Unit 5 Learning Activity:

The Use of Reversal Designs for Functional Analysis

We often identify behaviors that we want to change, either in ourselves or others. Many times behavioral issues are significant enough that the services of a Board Certified Behavior Analyst (BCBA) are requested to address the issue. In many instances, a Board Certified Assistant Behavior Analyst (BCaBA), under the supervision of a BCBA, will provide direct services with the goal of assessing the problem and developing an appropriate intervention. In either case, the goal is to decrease the behavior concerned.

So what’s the routine? The BCBA or BCaBA comes out. He or she conducts an assessment through indirect methods (interview client/others, review prior data/records) as well as direct methods (direct observation, recording observed responses/conditions, coordination of observation by others). Based on these indirect and direct assessment methods, a hypothesis regarding the function of the behavior is established and behavior intervention strategies are developed to teach appropriate replacement behaviors that serve the same function as the behaviors targeted for reduction. Then everyone lives happily ever after, correct?

Any BCBA or BCaBA who has developed interventions to address problems has been in the position of swallowing his or her pride and re-evaluating where the assessment went wrong in search of a more effective solution to the problem. If not, then he or she has only developed one intervention, and we will chalk it up to “beginner’s luck.” That being said, the question becomes: Why do our interventions fail? Here are some typical answers to that question:

* The data that was collected was inaccurate.
* No one is implementing the behavior plan consistently.
* There are too many changes to the individual’s environment. Everyone continues to reinforce the inappropriate behavior.

You get the point. In many instances, the BCBA or BCaBA is very reluctant to concede that the intervention might be ineffective. But how could this be so? mean, an elaborate functional behavioral assessment was conducted to narrow down the probable function of the behavior. The key word here is “probable.” This term, though convincing, leaves some room for doubt.

A method of verifying the effectiveness of an intervention that leaves little room for doubt is functional analysis. In a functional analysis, antecedents and consequences representing those in the person’s natural environment are arranged so that their separate effects on problem behavior can be observed and measured (Cooper, Heron, & Heward, 2007). In other words, in functional analysis, the antecedents and consequences are manipulated in an effort to test the hypothesis that they are indeed related to the occurrence of the problem behavior. This is not to be confused with functional assessment, which does not involve the manipulation of antecedents and consequences. Functional behavioral assessment can be thought of in terms of hypothesis development, while functional analysis can be thought of as hypothesis testing.

Hypothesis testing is rarely involved in the practice of ABA because of the time considerations for treatment and the practicality of doing this with more severe behavioral problems. Brief functional analysis has been incorporated more and more to ensure the accuracy of selected interventions. One means by which a functional analysis can be conducted is by employing a reversal design.

Reversal designs require at least three phases: initial baseline, in which the intervention is absent; an intervention phase, in which the intervention is introduced; and a return to baseline accompanied by a withdrawal of the intervention (Cooper et al., 2007). This sequence is often referred to as A (baseline) – B

(Intervention) – A (baseline) and is generally called an A-B-A design. When the intervention is withdrawn and the second baseline phase is re-started, the behavior is observed (usually by a graph) to determine the effects of the intervention on the behavior. It is through this means that a functional analysis is conducted to verify whether or not it was the intervention that was responsible for the change, not other potential influences.

For the current learning activity, you are to read an article from the behavior analysis literature that demonstrates the use of the A-B-A design to conduct a functional analysis in a general education setting. Please access the following article by clicking on the link below:

Ishuin, T. (2009). Linking brief functional analysis to intervention design in general education settings. *The*

*Behavior Analyst Today*, *10(1)*, 47–53. Retrieved on September 6, 2014 from <http://files.eric.ed.gov/fulltext/EJ862243.pdf>After reading the article, answer the following questions:

1. Why was a reversal design used for the current study? Be sure to include a discussion of the antecedents and consequences related to the behavior of the participant in the study.

