

# Creating Lasting Behavioral Change through the Generalization Analysis Worksheet

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The goal of any behavioral program is to facilitate lasting change. A significant criticism of behavioral programs is that they work in the clinical setting but do not generalize once the clinical program is stopped. The authors suggest that behavioral programs often do not generalize because clinicians fail to plan for generalization to occur (Maag, 2004). A technology for planning and facilitating generalization has been in existence since the 1970's (Stokes and Baer, 1977, Stokes and Osnes, 1986 and Stokes and Osnes, 1989). The authors have created a form to prompt clinicians and researchers to systematically plan for generalization as part of their behavioral programming. A case study is given to demonstrate how the form can be used to increase the probability of behavioral changes transferring to other settings and maintaining over time. The Generalization Analysis Worksheet is designed to assure that clinicians and researchers program for generalization as part of any behavioral program they design. If the technology suggested by Stokes and Baer, 1977, Stokes and Osnes, 1986 and Stokes and Osnes, 1989 is routinely programmed into behavioral programs, behaviorists may finally be able to answer the criticism that behavioral programs do not generalize.

Children's behavior and academic achievement are closely linked (Algozzine, Wang, & Violette, 2010), children whose behavior interferes with their learning and social development are one of the most frequent referrals to school specialists (Bramlett, Murphy, Johnson, Wallingsford, & Hall, 2002; Chalfant & Van Dusen Pysh, 1989). Often these children are referred to a behavioral specialist, whose job is to help the classroom teacher create a behavioral management plan. The first step in this process is to help the child, through behavioral change techniques, to stop an interfering behavior and to replace it with a more appropriate behavior. The next step is to help the child to generalize the behavior, which was learned in a specific time and place, across settings and time. This paper focuses on this second step, which is often overlooked (Rutherford & Nelson, 1988), and presents strategies to generalize behavior through the use of the "Generalization Analysis Worksheet" (Appendix A). Generalization processes must be planned from the start of any behavior plan (Miltenberger, 2008; Maag, 2004), and unless they are, the initial success in changing behavior is often not maintained (Schloss & Smith, 1998). One of the most comprehensive models for facilitating the generalization of behavior was put forth by Stokes and Osnes (1989), who refined the generalization classification of Stokes and Baer (1977) and Stokes and Osnes (1986). Stokes and Osnes (1989) identified 12 strategies that behavioral research has shown to promote generalization. To prompt the use of these strategies we have operationalized them through the development of a worksheet that helps prompt behavioral change. To facilitate long-term behavioral change (generalization), we propose the use of this Generalization Analysis Worksheet. The first part of the paper describes each of the strategies and how they relate to the generalization of behavioral change in the schools, and the second part of the paper presents a case example that uses the worksheet.

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### GENERALIZATION STRATEGIES

Stokes and Osnes (1989) presented a comprehensive model of generalization that included 12 strategies that support generalization. These strategies are as follows:

