2. Place shoe on up to the arch
3. Place shoe on at ball of foot
4. Place shoe at toes
5. Place shoe next to child's foot

The behavioural approach has been proven to be of significant value in increasing the effectiveness of treatment programs for the mentally retarded. Retarded children can be taught new skills and the behavioural approach has provided the special education teacher with the means for accomplishing this worthwhile goal.

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