A-B-A design can simply be defined as having to return to the baseline. This comes up when the research while in the middle of research gets to find out that the experiment has an extraneous variable and thus is forced to go back to the baseline. According to the case scenario that involved Michael the ABA or the reversal design was used due to some several reasons. One of the major reason that the study used the reversal design was that it provided different results depending on which variable that was used.

The different variables that were used included attention, play, and escape. Attention was the most responsive variable amongst the three and ones it was removed the behavior would reduce. On the other hand, when attention was brought back to the equation, the consequences were that the behavior would gradually increase. The antecedents that preceded the experiment were different with and without the variable. However, it was not that high as when it was compared with the attention phase (Cooper, Heron, Heward, 2007). About the design used which was the reversal design, results showed that the target behavior would drastically decrease in instances where attention was removed.

1. Did the results of the functional analysis conducted in the study support the original hypothesis of the function of noncompliance? Why or why not?

In the case scenario involving Michael, the reverse design was used to assess the presence of a functional relationship between the two behaviors. These behaviors were those of non-compliance and reinforcement which was attention according to Michael's case. During the escape phase, Michael tended to show some behaviors of non-compliance. However, it was not that high as when it was compared with the attention phase. About the design used which was the reversal design, results showed that the target behavior would drastically decrease in instances where attention was removed. On the other hand when attention was returned there would be an increase in the target behavior been experimented.

Unanimously one can argue that the results of the functional study conducted supported the original hypothesis of the function of non-compliance. The results indicated that they were so because of the attention that was being injected into the process. According to the graph that has been presented in the case study one can view that attention was recorded to be high followed by escape and then play. The graph also depicted that the behavior problem would occur mostly with the presence of attention (Ishuin, 2009). When attention would be removed from the equation, the problem behavior would reduce drastically.

There would those behaviors which would not be appropriate with the reverse design. Some examples would be that behavior which can cause self-injury or those that are aggressive. The main reason for this would be the ethical standards that would arise in the event of the removal of an intervention. It is also worth noting the presence of a provision that one can do more than one sessions. However, the personal recommendation would be to search for an alternative method in case the first one fails.

1. What do you think are some examples of behaviors in which a reversal design would not be advised, and why?

A reversal design can be defined as an experimental approach through which researchers use for the verification of the effects of an independent variable by having to eliminate it. However, there are examples of behaviors that the design would not be advised for. One of the behaviors is that of irreversibility and the educational system. The design as explained assesses the effects of the independent variables in a quick and faster way. However, it does not provide for the observation of the other experimental effects that may arise as a result of the changes and alterations.

Another behavior that the design does not advise for is that of the usage of it with some different variables that have some permanent effects. A reason for this is because it would be hard or even not possible to return to the baseline condition. If one uses the behavior of using the design with other different variables it gives space for being vulnerable and or all the effects that may be brought by the sequence (Cooper, Heron, Heward, 2007). Additionally, this would not allow the observers or the researchers to see the effects brought about by the independent variable for the behaviors that are targeted by the experiment.

It is advisable to note that on every occasion that behavior tends to be unchangeable, the effects may become continuous up until the cure is removed. Again if the behaviors are unchangeable in the reversal design, it also becomes non-educative and non-desirable for that behavior to go back to the baseline levels as expected. Lastly, the behavior of removing the reversal design especially at that moment when it is working properly is not advisable. One of the reasons as to why this is so because it would be unethical for not using it and yet it is the ultimate solution at the moment.

Reference

Cooper, J. O., Heron, T. E., & Heward, W. L. (2007). *Applied Behavior Analysis* (2nd ed.). Upper Saddle River, NJ: Pearson.

Ishuin, T. (2009). Linking brief functional analysis to intervention design in general education settings. The

Behavior Analyst Today, 10(1), 47–53. Retrieved on September 6, 2014 from <http://files.eric.ed.gov/fulltext/EJ862243.pdf>