1. *Use the normal consequences or rewards that already exist in the child's environment.* One needs to directly teach behaviors that are likely to come into contact with reinforcers (consequences) in the school or home. These are naturally occurring reinforcers that do not need to be programmed and include teacher attention, peer attention, and reward systems already in place. These can be used to generalize behavior if the behavior is similar to that which normally triggers the natural reinforcers. To identify the naturally occurring reinforcers that maintain the target behavior, one needs to observe the environment in which the behavior is to be generalized (e.g., home, school, classroom, playground, 5th period). For example, the classroom reward system that is already in place can be used as the reward system for training of the new behavior. Even if one's preliminary efforts include other rewards, one needs to include the existing classroom behavior system as part of the overall program. Another example is using a teacher's preferences for particular student behavior. One way to improve the child's relationship with the teacher and, consequently, his or her overall classroom behavior, is to determine which behaviors or characteristics the teacher naturally reinforces and to work on developing these behaviors as part of the overall behavior plan.
2. *Teach students to purposely request/recruit the natural reinforcers in the classroom, community, or home.* Sometimes teachers overlook the initial attempts at behaviors that are being intentionally taught to the student. This may be because the student's behavior is not yet frequent enough or the skill is not yet sufficiently developed. Generalization can be fostered by attention being brought to a student's newly learned behavior, which triggers the natural reinforcers present. For example, a student can be shown how to self-monitor his or her work accuracy, work productivity, or new positive behavior and then share the data with the teacher. Grids, charts, and checklists can be used to highlight the student's work and enable the teacher to pay more attention to it. Additionally, a student can be encouraged to ask for feedback from teachers: "How is this?" "Am I doing this right?"
3. *Eliminate behavior that may be a roadblock to generalization of the new behavior.* One needs to determine which, if any, reinforcers are maintaining the inappropriate behaviors. These could include teacher or peer attention or escape from activities that are not reinforcing. Then, it is important to determine ways of at least temporarily reducing or eliminating these reinforcers until the new behavior has a chance to take hold. For example, the teacher may reinforce the other children in the classroom for not reacting to (laughing at, commenting on) student's disruptive comments or outbursts, while at the same time reinforcing each occurrence of cooperative or attentive behavior. The teacher can make the student's academic work easier as a means to prevent the student from acting up, while at the same time reinforcing completion of the modified assignments.
4. *Reinforce any occurrence of generalization.* Teachers and other staff who work with the student need to reinforce the desired behavior even if it is not "perfect." For example, the special day class teacher can remind his or her instructional assistants to comment, "You paid attention!" each time they see the student, who is learning to follow directions, respond to a direction given by a staff member.
5. *Train the behavior across as many settings/environments/staff/teachers as possible.* The more the student practices the behavior in different settings, the more staff will request and reinforce the behavior and the more likely that the student will maintain the behavior. For example, when children are learning appropriate playground behavior, it is important that all of the playground supervisors become involved in the training process. At first, the new behavior may be taught with the help and monitoring of one supervisor, but as time goes on, all supervisors should be involved in the expectation of a particular behavior, including the uniform prompting and reinforcement of it.

6. *Devise ways that the people in the environment in which the behavior occurs respond to the new behavior such that the child recognizes that his or her behavior elicits a range of positive responses.* Behavior that is reinforced by a range of responses in the environment will be maintained more readily. Some staff may respond with a pat on the back and a smile, others may state, “What a good job!” while still others may bring the child’s positive behavior to the attention of family or peers.
7. *Teach the new behavior in various settings.* It is helpful to teach at different times of the day, with different children in the class, and in various classrooms. For example, once a student is proficient in a self-monitoring intervention (charting) for attentional problems in his or her classroom, he or she should be encouraged to use the same procedures in assemblies, at home, on field trips, and in other settings.
8. *Make consequences less predictable.* Once the new behavior is consistent, it is important to change the reinforcement schedule, particularly in terms of frequency and intensity. For example, after teaching a child to keep track of his or her homework by checking it each night and praising the child for his or her efforts, one can later switch to checking it every other night and then just weekly. As another example, once one has a high rate of attending to tasks in the child’s reading group by verbal reinforcement of each attentive response, then one can reduce the frequency of verbal reinforcement to every third time.
9. *Incorporate into the behavior change program, physical settings, or items common to the natural environments.* When possible, one should teach new behaviors in the setting in which they are expected to occur naturally. The child will associate the behavior with the setting and be more inclined to behave appropriately when he or she is in that setting in the future. If one is not able to use the natural setting, then one should try to make the training setting look as much like the natural setting as possible.
10. *Include common (to the natural setting) social cues in the behavior plan.* One should include important persons from the generalization setting (i.e., peers, teachers, parents) into the training. If those people with whom the child would normally come into contact are included in the training sessions, the child is more likely to extend the new behavior to those settings in which he or she encounters them again.
11. *Provide the child with a physical prompt that will remind or guide him or her in performing the behaviors in the natural environment.* For example, a child who is working on controlling angry outbursts may learn to generalize his or her newly learned control by using a business-card-sized reminder with “stop and think” printed on it that the child keeps in his or her pocket.
12. *Include in the behavior training verbal cues that the child can give him or herself in the new situation.* For example, one should provide the child with a self-talk script that will remind him or her of what the child is to do. For example, a child who gets anxious and consequently refuses to attempt tests can be trained to “talk” him or herself through the relaxation procedures that were taught to the child in the school psychologist’s office. A child who overreacts to teasing on the playground can be taught to “count to ten” before he or she responds.

### CASE EXAMPLE

This section presents a case example (taken from the case files of the second author) of how a comprehensive plan to facilitate generalization can be developed through the use of a Generalization Analysis Worksheet. The case example includes a statement of the problem, followed by a completed behavioral change plan. The behavioral change plan incorporates the components of generalization identified in the Generalization Analysis Worksheet. The number of each component incorporated from the worksheet is noted in parentheses following each relevant component.

John is an 11-year-old student who has been diagnosed with ADHD and qualifies for participation in a gifted educational program. He was referred to the Student Study Team (SST) because he frequently interrupts his teacher in an aggressive or rude manner, questioning the accuracy of the teacher's comments (even though his observations are often correct). The teacher has developed resentment of his style of questioning. The SST team has chosen to target his questioning style for modification. They do not want to decrease John's questioning of inaccurate information; rather, they want to teach John how to ask questions in a diplomatic manner. The student does not see why he needs to change his behavior and becomes argumentative when reprimanded by the teacher for his rudeness.

The SST decided that, if John does not change his behavior, he would have poor relationships with teachers and peers, causing John to be rejected. Indeed, reports from the teacher confirmed that peers were avoiding John and that teachers often complained about him. The SST completed the Generalization Analysis Worksheet as part of their treatment planning.

The plan (Figure 1) was constructed with the following considerations to enhance the likelihood that the new behavior would generalize to the natural environment. The team first generated a list of diplomatic phrases (e.g., "I've heard that," "I've read that," "I could be wrong, but") that could be used to precede any question asked by John and which served as an alternative to John's rude phrase (1). The phrases chosen are likely to elicit a positive response from teachers. To ensure that teachers noticed, John was taught to praise the teachers for acknowledging him (2). Initially, John was not motivated to change his rude questioning behavior because he was reinforced by the interaction with the teacher, as a result of correcting or arguing with the teacher. To decrease the payoff for rudeness, his teachers were taught not to reinforce him by arguing with him and to use a consistent time out for rude behavior (3). In addition, the teachers were taught to reinforce, through praise and points on a simple daily report card turned in at the end of the day, any examples of John using diplomatic questions (4). All teachers and instructional aides were informed of the program and multiple teachers were included in the training sessions (5).

A series of visual prompts was created to help John to use the diplomatic phrases. This included laminating a sheet of paper with the phrases for John to place on his desk and in his notebook. Visual prompts also were placed around the room so that when John or the teacher saw them, it reminded them of the program that was in place (7, 11). John was taught multiple diplomatic responses to shape the use of diplomatic questions as a class of behaviors, rather than as a discrete response. Schedules of reinforcement were developed to systematically shape the consistent use of diplomatic questioning that was resistant to extinction. As part of their reinforcement plan, a systematic set of criteria was developed to prompt changing from a fixed schedule of reinforcement to an intermittent schedule of reinforcement (8).

First, John was reinforced for every incidence in which he used the diplomatic phrases preceding a question. Once he was able to use diplomatic sentences for an average of 90% over a 10-day period, the schedule of reinforcement was changed to every other incidence of using a diplomatic phrase. Once again, when John was able to use diplomatic phrases for an average of 90%, reinforcement was changed to a variable schedule in which he was reinforced on the average of every third use of a diplomatic phrase. Training took place in several classrooms where John attended classes (9) and with selected students and teachers (10). During the session, John was taught self-mediated verbal prompts to ask questions in a diplomatic style and to self-reinforce for following through on his verbal prompt (12).

### **SUMMARY**

The research reviews of Stokes and Baer (1977) and Rutherford and Nelson (1988) have highlighted the need for and lack of generalization planning in behavioral interventions. This is in spite of the fact that Stokes, Osnes and Baer presented a technology for facilitating generalization in the 1970's and 80's. The present authors proposed a simple 12-strategy worksheet process that prompts behavioral change professionals to program the components of generalization into their behavior plans. As shown in the case study the application of these basic principles mediates long term retention of the learned behavior. They should become a routine step in planning for lasting behavior change. Until behavioral therapists routinely act on the recommendations of Stokes, Osnes and Baer we are not likely to answer the criticism that behavioral interventions do not generalize.

**Figure 1.** *Generalization analysis worksheet.*

Consultant: Ron Kotkin

Child: John

Date: July 20

Target Behavior: Questioning the teacher in a rude and aggressive manner

Strategy	Plan
1. <div style="border: 1px solid black; padding: 5px;">Connect behavior to the natural consequences.</div>	Teach diplomatic verbal statements likely to be positively perceived and reinforced by teachers.
2. <div style="border: 1px solid black; padding: 5px;">Teach the child to “go after” the natural consequences.</div>	Have the student track his use of tactful questions and share with the teacher. Train the student to praise the teacher for answering his question.
3. <div style="border: 1px solid black; padding: 5px;">At least temporarily, stop the reinforcement for inappropriate behaviors.</div>	Train teachers to give the student a timeout for rudeness.
4. <div style="border: 1px solid black; padding: 5px;">Aggressively reinforce any occurrence of generalization.</div>	Train all teachers to reinforce the student, through praise and points on a daily report card, for asking a question in a diplomatic manner, using one of the pivotal phrases taught to the student.
5. <div style="border: 1px solid black; padding: 5px;">Train in multiple settings with multiple trainers.</div>	Train in the multiple settings and with a sampling of teachers and peers from the natural setting.
6. <div style="border: 1px solid black; padding: 5px;">Create multiple responses to the behavior.</div>	Develop a range of responses that teachers and support staff could use in response to the student’s appropriate questions.
7. <div style="border: 1px solid black; padding: 5px;">Vary the antecedents (settings/circumstances) of the behavior training as much as possible.</div>	Use multiple visual prompts, such as pivotal sentences taped to the student’s desk or posted in his organizer. In addition, visual prompts could be placed on the wall so that when the student or teacher sees the prompt, each is reminded of the program in place.
8. <div style="border: 1px solid black; padding: 5px;">Vary the schedule and intensity of consequences.</div>	Set criteria for moving to an intermittent schedule of reinforcement based on the student’s successful use of diplomatic questions, reinforced by a more regular schedule.
9. <div style="border: 1px solid black; padding: 5px;">Incorporate the “look” of the natural environment in the training.</div>	Train in a classroom that is similar to the classrooms the student will be attending.
10. <div style="border: 1px solid black; padding: 5px;">Incorporate relevant people in the training.</div>	Bring teachers and peers into the training sessions to role-play the use of pivotal phrases in questioning teachers and peers.
11. <div style="border: 1px solid black; padding: 5px;">Incorporate a tangible prompt/reminder that he can take with him.</div>	Create a laminated sheet with pivotal sentences that the student can put on his desk at the beginning of a class period to remind him to use diplomatic questions. He also can have them taped to the inside of his organizer.
12. <div style="border: 1px solid black; padding: 5px;">Incorporate self-mediated verbal reminders/prompts.</div>	Teach the student self-talk to prompt and reinforce himself for using diplomatic questions. For example, “Ask in a nice way,” “See, he/she answered my question.”

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*Dr Kotkin is currently professor Emeritus at the University of California, Irvine. He served for twenty-six years as a Professor in the Department of Pediatrics and Director of the University of California at Irvine, Child Development Center Day Treatment Program for children with Attention Deficit Hyperactivity Disorder. He has been a special education teacher at the elementary school level. He is also a licensed clinical psychologist in the state of California. Dr. Kotkin previously served as a professor of special education. In addition, he is a consultant to school districts in developing individual and School Wide Behavior Interventions. Dr. Kotkin has published multiple articles and chapters on school-based intervention and has co-edited a book *Therapist's Guide to Learning and Attention Disorders*, with Aubrey Fine. He also developed the Irvine Paraprofessional Program, which was recognized by the Kentucky Federal Resource Center as a "promising practice" for intervening with students with ADHD in the general education classroom. He was also presented an award, with Jim Swanson and Steve Simpson by CHADD (*Children and Adults with Attention Deficit/Hyperactivity Disorder*) for development of the most innovative program in the country for serving children with ADHD in the general education classroom. He has been a presenter at many international and national conferences and also contributed his expertise to a major National Institute of Mental Health (NIMH) study on long term treatment effects of children with Attention Deficit Disorder. Dr. Kotkin is also on the Professional Advisory Board for CHADD.*

## REFERENCES

- Algozzine, B., Wang, C. & Violette, A.S. Reexamining the relationship between academic behavior and social behavior. *Journal of Positive Behavior Interventions*. Prepublished August 26, 2010. DOI: 10.1177/10983007093359084.
- Bramlett, R.K., Murphy, J.J., Johnson, J., Wallingsford, L., Hall, J.D. (2002). Contemporary practices in school psychology: A national survey of roles and referral problems. *Psychology in the Schools*, 39 (3), 327-335.
- Chalfant, J.C., & Van Dusen Pysh, M. (1989). Teacher assistance teams: Five descriptive studies on 96 teams. *Remedial and Special Education*, 10(6), 49-58.
- Maag, J.W. (2004). Behavior Management from Theoretical Implications to Practical Applications. Wadsworth.
- Miltenberger, R.G. (2008). *Behavior modification: Principles and procedures* (4th ed.). Belmont, CA: Wadsworth/Thomson Learning.
- Rutherford, R.B., & Nelson, C.M. (1988). Generalization and maintenance of treatment effects. In J.C. Witt, S.N. Elliot & F.M. Gresham (Eds.), *Handbook of behavior therapy in education* (pp. 277-324). New York: Plenum Press.
- Schloss, P.J., & Smith, M.A. (1998). *Applied behavior analysis in the classroom*. Boston: Allyn and Bacon
- Stokes, T.F., & Baer, D.M. (1977). An implicit technology of generalization. *Journal of Applied Behavior Analysis*, 10(2), 349-367.
- Stokes, T.F., & Osnes, P.G. (1986). Programming the generalization of children's social behavior. In P.S. Strain, M.J. Guralnick & H.M. Walker (Eds.), *Children's social behavior* (pp. 407-443). Orlando, FL: Academic Press.
- Stokes, T.F., & Osnes, P.G. (1989). An operant pursuit of generalization. *Behavior Therapy*, 20, 337-355.

### APPENDIX A

### Generalization Analysis Worksheet

Consultant: \_\_\_\_\_ Child: \_\_\_\_\_ Date: \_\_\_\_\_

Target Behavior: \_\_\_\_\_

Strategy

Plan

1. 

Connect behavior to the natural consequences.

 → \_\_\_\_\_  
\_\_\_\_\_
2. 

Teach the child to “go after” the natural consequences.

 → \_\_\_\_\_  
\_\_\_\_\_
3. 

At least temporarily, stop the reinforcement for inappropriate behaviors.

 → \_\_\_\_\_  
\_\_\_\_\_
4. 

Aggressively reinforce any occurrence of generalization.

 → \_\_\_\_\_  
\_\_\_\_\_
5. 

Train in multiple settings with multiple trainers.

 → \_\_\_\_\_  
\_\_\_\_\_
6. 

Create multiple responses to the behavior.

 → \_\_\_\_\_  
\_\_\_\_\_
7. 

Vary the antecedents of the behaviors as much as possible.

 → \_\_\_\_\_  
\_\_\_\_\_
8. 

Vary the schedule and intensity of consequences.

 → \_\_\_\_\_  
\_\_\_\_\_
9. 

Incorporate the “look” of the natural environment in the training.

 → \_\_\_\_\_  
\_\_\_\_\_
10. 

Incorporate relevant people in the training.

 → \_\_\_\_\_  
\_\_\_\_\_
11. 

Incorporate a tangible prompt/reminder that he can take with him.

 → \_\_\_\_\_  
\_\_\_\_\_
12. 

Incorporate self-mediated verbal reminders/prompts.

 → \_\_\_\_\_  
\_\_\_\_\_